COMPUTERS

Computer Systems
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.

1. The 4-H members must be currently enrolled in the 4-H STEM – Computers project to exhibit in this division.
2. Exhibit must have been completed during the current 4-H year.
3. 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.
4. See the last section for full details about exhibiting posters, display boards and notebooks.
5. 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 STEM 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:
   1. 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
   2. 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 STEM 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:
   1. A manila envelope with the Computer Exhibit Form attached to the front, this form can be downloaded at www.STEM4KS.com.
   2. 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.
   3. 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.
   4. 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.
   1. The “4-H Engineer’s Journal” should start with a dated entry describing what the 4-H member is trying to accomplish/build.
   2. 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).
   3. 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.
   4. Pictures can also be included in the “4-H Engineer’s Journal” but should not be more than 50% of the entries.
   5. The “4-H Engineer’s Journal” should contain at least one graphic.
   6. The “4-H Engineer’s Journal” must be at least 3 pages in length.
   7. An example of a “4-H Engineer’s Journal” can be found at www.STEM4KS.com.
   8. 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.

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11. 4-H’ers must bring a computer that will run their project to the fair for judging. Operating instructions are still required. 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.STEM4KS.com.

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

13. 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.

14. 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.

15. 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.

16. Judging will be based on a score sheet which can be found at www.STEM4KS.com. There are four (4) areas each exhibit will be judged on. They are:
   1. 4-H Engineers Journal (what I learned to make it work), 50% overall score
   2. Instructions (how I help others make it work), 25% overall score
   3. Functionality (does it work), 12% overall score
   4. Diagrams (and code if applicable) (how I think it works), 13% overall score

**Division – Computer Systems**

**Class - 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.’)

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

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

**Class - 5593** - Networked system consisting of two or more computers

**Class - 5594** - Chip system- a small (4 8"X4 8"X4 8") programmed physical device that accomplishes a specific task