

DEPARTMENT H	DIVISION 881			LEGO BUILDING
PREMIUM	Purple \$2.50	Blue \$2.00	Red \$1.50	White \$1.00
CLASS 901	Lego Model (500 pieces or less)			
CLASS 902	Lego Model (501 pieces or more)			
CLASS 903	Lego Original (500 pieces or less)			
CLASS 904	Lego Original (501 pieces or more)			

ROBOTICS

ROBOTICS RULES

- GENERAL RULES** – See GENERAL RULES – SCIENCE, ENGINEERING & TECHNOLOGY
- ENROLLMENT** – Youth enrolled in Robotics Explorer, Robotics Probe or GEAR TECH 21 may exhibit in any class within this division.
- TOP EXHIBIT** – A top exhibit will be selected from those exhibits receiving purple ribbons in the robotics division.
- MANUALS** – Printed materials are available from the Johnson County Extension Office for all currently enrolled 4-H members in Johnson County.

DEPARTMENT H	DIVISION 861			ROBOTICS
PREMIUM	Purple \$2.50	Blue \$2.00	Red \$1.50	White \$1.00
CLASS 1	Robotics Poster – Create a poster (14" x 22") communicating a robotics theme such as "Robot or Not", "Pseudo Code", "Real World Robots", "Careers in Robots" or "Autonomous Robotics", "Precision Agriculture" or a robotic topic of interest to the 4-H exhibitor.			
CLASS 2	Robotics Notebook – Explore a robotics topic in-depth and present your findings in a notebook. Documentation should include any designs, research, notes, pseudo code, 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 (see above).			
CLASS 3	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.			
CLASS 4	Robotics Career Interview - Interview someone who is working in the field of robotics and research that career. Interviews can either be written or in a multimedia format (CD/DVD). Written interviews should be in a notebook. Written reports should be three to five pages, double-spaced, 12-point font, and 1" margins. Multimedia reports should be between three and five minutes in length.			
CLASS 5	Robotics Sensor Notebook – Write pseudo code which includes at least one sensor activity. Include the code written and explain the code function.			
CLASS 6	Build a Robot (may use kit) – Include a robot and notebook including the pseudo codes for at least one program you have written for the robot, the robots purpose, and any challenges or changes you would make in the robot design or programming.			
CLASS 7	Kit Labeled Robot (cannot be programmed) – 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 project the youth has constructed, a description of what it does and an explanation of how it is similar to and different from a robot.			
CLASS 901	Other Exhibit – Other exhibit demonstrating the knowledge gained in this project.			

GEOSPATIAL

GEOSPATIAL RULES

- GENERAL RULES** – See GENERAL RULES – SCIENCE, ENGINEERING & TECHNOLOGY
- ENROLLMENT** – Youth enrolled in Geospatial or GEAR TECH 21 may exhibit in any class within this division.
- TOP EXHIBIT** – A top exhibit will be selected from those exhibits receiving purple ribbons in the geospatial division.
- MANUALS** – Printed materials are available from the Johnson County Extension Office for all currently enrolled 4-H members in Johnson County.

DEPARTMENT H	DIVISION 880			GEOSPATIAL
PREMIUM	Purple \$2.50	Blue \$2.00	Red \$1.50	White \$1.00
CLASS 1	Poster – Create a poster (not to exceed 14" x 22") communicating a GPS theme such as: how GPS or GIS works, careers that use GPS or GIS, how to use GPS, what is GIS, GPS or GIS in agriculture, precision agriculture, or a geospatial topic of interest.			
CLASS 2	4-H Favorite 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. Posters size should not exceed 14" x 22".			
CLASS 3	GPS Notebook – Keep a log of at least five places visited using a GPS enabled device. For each site, record the latitude, longitude, and elevation. Also include a description of the site, a paragraph explaining what was interesting about the site or finding it. Photos of each site and/or cache are optional but encouraged.			
CLASS 4	Geocache – Assemble a themed geocache. Each geocache should be a watertight container. It should include a logbook and pencil for finders to log their visits and may include small trinkets, geocoins, etc. for the finders to trade. Documentation should include a title, teaser description, and geographic coordinates of intended placement. Register the site at http://geocaching.com , include a print out of its registry. The entry may include a photograph of the cache in its intended hiding place.			
CLASS 5	Agricultural 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.			
CLASS 7	4-H History Map – Preserve 4-H History: Nominate a Point of Interest for the 4-H History Map Project include copy of submitted form in folder or notebook. To nominate a site for the 4-H history map please go to http://arcg.is/1bvGogV . For more information about 4-H history go to http://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)			
CLASS 8	GIS Thematic Map – Using any GIS software, create a thematic map. Thematic maps can utilize any subject of interest to you. Example maps would be Amelia Earhart's or Sir Francis Drake's voyage, population density maps, water usage maps, etc. Create GIS map using data from books and/or reliable internet sources (e.g. US Census Bureau, etc.). Map may be any size from 8 ½" x 11" up to 36" x 24". The map should include: title, base map, neat line, north arrow, and legend. Identify the source of your information on the back of the map.			

- CLASS 10 Careers Interview** – Interview someone who is working in a geospatial field and research that career. Interviews can either be written or in a multimedia format (CD/DVD). Written interviews should be in a notebook. Written reports should be three to five pages, double-spaced, 12-point font, and 1" margins. Multimedia reports should be between three and five minutes in length.

POWER OF WIND

POWER OF WIND RULES

1. **GENERAL RULES** – See GENERAL RULES – SCIENCE, ENGINEERING & TECHNOLOGY
2. **TOP EXHIBIT** – A top exhibit will be selected from those exhibits receiving purple ribbons in the Power of Wind division.
3. **MANUALS** – Printed materials are available from the Johnson County Extension Office for all currently enrolled 4-H members in Johnson County.

DEPARTMENT H PREMIUM	DIVISION 900	POWER OF WIND
	Purple \$2.50 Blue \$2.00 Red \$1.50 White \$1.00	
CLASS 1	Create and Compare Energy Resources Poster – Poser should explore two alternative/renewable energy resources. Compare and contrast the two resources including information on two of the following: amount of energy created, costs of production, usability of the energy, pros/cons, environmental impacts, etc. Posters can be any size up to 28" x 28".	
CLASS 2	Experiment Notebook – Notebook will explore the scientific method involving alternative/renewable energy sources. Information required: hypothesis, research, experiment, measurements, report or redefined hypothesis.	
CLASS 3	Solar as Energy Display – Items should be the original design of the 4-H exhibitor. Include the item, or a picture if the 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.	
CLASS 4	Water as Energy Display – Items should be the original design of the 4-H exhibitor. Include the item, or a picture if the 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 water.	
CLASS 5	Wind as Energy Display – Items should be the original design of the 4-H exhibitor. Include the item, or a picture if the 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 wind.	
CLASS 6	Other Nebraska Alternative Energy – Notebook should explore Nebraska's alternative energy sources 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 use of bio-products.	

WOODWORKING

WOODWORKING RULES

1. **GENERAL RULES** – See GENERAL RULES – SCIENCE, ENGINEERING & TECHNOLOGY
2. **ENTRY LIMITS** – 4-H members are allowed entries in only ONE UNIT of competition. 4-H members may only enter ONE EXHIBIT per class.
3. **EXHIBIT REQUIREMENTS** – ALL articles exhibited **MUST** include a plan stating dimensions and other critical instructions a builder would need to know to construct the project. Plans may include narrative instructions in addition to the dimension drawings. Part of the score depends on how well the project matches the plans. If plans are modified, the changes from the original need to be noted on the plans. All plans used for making the article must be securely attached to the project in a clear plastic cover. Any exhibits not having the required information will be lowered a ribbon placing.
4. **RECYCLED WOODWORKING DISPLAY** - 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? Why did 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?)
5. **TOP EXHIBIT** – A top exhibit will be selected from those exhibits receiving purple ribbons in the woodworking division.
6. **MANUALS** – Printed materials are available from the Johnson County Extension Office for all currently enrolled 4-H members in Johnson County.

DEPARTMENT H PREMIUM	DIVISION 911	WOODWORKING
	Purple \$2.50 Blue \$2.00 Red \$1.50 White \$1.00	
WOODWORKING – UNIT 1		
CLASS 910	Woodworking Article – Items made using skills learned in the <i>Measuring Up</i> manual (examples include: recipe holder, stilts, or other skill appropriate item). Items MUST be entered with construction plans (see above).	
CLASS 920	Woodworking Display – Display exemplifying one of the principles learned in the <i>Measuring Up</i> project.	
CLASS 930	Recycled Woodworking Article - Article made from recycled, reclaimed or composite wood. Article must be sanded and sealed and utilize one or more woodworking techniques learned in the <i>Measuring Up</i> project. 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.	
CLASS 940	Other Item – Other item displaying the knowledge gained in this project.	
WOODWORKING – UNIT 2		
CLASS 950	Woodworking Article – Items made using skills learned in the <i>Making the Cut</i> manual (examples include: birdhouse, footstool, napkin or letter holder, or other skill appropriate item). Items MUST be entered with construction plans (see above).	
CLASS 960	Woodworking Display – Display exemplifying one of the principles learned in the <i>Making the Cut</i> project.	
CLASS 970	Recycled Woodworking Article - Article made from recycled, reclaimed or composite wood. Article must be sanded and sealed and utilize one or more woodworking techniques learned in the <i>Making the Cut</i> project. 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.	
CLASS 980	Other Item – Other item displaying the knowledge gained in this project.	
WOODWORKING – UNIT 3		
CLASS 1	Woodworking Article – Items made using either joints, hinges, dowels, or a dado joining and other skills learned in the <i>Nailing It Together</i> manual (examples include: bookcase, coffee table, end table, or other skill appropriate item). Items are required to be appropriately finished. Items MUST be entered with construction plans (see above).	