



Missouri 4-H

University of Missouri
4-H Center for Youth Development

Electricity Project Brief

Learning Objectives

- Learn electrical terms, how electricity works, and how to use safely
- Construct simple switches, circuit boards and wire circuits
- Study magnetism and how it works
- Learn principles of electromagnets
- Build an electric motor
- Learn how electricity is transported from generating plant to consumer
- Study the importance of grounding
- Learn how to compute electrical loads
- Construct incandescent/fluorescent lights
- Learn about light and measure intensity

Fair Projects

- Homemade flashlight
- Simple switch or three way switch
- Circuit with two batteries and one light bulb
- Series circuit or Parallel circuit
- Soldered connection
- Electrical tool and supply kit
- Display of symbols on wires and cables and their meanings
- Poster on how to read an appliance nametag
- Chart showing the electrical usage of appliances

Demonstration Ideas

- Making simple repairs
- How to build an appliance tester, intercom set, hot plate, portable yard light, trouble light, or illuminated street numbers
- Making and using a test light
- Tying an underwriter's knot
- Installing safety devices
- Proper repair of extension cords
- How to select and use proper light switch to control modern home lighting
- How to wire a two-way switch, four-way, or relay switch
- How to read an electric meter and check the layout of wiring
- Making a pigtail splice
- How to check wiring layout
- Selecting electrical equipment and proper use of tools

Field Trips

- Visit a local electrical shop
- Visit the rural electric coop
- Tour a hydro electric power plant
- Virtual tours on computer ... find how breakers, switches, and circuit boards are made.

Ideas for Speech Topics

- Wiring a breaker box
- Wiring a switch
- Explaining how a three way switch works
- Volts and amps, what's the difference
- Using an electric volt meter
- Comparing electric use in different bulbs

Critical Thinking

- Why is it important to understand how electricity works?
- What are situations where it is important to know how to control the flow of electricity?
- Why is it sometimes better to learn something yourself by trying it rather than to find the answer in a book?
- If you were the electrician for a new home construction, where would you install series circuits?
- Name some important uses of switches in your everyday life.
- What are some things that you can do to use resources wisely?
- What benefits would there be to energy consumption if more LED's were used in electronics and lighting appliances?

Community Service

- Conduct an appliance survey
- Conduct a home safety-hazard hunt
- Do simple repairs for those who need help

Science & Technology

How have you used the science and technology process in this project area?

Examples:

- Hypothesize the problem with a switch not working
- Observe people wiring a building
- Build/Construct a wiring board
- Troubleshoot setting up a wiring system

Show Me Character

Trustworthiness - includes honesty, promise keeping and loyalty.

- Be dependable when working with dangerous equipment
- Be honest with your project leader and your teammates
- Only use equipment you have been trained to use
- Show off your talents-choose to build from scratch not using kits or pre-assembled projects

Respect - includes courtesy and proper treatment of people and things.

- Don't judge people based on the quality of their projects remember that everyone has tried their best
- Show care and respect for everyone's projects
- Treat others' projects the way you want your project treated

Responsibility - includes the pursuit of excellence, accountability and perseverance.

- Learn safety procedures for all equipment you use
- Be prepared with the materials you need to complete your projects
- Listen carefully to the instructions of your leaders
- Do your part when working in groups

Fairness - involves consistently applying rules and standards appropriately for different age groups and ability levels.

- Take turns using the equipment so everyone has equal time building and constructing
- Follow specifications and guidelines for your project
- Allow everyone access to the same materials
- Matter how they perform in shows
- Keep animals' surroundings properly maintained

Caring - promoting the well being of people and things in a young person's world. It denotes action and not just feelings.

- Be willing to help friends even if you are competing against them
- Thank leaders and facilitators that help you with your project
- Share your tools and supplies if someone else runs low or is having trouble

Citizenship - includes making the home community and county a better place to live for themselves and others.

- Always clean up your workspaces and messes left behind by others
- Share your talents by building something that you can donate or give as a gift
- Don't use any supplies that are not allowed
- Create waste free environments and think of ways to better your community and environment by using your skills

Show Me Standards

Missouri 4-H members will acquire the knowledge and skills to gather, analyze and apply information and ideas, communicate effectively, recognize and solve problems, make decisions and act as responsible members of society.

4-H members will acquire a solid foundation which includes knowledge of:

- **Mathematics** - addition, subtraction, multiplication and division; other number sense, including numeration and estimation; and the application of these operations and concepts in the workplace and other situations: data analysis, probability and statistics.

Resources

831 Electricity Unit 1

Y620 4-H Project Record
Y8310 Magic of Electricity
LG8350 Electric Excitement Helper's Activity Guide

832 Electricity Unit 2

Y620 4-H Project Record
Y8320 Investigating Electricity
LG8350 Electric Excitement Helper's Activity Guide

833 Electricity Unit 3

Y620 4-H Project Record
Y8330 Wired for Power
LG8350 Electric Excitement Helper's Activity Guide

834 Electricity Unit 4

Y620 4-H Project Record
Y8340 Entering Electronics
LG8350 Electric Excitement Helper's Activity Guide

To Order

Extension Publications online at <http://extension.missouri.edu/explore/shop/> or by phone 1-800-292-0969

For additional resources check with your local University of Missouri Extension Center or the 4-H Source Book at <http://www.4-hmall.org/educationalresources.aspx>.