

## **(NOT Eligible for State Fair)**

- Class 905 Switching Circuit: Build a three-way switch. Items used could include, but are not limited to the following: D cell batteries, battery holders, light bulb, bulb holder, cardboard, brass paper fasteners, wire. Write a short essay or create a poster that illustrates how three-way switches function.
- Class 906 Rocket Launcher: Construct a rocket launcher. Items used could include, but are not limited to the following: plastic pencil box, single pole switch, single throw switch, normally-open push button switch, wire, alligator clips, metal rod, rosin core solder, rocket engine igniters. 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 or display using photographs to show the "step by step process" used to build the launcher.
- Class 907 Stop the Crime: Build an alarm. Items used could include, but are not limited to the following: On-off push button switch, mercury switch, buzzer-vibrating or piezoelectric, battery, rosin core solder, wire, a plastic box with a lid to mount alarm circuit. Create a poster or display using photographs to show the "step by step process" you used to build your alarm.

## **WIRED FOR POWER: UNIT 3**

[Scoresheets SF224-227]:

- 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 22" x 28".

## **ELECTRONICS: UNIT 4**

[Scoresheets SF228-231]:

- 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 Entering Electronics project. Example includes: 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-H Member or from a manufactured kit that shows the electronic expertise of the 4-H Member. 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 22" x 28".

about wind and its uses; Design, create, build and test a wind-powered device; Explore wind as a potential energy source in the community.

- This category provides 4-H Members a way to present their ideas about renewable energy resources. Through participation in this category 4-H Members will learn more about physics, friction, energy, and elasticity. In addition, participants will make a display to go along with their findings.
- 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 notebooks so exhibitor may be identified if the entry tag is separated from the exhibit.
- Reports should be written using the scientific method whenever possible (Background; Question or Hypothesis; What you plan to do and What you did; Method Used and Observations; Results and 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.
- Posters can be any size up to 28" by 22" when ready for display. Example: Tri-fold poster boards should not exceed 28" by 22" when fully open for display.
- Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hphysics-powerofwind>
- Educational resources can be found at:  
<https://www.energy.gov/clean-energy>  
<https://www.eia.gov/energyexplained/renewable-sources/>  
<https://www.nrdc.org/stories/renewable-energy-clean-facts>  
[https://4hcurriculum.unl.edu/index.php/main/program\\_project/133](https://4hcurriculum.unl.edu/index.php/main/program_project/133)

## **DEPT. H / DIV. 900**

### **ENERGY**

[Scoresheets SF305-308]

- Class 1 Create and Compare Energy Resources Poster [SF307]: 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 28" by 22."
- Class 2 Experiment Notebook [SF305]: 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.
- Class 3 Solar as Energy Display/Poster [SF308]: Item should be the original design of the 4-H Member. Include the item, or a picture if item is in excess of 6' tall or 2' X 2'. 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/Poster [SF308]: Item should be the original design of the 4-H Member. Include the item, or a picture if item is in excess of 6' tall or 2' X 2'. Include a notebook of why the item was designed and how it harnesses the power of water.
- Class 5 Wind as Energy Display/Poster [SF308]: Item should be the original design of the 4-H Member. Include the item, or a picture if item is in excess of 6' tall or 2' X 2'. Include a notebook of why the item was designed and how it harnesses the power of wind.
- Class 6 Other Nebraska Alternative Energy [SF306]: 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, methane reactors, etc.

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# **ENERGY**

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## **ENERGY GUIDELINES**

- Learn basic principles of physics, such as friction, energy, elasticity; Do experiments with a radio-controlled pickup; Learn