Electricity MB 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.

Requirements marked with an asterisk (*) are to be completed prior to class. Bring checklist, diagram, documentation, meter reading with electric bill/calculations, and devices you built to show evidence of completing these requirements.

www.BoyScoutTrail.com

Electricity

Sample Home Inspection Checklist

This checklist needs to be approved by your merit badge counselor
before you use it to fulfill requirement #2 of the merit badge.

Name: _____ Unit: _____

1. Outlets

__ Identify any electrical outlets that have loose-fitting plugs and have a parent see that they get fixed

__ Identify missing or broken wall plates and have a parent replace them

__ Place safety covers on all unused outlets that are accessible to children

2. Cords

__ Replace frayed or cracked cords in all appliances, lights, and electronic equipment

__ Move cords out of traffic areas

__ Check that no nails or staples are used on cords

__ Check that no cords are under carpets or rugs

__ Check that no furniture is resting on cords

3. Extension Cords

__ Check for overloaded extension cords

__ Check for permanently used extension cords – they should be only used temporarily

__ Install safety closures on all extension cords

4. Plugs

__ Check that all plugs fit their outlets correctly

__ Check that the ground pin has not been removed from any plugs

__ Check that no plugs have been forced into an outlet

5. Ground Fault Circuit Interrupters (GFCIs)

__ Ensure GFCIs are installed in appropriate outlet locations in the kitchen, bathroom, laundry room, garage, and other locations (such as basements) where water may be present

__ Test GFCIs according to the manufacturer's instructions

__ Arrange replacement of non-functioning GFCI with a new GFCI

__ Repair any appliance that trips a GFCI at an authorized repair service or replace the appliance

6. Light Bulbs

__ Check bulbs in light fixtures to make sure they are the correct wattage for the size of the fixture. Replace bulbs that are a higher wattage than recommended

__ Check that all bulbs are screwed in securely

7. Circuit Breakers/Fuses

__ Check that circuit breakers and fuses are the correct size current rating for their circuit. Have a licensed electrician identify and label the correct size to use.

8. Appliances

__ Repair or replace any appliance that repeatedly blows a fuse or trips a circuit breaker or has given anyone a shock.

__ Check for appliances being used where they may fall into water. Figure out a better place to use the appliance and move it.

__ Check to see that all appliances are in good condition and working properly

__ Use surge protectors for all computer and home entertainment equipment and other appliances susceptible to burn-out from power spikes

9. Outdoor Safety

__ Check power tools and electric lawn mowers for frayed power cords, broken plugs, and cracked or broken housings

__ Check that all extension cords being used outside are specifically designed for outdoor use and are rated for the power needs of the tools being used
__ Check that no portable power tools are left plugged in when not in use
__ Ensure GFCIs are installed in outdoor outlet locations

10. Lightning

__ During an electrical storm, do not use appliances, computers, or telephones
__ During an electrical storm, do not take a shower or bath
__ Check that flashlights with fresh batteries are available for power outages

11. Space Heaters

__ Check that all space heaters are a minimum of 3 feet from any combustibles
__ Check that space heaters are not used where children may be left unsupervised
__ Check that all unused space heaters are turned off and unplugged
__ Check that space heaters are connected directly to an outlet and not an extension cord

12. Halogen Floor Lamps

__ Check that all halogen lamps are well away from combustibles
__ Do not use halogen lamps where children may be left unsupervised