

## SCIENCE, ENGINEERING & TECHNOLOGY DEPARTMENT H

*\*Denotes entries not eligible for State Fair*

### General Information:

The name and county of each exhibitor should appear separately on the back of each board, poster, or article, and on the front cover of the notebooks so owner of the exhibit may be identified if the entry tag is separated from the exhibit.

Several classes require a display board which should be a height of 24 inches and not to exceed 1/4-inch thickness. A height of 24 7/8 inches is acceptable to allow for the saw kerf (width) if two 24 inch boards are cut from one end of a 4 foot by 8-foot sheet of plywood. Nothing should be mounted within 3/4 inch of the top or bottom of the board. (Example: Woodworking & Electricity.)

Fabricated board such as plywood, composition board, or particle-type lumber may be used for demonstration displays. Demonstration boards should be sanded and finished to improve their appearance. The finish on a demonstration board will be judged as a woodworking exhibit. Demonstration boards should include an overall title for the display, plus other necessary labeling.

Reports should be written using the scientific method whenever possible (Background, the Question or hypothesis, what you plan to do and what you did, Method used and observations, Results: what you learned.) All reports should be computer generated and enclosed in a clear plastic cover. The reports should be attached securely to the display.

Please refer to the General Rules for the policy regarding firearms, items with a blade, and other related items.

Please refer to the General Rules for the policy regarding use of copywritten images.

## **Department H – AEROSPACE**

Rockets shall be supported **substantially** to protect the rocket from breakage. Rockets are to be mounted on a base not to exceed 12 inches x 12 inches and the base should be  $\frac{3}{4}$  inch thick. No metal bases. If the rocket fins extend beyond the edges of the required base (12 inches x 12 inches), then construct a base that is large enough to protect the fins. The base size is dictated by the size of the rocket fins.

The rockets shall be mounted vertically. Please do not attach sideboards or backdrops to the displays. A used engine or length of dowel pin is to be glued and/or screwed into the board and extended up into the rocket's engine mount to give added stability. Rockets shall be equipped as prepared for launching, with wadding and parachute or other recovery system. Rockets entered with live engines, wrong base size, or sideboards will not be judged. Complete factory assembled rockets will not be accepted.

A report, protected in a clear plastic cover, shall include: 1) rocket specifications (include original or photo of manufacturing packaging, stating rocket skill level), 2) a flight record of each launching (weather, distance, flight height) 3) number of launchings, 4) flight pictures 5) safety (choice of launch site? documentation of safe launch, preparations, and precautions) 6) objectives learned, and 7) conclusions.

The flight record should describe engine used, what the rocket did in flight, and recovery success. Points will not be deducted for launching, flight, or recovery failures described. This includes any damage that may show on the rocket. Judging is based upon display appearance, rocket appearance, workmanship, design or capabilities for flight, number of times launched, and report. Three launches are required to earn the maximum launch points given on the score sheets. For scoring, only actual launches count, misfires will not count towards one of the required three launches.

- For self-designed rockets only, please include a digital recorded copy of one flight. In the documentation please include a description of stability testing before the rocket was flown.
- Skill level of project is not determined by number of years in project. Skill level is determined by the level listed on the manufacturing packaging.
- 4-H Rocket project levels are not intended to correspond to National Association of Rocketry model rocket difficulty ratings or levels.
- **High power rockets (HPR) are similar to model rocketry with differences that include the propulsion power and weight increase of the model. They use motors in ranges over “G” power and/or weigh more than laws and regulations allow for unrestricted model rockets. These rockets are NOT appropriate for 4-H projects and will not be judged.**

- Posters can be any size not to exceed 28 inches x 22 inches when ready for display. Example: tri-fold poster boards are not 28 inches by 22 inches when fully open for display.

Entry level rockets, made with PLASTIC FINS and PLASTIC BODY TUBES, are COUNTY ONLY projects.

Scoresheets, forms, contest study materials, and additional resources can be found at <http://go.unl.edu/ne4haerospace>.

Resources:

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/120](https://4hcurriculum.unl.edu/index.php/main/program_project/120).

**Division 908 – 4-H Flops are Educational** Pay Category #7

\*Class 6 **Rocket flop in any class.** Explain why it was a flop and what you learned as a result. Include pictures, if available. Member may include damaged rocket and/or parts, but not required.

**Division 850 – Aerospace/Rockets** Pay Category #6

Class 1 **Rocket**– Any Skill Level Rocket with **wooden fins and cardboard body tubes** painted by hand or air brush.

Class 2 **Aerospace Display**– Poster or display board that shows one of the principles learned in the Lift Off project. Examples include: display of rocket parts and purpose, explaining the parts of a NASA rocket or shuttle, interview of someone in the aerospace field, or kite terminology. Include notebook containing terminology (definition), and what was learned. Display can be any size not to exceed 28 inches x 22 inches.

Class 3 **Rocket**– Any Skill Level Rocket with **wooden fins and cardboard body tubes** painted using commercial application, example: commercial spray paint.

**Division 850 – Self-Designed Rocket** Pay Category #5

Class 4 **Rocket**– Any self-designed rocket with **wooden fins and cardboard body tubes**.

**Division 850 – Unit 5– Drones** Pay Category #3

Class 5 **Drone Poster**– Exhibit shall be designed to educate yourself and others on one or more of the following topics: drone technologies, uses of drones, the different types of drones, types of training needed

to operate drones and the laws and regulations users shall follow.  
Poster can be any size not to exceed 28 inches x 22 inches.

Class 6

**Drone video**– Exhibit shall demonstrate how the drone interacts with the outside world. Examples include field scouting, surveying damage from natural disasters, drones used in commercial applications and settings, drones used for structural engineering. Exhibits should be submitted on a USB flash drive. Videos can be uploaded to a video streaming application and exhibitors **SHALL** provide a hard copy QR code for viewing. Video length shall not exceed five minutes. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.

**Division 850 – Careers**

Pay Category #4

\*Class 20

Careers Interview– Interview someone working in the field of aerospace, and research that career. Interviews can either be written or in a multimedia format on a flash drive. Written interviews should be in a notebook. Typed reports should be three to five pages, double spaced, 12 point font, and 1 inch margins, and submitted in a notebook or folder. Multimedia reports should be between three to five minutes in length.

## **Department H - COMPUTERS**

Each individual is limited to two exhibits per class. Participation in Interview Judging is expected. A CD or USB flash drive shall be included with project.

Scoresheets, forms, contest study materials, and additional resources can be found at <http://go.unl.edu/ne4hcomputers>.

### **Division 908 – 4-H Flops are Educational**

Pay Category #7

\*Class 1      **Computers flop in any class.** On a sheet of paper, explain why it was a flop and what you learned as a result.

### **Division 860 – Computer Mysteries - Unit 1**

Pay Category #6

Learn about hardware and software; Discuss Internet safety; Create and save data  
[https://4hcurriculum.unl.edu/index.php/main/program\\_project/123](https://4hcurriculum.unl.edu/index.php/main/program_project/123).

\*Class 15      **4-H Promotional Flyer**– Exhibit should be created on 8 ½ inch x 11 inch paper using commercially available graphics software package. Flyers can be color or black & white. Flyers can be a web page or a folded flyer. Put exhibit in a protective cover. Prefabricated posters/flyers from commercially available graphics programs will not be judged.

\*Class 16      **Cyber Cards** (for ages 8-12)– Exhibit will consist of two cyberspace greeting cards, on a flash drive labeled with exhibitor’s name. Exhibit may be a printout of each card and maximum one page of text explaining the steps taken to complete and send the cyber cards. One write-up will be for both cards. List website for the cards, and how you may be able to use cyber cards. Put in protective cover.

### **Division 860 – Computer Mysteries - Unit 2**

Pay Category #5

Use Internet search engines; Take apart a computer; Participate in a chat room; Create a newspaper or magazine

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/123](https://4hcurriculum.unl.edu/index.php/main/program_project/123).

Class 1      **Computer Application Notebook**– 4-H exhibitor should use computer application to create a graphic notebook utilizing computer technology. 4-H'er may create any of the following: greeting card (five different cards such as a birthday, wedding, anniversary, sympathy, get well, or other); a business card (three cards for three different individuals and businesses); menu (minimum of two pages including short description of foods and pricing); book layout (I-book); promotional flyer (three fliers promoting three different events); newsletter (minimum two pages); or other: examples such as

precision farming or family business logo, etc. This exhibit consists of a notebook (8 ½ inch x11 inch) which should include (1) a detailed report describing: (a) the task to be completed, (b) the computer application software required to complete the task, and (c) specific features of the computer application software necessary for completing the task; and (2) printout of your project. Project may be in color or black and white.

**Class 2      Produce a Computer Slideshow Presentation**– Using presentation software, a 4-H exhibitor designs a multimedia computer presentation on one topic related to youth. A notebook with a printout of all the slides should be submitted. Slideshow should include a minimum of 10 slides and no more than 25. Incorporate appropriate slide layouts, graphics, animations, and audio (music or voice and transition sounds do not count). Each slide should include notes for a presentation. All slideshows shall be submitted on a CD or USB flash drive. Entries can be uploaded to a cloud sharing service and exhibitors **SHALL** provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing.

**Division 860 – Computer Mysteries - Unit 3**

Pay Category #4

Build your own computer system; Design a Web site; Develop a multimedia presentation; Use spreadsheets

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/123](https://4hcurriculum.unl.edu/index.php/main/program_project/123).

**Class 3      Produce an Audio/Video Computer Presentation**– Using presentation software, a 4-H exhibitor designs a multimedia computer presentation on one topic related to youth, including audio and/or video elements. A notebook with a printout of all the slides should be submitted. The presentation should be at least 2 minutes in length and no more than 5 minutes in length, appropriate graphics, sound, and either a video clip, animation, or voice over and/or original video clip. All presentations shall be submitted on a CD or USB flash drive. Or entries can be uploaded to a cloud streaming service and exhibitors **SHALL** provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing. A notebook with a printout of all the slides should be submitted. The presentation should be at least two minutes in length and no more than five

- minutes in length, with appropriate graphics, sound, and either a video clip, animation, or voiceover and/or original video clip.
- Class 4 **How to STEM (Science, Technology, Engineering and Math) Presentation**– Youth design a fully automated two to five minute 4-H “how to” video. Submissions should incorporate a picture or video of the 4-H’er, as well as their name (first name only), age (as of January 1 of the current year), years in 4-H, and their personal interests or hobbies. Entries should be submitted on a USB flash drive. Or videos can be uploaded to a video streaming application and exhibitors **SHALL** provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing.
- Class 5 **Virtual Platform Presentation**— Youth design a fully automated education presentation using any multimedia platform such as Tik Tok, YouTube, Canva, Canvas, etc. Submissions may include a notebook, poster, etc., explaining the process, experience, and/or presentation. All submissions shall include a link to the virtual presentation. Entries should be submitted on a USB flash drive. Or entries can be uploaded to a cloud sharing service. Exhibitors **SHALL** provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.
- Class 6 **Create a Website/Blog or App**– Design a simple website, blog, or app for providing information about a topic related to youth. Include an explanation of why the entry was created. Any current website, blog, or app development platform is accepted such as Google Sites, iBuildApp, Wix, etc. If the website, blog, or app isn’t live, include all files on a flash drive in a plastic case. Entries can be uploaded to a cloud sharing service. Exhibitors **SHALL** provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.
- Class 7 **3D Printing**– 3D printing uses plastic or other materials to build a three-dimensional (3D) object for a digital design. Youth may use original designs or someone else’s they have re-designed in a unique way. Exhibits will be judged based on the motivation and/or problem identified. For example, 3D objects printed as part of the design process for robot or other engineering project. Include design notebook that addresses the following questions: 1) What was the motivation for your design or the problem you were solving with your design? I.e. is your item a functional or decorative piece? 2) Please

include a picture of original design, citation of designer/website OR if design is completely original (you created it using CAD software), then state that it's original. If item was not completely original, indicate what you did to the original design to modify it to better meet the design problem state in #1 above. Its design was modified multiple times, please indicate what change was made with each modification, and what prompted the need for the change. E.g. I printed it and the design was too fragile, so I resliced the print to make thicker external walls, or to have a denser infill. 3) Define your process for designing/printing. What software and/or hardware was used (indicate type of 3D printer or if item was created with 3D pen)? 4) What materials were selected for your project? 5) If your final design has any moving parts, define how you determined appropriate allowance in your design. 6) Identify any changes that you would make to improve your design.

Class 8

**Maker Space/Digital Fabrication**– This project is a computer generated project created using a laser cutter, vinyl cutter, heat press, or CNC router. Vector or 3D based software such as Corel Draw or Fusion 360 would be an example of an appropriate software used to create your finished project. Project should include a notebook with the following: a.) what motivated you to create this project, b.) software and equipment used, c.) directions on how to create the project, d.) prototype of plans, e.) cost of creating project, f.) iterations or modifications made to original plans, and g.) changes you would make if you remade the project.

**Team Entries:** to qualify for entry in Class 8— Maker Space/Digital Fabrication, shall clearly be the work of a team instead of an individual, and shall have at least 50% of all team members enrolled in 4-H. Additionally, all enrolled 4-H members on the team should complete and attach an entry tag to the materials. A supplemental page documenting the individual contributions to the project should be included. The entry will be judged as a team, with all team members receiving the same ribbon placing.



## **Department H – ELECTRICITY**

Purchased, pre-manufactured kits are discouraged for exhibit.

General Information for Electric Posters – 4-H electricity related posters are to be entered in the engineering area for exhibiting and judging.

Scoresheets, forms, contest study materials, and additional resources can be found <https://go.unl.edu/ne4helectricity>.

### **Division 908 - 4-H Flops are Educational**

Pay Category #7

\*Class 2      **Electricity flop in any class.** On a sheet of paper, explain why it was a flop and what you learned as a result.

### **Division 870 – Magic of Electricity - Unit 1**

Pay

Category #7

Resources: Explore electrical insulation; Learn about the effects of magnetism; Build an electromagnet and electric motor

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/126](https://4hcurriculum.unl.edu/index.php/main/program_project/126).

\*Class 11      **Control the Flow**– Make a switch. Use the following items: D cell battery, battery holder, insulated wire, 2 or 2.5 volt light bulb, bulb holder, paper clip, cardboard, and two brass paper fasteners to create a circuit that you can open and close.

\*Class 12      **Conducting Things**– Make a circuit with a switch and a light bulb that can be used to test different household items for their ability to act as an insulator or conductor. You shall find five items that are conductors and five items that are insulators. Create a table that illustrates your results.

\*Class 13      **Battery Powered Series and Parallel Circuits**– Circuits shall include both series and parallel, a simple switch and can be no more than 9 volts.

\*Class 14      **Bright Lights**– Create your own flashlight using items found around your house. Flashlights should be made out of items that could be recycled or reused. No kits please.

### **Division 870 – Investigating Electricity - Unit 2**

Pay Category #6

Decode circuit diagrams; Build circuits and test voltages; Build a rocket launcher and a burglar alarm

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/127](https://4hcurriculum.unl.edu/index.php/main/program_project/127).

\*Class 15      **Rocket Launcher**– Construct a rocket launcher out of the following materials: a plastic pencil box that is at least 4 inch x 8 inch, single pole switch, single throw switch, normally-open push button switch,

40 feet of 18 or 22 gauge stranded wire, 4 alligator clips, 2 by 6 board 6 inches long, 1/3 inch diameter metal rod, rosin core solder, soldering iron or gun, wire stripper, small crescent wrench, pliers, small Phillips and straight blade screwdrivers, drill, 1/8 inch and 1/4 inch drill bits, rocket engine igniters, additional drill bits matched to holes for two switches. You shall successfully build a rocket launcher and light two rocket igniters with your launcher. Firing a rocket off of the launcher is not required. Create a poster using photographs to show the “step by step process” you used to build your launcher.

- \*Class 16     **Battery Powered Series or Parallel Circuit**– Circuit may be either series or parallel, shall contain either a momentary and/or three-way switch, a circuit diagram with explanation and can be no more than 9 volts.
- \* Class 18     **Original Design**– Soldered circuit project (circuit shall contain an on/off switch, a motion or tilt activated switch, a light and sound producing device, and shall be powered by 9 volts. All connections in the circuit shall be soldered and circuit diagram with explanation shall be included).

**Division 870 – Wired for Power - Unit 3**

Pay Category #5

Measure electrical usage; Replace electrical switches; Evaluate light bulbs and test for electrical power

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/128](https://4hcurriculum.unl.edu/index.php/main/program_project/128).

- Class 1     **Electrical Tool/Supply Kit**– Create an electrical supply kit to be used for basic electrical repair around the house. Include a brief description of each item and its use. Container should be appropriate to hold items.
- Class 2     **Lighting Comparison**– Display showing the efficiency of various lighting (incandescent, fluorescent, halogen, Light Emitting Diodes, etc.). Exhibit could be a poster display or an actual item.
- Class 3     **Electrical Display/Item**– Show an application of one of the concepts learned in the Wired for Power project. Examples include: re-wiring or building a lamp, re-wiring or making a heavy duty extension cord, or developing an electrical diagram of a house. Exhibit could be a poster display or an actual item.
- Class 4     **Poster**– Poster should exemplify one of the lessons learned in the Wired for Power project. Posters shall not exceed 28 inches x 22 inches.

#### **Division 870 – Electronics - Unit 4**

Pay Category #5

Explore LED's and SCR's, transistors, and the construction of an SCR intruder alarm; Learn the basics of solid-state electronics; Build a blinking "flasher and an amplifier" explore LED's and SCR's

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/126](https://4hcurriculum.unl.edu/index.php/main/program_project/126).

- Class 5      **Electrical/Electronic Part Identification**– Display different parts used for electrical/electronic work. Exhibit should show the part (either picture or actual item) and give a brief description including symbol of each part and its function. Display should include a minimum of ten different parts.
- Class 6      **Electronic Display**– Show an application of one of the concepts learned in the Entering Electronics project. Examples include: components of an electronic device (refer to page 35 of the Entering Electronics manual).
- Class 7      **Electronic Project**– Exhibit an electronic item designed by the 4-H'er or from a manufactured kit that shows the electronic expertise of the 4-H'er. Examples include: a radio, a computer, or a volt meter.
- Class 8      **Poster**– Poster should exemplify one of the lessons learned in the Entering Electronics project. Posters shall not exceed 28 inches x 22 inches.

**Department H- 4-WHEELIN'**

**Division 875 – 4-Wheelin'**

Pay Category #7

\*Class 1

**Poster**– Poster should exemplify one of the lessons learned in the 4-Wheelin' project.

Poster shall not exceed 28 inches x 22 inches.

## **Department H – ROBOTICS**

Posters shall not exceed 28 inches by 22 inches when ready for display. Example: tri-fold poster boards are not 28 inches by 22 inches when fully open for display.

Scoresheets, forms, contest study materials, and additional resources can be found at <http://go.unl.edu/ne4hrobotics>.

Team Entries: team materials entered in robotics classes that are clearly the work of a team instead of an individual shall have at least 50% of all team members enrolled in 4-H. Additionally, all enrolled 4-H members on the team should complete and attach an entry tag to the materials. A supplemental page documenting the individual contributions to the project should be included. The entry will be judged as a team, with all team members receiving the same ribbon placing.

Creating a video of your robot in action would be helpful for the judges but is not mandatory. Videos should be submitted on a USB flash drive. Or videos can be uploaded to a video streaming application and exhibitors SHALL provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.

### **Division 908 – 4-H Flops are Educational**

Pay Category #7

\* Class 5      **Robotics flop in any class.** On a sheet of paper, explain why it was a flop and what you learned as a result.

### **Division 861 – Robotics**

Pay Category #4

Class 1      **Robotics Poster**– Create a poster (28 inches x 22 inches) communicating a robotics theme such as “Robot or Not”, “Pseudocode”, “Real World Robots”, “Careers in Robots”, “Autonomous Robotics”, “Precision Agriculture” or a robotic topic of interest to the 4-H’er.

Class 2      **Robotics Notebook**– Explore a robotics topic in-depth and present your findings in a notebook. Documentation should include any designs, research, notes, pseudocode, data tables, or other evidence of the 4-H’ers learning experience. The notebook should contain at least three pages. Topics could include a programming challenge, programming skill, calibration, sensor exploration, or any of the topics suggested in Class 1.

Class 4      **Robotics/Careers Interview**– Interview someone who is working in the field of robotics and research the career in robotics. Interviews can either be written or in a multimedia format such as a short video uploaded to a cloud sharing service. Include a QR code with your project to allow for judging access. Or videos can be uploaded to a

video streaming application and exhibitors SHALL provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing. Written interviews should be in a notebook. Written reports should be 3 to 5 pages, double spaced, 12-point font, and 1 inch margins. Multimedia reports should be between 3 to 5 minutes in length.

**Class 5 Robotics Sensor Notebook**– Write pseudo code which includes at least three sensor activity. Include the code written and explain the code function. Codes can be submitted as a multimedia format uploaded to a cloud sharing service. Include a QR code with your project to allow judging access. Multimedia presentations should be 3 to 5 minutes in length. Videos should be submitted on a USB flash drive. Videos can also be uploaded to a video streaming application and exhibitors SHALL provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permissions for public viewing.

**Class 7 Kit Labeled Robot (cannot be free programmed) and Notebook**– This class is intended for explorations of robotic components such as arms or vehicles OR educational kits marketed as robots that do not have the ability to be programmed to “sense, plan, and act.” The exhibit should include a notebook with the robot the youth has constructed. Included in the notebook should be 1) a description of what the robot does, 2) pictures of programs the robot can perform, 3) why they chose to build this particular form, and 4) how they problem solved any issues they might have had during building and programming. A picture story of assembly is recommended. Robot will not be displayed in locked case.

**Class 8 3D Printed Robotics Parts**— This class is intended for youth to create parts, through 3D printing, to help create their robot or aid the robot in completing a coded function. Project should include notebook describing the process used to create the project, describe the success of your designed piece (did it work), intended use of the product and the modifications made to the item.

### **Division 863 – Junk Drawer Robotics**

Pay Category #4

All exhibits should be original designs made with everyday objects and materials. Exhibits should be based on directions in the Junk Drawer Robotics Notebook. Projects should include designs and worksheets from the manual.

### *Junk Drawer Robotics 1 – Give Robots a Hand*

Discover the design and functions of robotic arms; Build a robotic arm that moves  
[https://4hcurriculum.unl.edu/index.php/main/program\\_project/136](https://4hcurriculum.unl.edu/index.php/main/program_project/136).

- \*Class 1      **Marshmallow Catapult**– Build a catapult that will launch a marshmallow
- \*Class 2      **Balance Beam Design**– Modify catapult to be used as a balance beam
- \*Class 3      **Robot Arm**– Design and build a robotic arm using levers to pick up and move a weight from one spot to another location
- \*Class 4      **Gripper**– Design and build a gripper to pick up a ping pong ball, plastic golf ball, plastic egg, or toy block
- \*Class 5      **Put It All Together**– Combine the work of the robot arm, power source, and gripper into one robot

### *Junk Drawer Robotics 2 – Robots on the Move*

Explore robot movement, power transfer, and locomotion; Design and build machines that roll, slide, draw, or move underwater  
[https://4hcurriculum.unl.edu/index.php/main/program\\_project/137](https://4hcurriculum.unl.edu/index.php/main/program_project/137).

- \*Class 6      **Clipmobile**– Design and build a vehicle that can carry a box of paper clips down a ramp using items listed in robotics notebook
- \*Class 7      **Can-Can Robot**– Design and build an electric motor powered robot made from a paper or plastic cup. The robot should be able to draw or make marks on a piece of paper
- \*Class 8      **Es-Car-Go**– Design and build a vehicle that is powered by a motor and battery and uses a gear train to make it go slow and climb a ramp
- \*Class 9      **Underwater ROV**– Design and build an underwater ROV that can be powered to go up and down in a tank of water

### *Junk Drawer Robotics 3 – Mechatronics*

Make the connection between the mechanical and electronic elements of robots; Explore sensors, write programs, build circuits, and design your own robot  
[https://4hcurriculum.unl.edu/index.php/main/program\\_project/138](https://4hcurriculum.unl.edu/index.php/main/program_project/138).

- \*Class 10     **Switch**– Design and build a single pole double throw switch to control two different lights at the same time
- \*Class 11     **Robot**– Build a robot that will travel around an object or wall using a sensor for control
- \*Class 12     **Breadboard**– Create a working electronic circuit using a solder-less breadboard
- \*Class 13     **Robot**– Build a robot that will perform a specific task

## **Department H – GEOSPATIAL**

Youth in Geospatial may exhibit in any class within this division.

Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hgeo>.

Learn about Geography; Learn about Geographic Information Systems (GIS); Learn about Global Positioning Systems (GPS)

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/132](https://4hcurriculum.unl.edu/index.php/main/program_project/132).

### **Division 880**

Pay Category #6

- Class 1 **Poster**– Create a poster (not to exceed 14 inches x 22 inches) communicating a GPS theme such as How GPS or GIS works, Careers that use GPS or GIS, How to use GPS, What is GIS, GPS or GIS in Agriculture, Precision Agriculture, or a geospatial topic of interest.
- Class 2 **4-H Favorite Place or Historical Site Poster**– The 4-H exhibitor identifies a favorite place or historical site (including grave sites) in Nebraska. Exhibit should include latitude and longitude, digital picture, and local area map. Poster size should not exceed 14 inches x 22 inches.
- Class 3 **GPS Notebook**– Keep a log of at least five places visited using a GPS enabled device. At least one site should be from a community other than where you live. For each site, record the latitude, longitude, and elevation. Also include a description of the site, a paragraph explaining what was interesting about the site or finding it. Photos of each site and/or cache are optional but encouraged.
- Class 4 **Geocache**– Assemble a themed geocache (physical geocache is **REQUIRED** with exhibit). Each geocache should be a water-tight container. It should include a logbook and pencil for finders to log their visits and may include small trinkets, geo-coins, etc. for the finders to trade. Documentation should include a title, teaser description, and the geographic coordinates of intended placement. Register the site at [geocaching.com](http://geocaching.com), include a print-out of its registry. The entry may include a photograph of the cache in its intended hiding place.
- Class 5 **Agriculture Precision Mapping**– 4-H’ers will assemble a notebook that will include a minimum of two digital copies of various data layers that can be used in precision agriculture to identify spatial patterns and/or correlations (printed copies of websites where applications can be purchased is acceptable) and a report of how the



analysis of the various data will be used to make a management decision.

- Class 6 **4-H History Map/Preserve 4-H History**– Nominate a Point of Interest for the 4-H History Map Project. Include copy of submitted form in folder or notebook. To nominate a site for the 4-H history map please go to <http://arcg.is/1bvGogV>. For more information about 4-H history go to [http://4hhistorypreservation.com/History\\_Map/](http://4hhistorypreservation.com/History_Map/). For a step by step video on nominating a point, please go to this link: <http://tinyurl.com/nominate4h>. Write a brief description of historical significance of 4-H place or person (a minimum of one paragraph).
- Class 7 **GIS Thematic Map**– Using any GIS software, create a thematic map. Thematic maps can utilize any subject of interest to the 4-H'er. Examples of maps would be Amelia Earhart's flight plan or Sir Francis Drake's voyage, population density maps, water usage maps, or 4-H projects in Nebraska. Create a GIS Map using data from books and/or internet. Use reliable data, (U.S. Center for Disease Control or U.S. Census Bureau, etc.). Map may be any size from 8 ½ inches x 11 inches up to 36 inches x 24 inches. Should include Title, Base Map, Neat Line, North Arrow, and Legend. Identify the source of your information on the back of the map.
- Class 8 **Virtual Geocache**– Keep a log of at least 5 places visited using a virtual geocache platform. At least one site should be from a community other than where you live. For each site, record the latitude, longitude, and elevation. Also include a description of the site, and a paragraph explaining what was interesting about the site or finding it. Photos of each site and/or cache are optional, but highly encouraged.

## **Department H - Energy**

The name and county of each exhibitor should appear separately on the back of each board, poster, or article and on the front cover of the notebooks so the owner of the exhibit may be identified if the entry tag is separated.

Reports should be written using the scientific method whenever possible (Background, the Question or hypothesis, what you plan to do and what you did, Method used and observations, Results: what you learned. All reports should be typed and enclosed in a clear plastic cover. The reports should be attached securely to the display.

Posters shall not exceed 28 inches by 22 inches when ready for display. Example: tri-fold poster boards are not 28 inches x 22 inches when fully open for display.

Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hphysics-powerofwind>.

Renewable Energy Resources:

United States Department of Energy: <https://www.energy.gov/clean-energy>

U.S. Energy Information Administration:

<https://www.eia.gov/energyexplained/renewable-sources/>

Natural Resources Defense Council: <https://www.nrdc.org/stories/renewable-energy-clean-facts>

### **Division 900 – Energy**

Pay Category #6

- |         |  |
|---------|--|
| Class 1 | <b>Create and Compare Energy Resources Poster</b> – Poster should explore two alternative/renewable energy resources. Compare and contrast the two resources including two of the following: amount of energy created, costs of production, usability of the energy, pros/cons of environmental impacts, etc. Posters shall not exceed 28 inches by 22 inches. |
| Class 2 | <b>Experiment Notebook</b> – Notebook will explore the scientific method involving alternative/renewable energy sources. Information required: 1.) Hypothesis 2.) Research 3.) Experiment 4.) Measure 5.) Report or Redefine Hypothesis.   |
| Class 3 | <b>Solar as Energy Display/Poster</b> – Item should be the original design of the 4-H'er. Include the item, or a picture if item is in excess of 6 feet tall or 2 feet x 2 feet. Include a notebook of why the item was designed and how it harnesses the power of the sun. Examples include solar ovens, solar panels, etc.                                   |
| Class 4 | <b>Water as Energy Display/Poster</b> – Item should be the original design of the 4-H'er. Include the item, or a picture if item is in excess of 6 feet  |

tall or 2 feet x 2 feet. Include a notebook of why the item was designed and how it harnesses the power of water.

Class 5

**Wind as Energy Display/Poster**– Item should be the original design of the 4-H'er. Include the item, or a picture if item is in excess of 6 feet tall or 2 feet x 2 feet. Include a notebook of why the item was designed and how it harnesses the power of wind.

Class 6

**Other Nebraska Alternative Energy**– Notebook should explore Nebraskan alternative energy source besides wind, water, and solar power. Include information on type of power chosen, infrastructure for distribution, what resources are needed to create this alternative resource, cost of production, and potential uses of bio-products. Examples include geothermal, biomass, ethanol, bio-diesel, methane reactors, etc.

## **Department H – WOODWORKING**

The ability to build objects as designed by another person is an important life skill. Professional woodworkers often are hired to build objects to exacting specifications as laid out in a written plan.

Requirements: All articles exhibited **shall include a plan (with drawings or sketch or blueprints)** stating dimensions and other critical instructions a builder would need to know how to build the project. **Plans may include narrative instructions in addition to the dimension drawings and include any alternations to the original plan.** Part of the score depends on how well the project matches the plans. If plans are modified, the changes from the original need to be noted on the plans. All plans used for making the article shall be securely attached and protected by a clear plastic cover.

4-H'ers shall be in **Unit 3 or Unit 4** for the exhibit to be considered for State Fair. All projects shall have appropriate finish.

Resources: [https://4hcurriculum.unl.edu/index.php/main/program\\_project/144](https://4hcurriculum.unl.edu/index.php/main/program_project/144)  
Scoresheets, forms, contest study materials, and additional resources can be found at <http://go.unl.edu/ne4hwoodworking>.

### **Division 908 – 4-H Flops are Educational**

Pay Category #7

\*Class 3 **Woodworking flop in any class.** On a sheet of paper, explain why it was a flop and what you learned as a result.

### **Division 911 – Measuring Up – Unit 1**

Pay Category #4

Develop skills such as measuring, squaring, and cutting a board; driving nails; and using clamps and screws. Build a picture frame, letter holder, box, or airplane.

\*Class 9 **Article made with hand tools**– Select from these Unit 1 manual items: flower box, napkin or letter holder, or picture frame.

\*Class 10 **Article made with hand tools**– Select from Unit 1 manual but not shown in class 9, or from plans comparable to those in Unit 1 manual.

### **Division 911 – Making the Cut – Unit 2**

Measure, cut, sand, drill, and use advanced hand and power tools; Apply paint and use bolts and staples; Build a sawhorse, birdhouse, tool box, or stool.

\*Class 11 **Article made with advanced hand and power tools**— Select from sawhorse, birdhouse, tool box, or a stool.

\*Class 12 **Article made with advanced hand and power tools**—Select from Unit 2 manual but not shown in class 11, or from plans comparable to those in Unit 2 manual.

### **Division 911 – Nailing it Together – Unit 3**

Pay Category #4

Practice measuring angles, cutting dado and rabbet joints; Use a circular saw, table saw, and a radial arm saw; Sand and stain wood.

- Class 1      **Woodworking Article**— Item should be made using either joints, hinges, dowels, or a dado joining made using skills learned in the Nailing It Together manual. Item is required to be appropriately finished. Examples include: bookcase, coffee table, or end table.
- Class 3      **Recycled Woodworking Display**— Article made from recycled, reclaimed, or composite wood. Article shall be appropriately finished and/or sealed and utilize one or more woodworking techniques from page 2 of the Unit 3 manual. Exhibit shall include the woodworking plan and a minimum one-page report of how the engineering design process was used to develop the woodworking plan. Engineering Design Process: 1.) State the problem (why did you need this item?), 2.) Generate possible solutions (how have others solved the problem? What other alternatives or designs were considered?), 3.) Select a solution (how does your solution compare on the basis of cost, availability, and functionality?), 4.) Build the item (what was your woodworking plan, and what processes did you use to build your item?), 5.) Reason for article finish (what type of finish, how did you finish or why you chose this finish?), 6.) Evaluate (how does your item solve the original need?), and 7.) Present results (how would you do this better next time?)
- Class 4      **Composite Wood Project**— 60% of the project shall be wood and 40% made from other materials such as metal, rubber, resin, etc. All plans and plan alternations shall be attached to the article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish.
- Class 5      **Outdoor Wood Project made with Treated Wood**— Treated wood projects DO NOT have to have a finished coating. All plans and plan alternations shall be attached to the article. Protect plans with a cover. Examples include: picnic tables, planters, outdoor furniture, etc.
- Class 6      **Wood Projects created on a Turning Lathe**— Article is the object created from spinning wood on a turning lathe. Article shall be appropriately finished and/or sealed. Exhibit shall include plans detailing design and process of completion, any changes made to the design, details of finishing techniques, and other relevant information about the article. Include a description of tools used.

**Division 911 – Finishing Up - Level 4**

Pay Category #3

Class 7 **Woodworking Article**– Item made using skills learned in the Finishing it Up project. Examples include: dovetailing, making a pen using lathe, overlays, using a router, etc. Item is required to be appropriately finished.

Class 8 **Recycled Woodworking Display**– Article made from recycled, reclaimed, or composite wood. Article shall be appropriately finished **and/or sealed** and utilize one or more woodworking techniques from page 2 of the Unit 4 manual. Exhibit shall include the woodworking plan and a minimum one-page report of how the design and engineering process was used to develop the woodworking plan.

Engineering Design Process:

- 1) State the problem (why did you need this item?)
- 2) Generate possible solutions (how have others solved the problem? What other alternatives or designs were considered?)
- 3) Select a solution (how does your solution compare on the basis of cost, availability, and functionality?)
- 4) Reason for article finish (what type of finish, how did you finish, or why you chose this finish?)
- 5) Build the item (what was your woodworking plan, and what processes did you use to build your item?)
- 6) Evaluate (how does your item solve the original need?)
- 7) Present results (how would you do this better next time?)

**Division 911 – Careers**

Pay Category #4

\*Class 12 **Careers Interview**– Interview someone who is working in the field of woodworking and research that career. Interviews can either be typed or in a multimedia format (CD/DVD or USB flash drive). Written interviews should be in a notebook, and be three to five pages, double spaced, 12-point font, and 1 inch margins. Multimedia reports should be between 3 to 5 minutes in length.

## **Department H - WELDING**

### **Division 920 – Arcs and Sparks**

All welds exhibited in Class 1 or 2 shall be mounted on a 12 inches high x 15 inches long display board of thickness not to exceed 3/8 inch. Attach each weld on a wire loop hinge or equivalent, so the judge can look at the bottom side of the weld when necessary. Each weld should be labeled with information stating: 1) type of welding process (stick, MIG, TIG, Oxy-Acetylene, etc.), 2) kind of weld, 3) welder setting, 4) electrode/wire/rod size, and 5) electrode/wire/rod ID numbers. **Attach a wire to display board so it can be hung like a picture frame. No picture frame hangers accepted.** If no plans are included with welding article or welding furniture, item will not be judged.

#### *4-H Welding Project Tips and Suggestions*

##### Class 1:

1. All welds should be made with the same electrode/wire/rod size, and number.
2. Welds should be made only on one side of metal so penetration can be judged.
3. Welds should be cleaned with chipping hammer and wire brush. Apply a coat of light oil (penetrating oil) to the metal to prevent rusting. Wipe off excess oil.
4. Welds should be of the same size and thickness as metal. These pieces, referred to as coupons, should be 1.5 inches – 2 inches wide and 3.5 inches – 4 inches long. A good way to get this size is to buy new cold rolled strap iron and cut to length. The extra width is needed to provide enough metal to absorb the heat from the welding process and prevent the coupons from becoming too hot before the bead is completed. Narrower coupons will become very hot, making an average welder setting too cold at the bead start, just about right in the middle, and too hot at the end. The correct way to weld narrow strips is to make short beads and allow time to cool, however this project requires a full length bead.
5. Stick welding: Suggested coupon thickness–1/4 inch if using 1/8 inch rod. Suggested rod–AC and DC straight or reverse polarity – first E-7014, second E-6013.
6. MIG welding: Suggested coupon thickness–1/4 inch if using .035 wire and 1/8 inch if using .023 wire.
7. Oxy-Acetylene: Suggested coupon thickness–1/8 inch. Suggested rod–1/8 inch mild steel rod.

##### Class 2:

1. It is suggested that all welds be of the same size and thickness of metal. These pieces are referred to as coupons. The welds can be on one coupon that is about 4 inches x 4 inches or on individual coupons that are about 2 inches x 4 inches and ¼ inch thick. Suggested rods for this class of position welds for AC

and DC straight or reverse polarity is, first E-6013, second E-7014, and E-6010 for DC reverse polarity only.

2. Welds should be cleaned with a chipping hammer and wire brush. Apply a coat of light oil (penetrating oil) to the metal to prevent rusting. Wipe off excess oil.

Classes 3 & 4:

1. All welds should be cleaned and protected from rust with paint or light oil. Plans are to be complete enough that if they were given to a welding shop, the item could be made without further instructions. Bill of materials should include a cost for all items used including steel, electrodes, paint, wheels, etc.

Scoresheets, forms, contest study materials, and additional resources can be found at <http://go.unl.edu/ne4hwelding>.

Resources: Learn to cut metal with an arc solder; Weld high carbon, spring steel, and alloy steels; Weld horizontal, vertical, and overhead positions  
[https://4hcurriculum.unl.edu/index.php/main/program\\_project/143](https://4hcurriculum.unl.edu/index.php/main/program_project/143).

**Division 908 - 4-H Flops are Educational**

Pay Category #7

- \*Class 4      **Welding flop in any class.** On a sheet of paper, explain why it was a flop and what you learned as a result.

**Division 920 – Welding**

Pay Category #4

- Class 1      **Welding Joints**– A display of one butt, one lap, and one fillet weld.
- Class 2      **Position Welds**– A display showing three beads welded in the vertical down, horizontal, and overhead positions.
- Class 3      **Welding Art**– Any art created using tack welds to hold the metal pieces together (examples include horseshoe project). Type of welder, welder settings, all plans, plan alternations, and a bill for material shall be attached to the article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish.
- Class 4      **Welding Article**– Any shop article where welding is used in construction. 60% of item shall be completed by 4-H'er and notes regarding laser welding or machine welding shall be included. Type of welder, welder settings, all plans, plan alternations, and a bill for material shall be attached to article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish.
- Class 5      **Welding Furniture**– Any furniture with 75% welding used in the construction. 60% of item shall be completed by 4-H'er and notes regarding laser welding or machine welding shall be included. Type of



welder, welder settings, all plans, plan alternations, and a bill for material shall be attached to article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish.

Class 6

**Plasma Cutter/Welder Design**– Plasma cutter/welder allows for detailed design(s) to butt cut into metal. 4-H’ers will create a notebook describing the design process to create the “artwork” to butt cut into metal. In this notebook include: 1.) a photo (front and back) of the finished project. 2.) instructions on how the design was created (include software used), this allows for replication of the project, and 3.) lessons learned or improvements to the project 4) Steps to finish the project.

Class 7

**Composite Weld Project**—60% of the project shall be welded and 40% made from other materials such as wood, rubber, etc. Type of welder, welder settings, all plans, plan alternations, and a bill for material shall be attached to article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish.

**Division 930 – SET Careers**

Pay Category #4

\*Class 1

**Career Interview**– Interview someone who is working in any field associated with science, engineering, and technology, and research that career (i.e. computer programmer, architect, engineer, pilot, etc.). Interviews can either be typed or in a multimedia format. Written interviews should be in a notebook, and be 3 – 5 pages, double spaced, 12-point font, and 1 inch margins. Multimedia reports should be between 3 – 5 minutes in length.

## **Department H – ENTOMOLOGY**

Specimens in display collections should be mounted properly and labeled with location, date of collection, name of collector, and order name. Follow mounting and labeling instructions in the Nebraska 4-H Entomology manual. Boxes are preferred to be 12 inches high x 18 inches wide, and landscape orientation, so they fit in display racks. Purchase of commercially-made boxes is allowed. All specimens are to be pinned and labeled by the exhibitor. No purchased specimens allowed. No projects over 50 pounds allowed.

Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hentomology>.

### Resources:

Entomology 1—Make an insect collection; Learn where to look for insects; Learn how to identify and classify insects

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/62](https://4hcurriculum.unl.edu/index.php/main/program_project/62).

Entomology 2—Complete an insect collection table; Plan an insect collection trip; Raise meal worms; Explore insect legs; and collect insects with an extractor

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/63](https://4hcurriculum.unl.edu/index.php/main/program_project/63).

Entomology 3—Test ant food preferences; Conduct honeybee learning experiments; Record insect observations; Identify insect mouth types

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/64](https://4hcurriculum.unl.edu/index.php/main/program_project/64).

Insectigator—Learn the difference between an insect and a bug; Identify insect parts and know why each is important; Find and examine bugs and insects in the field; Design your own insect or create a home for an insect

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/61](https://4hcurriculum.unl.edu/index.php/main/program_project/61).

### **Division 800 – Entomology/Insectigator**

Pay Category #6

Class 1      **Entomology Display, First-Year Project**– Collection to consist of 25 or more different kinds (species) of insects representing at least six orders. Limit of one box.

Class 2      **Entomology Display, Second-Year Project**– Collection to consist of a minimum of 50 kinds (species) of insects representing at least eight orders. Replace damaged or poorly mounted specimens. At least 25 species shall be present from after July 1 of the previous year. Limit of two boxes.

Class 3      **Entomology Display, Third-Year or More Project**– Collection to consist of a minimum of 75 kinds (species) of insects representing at least ten orders. Replace damaged or poorly mounted specimens. At least 25 species shall be present from after July 1 of previous year. Limit of three boxes.

- Class 4 **Special Interest or Advanced Insect Display**– Educational display developed according to personal interests and/or advanced identification capability. This is also an opportunity to highlight favorite insects in a creative arrangement. Insects should conform to pinning and mounting standards as in Classes 1-3 and be protected in an insect box. Each specialty display should include names of the insects, interesting information about them, and why the display was made. Advanced identification collections should have insects grouped with labels that correspond with identification level (e.g. family, genus, species). A specialty collection may consist of insects by taxonomic group (e.g. butterflies, grasshoppers, dragonflies, scarab beetles) or by host, subject, or habitat (e.g. insect pests of corn, aquatic insects, insect mimicry, insect galls, insects from goldenrod, insect pollinators. etc.).
- Class 5 **Insect Habitats**– Habitats consist of any hand-crafted objects, made of natural or artificial materials, to be placed outdoors, which promote or conserve insects in the environment. Insects may include bee pollinators, butterflies, beneficial insects, etc. A one-page report describing activities shall accompany the exhibit. Report should include placement, target insect, why materials were chosen, functional design, and indicators of success. See the following resources for reports: Nebraska Extension NebGuide: Creating a Solitary Bee Hotel; University of Minnesota: Wild Bees and Building Wild Bee Houses; National Wildlife Federation: How to Provide Water in Monarch Gardens.
- Class 6 **Macrophotography**– Subjects should be insects, spiders or other arthropods, or any nests, webs or constructions they make. All exhibit prints should be either 8 inches x 10 inches or 8 ½ inches x 11 inches and mounted on rigid, black 11 inches x 14 inches poster or mat board. Either orientation is acceptable. No frames or mat board framing is allowed. A caption of a few sentences should explain the subject and be printed on white paper and glued below the print on the poster or board.
- Class 7 **Insect Poster/Display Exhibits**– Exhibits can be posters or three-dimensional displays, and artistic creativity is encouraged. Posters should be no larger than 22 inches x 28 inches. They should be instructional and attractive, and have pictures, drawings, charts, or graphs. Posters and displays may show any aspect of insect life, habitat, or related conservation or management. Examples include life history and other facts about an insect; insect anatomy; how to manage insects in a farm, home, lawn or garden setting; experiences

rearing one kind of insect; survey of an important insect; insect behavior (ex. nesting finding food, mobility, defenses, etc.); habitats (e.g. forests, grasslands, wetlands, rivers or lakes) and what insects are found there, etc. Three-dimensional displays, such as dioramas, sculptures, models or decorative boxes should have a page of explanatory information accompanying them and fit within a 22 inches x 28 inches area.

Class 8

**Reports or Journals**– Reports and journals should be in a 3-ring binder. A report may be informational, that is, an original article about a favorite insect, a history of insect outbreaks, diseases caused by insects, insects as food, etc. Or, it may be a research report about an investigation or experiment done in a scientific manner. It then should have a basic introduction of the insect studied, methods used, observations, and results of the project. Tables, graphs and images are helpful to include. A journal is an observational study over a period of time with personal impressions. It may cover watching changes in kinds of butterflies over the summer, rearing a specific insect from egg to adult, managing a bee hive, observations of insects in a specific habitat, accounts of insect behavior in a forest or flower garden, etc.

## **Department H – VETERINARY SCIENCE**

### **A Veterinary Science exhibit may consist of a poster, notebook, or a display.**

The exhibit may represent material from any of the Veterinary Science projects including entry level exhibits from Unit 1. If photographs are to be part of the exhibit, remember that they will be viewed by the public. Make sure that the photographs are in good taste and will not be offensive to anyone. Graphic photographs of excessive bleeding, trauma, or painful procedures are not appropriate. For exhibits related to veterinary surgical procedures, aseptic techniques need to be shown, for example: use of drapes, use of sterile procedures, wearing of gloves, and other appropriate veterinary medical practices.

*First-Aid Kits*— Because of public safety concerns and risk of theft of first-aid kit contents (veterinary drugs/equipment) with perceived potential for drug abuse, **animal first aid kits containing any drugs or medications will not be judged nor displayed. First Aid kits wishing to include medication information should instead utilize written descriptions, photographs, drawings, computer generated print-outs, or empty packaging of pharmaceuticals.**

*Veterinary Science Posters*— This exhibit presents the viewer with a design that is simple and direct, unlike a display that usually presents more information. A poster should not exceed 22 inches x 28 inches and may be either vertical or horizontal.

*Veterinary Science Displays*— A display may include but is not limited to: a 3-dimensional exhibit, a scale model, the actual product (for example: skeleton; teeth; samples of leather, fur, or dried skin damaged by disease or parasites), or a notebook. A display is not a poster. A display may be mounted on poster board not to exceed 22 inches x 28 inches, or on ¼ inch plywood or equivalent that does not exceed 24 inches high or 32 inches wide, or in a three-ring binder or another bound notebook format.

*Appropriate Veterinary Science Topics*— Maintaining health, specific disease information, photographic display of normal and abnormal characteristics of animals, animal health or safety, public health or safety, proper animal management to ensure food safety and quality, efficient and safe livestock working facilities, or a topic of the exhibitor's choosing related to veterinary medicine or veterinary science.

\* Remember, since these are science displays, all references and information needs to be properly cited. Proper sources include but are not limited to: professional journals and publications, professional AVMA accredited websites, interviews with veterinarians and excerpts from Veterinary Educational Literature.

**Plagiarism will result in a disqualification.** Please study your topic and present the information to your audience in your own words.

Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hvetscience>.

Resources:

Animal Disease—study bacteria, viruses, and parasites; Learn about diseases' relationship to nutrition, stress, heredity, and poison; Learn basic disease prevention techniques.

Animal Health and its relationship to our world—study environmental influences on animal health; Learn about maintaining animal health; Explore veterinary medicine as a career.

The Normal Animal—take an animal's temperature and pulse; Recognize healthy skin and membranes; Clean and disinfect animal's quarters.

Veterinary Science—Understand animals' basic needs; Keep health records; Learn about future veterinary science technology

[https://4hcurriculum.unl.edu/index.php/main/program\\_project/20](https://4hcurriculum.unl.edu/index.php/main/program_project/20).

**Division 840**

Pay Category #6

Class 1	<b>4-H Veterinary Science Large Animal Poster, Notebook, or Display</b>
Class 2	<b>4-H Veterinary Science Small Animal/Pet Poster, Notebook, or Display</b>