

# **Electricity**

## **Department H, Division 870**

Superintendent - Lori Walla  
Jr. Superintendent -

### **General Rules**

- A. Limit of four (4) exhibits per exhibitor per project in this Division
- B. 4-H electricity related posters (Classes H870001 and H870002) are to be entered in the engineering Division for exhibiting and judging. Refer to Division B - Posters for general requirements.
- C. You must be in your third year of an electricity project to exhibit in electricity classes at state fair.
- D. Display board should be a height of 24 inches and not to exceed 1/4 inch thick. A height of 23 7/8" is acceptable to allow for the saw kerf (width) is two 24 inch boards are cut from one end of a 4' x 8' sheet of plywood. Nothing should be mounted within 3/4" of the top or bottom of the board.
- E. Fabricated board such as plywood, composition board, or particle-type lumber may be used for demonstration displays.
- F. Demonstration boards should be sanded and finished to improve their appearance. The finish on a demonstration board will be judged as a woodworking exhibit.
- G. Demonstration boards should include an overall title for the display, plus other necessary labeling.
- H. All reports should be clearly written or typed and enclosed in a clear, plastic cover. The reports should be attached securely to the display.
- I. The name and county of each exhibitor should appear separately on the back of each board, poster or article and on the front cover of the notebooks so owner of exhibit may be identified if the entry tag is separated from the exhibit.

### **Division H870, Electricity**

**Electricity Unit 1** - For classes H870100 - H870103 please refer to 4-H manual Unit 1-"Magic of Electricity".

- H870100 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.
- H870101 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.
- H870102 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.

H870103 Unit 1 Is There a Fork in the Road? Use the following items to construct a parallel and a series circuit display board. Items: D cell battery, battery holder, insulated wire, bulb holder and a 2 or 2.5 volt light bulb.

**Electricity Unit 2** - For classes H870104 - H870106 please refer to 4-H manual Unit 2 "Investigating Electricity"

H870104 Unit 2 Case of the Switching Circuit: Use the following items: two D cell batteries, two battery holders, light bulb, bulb holder, a 3" x 6" 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 functions.

H870105 Unit 2 Rocket Launcher: Construct a rocket launcher out of the following materials: a plastic pencil box that is at least 4" x 8", single pole switch, single throw switch, normally-open push button switch, 40 feet of 18 or 22 gauge stranded wire, 4 alligator clips, 2x 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

H870106 Unit 2 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" x4" x 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 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.

**Electricity Unit 3 – Wired for Power**

H870001\* 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.

H870002\* 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.

H870003\* 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.

H870004\* 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".

#### **Electronics Unit 4**

H870005\* 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.

H870006\* Electronic Display (SF229) - Show an application of one of the concepts learned in the Electronics project. Examples include: components of a electronic device

H870007\* Electronic Project (SF230) - Exhibit an electronic item designed by the 4-Her or form a manufactured kit that shows the electronic expertise of the 4-Her. Examples include: a radio, a computer, or a volt meter.

H870008\* 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".

H870099 Other Electric Exhibit- Not eligible for State Fair or County Fair Division Awards. Must meet guidelines stated in Project Manual.

#### **Careers**

H870010\* Careers Interview (SF239) - Interview someone who is working in the field of electricity 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 3 to 5 pages, double spaced, 12 point font and 1" margins. Multimedia reports should be between 3 to 5 minutes in length.