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WELCOME TO
2024 MERRICK COUNTY FAIR
JULY 27 - 31
4-H, FFA & OPEN CLASS EXHIBITS

Merrick County Fairboard-308-940-0884 Merrick County Extension Office-308-946-3843

YOUR MERRICK COUNTY AGRICULTURAL AND FAIR ASSOCIATION

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Karen Knight-Kutschkau and Jean Waggoner – Open Class Needlework, Fine Arts & Misc.
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Mollie Nielsen - Open Class Poultry and Rabbits

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MERRICK COUNTY 4-H AMBASSADORS

Keir Albert 2023-2024
Shelby Hostler 2023-2024
Makenna Mottl 2024-2025
Chloe Jefferson 2024-2025

RULES AND REGULATIONS
MERRICK COUNTY'S 73rd
FREE FAIR

1) Exhibits will get their entry card at each department where they wish to enter articles.
2) Open Class entries should be made **Sunday, July 28, 1:00 - 4:00 p.m.**
3) 4-H static exhibits will be entered on **Thursday, July 25, 1:00 p.m. - 5:00 p.m., Friday July 26, 8:00 a.m.-5:00 p.m., and Saturday, July 27, 8:00 a.m. - 12:00 p.m.**
4) Livestock exhibits will be entered **Sunday, July 28**
    - Youth poultry and rabbits must be in place by 4:00 p.m. on **Saturday, July 27.**
    - Youth hogs must be in place by 11:00 a.m.
    - Youth sheep and goats must be in place by 1:00 p.m.
    - Youth market beef must be in place by 2:30 p.m.
    - Youth breeding beef must be in place by 3:30 p.m.
    - Youth bucket calves must be in place by 4:00 p.m.
5) No ribbon will be given out until animals are properly checked-in with the superintendent of that area. Animals are judged according to merit.
6) All livestock owners will have their pens cleaned by 8:00 a.m. each day and put pen cleanings in the designated area.
7) Exhibit building will be open Monday, Tuesday, and Wednesday from 8:00 a.m. - 9:00 p.m.
8) 4-H Static Exhibits may begin release at 8 p.m. on Wednesday. 4-H Livestock must not be removed until after midnight. Open Class exhibits will be released from 8:00 a.m. - 10:00 a.m. on Thursday. Premiums will be paid at that time for Open Class only.

4-H AND FFA DEPARTMENT

1) It is the policy of the University of Nebraska - Lincoln, Institute of Agriculture and Natural Resources and Merrick County 4-H Council not to discriminate based on sex, age, handicap, race, color, religion, marital status, veteran status, national or ethnic origin or sexual orientation.
2) All exhibits are at the exhibitor's risk. The Merrick County Ag Society and Merrick County 4-H Council are not responsible for any damage, loss or death to an exhibit or animal.
3) If a project item or animal is shown at another county's fair as a 4-H or FFA project, it is **NOT** eligible for competition in Merrick County. It will be disqualified.
4) Judges will place awards based on merit. They will be instructed to use the group method similar to the plan followed by the Nebraska State Fair, whereby exhibits of nearly equal merit will receive equal ribbons. The judge's decision will be final in all classes. Awards will be given according to the rules and regulations set forth in this premium list.

Purple - Superior Blue - Excellent Red - Good White - Needs Improvement Orange- Flops Lime Green- Afterschool Project

5) **4-H AGE REGULATIONS** - The age regulations for Merrick County 4-H membership as determined by the Merrick County 4-H Executive Council shall be that a member must be 8 years of age on December 31st of the previous year (turn 9 during the current year) and the last year of eligibility is 4-H age 18 on December 31st (or the calendar year the member becomes 19).
6) FFA members may exhibit livestock until the age of 21. Enrollment must be confirmed with the FFA Advisor. Annual quality assurance training through Youth for the Quality Care of Animals (YQCA) must be completed online at yqca.org by July 10.
7) 4-H and FFA members show together in livestock, crops, and plant science. The total number of animals shown is indicated at the beginning of each species area. 4-H and FFA will follow the rules according to this fairbook.

CLOVER KIDS GUIDELINES: Clover Kids classes can be found on page 66.

a) The 4-H Clover Kid Program is for youth between the ages 5-7 years old by January 1 of the current calendar year. 4-H Clover Kid exhibitors must be enrolled as a 4-H member by June 15.
b) Clover Kid animal exhibits are to be no more than six months of age and no more than 350 pounds at time of show, with the exception of small animals (dog, cat, etc.) Age, size, and temperament of animal projects must be appropriate for the exhibitor's age and size. Clover Kids will only show in showmanship classes, no market or breeding classes. The horse project is not available for Clover Kids.
c) Clover Kids may exhibit at the county fair and participate in 4-H contests receiving special ribbons with a premium of $1.00. However, they will not be eligible for participation in the Livestock Sale, and will not be considered for any incentive, championship, trophy, medal, or plaque competition on an individual basis. They will be considered as part of a club competition in such activities as herdsmanship, performing arts or club contest.

ELIGIBILITY REQUIREMENTS FOR EXHIBITORS: An exhibitor must be a 4-H member enrolled in the project they are exhibiting.

8) All 4-H exhibits that do not conform to the specs, rules and regulations set forth in this premium list will drop one ribbon placing.
9) Be sure to check the number of entries per project and entry number for each division. **All projects other than livestock have only one entry per class number.**
10) Premiums will be paid when the 4-H member submits a completed Achievement Application to the Ext. Office **by October 1**. Premium money will be available at the year-end 4-H Achievement Celebration. If premium money is not picked up by Dec 1, monies will be turned back to the Merrick County Ag Society.
11) An ***** indicates an exhibit is eligible for State Fair. All items eligible for State Fair must receive a purple ribbon. The last year of eligibility is the calendar year the member becomes 19 years of age.
12) All exhibitors showing any animals are required to wear the required 4-H/FFA T-Shirt, black/blue jeans, and closed toe shoes. Hats, caps or other headgear are prohibited. Exhibitors in the horse show will wear a long white sleeve shirt or blouse, dark blue jeans, boots, hat and a 4-H armband. The 4-H armband may be purchased for $3.00.
13) An exhibit or exhibitor must be at least purple ribbon quality before a rosette or award is awarded, and the judge must deem it worthy of the award.
14) Substance Abuse - Use or possession of tobacco, alcoholic beverages, or drugs (except for medical purposes) by any exhibitor who is participating in 4-H/FFA at the Merrick County Fair will result in immediate disqualification of that exhibitor's entry.
15) **PROTESTS**

a) The respective division superintendent has the authority to make appropriate decisions based on the Premium List, and these will be adhered to by all.
b) A committee shall be appointed to serve as a protest group. They will meet daily if needed to act upon concerns. All protests must be submitted in writing and signed. Written protests must be submitted to the Extension Educator. He/She will then convene the committee for their deliberation.
c) The written protest must include: **1)**Names of persons involved. **2)**Nature of concerns. **3)**Situation and documentation. **4)**Recommendations for correction. **5)**Specific action, rule, etc. in question. **6)**Additional persons committee may contact for further clarification. (**two Fairboard, two 4-H Council) 7)**Procedures and/or steps carried out by person involved prior to submission to the Extension Educator.
d) The committee will review the written protest. They may discuss the situation with affected persons and show officials to include county fair management if appropriate, to make a final decision. The committee will recommend appropriate action to management in writing. The recommendations will be followed and communicated both verbally and in writing to the group or individual affected.
e) In case of protest the exhibitor may be allowed to show but results of showing will be subject to change based on the outcome of the protest process. This allows for smooth operation of the show and facilitates appropriate processing.
f) The management reserves the right to withhold premium and/or award. The exhibitor may also be excluded from the show if action warrants.
g) The appeals process is limited to the 4-H/FFA exhibitor, 4-H/FFA parent or registered 4-H volunteer leader.
h) Protests will not be accepted after the exhibit is released from the 4-H Division.

16) **Member/Parent Code of Conduct-**Character Development is the cornerstone of the 4-H program, and therefore we expect all people involved with the 4-H program to exemplify the six pillars of character, which are Trustworthiness, Respect, Responsibility, Fairness, Caring, and Citizenship. Please make yourself aware of these expectations.
    - Treat members, parents, Extension staff, judges and others with respect, courtesy and consideration. Avoid and prevent put-downs, insults, name-calling, yelling and other verbal and non-verbal conduct likely to offend, hurt or set a bad example.
    - Model kindness and compassion for others and be a team member, discouraging selfishness.
    - Practice fair-mindedness by being open to ideas, suggestions, and opinions of others.
    - Obey laws and rules as an obligation of being a good citizen, and promote the responsible treatment of animals and stewardship of the environment.
    - Provide and maintain a safe environment, not carelessly or intentionally harming youth or adults in any way: verbally, mentally, or physically.

UNIVERSITY OF NEBRASKA - LINCOLN ACCOMMODATIONS
The University of Nebraska-Lincoln is committed to providing accommodations necessary to allow individuals with disabilities to function effectively and safely while participating in 4-H events. If you believe you may need accommodation, please contact Faculty/Staff Disability Services at acces@unl.edu or call 402-472-3417.

UNIVERSITY OF NEBRASKA - EEO STATEMENT
Nebraska Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln cooperating with the Counties and the United States Department of Agriculture. The 4-H Youth Development program abides with the nondiscrimination policies of the University of Nebraska - Lincoln and the United States Department of Agriculture.

4-H PRE-FAIR ACTIVITIES AND 2024 MERRICK COUNTY FAIR

All dates, times, and contest/show formats are subject to change.

February

13 (Tues.)	6:00 p.m.	Junior Indoor Archery Contest - 4-H Building
18 (Sun.)	1:30 p.m.-4:30 p.m.	Market Beef Rate-of-Gain Weigh-Day - Central City Vet Clinic
20 (Tues.)	6:00 p.m.	Intermediate & Senior Indoor Archery Contest - 4-H Building

March

2 (Sat.)	2:00 p.m.	Air Rifle Contest - 4-H Building

April

1 (Mon.)	6:30 p.m.	Communication Contest - 4-H Building
27 (Sat.)	1:00 p.m.	Shotgun Contest - Sportsman's Club

May

16 (Thurs.)	5 p.m.-7 p.m.	Market Sheep & Goat Rate-of-Gain Contest Weigh-in - Indoor Arena
31 (Fri.)	5:00 p.m.	State Horse ID's and Levels Testing **DUE** to the Ext. Office

June

1 (Sat.)	5:00 p.m.	State Horse Entry Forms **DUE ONLINE**
14 (Thur.)	5:00 p.m.	**ALL 4-H and FFA** County Animal ID's **DUE** to the Extension Office **ALL 4-H and FFA** State Fair Livestock DNA Envelopes **DUE** to the Extension Office
29 (Sat.)	9:00 a.m.	Outdoor Archery Contest - Fairgrounds

Pre-entries 

July

10 (Mon.)	5:00 p.m.	**ALL 4-H and FFA** Static, Animal, Clothing Pre-entries **DUE** to the Extension Office **ALL 4-H and FFA** YQCA training complete Vaccination records **DUE** for cats, dogs and ferrets

July continued

20 (Sat.)	9:00 a.m.	Fair Cleanup - Fairgrounds
	9:00 a.m.	Bicycle Rodeo Contest - Fairgrounds
	11:00 a.m.	Ice Cream Roll Contest - 4-H Building
23 (Tue.)	9:00 a.m.	Clothing Construction & Fashion Show Judging - 4-H Building
	7:30 p.m.	4-H Night and Performing Arts Contest - 4-H Building
25 (Thurs.)	1 p.m.-5 p.m.	4-H Static Check-in - 4-H Building
26 (Fri.)	8 a.m.-5 p.m.	4-H Static Check-in - 4-H Building
27 (Sat.)	6:30 a.m.-4 p.m.	4-H Food Stand Open
	6 a.m.-7 a.m.	Horse Show Check-in - Indoor Arena
	7:00 a.m.	Horse Show - Indoor Arena
	8 a.m.-12 p.m.	4-H Static Check-in - 4-H Building
	5 p.m.-7 p.m.	**Poultry & Rabbit Check-in - Annex Building**
28 (Sun.)	8 a.m.-8 p.m.	4-H Food Stand Open, 4-H Building closed for Judging
	8 a.m.-11 a.m.	Hog Weigh-in & Check-in - Hog Barn
	**8:00 a.m.**	**Rabbit Show** - Indoor Arena
	11:00 a.m.	**Poultry Show** *or 30-minutes after Rabbit Show* - Indoor Arena
	11 a.m.-1 p.m.	Goat & Sheep Weigh-in & Check-in - Southside Livestock Barn
	1 p.m.-4 p.m.	Open Class Exhibit Check-in - 4-H Building
	1 p.m.-2:30 p.m.	Market Beef Weigh-in & Check-in - Northside Livestock Barn
	2:30-3:30 p.m.	Breeding Beef Check-in - Northside Livestock Barn
	3:30-4 p.m.	Feeder & Bucket Calf Check-in, **DUE** Bucket Calf Project Record Book - Northside Livestock Barn
	4:30 p.m.	Livestock Judging Contest - Indoor Arena
29 (Mon.)	7 a.m.-9 p.m.	4-H Food Stand Open, 4-H Building Open
	**7:00 a.m.**	**Hog Show** - Indoor Arena
	1:00 p.m.	**Meat Goat Show** - Indoor Arena
	4:00 p.m.	**Sheep Show** *or 30-minutes after Meat Goat Show* - Indoor Arena
30 (Tue.)	7 a.m.-9 p.m.	4-H Food Stand Open, 4-H Building Open
	8:00 a.m.	Beef Show - Indoor Arena
31 (Wed.)	7 a.m.-9 p.m.	4-H Food Stand Open
	7:30 a.m.	Dog Check-in - Vendor and Exhibitor Building
	8:00 a.m.	Dog Show - Vendor and Exhibitor Building
	10:30 a.m.	**Dog Agility** - Indoor Arena
	**11:30 p.m.**	**Cat & Companion Animal Check-in Indoor Arena**
	12:00 p.m.	**Cat & Companion Animal Show *or immediately following the Dog Agility Show*** - **Indoor Arena**
	1:30 p.m.	4-H Overall Livestock Showman Contest - Indoor Arena
	**4:45 p.m.**	**4-H & FFA Member Group Picture** - Indoor Arena
	5:00 p.m.	**Livestock Sale** - Indoor Arena
	8:00 p.m.	Release ALL Static Exhibits - 4-H Building

August

1 (Thur.)	1 a.m.-10 a.m.	Release ALL Livestock
	6 a.m.-10 a.m.	Release ALL Poultry & Rabbit
	7 a.m.-8:30 a.m.	FREE EXHIBITOR & FAMILY BREAKFAST sponsored by Central City Area Chamber of Commerce
	8 a.m.-10 a.m.	Release ALL Static Exhibits
	12:00 p.m.	Extension Office Closed - Fair Recovery
2 (Fri.)	8 a.m.-5 p.m.	Extension Office Closed - Fair Recovery

4-H AND FFA SUPERINTENDENTS

- Air Pistol, Small Bore, Hunting Skills – *TBD*
- BB Gun & Rifle – *Matt Douglass, Phillip Johnson*
- Beef – *Kane Brandes, Ryan Kucera*
- Beyond the Needle, Fiber Arts, Quilt Quest – *Darcy Ray*
- Bicycle Rodeo – *Jen Myers*
- Cat & Companion Animal – *Mollie Nielsen*
- Clover Kids – *Jr. Leaders*
- Consumer & Family Science, Citizenship & Entrepreneurship, Safety, Photography – *Nikki Ferraro*
- Dog – *Kim & Travis Stuhmer*
- Fashion Show – *Kendra Jefferson, Jamie Wright*
- FFA – *Payden Woodruff, Jessica Brondel, Alex Stocker, Katie Hornung*
- Food & Nutrition – *Angela Blomstedt*
- Herdsmanship – *TBD*
- Hog – *Brian Jefferson, Isaac Jefferson*
- Home Environment – *Kelly & Doug McHargue*
- Horse – *Russ & Carolyn Kucera*
- Indoor Archery – *Sara Umstead, Brian Thomas*
- Livestock Judging Contest – *Payden Woodruff, Darcy Ray, Alex Stocker*
- Meat Goat & Sheep – *Craig Nelson, Jon Root*
- Outdoor Archery – *AAron Blanchard*
- Overall Livestock Showman – *Alex Stocker, Chase Samuelson*
- Plant Science – *Bailey Jefferson*
- Rabbits & Poultry – *Mollie Nielsen*
- Sewing for Fun, STEAM Clothing 1, 2, 3, – *Amy Greving, Nicole Greving*
- Shotgun – *Craig Nelson, Aaron Heins*
- STEM & Conservation – *Beth Johnson*

THANK YOU TO THE FOLLOWING BUSINESSES & INDIVIDUALS FOR SPONSORING 2023 AWARDS & INCENTIVES

- AKRS Equipment
- Albert Acres Cattle Company
- Bank of Clarks
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- Bill's Volume Sales
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- Central City Mall
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- Merrick Foundation, Inc.
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- Mr. K Angus and T & E Angus
- Agricultural Institute of Nebraska Husker Harvest Days
- Nelson Brothers Fencing
- Palmer Local Market
- Platte River Riders 4-H Horse Club
- Nona Lechtenberg
- Root-Collins Club Lambs
- Runza Attn: Rex and Noah Luebbe
- Schank Memorial
- Silver Creek Mini Mart
- Simonson Show Goats
- State Farm Insurance
- Stoltenberg Irrigation, Inc.
- Sullivan Agency
- Supernaw Law Office
- The Dentist
- Tom & Eve Reimers
- Trav's U-Save Pharmacy
- Trico Heating and Air
- Vlcek Gardens, Inc.
- Walts Aerial Spraying
- Wegner Monument
- Wert Show Lambs
- You Are Worth It LLC

FLOPS/HARD LUCK

FLOPS/HARD LUCK CLASS

HL-900-02. An exhibit and a written story about any exhibit, from any department, that did not turn out the way it was planned. Include what happened, what you learned and what you will do differently next time. Exhibits will receive an orange ribbon with a premium of $1.00.

SCIENCE, TECHNOLOGY, ENGINEERING AND MATH
Superintendent Beth Johnson

GENERAL RULES FOR ALL CLASSES

1) 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 from the exhibit.

ROCKETS/DRONES- This category gives 4-H'ers a chance to display the rockets and drones they have created. Through participation in this category 4-H'ers will show judges what they learned about and how they adapted their exhibit throughout this project. Involvement in STEM Rockets gives participants a first-hand experience in modern technology.

RULES: One entry per class number. See General Rules for exhibits

1) 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 12x12" and the base should be 3/4" thick. No metal bases. If the rocket fins extend beyond the edges of the required base (12x12”), then construct a base that is large enough to protect the fins. The base size is dictated by the size of the rocket fins.
2) 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.
3) 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.
4) 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, 4) flight pictures 5) Safety (how did you choose your launch site? Document safe launch, preparations, and precautions) 6) objectives learned and 7) conclusions.
5) 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.
6) 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 for the State Fair, only actual launches count, misfires will not count towards one of the required three launches.
    a) For self-designed rockets only, please include digital recorded copy of one flight. In the documentation please include a description of stability testing before the rocket was flown.
    b) 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.
    c) 4-H Rocket project levels are not intended to correspond to National Association of Rocketry model rocket difficulty ratings or levels.
7) 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.
8) Posters can be any size up to 28x22” when ready for display. Example: tri fold poster boards are not 28x22” when fully open for display.
9) Entry level rockets, made with PLASTIC FINS and PLASTIC BODY TUBES, are COUNTY ONLY projects.

Fly kites and launch rockets; Explore space; Experience disorientation; Learn to fly an airplane; Make a shuttle on a string; Control flight directions; Create an altitude tracker; Evaluate navigation systems; Explore pilot certification requirements

PREMIUM: Purple $2.00; Blue $1.50; Red $1.00; White $.50

Rockets-Youth enrolled in STEM Rockets may exhibit in any class within this division.

***H-850-001.** Rocket: Any skill level rocket with **wooden fins and cardboard body tubes** painted by hand or air brush.

***H-850-002.** Aerospace Display: Poster or display board that 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 28x22".

***H-850-003.** Rocket: Any Skill Level 2 Rocket with wooden fins and cardboard body tubes painted using commercial application for example commercial spray paint.

Self-Designed Rocket-Youth enrolled in STEM Rockets may exhibit in any class within this division.

***H-850-004.** Rocket: Any self-designed rocket with wooden fins and cardboard body tubes.

Drones-Youth enrolled in STEM may exhibit in any class within this division.

***H-850-005.** 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 28x22".

***H-850-006.** 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, and drones used for structural engineering. Video should not exceed 5 minutes. State fair qualified videos should be submitted to https://go.unl.edu/2024nesfset by August 15, 2024, or 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.

COMPUTERS- This category gives 4-H'ers a chance to display their knowledge of computers. Through participation in this category 4-H'ers will develop presentations that show judges their knowledge in the different aspects of computer science. Involvement in STEM Computers gives participants a first-hand experience in modern technology.

Learn about hardware and software; Discuss Internet safety; Create and save data; Use Internet search engines; Take apart a computer; Participate in a chat room; Create a newspaper or magazine; Build your own computer system; Design a Website; Develop a multimedia presentation; Use spreadsheets

PREMIUM: Purple $2.50; Blue $2.00; Red $1.50; White $1.00

Computer Mysteries Unit 2

***H-860-001.** Computer Application Notebook– 4-H exhibitors should use computer applications to create a graphic notebook utilizing computer technology. 4-Her 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 (3 cards for 3 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 (8.5x11 inches) 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.

***H-860-002.** 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 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 15th, 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

***H-860-003.** 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. State Fair qualified entries should be submitted to https://go.unl.edu/2024nesfset by August 15th, 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.

***H-860-004.** How to STEM (Science, Technology, Engineering and Math) Presentation- 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 15th, 2024, or videos can 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.

***H-860-005.** Virtual Platform Presentation - Youth design a fully automated educational 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 must include a link to the virtual presentation. State Fair qualified entries should be submitted to https://go.unl.edu/2024nesfset by August 15th, 2024. Entries can also 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 permissions for public viewing.

***H-860-006.** 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. State Fair qualified entries should be submitted to https://go.unl.edu/2024nesfset by August 15th, 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 permissions for public viewing.

***H-860-007.** 3D PRINTING: 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 redesigned 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? ie. 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. 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 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.

*** H-860-008.** Maker Space/Digital Fabrication – 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.

ROBOTICS- This category involves the many different aspects of Robotics. Participants will learn more about how robots are designed and developed as well as the mechanical and electronic elements of robots. Involvements in STEM Robotics gives participants first-hand experience in modern technology.

Discover the design and functions of robotic arms; Build a robotic arm that moves; Explore robot movement, power transfer, and locomotion; Design and build machines the roll, slide, draw or move underwater; Make the connection between the mechanical and electronic elements of robots; Explore sensors, write programs, build circuits and design your own robot; Use commercial robotics kits to explore the world of robotics; Learn to program your robot using sensors, loops and conditional statements

PREMIUM: Purple $2.00; Blue $1.50; Red $1.00; White $.50

***H-861-001.** Robotics Poster - Create a poster (14x22") communicating a robotics theme such as "Robot or Not", "Pseudocode", "Real World Robots", "Careers in Robots" or "Autonomous Robotics", "Precision Agriculture" or a robotic topic of interest to the 4-Her.

***H-861-002.** 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 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.

***H-861-003.** 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.

***H-861-004.** 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 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.

***H-861-005.** Robotics Sensor Notebook - Write pseudo code which includes at least three sensor activities. 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 can also 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.

***H-861-007.** Kit Labeled Robot (cannot be 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. If robot is more than 15x20 they may not be displayed in locked cases.

***H-861-008.** 3D Printed Robotics Parts (SF244). 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.

JUNK DRAWER ROBOTICS - one entry per class number.

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

Junk Drawer Robotics 1 – Give Robots a Hand

H-865-001. Marshmallow Catapult – Build a catapult that will launch a marshmallow.
H-865-002. Balance Beam Design – Modify catapult to be used as a balance beam.
H-865-003. Robot Arm – Design and build a robotic arm using levers to pick up and move a weight from one spot to another location.
H-865-004. Gripper – Design and build a gripper to pick up a ping pong ball, plastic golf ball, plastic egg or toy block.
H-865-005. 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

H-865-006. Clip Mobile – Design and build a vehicle that can carry a box of paper clips down a ramp using items listed in robotics notebook.
H-865-007. 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.
H-865-008. 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.
H-865-009. 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

H-865-010. Switch – Design and build a single pole double throw switch to control two different lights at the same time.
H-865-011. Robot – Build a robot that will travel around an object or wall using a sensor for control.
H-865-012. Breadboard – Create a working electronic circuit using a solderless breadboard.
H-865-013. Robot – Build a robot that will perform a specific task.

ELECTRICITY- 4-H'ers have the opportunity to create informational exhibits about the different aspects of electricity and will be better educated about electricity and be able to present their knowledge to others.

Explore electrical insulation; Learn about the effects of magnetism; Build and electromagnet and electric motor; Decode circuit diagrams; Build circuits and test voltages; Build a rocket launcher and a burglar alarm; Measure electrical usage; Replace electrical switches; Evaluate light bulbs and test for electrical power; 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""xplore LED's and SCR's

PREMIUM: Purple $2.00; Blue $1.50; Red $1.00; White $.50

Magic of Electricity: Unit 1

H-870-009. Toy Electric Motor from Pre-Manufactured Kit - Working model of an electric motor. The motor should have the major parts labeled. A short, written description of how the motor works is to be included in a clear protective cover.
H-870-010. Electronic Equipment made from a purchased pre-manufactured kit. Include a report explaining purpose of item, operating instructions, and wiring diagrams. Include items needed to demonstrate operation of equipment if possible.
H-870-011. Bright Lights - Create your own flashlight using items found around your house. Flash lights should be made out of items that could be recycled or reused. No kits please.
H-870-012. 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.
H-870-013. 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 must find five items that are conductors and five items that are insulators. Create a table that illustrates your results.
H-870-014. Is There a Fork in the Road - Use the following items to construct one parallel and one series circuit. Items: D cell battery, battery holder, insulated wire, bulb holder and a 2- or 2.5-volt light bulb.
H-870-015. Other project using skills from Unit I. May be combined with another project (ex. farmstead display, etc.)

Investigating Electricity: Unit 2

H-870-016. Case of the Switching Circuit - Use the following items: two D cell batteries, two battery holders, light bulb, bulb holder, a 3x6" piece of cardboard, six brass paper fasteners and approx. 2' of 24 gauge insulated wire to build a three-way switch. Write a short essay or create a poster that illustrates how three-way switches function.
H-870-017. Rocket Launcher - Construct a rocket launcher out of the following materials: a plastic pencil box that is at least 4x8", single pole switch, single throw switch, normally-open push button switch, 40 feet of 18 or 22 gauge stranded wire, 4 alligator clips, 2x6 board 6" long, ½ 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 and 1/4 inch drill bits, rocket engine igniter, additional drill bits matched to holes for two switches. You must successfully build a rocket launcher and light two rocket igniters with your launcher. Create a poster using photographs to show the "step by step process" you used to build your launcher.
H-870-018. Stop the Crime - Build an ALARM using the following materials: On-off push button switch, mercury switch, buzzer-vibrating or piezoelectric, 9-volt battery, battery holder, 4x4x1/8" Plexiglass board to mount circuit on; rosin core solder, soldering gun/iron, 2' of 22-gauge wire, wire strippers, hot glue sticks, hot glue gun and a plastic box with a lid to mount your alarm circuit on. Create a poster using photographs to show the "step by step process" you used to build your alarm.

Wired for Power: Unit 3

***H-870-001.** 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.

***H-870-002.** Lighting Comparison - Display studying the efficiency of various lighting (incandescent, fluorescent, halogen, Light Emitting Diodes, etc.). Exhibit could be a poster display, or an actual item.

***H-870-003.** 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.

***H-870-004.** Poster- Poster should exemplify one of the lessons learned in the Wired for Power Project. Posters can be any size up to 28x22”

Entering Electronics: Unit 4

***H-870-005.** 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 contain a minimum of 10 different parts.

***H-870-006.** Electronic Display - Show an application of one of the concepts learned in the Electronics project. Examples include; components of an electronic device (refer to page 35 of the manual).

***H-870-007.** Electronic Project - Exhibit an electronic item designed by the 4-Her or from a manufactured kit that shows the electronic expertise of the 4-Her. Examples include: a radio, a computer, or a voltmeter.

***H-870-008.** Electronic Poster -should exemplify one of the lessons learned in the Entering Electronics Project. Posters can be any size up to 28x22"

GEOSPATIAL- Geospatial is a diverse category that includes a variety of exhibits 4-H'ers can get involved in. Through participation in this category 4-H'ers will gain more knowledge about Nebraska's rich history and diverse geography. Take close note of the rules to ensure your exhibit qualifies.

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

PREMIUM: Purple $2.50; Blue $2.00; Red $1.50; White $1.00

***H-880-001.** Poster- Create a poster (not to exceed 14x22”) 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.

***H-880-002.** 4-H Favorite Places 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 14x22”

***H-880-003.** GPS Notebook-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.

***H-880-004.** 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 trinket, 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, include a print-out of its registry. The entry may include a photograph of the cache in its intended hiding place.

***H-880-005.** Agriculture Precision Mapping–4-Hers 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 were applications can be purchased is acceptable) A report of how the analysis of the various data will be used to make a management decision.

***H-880-006.** 4-H History MapPreserve 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://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 historical significance of 4-H place or person. (a minimum of one paragraph)

***H-880-007.** GIS Thematic Map – Using any GIS software, create a thematic. Thematic maps can utilize any subject of interest to the 4-Her. Example map would be Amelia Earhart’s or Sir Francis Drake’s voyage population density maps, water usage 8½x11” 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 8.5x11” up to 36x24”, should include Title, Base Map, Neat Line, North Arrow, and Legend. Identify the source of your information on the back of map.

***H-880-008.** 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, a paragraph explaining what was interesting about the site or finding it. Photos of each site and/or cache are optional, but highly encouraged.

WOODWORKING- 4-H'ers have the opportunity to create exhibits about varying levels of woodworking. Participants can also create informational exhibits about their woodworking projects. Involvement in this category 4-H'ers will be better educated about and better their woodworking skills.

1) All articles exhibited must 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 alterations 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. All plans used for making the article must be securely attached and protected by a clear plastic cover.

2) 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. **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.**

Develop skills such as measuring, squaring and cutting a board, driving nails, and using clamps and screws; Build a picture frame, a letter holder, a box, or an airplane; 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 a stool; Practice measuring angles, cutting dado and rabbet joints; Use a circular saw, a table saw, and a radial arm saw; Sand and stain wood

Woodworking Wonders 1 – Measuring Up/Woodworking Wonders 2 – Making the Cut
PREMIUM: Purple $2.00; Blue $1.50; Red $1.00; White $.50

H-911-020. Article: Item made using skills learned in the Measuring Up manual
H-911-030. Article: Item made using skills learned in the Making the Cut manual.

Woodworking Wonders 3 – Nailing It Together
PREMIUM: Purple $2.50; Blue $2.00; Red $1.50; White $1.00

***H-911-001.** 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.

***H911-003.** Recycled Display – 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 based on 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 choose this finish? 6) Evaluate (How does your item solve the original need?) 7) Present results (How would you do this better next time?)

***H-911-004.** Composite Wood Project - 60% of the project must be wood and 40% made from other materials such as metal, rubber, resin, etc. All plans and plan alterations 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.

***H-911-005.** Outdoor Wood Project made with Treated Wood- Treated wood projects DO NOT have to have a finished coating. All plans and plan alterations 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.

***H-911-006.** Wood Projects created on a Turning Lathe - 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.

Woodworking Wonders 4 – Finishing Up
PREMIUM: Purple $2.50; Blue $2.00; Red $1.50; White $1.00

***H-911-007.** Article: Item made using skills learned in the Finishing It Up manual. Examples include dovetailing, making a pen using lathe, overlays, using a router, etc. Item is required to be appropriately finished.

***H-911-008.** Recycled Display – 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. 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 choose this finish? 6) Evaluate (How does your item solve the original need?) 7) Present results (How would you do this better next time?)

WELDING- All metal welding processes accepted. This category helps 4-H'ers learn the basics of welding. In addition, 4-H'ers get the opportunity to present their knowledge on the topic and display what they have made. Involvement in STEM Welding gives participants a first-hand experience in a skill that can be used for a lifetime.

1) 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.
2) All welds exhibited in class 1 or 2 must be mounted on a 12x15" display board of thickness not to exceed 3/8". 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 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.
3) Fabricated board such as plywood, composition board, or particle-type lumber may be used for demonstration displays.

4) Demonstration boards should be sanded and finished to improve their appearance. The finish on a demonstration board will be judged as a woodworking exhibit.
5) 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.
6) If no plans are included with welding art, welding article, welding furniture or composite weld project item will be disqualified.
7) Type of welder, welder settings, all plans, plan alternations, and a bill for material must be attached to the article.
8) 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.

Learn to cut metal with an arc solder; Weld high carbon, spring steel and alloy steels; Weld horizontal, vertical and overhead positions

Class 1 4-H Welding Project Tips and Suggestions

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. Stick welding: Suggested coupon thickness -1/4" if using 1/8" rod. Suggested rod-AC and DC straight or reverse polarity-first E-7014, second E-6013. MIG welding: Suggested coupon thickness -1/4" if using .035 wire and 1/8" if using .023 wire. Oxy-Acetylene: Suggested coupon thickness -1/8". Suggested rod–1/8" mild steel rod.

Class 2 4-H Welding Project Tips and Suggestions

1) It is suggested that all welds be of the same size and thickness as metal. These pieces are referred to as coupons. The welds can be on one coupon that is about 4x4" or on individual coupons that are about 2x4" inch and ¼" 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 4-H Welding Project Tips and Suggestions

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.
2) **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.**

PREMIUM: Purple $2.00; Blue $1.50; Red $1.00; White $.50

***H-920-001.** Welding Joints-a display of one butt, one lap, and one fillet weld.

***H-920-002.** Position Welds-a display showing 3 beads welded in the vertical down, horizontal and overhead positions.

***H-920-003.** Welding Art-any art created using tack welds to hold the metal pieces together (examples include horseshoe projects). Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish.

***H-920-004.** Welding Article-any shop article or piece of furniture 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.

***H-920-005.** Welding furniture-any furniture with 75% 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.

***H-920-006.** Plasma Cutter/Welder Design-Plasma cutters/welders allowed for detailed design(s) to buttcut into metal. 4Hers will create a notebook describing the design process to create the "artwork" to butt cut into the metal. In the notebook include: a) A photo (front and back) of the finished project. b) Instructions on how the design was created (include software used), this allows for replication of the project c) Lessons learned or improvements to the project. d) Steps to finish the project.

***H-920-007.** Composite Weld Project- 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 alterations, 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 the project may be displayed outside.

ENERGY- This category provides 4-H'ers a way to present their ideas about renewable energy resources. Through participation in this category 4-H'ers will learn more about physics, friction, energy, and elasticity. In addition, participants will make a display to go along with their findings.

Learn basic principles of physics, such as friction, energy, elasticity; Do experiments with a radio-controlled pickup; Learn about wind and its uses; Design, create, build and test a wind-powered device; Explore wind as a potential energy source in the community

PREMIUM: Purple $2.50; Blue $2.00; Red $1.50; White $1.00

***H-900-001.** Create and Compare Energy Resources Poster–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 28x22."

***H-900-002.** Experiment Notebook–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.

***H-900-003.** Solar as Energy Display-Item should be the original design of the 4-Her. Include the item, or a picture if item is in excess of 6' tall or 2'X2'. 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.

***H-900-004.** Water as Energy Display-Item should be the original design of the 4-Her. Include the item, or a picture if item is in excess of 6' tall or 2'X2'. Include a notebook of why the item was designed and how it harnesses the power of water.

***H-900-005.** Wind as Energy Display –Item should be the original design of the 4-Her. Include the item, or a picture if item is in excess of 6' tall or 2'X2'. Include a notebook of why the item was designed and how it harnesses the power of wind.

***H-900-006.** 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, methan reactors, etc.

MISCELLANEOUS ENGINEERING- one entry per class number.

PREMIUM: Purple $2.00; Blue $1.50; Red $1.00; White $.50

M-900-007. Small Engines 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.

M-900-008. 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.)

M-900-009. Rebuilt Farm Tractor/Machine