

4-H ELECTRICAL SCIENCE GUIDELINES

Helping youth develop life skills is part of the goal of 4-H. The following are suggested guidelines for providing learning experiences in the electrical science project area and making it a more educational and consistent type of program.

GENERAL GUIDELINES

- Learn the basic fundamentals of electronics.
- Learn how basic electronic equipment operates.
- Become familiar with electricity and its applications.
- Learn methods and materials for distributing and controlling electricity.
- Develop skill in making and using electrical equipment.
- Develop the ability to plan electrical systems for the home.
- 4-H bulletins are available from the Cooperative Extension Service office.

The fair classes for electrical science are categorized as basic skill, intermediate, and advanced electrician. The class is determined by the number of years of experience a member has had in the project area and is flexible depending on the member's ability. The skill level should be determined by the leader. For example, the 4-H'er who has no electrical experience should start at the basic skill level, and if they are older, they can move into the more advanced levels quicker. On the other hand, a new project member who has had prior experience could start at the intermediate or advanced level. The level should best meet the needs and experience of the member.

The suggested experience guidelines are:

- Basic Skill: 1-2 years in the project
- Intermediate: 3-4 years in the project
- Advanced: 5 years and over in the project

EXPERIENCE GUIDELINES

Beginning or Basic Skill:

- A. Learn about conductors and the basic tools for electrical work.
- B. Learn about electricity and simple circuits.
- C. Learn basic wiring skills.
- D. Learn basic steps for good lighting.
- E. Learn about electromagnetism and its uses.
- F. Learn about electrical careers.

Intermediate:

- A. Learn about electrical safety and sizes of equipment and conductors for electrical circuits.
- B. Learn about circuits and how they are grounded for safety.
- C. Learn how an electric motor operates and how motors are controlled.
- D. Learn how lamps operate and the basic requirements for lighting.
- E. Learn about magnetism and some of its applications.

- F. Learn how electricity is measured.
- G. Learn about electronic components and how to build a simple electronic circuit.

Advanced:

- A. Learn about common induction motors and how they are controlled.
- B. Learn how electricity is generated and distributed.
- C. Learn advanced wiring skills.
- D. Learn how to make electrical plans.
- E. Learn about control systems.
- F. Learn advanced lighting skills.
- G. Learn about electrical heat.
- H. Learn advanced basics of electric circuits.
- I. Learn about resistance, capacitance, and inductance.
- J. Learn how a basic radio operates.
- K. Learn how amplifiers operate.
- L. Learn how a radio broadcaster and a superheterodyne receiver operate.
- M. Learn about other complex electronic equipment.

IDEAS FOR ELECTRIC PROJECT AND ACTIVITIES

Your 4-H electric members often are looking for ideas of things to make or do. You as a leader can guide them in their selection. Here is a listing of some suggested articles and exercises for each level. Please don't feel limited to these. Several projects are listed in two or more groups - more difficult work should be required for older members.

Beginning or Basic Skill Electrician

Electrical conductor board
Tools for electricians
Electrical circuits
Trouble lights
Rewiring a lamp
Care of motors
Make a flashlight
Reading the meter
Care of the hand iron
Heat lamps
Moveable spotlight
Portable flood lamp
Workbench light
Electrical inventory
Extension cord
Toy electric motor
Electric cord reel
Make a lamp
Care of small appliances
Lighted sign
Fuse collection

Light bulb collection
Poultry water heater
Lighting survey
Heating survey
Power survey
Disc sander
Cord board
Wire board
Radio
Infra-red corn popper
Study center

Intermediate Electrician

Rewire lamps
Ventilating fan
Equipment operating costs
Lighting survey
Installation of doorbell
Installation of door chimes
Intercommunication system
Belt sander
Yard light
Swing arm lamp
Infra-red heater
Drill press
Electric grinder
Test lamp
Ice cream freezer power unit
Moveable spot light
Lighted house numbers
Install a motor
Quiz board
Wiring plan of building
Wire size & use collection
Call bell
Water heater
Pilot lights
Equipment table
Heated dog house
Fuse board
Connector board
Game board
Phonograph
Radio
Study center
Switch to light to receptacle combination

Advanced Electrician

Motor installation
 Wiring panel
Wire a small building
Install convenience outlets
 Drill press
Conveyor
Install light switches
Electric lawn mower
Light dimmer
Circular saw
Air compressor
Electric hotbed
Valence or cornice lighting
Outdoor lighting fixture
Quiz board
Insect Trap
Alarm bell
Reverse switch for an electric Chick brooder motor
Electric fence installation
House wiring plan
Install automatic feeding equipment
Garage door opener
Lighted picture frame
Electric sewing machine
Radio
Electric hoist
Phonograph
Voltmeter

Plans for these articles are available from a variety of sources. Some will be found in 4-H bulletins, while others may be found in commercial literature and magazines. Some members may wish to draw their own plans, particularly for advanced projects.

4-H FAIR CLASSES FOR ELECTRICAL SCIENCE

General Information:

1. Member should enter the skill level appropriate for their experience.
2. An exhibit that does not meet the established criteria for a class will be dropped one grade.
3. Attach index card to exhibit tag if member is disabled or has reached his/her capability. Use card to briefly explain this. Disabled members may remain at basic skill or intermediate level.

Class

- * Basic Skill Electrician - 3 articles or 2 articles and a written report on project.
- * Intermediate Electrician - 2 articles or 1 article and a written report on project.
- * Advanced Electrician - advanced article or a written report if article is not movable.
- * Advanced Electrician - 1 electronic article.
- * Exhibit educational display notebook is required.