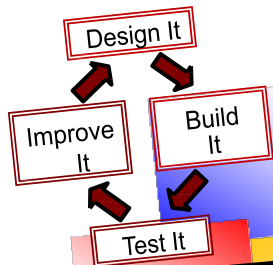


NATIONAL YOUTH ENGINEERING CHALLENGE



Electric Energy Challenge

September 24-26, 2017

Tippecanoe County Fairgrounds, Lafayette, IN

This contest is designed to give youth who are enrolled in the youth-based electric and electronics programs an opportunity to demonstrate their knowledge of electricity, the efficient use of electricity, care, maintenance, and safety of electrical equipment and apparatus found on the farm and in the home, including electronics. Safety will be stressed throughout the contest.

This contest will include (time limits as shown):

1. Written examination (*20 minutes*)
2. Identification of Electrical Equipment and/or parts of the equipment that are found on the farm or in the home, including electrical and electronic symbols (*15 minutes*)
3. Visual Presentation (*15 minutes maximum, 10 minutes preferred*)

References

- Electric 1-4 and Helper's Guide, National 4-H Electric Series
- Indiana 4-H Electric Curriculum, Divisions 1 to 5
The Education Store - Purdue University
<https://mdc.itap.purdue.edu/>
1-888-398-4636

Designated judges will preside over the event and their decisions will be final.

Visual Presentation should involve a discussion and/or demonstration of some aspect of electrical energy such as generation, safe use, or conservation. Participants may use working equipment but must observe proper safety precautions when demonstrating any live electrical part.

Participants must furnish their own demonstration materials. Visuals should be readable at 20 feet.

Penalty points = 200 - (average score _____ x 2)

It is the policy of the Cooperative Extension Service that all persons shall have equal opportunity and access to the programs, services, activities and facilities without regard to race, color, sex, religion, national origin, age, marital status, parental status, sexual orientation, disability or status as a veteran.

Contestant's Name _____ State _____ Number _____

NATIONAL YOUTH ELECTRIC ENERGY CONTEST

EVENTS	PENALTY POINTS
Written Examination	_____
Parts Identification	_____
Visual Presentation 200 - (average score _____ x 2) =	_____
Total Penalty Points (Low score wins)	_____

Event No. I. Written Examination

Will consist of 25 multiple choice questions pertaining to the Electric program, care, maintenance and safety taken from the National 4-H literature.

Rules:

1. Four penalty points will be given for each question answered incorrectly or unanswered.
2. Time limit 20 minutes.

Scoring: Questions missed _____ x 4 = _____ Total Penalty Points

Event No. II. Parts Identification

Will consist of a group of 25 numbered parts or symbols which must be identified. Participant will place number by the most correct part name on a list of various electrical or electronic parts.

Rules:

1. Each part to be identified will be numbered.
2. Time limit 15 minutes

Scoring: Parts missed _____ x 4 = _____ Total Penalty Points

ELECTRIC ENERGY PARTS AND SYMBOLS IDENTIFICATION

The parts to be identified have numbers attached to them. Select the most correct part name from this list. Write the corresponding number beside the name.

Symbols — Electrical & Electronic

- | | | |
|--------------------------------------|----------------------------------------------------------|---------------------------------------------------------|
| _____ Antenna, aerial | _____ Outlet for ceiling lighting
or recessed fixture | _____ Switch and outlet combination |
| _____ Antenna, loop | _____ Outlet for clock | _____ Switch, double pole or DPST |
| _____ Battery, multiple cell | _____ Outlet, combination radio
or TV and power | _____ Switch, rotary |
| _____ Battery, single cell | _____ Outlet, duplex | _____ Switch, single pole or SPST |
| _____ Capacitor | _____ Outlet, fan | _____ Switch, three-way or SPDT |
| _____ Capacitor, variable | _____ Outlet, floor | _____ Switch, weatherproof |
| _____ Connected wires | _____ Outlet, lighting | _____ Transformer, air core |
| _____ Diode | _____ Outlet, weather proof | _____ Transformer, iron core |
| _____ Ground | _____ Relay, DPDT | _____ Transistor, FET |
| _____ Head phones | _____ Relay, SPST | _____ Transistor, NPN |
| _____ Inductor, adjustable core | _____ Resistor | _____ Transistor, PNP |
| _____ Inductor, air core | _____ Resistor, potentiometer | _____ Transistor, silicon controlled
rectifier (SCR) |
| _____ Inductor, iron core | _____ Resistor, variable or
adjustable | _____ Transistor, TRIAC |
| _____ Junction box | _____ Speaker | _____ Unconnected wires |
| _____ Lamps in parallel | | |
| _____ Lamps in series | | |
| _____ Outlet equipped with drop cord | | |

Parts and Equipment — Electrical & Electronic

- | | | |
|--------------------------------------------------|----------------------------------------------------|-------------------------------------|
| _____ Ammeter | _____ Junction box | _____ Plug, polarized |
| _____ Antenna, aerial | _____ Lamp holder | _____ Relay, DPDT |
| _____ Antenna, loop | _____ Lamp holder with pull string | _____ Relay, SPST |
| _____ Battery, multiple cell | _____ Lamp socket for three-way bulb | _____ Resistor |
| _____ Battery, single cell | _____ Lamp socket, normal on/off | _____ Resistor, potentiometer |
| _____ Bell | _____ Lamp, fluorescent | _____ Soldering gun |
| _____ Capacitor, electrolytic | _____ Lamp, high-pressure sodium | _____ Soldering iron |
| _____ Capacitor, non-electrolytic | _____ Lamp, incandescent | _____ Speaker |
| _____ Capacitor, variable | _____ Lamp, mercury vapor | _____ Splice, rat tail |
| _____ Circuit breaker, 120V | _____ Lamps in parallel | _____ Splice, Western Union |
| _____ Circuit breaker, 240V | _____ Lamps in series | _____ Spring clip |
| _____ Circuit fault indicator | _____ Lineman's pliers | _____ Switch and outlet combination |
| _____ Connector, split bolt | _____ Microphone | _____ Switch, dimmer |
| _____ Connector, wedge grip | _____ Needle nose pliers | _____ Switch, double pole or DPST |
| _____ Connector, wire nut | _____ Outlet, 240V 20A | _____ Switch, four-way |
| _____ Crimp lug | _____ Outlet, 240V 30A | _____ Switch, push button |
| _____ Diagonal cutters | _____ Outlet, 240V 50A | _____ Switch, rotary |
| _____ Diode | _____ Outlet, combination radio
or TV and power | _____ Switch, single pole or SPST |
| _____ Fuse, cartridge | _____ Outlet, duplex | _____ Switch, three-way or SPDT |
| _____ Fuse, plug | _____ Outlet, floor | _____ Switch, weatherproof |
| _____ Ground fault circuit
interrupter (GFCI) | _____ Outlet, weatherproof | _____ Thermostat |
| _____ Head phones | _____ PC board | _____ Transformer, iron core |
| _____ Indicator light | _____ Plug, 240V 20A | _____ Volt meter |
| _____ Inductor, adjustable core | _____ Plug, 240V 30A | _____ Volt-Ohm meter or multimeter |
| _____ Inductor, air core | _____ Plug, 240V 50A | _____ Watt meter |
| _____ Inductor, iron core | _____ Plug, grounded type | _____ Watt-hour meter |
| _____ Integrated circuit | _____ Plug, grounding | _____ Wire stripper |

Parts missed _____ x 4 = _____ Total Penalty Points

Event No. III — Electric Energy Visual Presentation

Title of Presentation _____

Items under the major divisions I, II, and III should be scored. Space under "Judges' Comments" is for additional scoring suggestions and ideas. Time limit: 15 minutes maximum; 10 to 12 minutes preferred.

FACTORS FOR SCORING	MAXIMUM SCORE 5 POINTS EACH	JUDGES' COMMENTS
I. The Presenter (20 points) <u>A. Appearance</u> <u>B. Voice</u> <u>C. Poise</u> <u>D. Grammar</u>	_____ _____ _____ _____	
II. Presentation (35 points) <u>A. Introduction</u> <u>B. Appropriate Method</u> <u>C. Verbal Presentation</u> <u>D. Teaching Aids</u> <u>E. Organization</u> <u>F. Audience View</u> <u>G. Summary</u>	_____ _____ _____ _____ _____ _____ _____	
III. Subject Matter (45 points) A. Selection of Subject <u>1. Reason for Choice</u> <u>2. One Basic Theme</u> <u>3. Practical</u> B. Information Presented <u>1. Accurate</u> <u>2. Up-to-Date</u> <u>3. Complete</u> <u>4. Appropriate for Age and Experience</u> C. Knowledge of Subject <u>1. Principles</u> <u>2. Application</u>	_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	

TOTAL _____

NOTE: The "average score" entered on the event scoresheet is the average score calculated from the multiple judges.

POINTS TO CONSIDER IN SCORING VISUAL PRESENTATION

- I. The Presenter (20 points)
 - A. Appearance — Neat appropriate dress, good posture. Is the presenter well groomed? Is the clothing he/she is wearing suitable for the task he/she is performing?
 - B. Voice — Distinct, forceful, yet natural. Is the presenter's voice clear with distinct enunciation, and reasonably strong? Is he/she enthusiastic?
 - C. Poise — Calm, pleasant, confident. Does the presenter keep his/her composure even when something appears to go wrong or does go wrong? Does he/she have self-assurance, yet a pleasant manner?
 - D. Grammar — Correct, well-chosen words. Does he/she use correct grammar and has he/she chosen words that make the meaning clear?

- II. Presentation (35 points)
 - A. Introduction — Effective, interesting. This is an explanation of the presentation not an introduction of the presenter. Does it get the attention of the audience?
 - B. Appropriate Method — Did the presenter choose a demonstration when an illustrated talk would have enabled him/her to do a better job?
 - C. Verbal Presentation — Steps, illustrative material, and explanation coordinated. Does the presenter talk about what he/she is showing and explain the procedure? If information given is to fill time during the process, is it related to what is being shown?
 - D. Teaching Aids — Equipment, models, charts, and supplies effective and well arranged. Did the presenter choose the teaching aid that would best tell the story? Were the charts and models neat, concise, and appropriate?
 - E. Organization — Presentation well organized, steps clear and logical, not memorized. Is evidence shown that the presenter has planned his/her presentation?
 - F. Audience View — Are aids large enough for audience to see? Does the presenter keep space in front of him/her open so that audience can see what he/she is doing?
 - G. Summary — Are key points summarized?

- III. Subject Matter (45 points)
 - A. Selection of Subject
 1. Reason for Choice — Why did the presenter choose this particular subject?
 2. One Basic Theme — Is the presentation confined to one theme or is it so broad in scope that it cannot be covered in the allotted time?
 3. Practical — Is the subject important to the project area and to the presenter?
 - B. Information Presented
 1. Accurate — Is the information correct? Could you follow directions given?
 2. Up-to-Date — Is it the most current information to which the presenter would have had access or is obsolete information given?
 3. Complete — Are all the steps in the process shown?
 4. Appropriate for Age and Experience — Is the presentation appropriate to the age and experience of the presenter?
 - C. Knowledge of Subject
 1. Principles — Did the presenter understand principles and practices presented?
 2. Application — Did he/she understand application of information presented?