General Information:

A. 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 exhibit may be identified if the entry tag is separated from the exhibit.

B. All static exhibits must have received a purple ribbon at the county fair to advance to the State Fair.

C. Posters can be any size up to 28" x 22" when ready for display. Example: trifold poster boards are not 28" x 22" when fully open for display.

D. Several classes require a display board, which should be a height of 24 inches, and not to exceed 1/4" in thickness. A height of 24 7/8" is acceptable to allow for the saw kerf (width) if two 24-inch boards are cut from one end of a 4' x 8' sheet of plywood. Nothing should be mounted within 3/4" 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.

E. 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.

F. Team Entries: To qualify for entry at the Nebraska State Fair team materials entered in H860008 – Maker Space/Digital Fabrication must clearly be the work of a team instead of an individual and must 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.

DIVISION 850: AEROSPACE

A. Rockets must be supported substantially to protect the rocket from breakage. Rockets are to be mounted on a base that has dimensions equal or less than 12 inches x 12 inches and the base should be ¾ inches 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.

B. The rockets must be mounted vertically. Please do not attach sideboards or backdrops to the displays. In addition, a used engine or length of dowel pin is to be glued and/or screwed into the board and extended up into the rockets engine mount to give added stability.

C. Rockets must 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 be disqualified.

D. A report, protected in a clear plastic cover, must include: 1) rocket specification (include original or photo of manufacture packaging stating rocket skill level, 2) a flight record for each launching (weather, distance, flight height), 3) number of launchings, and 4) flight pictures, 5) Safety (how did you choose your launch site? Document safe launch, preparations, and precautions, 6) objectives learned and 7) conclusions.

E. The flight record should describe the 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 be shown on the rocket. Complete factory assembled rockets will not be accepted at the State Fair.

F. Judging is based upon display appearance, rocket appearance, workmanship, design or capabilities for flight, and number of times launched and report. Three launches are required to earn the 9 maximum launch points given on the score sheets. For scoring for the State Fair, 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.
   - The 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.

G. 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 be disqualified.

H. Posters can be any size up to 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.

I. All static exhibits must have received a purple ribbon at the county fair to advance to the State Fair. Entry level rockets, made with PLASTIC FINS and PLASTIC BODY TUBES, are COUNTY ONLY projects.

Aerospace/Rockets

H850001. Rocket. (SF 92) Any Skill Level Rocket with **wooden fins and cardboard body tubes** painted by hand or air brush.

H850002. Aerospace Display. (SF 93) Poster or display board displays or exemplifies 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 up to 28 inches by 22 inches.

H850003. Rocket. (SF 92) Any Skill Level Rocket with wooden fins and cardboard body tubes painted using commercial application example commercial spray paint.

Youth enrolled in Aerospace 2,3, or 4 may exhibit in any class within this division.

H850004. Rocket. (SF92) Any self-designed rocket with wooden fins and cardboard body tubes.

Drones

H850005. Drone Poster. Exhibit must 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 must follow. Posters can be any size up to 28 inches by 22 inches.

H850006. Drone Video. Exhibit must 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. State Fair Qualified video should not exceed 5 minutes. Videos should be submitted to https://go.unl.edu/2024nesfset by August 10, 2024. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing. For county fair, videos should be submitted to Dawes County at dawes-county@unl.edu.

DIVISION 860: COMPUTERS COMPUTER MYSTERIES – UNIT 2

H860001. Computer Application Notebook. (SF 277) 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 (5 different cards such as a birthday, wedding, anniversary, sympathy, get well or other); a business card (5 cards for 5 different individuals and businesses); menu (minimum of 2 pages including short description of foods and pricing); book layout (I-book); promotional flyer (3 flyers promoting 3 different events); newsletter (minimum 2 pages); or other: examples such as precision farming or family business logo etc. This exhibit consists of a notebook (8.5" x 11") which should include a (1) a detailed report describing: (a) the task to be completed, (b) the computer application software required to complete the task (c) specific features of the computer application software necessary for completing the task (2) print out of your project. Project may be in color or black and white.

H860002. Produce a Computer Slideshow Presentation. (SF 276) 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 not 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 must be uploaded. State fair qualified entries should be submitted to https://go.unl.edu/2024nesfset by August 10th, 2024. Or entries can be uploaded to a cloud sharing service and exhibitors MUST 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.

COMPUTER MYSTERIES – UNIT 3

H860003. Produce an Audio/Video Computer Presentation. (SF 276) 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 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. State Fair qualified entries should be submitted to https://go.unl.edu/2024nesfsett by August 10th, 2024, or entries can be uploaded to a cloud streaming service and exhibitors **MUST** 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. All presentations for county fair should be emailed to Dawes County at dawes-county@unl.edu or the presentation can also be uploaded to a video streaming application and exhibitors must provide a hard copy QR code for viewing.

H860004. How to STEM (Science, Technology, Engineering and Math) Presentation. (SF 276) Youth design a fully automated 2 to 5 minute 4-H "how to" video. Submissions should incorporate a picture or video of the 4-Her, 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. State fair eligible entries should be submitted to https://go.unl.edu/2024nesfset by August 10th, 2024, or videos can be uploaded to a video streaming application and exhibitors **MUST** provide a hard copy QR code for viewing. Exhibitors should to test their codes or links on several devices to check for appropriate permissions for public viewing.

H860005. Virtual Platform Presentation. (SF276) - 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., explain the process, experience, and/or presentation. All submissions must include a link to the virtual presentation. State Fair qualified entries should be submitted to https://go.unl.edu/2024nesfset by August 10th, 2024. Entries can be uploaded to a cloud sharing service. Exhibitors MUST provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devices to check for appropriate permission for public viewing.

H860006. Create a Web Site/Blog or App. (SF 275) 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 a app isn't live, include all files to https://go.unl.edu/2024nesfset by August 10th 2024. Entries can be uploaded to a cloud sharing service. Exhibitors MUST provide a hard copy QR code for viewing. Exhibitors are encouraged to test their codes or links on several devise to check for appropriate permissions for public viewing.

H860007. 3D Printing. (SF 1050) 3D printing uses plastic or other materials to build a three-dimensional (3D) object from a digital design (including 3D Pen Creation). 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. Must 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 stated in #1 above. If its design was modified multiple times, please indicate what change was made with each modification, and what prompted the need for the change. I.e., I printed it and the design was too fragile, so I resliced the print to make thicker external walls or 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.

H860008. Maker Space/Digital Fabrication. (SF 1050) This project is a computer generated projected 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:

1. What motivated you to create this project?
2. Software and equipment used
3. Directions on how to create the project
4. Prototype of plans
5. Cost of creating project
6. Iterations or modifications made to original plans
7. Changes you would make if you remade the project

Team Entry Option: To qualify for entry at the Nebraska State Fair team materials entered in H8600087 – Maker Space/Digital Fabrication must clearly be the work of a team instead of an individual and must 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.

DIVISION 861: ROBOTICS

A. **Team Entries:** To qualify for entry at the Nebraska State Fair team materials entered in robotics classes that are clearly the work of a team instead of an individual must 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.

B. Creating a video of your robot in action would be helpful for the judges but is not mandatory. Videos should be uploaded to a video streaming application and exhibitors should provide a hard copy QR code for viewing. State Fair qualified videos should be submitted to https://go.unl.edu/2024nesfset by August 10th, 2024. Or videos can be uploaded to a video streaming application and exhibitors MUST 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.

H861001. Robotics Poster. (SF 236) 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.

H861002. Robotics Notebook. (SF 237) 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, a programming skill, calibration, sensor exploration, or any of the topics suggested in Class 1.

H361003. Robotics Showcase – Robotics Video. This class should be displayed in a notebook. The notebook should include a video clip on a CD/DVD that demonstrates the robot performing the programmed function. Include your pseudo code and screenshots of the actual code with a written description of the icon/command functions. All videos should be emailed to Dawes County at dawes-county@unl.edu. Files must be saved in a PC compatible format with county name and last name of participant before emailing.

H861004. Robotics /Careers Interview. (SF 239) 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. State Fair qualified videos should be submitted to [https://go.unl.edu/2024nesfset by August 10th 2024](https://go.unl.edu/2024nesfset). Or videos can be uploaded to a video streaming application and exhibitors MUST 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.

H861005. **Robotics Sensor Notebook.** (SF 241) Write pseudo code, which includes at least one 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. State Fair qualified videos should be submitted to https://go.unl.edu/2024nesfset by August 10th, 2024. Videos can also be uploaded to a video streaming application and exhibitors MUST 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.

H861007. Kit Labeled Robot (cannot be free programmed) and Notebook. (SF 243)
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. If robot is more than 15 inches x 20 inches they may not be displayed in locked cases.

H861008. 3D Printed Robotics Parts. (SF244) This class is intended for youth to create parts through 3D printing that 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 870: ELECTRICITY
MAGIC OF ELECTRICITY – UNIT 1 (Not State Fair Eligible)
H870009. Demonstration Board. Exhibit is to be prepared on a board that is 1/4" thick and 24" high x 32" wide. Exhibit may include a simple switch, simple fuse, and/or conductors/non-conductors. Be sure to include the appropriate labeling.
H870010. A Poster. That describes and explains any one of these concepts related to electricity: electrical materials appreciation of electricity, open and closed switches, and conductivity of materials. change to should exemplify one of the lessons learned in the Magic of Electricity project. Poster can be any size up to 28 inches x 22 inches)
H870011. Design a Project. That demonstrates the capacity for conductivity of materials.

INVESTIGATING ELECTRICITY – UNIT 2 (Not State Fair Eligible)
H870012. Build a Circuit Board. Exhibit should be a series or parallel circuit.
H870013. Build a Burglar Alarm.
H870014. Build a Rocket Launcher.
H870015. Telegraph Station. Exhibit must include one telegraph key and one telegraph sounder. The telegraph must be attached to a wooden base and wired to a battery to demonstrate its operation. Label the display and the major components.
H870016. Electric Toy Motors. Working model of an electric motor. The motor is to be of the 4-H'ers designed should have the major parts labeled. A short, written description of how the motor works is to be included in a clear protective cover. No pre-manufactured electric motors will be accepted.
H870017. Toy Electric Motor Converted to DC or AC Generator. Exhibit is to consist of a toy electric motor shown in Unit II, converted to use as a DC or AC generator. Generator should be exhibited on base including a battery and a light bulb or Galvanism to demonstrate its operation. Title the exhibit and label the major parts.
H870018. A Poster – describe and explain the purpose of the National Electrical Code.
H870019. A Poster – illustrate how an electrical usage meter or a main service panel for a building works.

ELECTRICITY – UNIT 3
H870001. Electrical Tool/Supply Kit. (SF 224) 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.
H870002. Lighting Comparison. (SF 225) Display studying the efficiency of various lighting (incandescent, fluorescent, halogen, Light Emitting Diodes, etc.). Exhibit could be a poster display, or an actual item.
H870003. Electrical Display/Item. (SF 226) 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
H870004. Poster. (SF 227) Poster should exemplify one of the lessons learned in the Wired for Power project. Posters can be any size up to 28 inches by 22 inches.

ELECTRONICS – UNIT 4
H870005. Electrical/Electronic Part Identification. (SF 228) 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 10 different parts.
H870006. Electronic Display. (SF 229) Show an application of one of the concepts learned in the Entering Electronics project. Examples include: components of an electronic device (refer to p. 35 of the Electronic manual).
H870007. Electronic Project. (SF 230) 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 voltmeter.

H870008. Poster. (SF 231) Poster should exemplify one of the lessons learned in the Entering Electronics project. Posters can be any size up to 28 inches by 22 inches.

DIVISION 880: GEOSPACIAL

H880001. Poster. (SF 299) 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.

H880002. 4-H Favorite Places or Historical Site Poster. (SF 299) 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.

H880003. GPS Notebook. (SF 300) Keep a log of at least 5 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.

H880004. Geocache. (SF 301) 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 trinket, geocoins, 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, include a print-out of its registry. The entry may include a photograph of the cache in its intended hiding place.

H880005. Agriculture Precision Mapping. (SF 302)4-Her's will assemble a notebook that will include a minimum of 2 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). A report of how the analysis of the various data will be used to make a management decision.

H880006. 4-H History Map/Preserve 4-H History. (SF300) 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://www.4-hhistorypreservation.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 the historical significance of 4-H place or person. (a minimum of one paragraph)

H880007 - GIS Thematic Map. (SF302) Using any GIS software, create a thematic map. Thematic maps can utilize any subject of interest to the 4-H'er. Example map would be Amelia Earhart's or Sir Francis Drake's voyage, population density maps, water usage maps or 4-H project in Nebraska. Create GIS Map using data from books, and/ or internet. Use reliable data, (U.S. Center or U.S. Census Bureau etc.) Map any size from 8.5 inches x 11 inches up to 36 inches x 24 inches, which should include Title, Base Map, Neat Line, North Arrow, and Legend. Identify the source of your information on the back of the map.

H880008. Virtual Geocache. (SF300) 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, a paragraph explaining what was interesting about the site or finding it. Photos of each site and/or cache are optional, but highly encouraged.

DIVISION 900: SET PHYSICS/POWER OF WIND

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

H900001. Create and Compare Energy Resources Poster. (SF 307) – Poster should explore 2 Alternative/renewable energy resources. Compare and contrast the 2 resources including two of the following information: amount of energy created, costs of production, usability of the energy, pros/cons of environmental impacts, etc. Posters can be any size up to 28 inches by 22 inches.

H900002. Experiment Notebook. (SF 305) – 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.

H900003. Solar as Energy Display/Poster. (SF 308) - Item should be the original design of the 4-Her. 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 sun. Examples include solar ovens, solar panels, etc.

H900004. Water as Energy Display/Poster. (SF 308) - Item should be the original design of the 4-Her. 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.

H900005. Wind as Energy Display. (SF308) – Item should be the original design of the 4-Her. 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.

H90006. Other Nebraska Alternative Energy. (SF 306) –Notebook should explore Nebraska an 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.

DIVISION 911: WOODWORKING

A. All articles exhibited must include a plan (with drawings or sketch or blueprint) stating dimensions and other critical instructions a builder would need to know to build the project and 4-H'ers name & county.

B. 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 the plans are modified, the changes from the original need to be noted on the plans.

C. All plans used for making the article must be securely attached and protected by a clear plastic cover.

D. 4-H'ers must be in Unit 3 or Unit 4 for the exhibit to be considered for State Fair.

E. All projects must have appropriate finish. If the project (i.e. picnic tables, wishing wells, swings, chairs, bridges, doghouses, etc.) is designed to be used outside, it will be displayed outside.

F. All outside projects MUST have supporting information placed in a protective bag to prevent damage from weather events such as rain and be ATTACHED to projects with string, zip ties, etc.

G. Only one exhibit allowed per 4-H'er per class.

MEASURING UP –UNIT 1 (Not State Fair Eligible)

H911021. Build a Flower Box. – include your plan

H911022. Build a Letter Holder. – include your plan

H911023. Build a Picture Frame. – include your plan

MAKING THE CUT –UNIT 2 (Not State Fair Eligible)

H911024. Display of Wood Samples. – display at least 6 different wood samples, attach securely to a ¼" or 3/8" board, label each sample with tree species and type of wood (hard or soft),

H911025. Woodworking Tools Poster. – Create a poster showing at least 6 tools used in woodworking. Label each tool with its name and general use.

H911026. Build a Napkin Holder. – include your plan

H911027. Build a Birdhouse. – include your plan

H911028. Build a Foot Stool. – include your plan

H911029. Build a Toolbox or a Sawhorse. – include your plan

H911030. Build an Article. – using at least 2 different hand tools, include your plan and what tools you used.

NAILING IT TOGETHER – UNIT 3

H911001. Woodworking Article. (SF 91) 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.

H911003. Recycled Woodworking Display. (SF 91) Article made from recycled, reclaimed or composite wood. Article must be appropriately finished and/or sealed and utilize one or more woodworking techniques from page 2 of the Unit 3 manual. Exhibit must 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?)
7. Present results (How would you do this better next time?)

H911004 - Composite Wood Project. - (SF96) 60% of the project must be wood and 40% made from other materials such as metal, rubber, resin, etc. All plans and plan alternations must 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 because project may be displayed outside.

H911005 - Outdoor Wood Project made with Treated Wood. - (SF97) Treated wood projects DO NOT have to have a finished coating. All plans and plan alternations must be attached to the article. Protect plans with a cover. If project is designed to be outside. Examples include: picnic tables, planters, outdoor furniture, etc.

H911006 – Wood Projects. created on a Turning Lathe - (SF   ) –- Article is the object created from spinning wood on a turning lathe. Article must be appropriately finished and/or sealed. Exhibit must 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. Must include a description of tools used.

FINISHING UP – UNIT 4

H911006. Woodworking Article. (SF 91) 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.

H911008. Recycled Woodworking Display. (SF 91) Article made from recycled, reclaimed, or composite wood. Article must be appropriately finished and/or sealed and utilize one or more woodworking techniques from page 2 of the Unit 4 manual. Exhibit must include the woodworking plan and a minimum one-page report of how the design and engineering process was used to develop the woodworking plan.

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 920: WELDING
(All metal welding processes accepted.)
ARCS AND SPARKS
A. All welds exhibited in class 1 or 2 must be mounted on a 12 inch high x 15 inch 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.
B. Each weld should be labeled with information stated 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 be disqualified.
C. 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 include 4-Her name and county, be computer generated and enclosed in a clear plastic cover. The reports should be attached securely to the display.
D. All outside projects MUST have entry tag and supporting information placed in a protective bag to prevent damage from weather events such as rain and be ATTACHED to projects with string, zip ties, etc.

H920001. Welding Joints. (SF 281)
A display of one butt, one lap and one fillet weld.
H920002. Position Welds. (SF 281)
A display showing three beads welded in the vertical down, horizontal and overhead positions.

Classes 3-5: Type of welder, welder settings, all plans, plan alternations, and a bill for material must 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 because project may be displayed outside.
H920003. Welding Art. (SF283) Any art created using tack welds to hold the metal pieces together (examples include horseshoe projects).
H920004. Welding Article. (SF 281) Any shop article where welding is used in the construction. 60% of item must be completed by 4Her and notes regarding laser welding or machine welding must be included.
H920005. Welding furniture. (SF 282) Any furniture with 75% welding used in the construction. 60% of item must be completed by 4-Her and notes regarding laser welding, or machine welding must be included. **Type of welder, welder settings, all plans, plan alternations, and a bill for material must 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 because project may be displayed outside.
H920006. Plasma Cutter/Welder Design. (SF 239) Plasma cutters/welders allowed 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 but into the metal. Notebook should include:
1. A photo of the finished project (front and back).
2. Instructions on how the design was created (include software used), this allows for replication of the project.
3. Lessons learned or improvements to the project.
4. Steps to finish the project.
H92007. Composite Weld Project. - (SF280) 60% of the project must 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 must be attached to the article.** Protect plans with a cover. If project is designed to be outside, it is required to have an appropriate outdoor finish because project may be displayed outside.

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. It is suggested that all welds be on the same size and thickness of metal. These pieces, referred to as coupons, should be 1.5 to 2 inches wide and 3.5 to 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- ¼ inch if using 1/8 inch rod
    • Suggested rod-AC and DC straight or reverse polarity- first E-7014, second E-6013 MIG welding:
    • Suggested coupon thickness-1/4 inch if using .035 wire and 1/8 inch if using .023 wire 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 on 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.

Class 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.

DIVISION 890: SMALL ENGINES - Not State Fair Eligible
WARM IT UP – UNIT 2
H890001. Small Engine Display/Item. Show an application of one of the concepts learned in the Warm It Up project. Examples include: comparison of engine oil types, transmissions, or safety related to engines. Exhibit could be a poster display or an actual item.
TUNE IT UP – UNIT 3
H890002. Engine Display/Item. Display/Item should exemplify one of the lessons learned in the Tune It Up project. Examples include: diagnostic tools, fuel systems, ignition systems. If a complete engine is exhibited, it will not be started. However, display needs to report process of building/rebuilding engine and how/where engine will be utilized (i.e., lawn mower, weed eater, snow blower, etc.).

DIVISION 891: RESTORED VEHICLE - Not State Fair Eligible
H891001. Restored Vehicle. A detailed report with pictures explaining the process used to restore or overhaul the vehicle is required. The vehicle may or may not be exhibited at the fair.

DIVISION 926: ROPE - COUNTY ONLY.

Each rope exhibit must be mounted on a board that is ¼" thick, 24" high x 32" wide. Either manila or synthetic rope may be used. When halters are exhibited, the tie rope, plus a required second piece of rope must show any three of the following items: 1) end whipping, 2) eye splice, 3) crown splice, 4) rosebud knot, 5) Matthew Walker knot, or 6) diamond knot.

H926001. Rope Display. At least 10 and not more than 12 knots, hitches, and splices (include 2 splices) made of 3/8" rope. Include appropriate board title and item labels. The end of all ropes must be whipped, judging consideration will be given to difficulty of items shown on the board.

H926002. Single Loop or Double Loop Halter. Sheep and goats use 3/8" rope. See above requirements for halter exhibits.

H926003. Single Loop or Double Loop Halter. Cattle and horses use 5/8" or ¾" rope. See above for halter exhibits.

H926004. Braided Rope. (Homemade) To be mounted on 24" x 32" rope board.

H926005. "You Design It" with Rope. To be mounted on a 24" x 32" rope board or not to exceed one exhibit area of 24" x 32", plastic or hemp rope.

H926006. "You Design It" with Rope – Horse Accessories. To be mounted on a 24" x 32" rope board or not to exceed one exhibit area of 24" x 32", plastic or hemp rope.

H926007. Other.