STEM Astronomy
Judging Sunday, July 25; 1:00 p.m.

1. Limit 1 entry.
2. Refer to Rules & Regs on pages 4-6.
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 exhibitor is required to complete the “4-H STEM Astronomy Information Form, which is available at: www.STEM4KS.com. This form must be attached to the outside of a 10” x 13” manila envelope. You must 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 those exhibits.
6. Two photographs showing telescope construction and operation are required. Photographs should be mounted on one side of an 8 1/2” x 11” page. A brief caption should accompany each photograph. Place photos in the 10” x 13” manila envelope.
7. The telescope must be properly assembled and painted with a smooth and uniform finish. Decals, if used, should be attached smooth and tight.
8. Telescopes designed by the exhibitor must be original, not a modification of an existing kit.
9. Exhibitor’s name, county, age, and year(s) in project must be tagged or labeled in a prominent location on the telescope.
10. If a safety violation is noted by the judges, superintendent, or other staff, the exhibit, at judge’s discretion will receive a participation ribbon.

4115 Educational Exhibit

4202 Beginning Diorama: 2 architectural features beyond floors, ceilings, and walls.
4203 Advanced Diorama: 3 or more architectural features beyond floors, ceilings, and walls, plus 1 or more motion elements.
4204 Building Creations

STEM Computers
Judging Sunday, July 25; 1:00 p.m.

1. Limit 1 entry.
2. Refer to Rules & Regs on pages 4-6.
3. Exhibitor’s name, county, age, and year(s) in project must be tagged or labeled in a prominent location on the exhibit, educational display, notebook, and/or poster.
4. If a safety violation is noted by the judges, superintendent, or other staff, the exhibit, at judge’s discretion will receive a participation ribbon.
5. Exhibitor must 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 required.
6. For more details on Computer System rules and guidelines, please refer to the Kansas State Fair 4-H Exhibitor Handbook.
7. For all STEM Educational Exhibits, see rules on page 29.

STEM Robotics
Judging Sunday, July 25; 1:00 p.m.

1. Limit 1 entry per class, max. of 2 entries, per division.
2. Refer to Rules & Regs on pages 4-6.
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 contain (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. For all STEM Educational Exhibits, see rules on page 29.

STEM: Rocketry
Judging Sunday, July 25; 1:00 p.m.

Rocket Launch Tuesday, July 27; 3:00 p.m. WHS Football Field

1. Limit 1 entry per class, max. of 2 entries, per division.
2. Refer to Rules & Regs on pages 4-6.
3. All rocket exhibited must be constructed during the current 4-H year.
4. If a rocket qualifies 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.
5. If two rockets are entered, one rocket must be a “model rocket kit” and the second may be entered into any other applicable class. An exhibitor may not enter two rockets in the same class.
6. 4-Hers are to complete and sign the rocketry information form, available from www.STEM4KS.com and attach it to a 10” x 13” 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, modifications made to the rocket, additional page for altitude calculations if the space on the form is not enough. Additionally, original design rockets need to include: up to 5 additional pages of photos and documentation of how the rocket was tested for stability.
7. Rockets are displayed upright on a display stand with a sturdy rod that does not extend past the top of the rocket or stand, 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 a 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. Angles of fins must fall within a plus or minus 2 degree variation using an approved fin alignment guide (KSSTAC10). An official fin guide is available from www.STEM4KS.com.
11. 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.
12. Fins and launch lugs are to be filleted to reduce drag and properly secure them to the model.
13. Engine mounts are to be securely attached to the body tube and any seams or plastic parts are to be sand ed smooth.
14. The recovery system (typically a parachute or streamer) should be attached according to the instructions and the nose cone is to fit snugly, but still allow for easy removal.
15. Exhibits must be uniformly painted and smoothly finished or finished as per rocket instructions and decals, if used, are applied smoothly.
16. Scale models are to be finished and completed with a majority of decals (greater than 70%).
17. Original design rockets, must be designed by exhibitor; who is 11 years or older, cannot be a modification of a pre-existing kit and must be of original design.
18. 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.
19. Rockets that use more than one ‘D’ engine or equivalent are considered mid or high power rockets and may only be exhibited by youth 14 and up who hold a membership in either NAR or Tripoli organizations. A high power information form is to be completed and placed inside of the information packet.
20. Models may not be judged based on their paint scheme, with the exception of rockets that fit the definition of a scale model. They may be judged based on the paint scheme.
21. For all STEM Educational Exhibits, see rules on page 29.

ALL 4-H PROJECTS MUST BE PRE-ENTERED THROUGH FAIRENTRY BY THE FIRST FRIDAY IN JULY.

OPEN CLASS PRE-ENTRY IS PREFERRED.

4125 Robot from kit
4126 Robot designed by exhibitor
4127 Programmable robot made from kit
4128 Robot designed & constructed by exhibitor
4129 Junk Drawer Robotics
4130 Team Robot designed by 2 or more exhibitors
4131 Educational Exhibit

4208 Robot made from kit
4209 Robot designed by exhibitor
4210 Educational Exhibit