Science, Engineering & Technology- Department H
Division 870 – Electricity

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.

Rules

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. Several classes require a display board which should be a height of 24 inches and not to exceed 1/4-inch thickness. A height of 24 7/8 inches is acceptable to allow for the saw kerf (width) if two 24 inch boards are cut from one end of a 4 foot by 8-foot sheet of plywood. Nothing should be mounted within 3/4 inch of the top or bottom of the board. (Example: Woodworking & Electricity.)
    - Fabricated board such as plywood, composition board, or particle-type lumber may be used for demonstration displays.
    - Demonstration boards should be sanded and finished to improve their appearance. The finish on a demonstration board will be judged as a woodworking exhibit.
    - Demonstration boards should include an overall title for display, plus other necessary labeling.
    - Reports should be written using the scientific method whenever possible.

For General Rules click here

Eligibility

Exhibits must have received a purple ribbon at the county fair to advance to State Fair.

Scoresheets, Forms, and Contest Study Materials

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

Special Awards

Premier 4-H Science Award is available in this area. Please see click here for more details.

*** The following 900 number classes are not eligible for State Fair consideration***

ELECTRICITY - MAGIC OF ELECTRICITY UNIT 1

CLASS 901* **UNIT 1 BRIGHT LIGHTS**
Create your own flash light using items found around your house. Flash lights should be made out of items that could be recycled or reused. No kits please.

CLASS 902* **UNIT 1 CONTROL THE FLOW: MAKE A SWITCH**
Use the following items: D cell battery, battery holder, insulated wire, 2 or 2.5 volt light bulb, bulb holder, paper clip, cardboard, and two brass paper fasteners to create a circuit that you can open and close.

CLASS 903* **UNIT 1 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.

CLASS 904* **UNIT 1 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.

ELECTRICITY - INVESTIGATING ELECTRICITY UNIT 2

CLASS 905* **UNIT 2 CASE OF THE SWITCHING CIRCUIT**
Use the following items: two D cell batteries, two battery holders, light bulb, bulb holder, a 3inch by 6 inch piece of cardboard, six brass paper fasteners and approx. 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.

CLASS 906* **UNIT 2 ROCKET LAUNCHER**
Construct a rocket launcher out of the following materials: a plastic pencil box that is at least 4inches by 8inches, single pole switch, single throw switch, normally open push button switch, 40 feet of 18 or 22 gauge stranded wire, 4 alligator clips, 2-by 6-board 6 inches long, 1/8 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 igniter, additional drill bits matched to holes for two switches. You must successfully build a rocket launcher and light two rocket igniter 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.

CLASS 907* **UNIT 2 STOP THE CRIME: BUILD AN ALARM**
Use the following materials: On-off push button switch, mercury switch, buzzer-vibrating or piezoelectric, 9-volt battery holder, 4 inch by 4 inch by 1/8 inch

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 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.

CLASS 920* **OTHER ELECTRIC OR ELECTRONIC EXHIBIT**

These should be exhibits that are made out of household, reusable or recyclable items. Possible project ideas could include, but are not limited to the following, non-wooden quiz box, non-wooden steady hand tester, a battery operated simple circuit, homemade battery powered electric motor, etc. NO KITS ALLOWED

ELECTRICITY- WIRED FOR POWER – UNIT 3

CLASS 1 **ELECTRICAL TOOL/SUPPLY KIT** (SF224)

Create an electrical supply kit to be used for basic electrical repair around the house. Include a brief description of each item and its use. Container should be appropriate to hold items.

CLASS 2 **LIGHTING COMPARISON** (SF225)

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

CLASS 3 **ELECTRICAL DISPLAY/ITEM** (SF226)

Show an application of one of the concepts learned in the Wired for Power project. Examples include: re-wiring or building a lamp, re-wiring or making a heavy duty extension cord or developing an electrical diagram of a house. Exhibit could be a poster display, or an actual item

CLASS 4 **POSTER** (SF227)

Poster should exemplify one of the lessons learned in the Wired for Power Project. Posters can be any size up to 28" by 22".

ELECTRICITY - ELECTRONICS – UNIT 4

CLASS 5 **ELECTRICAL/ELECTRONIC PART IDENTIFICATION** (SF228)

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.

CLASS 6 **ELECTRONIC DISPLAY** (SF229)

Show an application of one of the concepts learned in the Electronics project. Examples include: components of an electronic device (refer to p. 35 of the Entering Electronics manual).

CLASS 7 **ELECTRONIC PROJECT** (SF230)

Exhibit an electronic item designed by the 4-Her or from a manufactured kit that shows the electronic expertise of the 4-H'er. Examples include: a radio, a computer, or a volt meter.

CLASS 8 **POSTER** (SF231)

Poster should exemplify one of the lessons learned in the Entering Electronics Project. Posters can be any size up to 28" by 22".

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

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

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

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" "Explore LED's and SCR's.

URL: https://4hcurriculum.unl.edu/index.php/main/program_project/129