



# 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.

### **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 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.



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: \_\_\_\_\_

---

---

---

---

---

---

---

---

---

---