



ELECTRICITY

Merit Badge Requirements

- 1) Show magnetic attraction and repulsion. Make and use a simple electromagnet.
- 2) Explain the difference between a direct current and an alternating current.
- 3) Make a simple drawing to show how a chemical cell and an electric bell work.
- 4) 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 change the fuse or reset the circuit breaker safely.
- 5) Explain what overloading an electric circuit means. Tell what you have done to make sure your homes circuits aren't overloaded.
- 6) Demonstrate how to repair a plug on an appliance cord.
- 7) Show how to rescue a person touching a live wire in the home. Show first aid if the person is unconscious from electrical shock.
- 8) Show on a floor plan of a room in your home the lights, switches, and outlets. Show which fuse or circuit breaker protects each.
- 9) Read an electric meter. Figure an electric bill from the meter readings.
- 10) Explain 10 electrical terms such as volt, ampere, watt, Ohm, resistance, potential difference, rectifier, rheostat, conductor, ground, circuit, or 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 to a house current. Tell how it works.

Scout Name: _____ Unit #: _____ Date: _____

Requirement 1

Show magnetic attraction and repulsion. Briefly describe how you did this: _____

Make and use a simple electromagnet. Describe how you made the magnet: _____

Requirement 2

Explain the difference between a direct current and an alternating current: _____

Requirement 3

Use the space below to show how a chemical cell and an electric bell work:

Requirement 4

Explain why a fuse blows or a circuit breaker trips: _____

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

Describe how you would change the fuse or reset the circuit breaker safely: _____

___ Show how you would change the fuse or reset the circuit breaker safely.

Requirement 5

Explain what overloading the circuit means: _____

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

Requirement 6

Describe how you repair a plug on an appliance cord: _____

___ Demonstrate how you repair a plug on an appliance cord.

Requirement 7

__ Demonstrate to your counselor the proper way to rescue a person touching a live wire in a home.

Briefly describe the process and the precautions that must be taken: _____

__ Demonstrate to your counselor the proper first aid procedure if a person is unconscious from electrical shock.

Briefly describe the process: _____

Requirement 8

You have been asked to show on a floor plan of a room in your home the lights, switches, and outlets. And to also show which fuse or circuit breaker protects each. If you do not have a floor plan of a room in your home available, use the area below to draw one and then label it accordingly.



Requirement 9

Read an electric meter. What was the reading you took? _____

Figure an electric bill from the meter readings. How much was the electric bill? \$_____

Requirement 10

Explain 10 of the following 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.

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If you selected **Option B**:

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

__ Demonstrate the working motor to your counselor.

If you selected **Option C**:

Build a simple rheostat.

Describe how you built the rheostat: _____

Describe how your rheostat works: _____

__ 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: _____

__ 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: _____
