

- H861009. **3D/NON-MOBILE ROBOT** - Construct out of items found around the home. Provide a short description of your robot, including steps you took to construct the robot and items used.
- H861010. **ROBOT/STEM ART** - The purpose of this class is to allow artistic exhibits that contain a science and technology theme. This class can use any form of medium. Examples might include paintings, drawings, photographs, or songs or poems written by the exhibitor. Entries must be appropriate for fair display and no larger than 24" x 24". For example: paintings or photographs should be displayed in notebook format or mounted on a sturdy display panel. All entries must include a title and brief explanation of the purpose or message (what is the exhibit meant to show).
- H861011. **LEGO INITIAL** - Construct the first letter of your first or last name out of Legos. Entries must not reach over 12" in height and 18" in width. Can be two or three dimensional. If two dimensional, make sure the letter is securely fastened to a poster or wood board. If 3D, please place initial on a sturdy surface and make sure it is able to stand on its own. Include a brief explanation of the exhibit.
- H861012. **OTHER/CATCH ALL** - Other robotics exhibit that does not fit into any other class.
- H861013. **FIRST LEGO LEAGUE ~ INTO ORBIT** - Any exhibit that showcases member participation in the 2017-2019 Animal Allies Season. Exhibit examples: poster board, scrapbook, brochure, etc.

## ROBOTICS SHOWCASE

- H861003.\* **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 for state fair should be emailed to Amy Timmerman atimmerman2@unl.edu before August 15. Files must be saved in a PC compatible format with county name and last name of participant before emailing.

## DEPARTMENT ELECTRICITY

PREMIUMS: Purple-\$4.50; Blue-\$4.00; Red-\$3.50; White-\$2.50

In this category 4-H'ers have the opportunity to create informational exhibits about the different aspects of electricity. Through involvement in this category 4-H'ers will be better educated about electricity and be able to present their knowledge to others. For more resources and materials in this category refer to the resource section at the bottom of the page.

- 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.
- Each individual is limited to one exhibit per class. All static exhibits must have received a purple ribbon at the county fair to advance to the State Fair.
- Several classes require a display board which should be a height of 24 inches and not to exceed 1/4-inch thickness. A height of 24 7/8 inches is acceptable to allow for the saw kerf (width) if two 24 inch boards are cut from one end of a 4 foot by 8-foot sheet of plywood. Nothing should be mounted within 3/4 inch of the top or bottom of the board. (Example: Woodworking & Electricity.)
  - a. Fabricated board such as plywood, composition board, or particle-type lumber may be used for demonstration displays.
  - b. Demonstration boards should be sanded and finished to improve their appearance. The finish on a demonstration board will be judged as a woodworking exhibit.
  - c. Demonstration boards should include an overall title for the display, plus other necessary labeling.
  - d. 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.

## DIVISION 871 – ELECTRICITY 1

### MAGIC OF ELECTRICITY UNIT 1

- H871001. **BRIGHT LIGHTS** – Create your own flashlight using items found around your house. Flashlights should be made out of items that could be recycled or reused. No kits please.
- H871002. **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.
- H871003. **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.
- H871004. **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.

## DIVISION 872 – ELECTRICITY 2

### INVESTIGATING ELECTRICITY UNIT 2

- H872001. **CASE OF THE SWITCHING CIRCUIT** – Use the following items: two D cell batteries, two battery holders, light bulb, bulb holder, a 3" by 6" piece of cardboard, six brass paper fasteners and approximately two feet 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.
- H872002. **ROCKET LAUNCHER** – Construct a rocket launcher out of the following materials: a plastic pencil box that is at least 4" by 8", single pole switch, single throw switch, normally-open push button switch, 40 feet of 18 or 22 gauge stranded wire, 4 alligator clips, 2- by 6- board 6" long, 1/8 inch diameter metal rod, rosin core solder, soldering iron or gun, wire stripper, small crescent wrench, pliers, small Phillips and straight blade screwdrivers, drill, 1/8 inch and 1/4 inch drill bits, rocket engine igniters, additional drill bits matched to holes for two switches. You must successfully build a rocket launcher and light two rocket igniters with your launcher. You DO NOT have to actually fire a rocket off of the launcher. Create a poster using photographs to show the "step by step process" you used to build your launcher.
- H872003. **STOP THE CRIME** – Build an ALARM using the following materials: On-off push button switch, mercury switch, buzzer-vibrating or piezoelectric, 9-volt battery, 9-volt battery holder, 4" by 4" by 1/8" Plexiglas board to mount circuit on; rosin core solder, soldering gun/iron, two feet 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.

## DIVISION 870 – ELECTRICITY 3

### ELECTRICITY WIRED FOR POWER – UNIT 3

- H870001.\* **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. SF224
- H870002.\* **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. SF225
- H870003.\* **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. SF226
- H870004.\* **POSTER** – Poster should exemplify one of the lessons learned in the Wired for Power Project. Posters can be any size up to 28" by 22". SF227

## DIVISION 870 – ELECTRICITY 3

### ELECTRONICS – UNIT 4

- H870005.\* **ELECTRICAL/ELECTRONIC PART IDENTIFICATION** – Display different parts used for electrical/electronic work. Exhibit should show the part (either picture or actual item) and give a brief description, including symbol of each part and its function. Display should include a minimum of 10 different parts. SF228
- H870006.\* **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 Electronics manual). SF229
- H870007.\* **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 volt meter. SF230
- H870008.\* **POSTER** – Poster should exemplify one of the lessons learned in the Entering Electronics Project. Posters can be any size up to 28" by 22". SF231

## ELECTRICITY RESOURCES

### ELECTRIC EXCITEMENT 1

Explore electrical insulation; Learn about the effects of magnetism; Build and electromagnet and electric motor  
URL: [https://4hcurriculum.unl.edu/index.php/main/program\\_project/126](https://4hcurriculum.unl.edu/index.php/main/program_project/126)

### ELECTRIC EXCITEMENT 2

Decode circuit diagrams; Build circuits and test voltages; Build a rocket launcher and a burglar alarm  
URL: [https://4hcurriculum.unl.edu/index.php/main/program\\_project/127](https://4hcurriculum.unl.edu/index.php/main/program_project/127)

### ELECTRIC EXCITEMENT 3

Measure electrical usage; Replace electrical switches; Evaluate light bulbs and test for electrical power  
URL: [https://4hcurriculum.unl.edu/index.php/main/program\\_project/128](https://4hcurriculum.unl.edu/index.php/main/program_project/128)

### ELECTRIC EXCITEMENT 4

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  
URL: [https://4hcurriculum.unl.edu/index.php/main/program\\_project/129](https://4hcurriculum.unl.edu/index.php/main/program_project/129)