MERIT BADGE SERIES

ELECTRICITY

DANGER
HIGH VOLTAGE
UNAUTHORIZED PERSONNEL
KEEP OUT

STEM-Based
ELECTRICITY

“Enhancing our youths’ competitive edge through merit badges”
Requirements

1. Demonstrate that you know how to respond to electrical emergencies by doing the following:
   a. Show how to rescue a person touching a live wire in the home.
   b. Show how to render first aid to a person who is unconscious from electrical shock.
   c. Show how to treat an electrical burn.
   d. Explain what to do in an electrical storm.
   e. Explain what to do in the event of an electrical fire.

2. Complete an electrical home safety inspection of your home, using the checklist found in this pamphlet or one approved by your counselor. Discuss what you find with your counselor.

3. Make a simple electromagnet and use it to show magnetic attraction and repulsion.

4. Explain the difference between direct current and alternating current.

5. Make a simple drawing to show how a battery and an electric bell work.

6. Explain why a fuse blows or a circuit breaker trips. Tell how to find a blown fuse or tripped circuit breaker in your home. Show how to safely reset the circuit breaker.

7. Explain what overloading an electric circuit means. Tell what you have done to make sure your home circuits are not overloaded.
8. Make a floor plan wiring diagram of the lights, switches, and outlets for a room in your home. Show which fuse or circuit breaker protects each one.

9. Do the following:
   a. Read an electric meter and, using your family’s electric bill, determine the energy cost from the meter readings.
   b. Discuss with your counselor five ways in which your family can conserve energy.

10. Explain the following electrical terms: volt, ampere, watt, ohm, resistance, potential difference, rectifier, rheostat, conductor, ground, GFCI, circuit, and short circuit.

11. Do any TWO of the following:
   a. Connect a buzzer, bell, or light with a battery. Have a key or switch in the line.
   b. Make and run a simple electric motor (not from a kit).
   c. Build a simple rheostat. Show that it works.
   d. Build a single-pole, double-throw switch. Show that it works.
   e. Hook a model electric train layout to a house circuit. Tell how it works.
Electricity Resources

Scouting Literature

Deck of First Aid; Chemistry, Electronics, Energy, Engineering, First Aid, Home Repairs, Inventing, Lifesaving, Nuclear Science, and Safety merit badge pamphlets

With your parent’s permission, visit the Boy Scouts of America’s official retail website, www.scoutshop.org, for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Books


**Organizations and Websites**

**Boston Museum of Science**
Telephone: 617-723-2500
Theater of Electricity website:
http://www.mos.org/live-presentations/lightning

**Energy Information Administration**
1000 Independence Ave. SW
Washington, DC 20585
Website: http://www.eia.gov

**Energy Kids Page**
Website: http://www.eia.gov/kids

**Home Energy Saver**
Website: http://hes.lbl.gov

**HowStuffWorks.com**
c/o Convex Group Inc.
One Capital City Plaza
3350 Peachtree Road NE, Suite 1500
Atlanta, GA 30326-1425
Website: http://www.howstuffworks.com

**Institute of Electrical and Electronics Engineers**
445 Hoes Lane
Piscataway, NJ 08854-4141
Telephone: 732-981-0060
Website: http://www.ieee.org

**National Energy Education Development Project**
8408 Kao Circle
Manassas, VA 20110
Telephone: 703-257-1117
Website: http://www.need.org

**North American Electric Reliability Corporation**
1325 G St. NW, Suite 600
Washington, DC 20005-3801
Telephone: 202-400-3000
Website: http://www.nerc.com

**Safe Electricity.org**
Electric Universe
Website: http://eec.electricuniverse.com

**U.S. Department of Energy**
1000 Independence Ave. SW
Washington, DC 20585
Telephone: 202-586-5000
Website: http://energy.gov

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(Hauksbee demonstrating electrostatic generator)

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Dan Bryant—pages 18 (electromagnet), 19 (6-volt battery), and 34–35 (steps for making a motor)

John McDearmon—all illustrations on pages 7, 12, 14, 16–17, 19, 21–23, 41, and 56–58

Brian Payne—pages 37 (steps for making a rheostat), 39 (Scout looking at breaker box), 40, 42, 43 (Scouts inspecting light fixture), 46 (Scouts), 48 (Scout reading electric meter), 50, 52, 55, and 60

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