

INDIANA STATE 4-H ELECTRIC CONTEST

2009 GUIDELINES

This contest is designed to give 4-H members enrolled in the 4-H Electric program 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. Practical wiring exercise (45 minutes maximum)
4. Demonstration/Illustrated talk (3 to 5 minutes)

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

The 2009 state contest will be held on Saturday, August 15th during the Indiana State Fair. To register for the event contact your county Extension office by August 1.

The winner of this event will represent Indiana at the National 4-H Electric Contest held September 27 - 29, 2009 at Purdue University. Also, the winner will receive a \$500 scholarship for education beyond high school. **NOTE: Previous winners are not eligible for the \$500 scholarship, but may compete for a special trophy.**

NOTE: For 2009 this contest will be open only to those youth in grades 8 to 12.

Event No. I. Written Examination

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

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 that must be identified. Participant will place a 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 _____

Event No. III Hands-On 4-H Electric Wiring Activity

This component of the State 4-H Electric Contest will permit the participant to demonstrate before his peers and a panel of judges his/her ability to properly and correctly complete an assigned wiring task.

The event will consist of a contestant completing a wiring task using actual components along with a wiring diagram. The specific wiring task will not be made known to the contestant prior to the start of this part of the contest. Potential wiring tasks may include, but not be limited to: wiring 3-way switches with lights; wiring a single pole switch with a light and receptacle; wiring a breaker panel with receptacle(s).

All contestants will complete the exact same wiring task. The wiring task will be conducted in a secluded area to ensure fairness and equality.

All components necessary for the completion of the assigned task, including hand tools, will be provided. Extra components will be available in the event that an item is damaged during the construction process.

Contestants must notify an official judge when they have completed the assigned wiring task and wish for the judges to evaluate their work. Their time will be recorded and no further work will be allowed. The project will be evaluated with the contestant present. Contestants will be expected to verbally explain to the judges what they did. This process should be very informal and the contestant should be put at ease.

Scoring will be as follows:

- 5 penalty points for each minute (or part of) beyond 30 minutes
- 5 penalty points for each infraction of failing to strip wire properly (correct length, etc.)
- 5 penalty points for each infraction of wrapping the wire the wrong way around a screw
- 5 penalty points for each safety infraction
- 10 penalty points for each wire connected to the wrong terminal (screw)
- 10 penalty points for each infraction of failing to properly ground the system
- 30 penalty points for failure to produce a finished product that would work if plugged into an electrical source

Event No. IV. Hands-on Wiring Discussion/Presentation

The discussion/presentation talk will be a summary/review/explanation of the practical wiring exercise mentioned in “Event No. III. The contestant will explain what they did under “Event No. III, why they wired the components as they did and what would be some practical applications of the device.

- Should last from 3 to 5 minutes. No penalty will be assess for times less than or more than the suggested 3 to 5 minutes.
- The contestant will be scored on how well they verbally explained why they wired the device in “Event No. III the way they did and how the device might be used in the “real” world.
- Contestants will be scored on their ability to effectively compose and present their thoughts on device constructed in Event No. III.

Following is a list of the factors that will be considered in the scoring process:

The 4-H Member	Presentation	Subject Matter
1. Appearance	1. Verbal presentation	1. Accurate
2. Voice	2. Organization	2. Up-to-date
3. Poise		3. Complete
4. Grammar		4. Knowledge of subject

Name: _____
Contestant Number: _____
County: _____

ELECTRIC ENERGY PARTS AND SYMBOLS IDENTIFICATION

Write the corresponding number beside the name. Each part to be identified will be numbered. Time limit 15 minutes. *Scoring:* Parts missed _____ x 4 = Total Penalty Points _____.

Symbols Electrical & Electronic

- | | |
|-------------------------|-----------------------------------|
| _____ Battery | _____ Speaker |
| _____ Capacitor | _____ Switch, single pole or SPST |
| _____ Connected wires | _____ Switch, three-way or SPDT |
| _____ Diode | _____ Switch, double pole or DPST |
| _____ Ground | _____ Switch, DPDT |
| _____ Head phones | _____ Transformer |
| _____ Lamps in parallel | _____ Transistor |
| _____ Lamps in series | _____ Unconnected wires |
| _____ Resistor | |

Parts and Equipment Electrical & Electronic

- | | |
|---|-----------------------------------|
| _____ Ammeter | _____ Needle nose pliers |
| _____ Capacitor | _____ Outlet, 240V |
| _____ Circuit breaker, 120V | _____ Outlet, duplex |
| _____ Circuit breaker, 240V | _____ PC board |
| _____ Connector | _____ Relay |
| _____ Wire nut | _____ Resistor |
| _____ Diode | _____ Soldering iron |
| _____ Fuse | _____ Speaker |
| _____ Ground fault circuit interrupter (GFCI) | _____ Switch, four-way |
| _____ Integrated circuit | _____ Switch, single pole or SPST |
| _____ Junction box | _____ Switch, three-way or SPDT |
| _____ Lamp holder | _____ Thermostat |
| _____ Lamp, fluorescent | _____ Transformer |
| | _____ Volt-Ohm meter |

Contestant's Number _____

Name: _____

State: _____

**Practical Wiring
Procedure:**

1. Contestants will complete a wiring exercise.
2. Contestants must notify one of the official judges when they have completed their wiring task. Their time will be recorded and no further work will be allowed. They must then explain to the official judges what they did and how they did it.
3. Penalty points for time begin after 30 minutes. Maximum time allowed = 45 minutes.

Scoring:

	Number of Infractions	Penalty Points Per Infraction	Total Penalty Points
Time over 30 minutes (round to next highest minute)	_____	x 5	_____
Wire stripping infractions	_____	x 5	_____
Wires improperly wrapped	_____	x 5	_____
Safety infractions	_____	x 5	_____
Wires connected to wrong terminal (screw)	_____	x 10	_____
Failure to properly ground system	_____	x 10	_____
Failure of finished product to work properly if plugged into an electrical outlet	_____	x 30	_____
		TOTAL POINTS	_____