



# ELECTRICITY

## Merit Badge 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 a direct current and an 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) On a floor plan of a room in your home, make a wiring diagram of the lights, switches, and outlets. 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, 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 current. Tell how it works.

**Requirement 1**

Demonstrate that you know how to respond to electrical emergencies by doing the following:

\_\_ Show how to rescue a person touching a live wire in the home.

Briefly describe the process and the precautions that must be taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_ Show how to render first aid to a person who is unconscious from electrical shock.

Briefly describe the process: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_ Show how to treat an electrical burn.

Briefly describe the process: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_ Explain what to do in an electrical storm.

Briefly describe the process and the precautions that must be taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_ Explain what to do in the event of an electrical fire.

Briefly describe the process and the precautions that must be taken: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Requirement 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.

Briefly describe how you did this and what you found: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Requirement 3**

Make a simple electromagnet and use your magnet to show magnetic attraction and repulsion

Describe how you made the magnet: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Briefly describe how you used your magnet to show magnetic attraction and repulsion. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Requirement 4**

Explain the difference between a direct current and alternating current: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Requirement 5**

Make a simple drawing to show how a battery and an electric bell work. Use the space below.



**Requirement 6**

Explain why a fuse blows or a circuit breaker trips: \_\_\_\_\_

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Tell how to find a blown fuse or a tripped circuit breaker in your home: \_\_\_\_\_

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Show how you would safely reset the circuit breaker. Briefly describe the process: \_\_\_\_\_

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**Requirement 7**

Explain what overloading an electric circuit means: \_\_\_\_\_

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Tell what you have done to make sure your home circuits aren't overloaded: \_\_\_\_\_

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### Requirement 10

Explain the following electrical terms:

Volt: \_\_\_\_\_  
\_\_\_\_\_

Ampere: \_\_\_\_\_  
\_\_\_\_\_

Watt: \_\_\_\_\_  
\_\_\_\_\_

Ohm: \_\_\_\_\_  
\_\_\_\_\_

Resistance: \_\_\_\_\_  
\_\_\_\_\_

Potential Difference: \_\_\_\_\_  
\_\_\_\_\_

Rectifier: \_\_\_\_\_  
\_\_\_\_\_

Rheostat: \_\_\_\_\_  
\_\_\_\_\_

Conductor: \_\_\_\_\_  
\_\_\_\_\_

Ground: \_\_\_\_\_  
\_\_\_\_\_

Circuit: \_\_\_\_\_  
\_\_\_\_\_

Short Circuit: \_\_\_\_\_  
\_\_\_\_\_

### Requirement 11

You have been given five options for this requirement. Select and complete two of them.

If you selected *Option A*:

Connect a buzzer, bell or light with a battery. Have a key or switch in the line. Use the space below to draw a simple sketch of your project.

Scout Name: \_\_\_\_\_ Unit #: \_\_\_\_\_ Date: \_\_\_\_\_

If you selected **Option B**:

Make and run a simple electric motor (not from a kit). Briefly explain how you made the motor: \_\_\_\_\_

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\_\_\_ Demonstrate the working motor to your counselor.

If you selected **Option C**:

Build a simple rheostat.

Describe how you built the rheostat: \_\_\_\_\_

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Describe how your rheostat works: \_\_\_\_\_

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\_\_\_ Show your working rheostat to your counselor.

If you selected **Option D**:

Build a single-pole double-throw switch.

Briefly describe how the switch was built: \_\_\_\_\_

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\_\_\_ Show the working switch to your counselor.

If you selected **Option E**:

Hook a model electric train layout to a house circuit.

Describe the process and how this works: \_\_\_\_\_

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