

# Electronics Merit Badge

## 2010 Merit Badge College Syllabus



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### The Instructor

Hello,

My name is Chris Bernier. Scoutmaster for Troop 433 in Winslow Maine. I have been in Scouting since 1984. I am an Eagle Scout and have been Scoutmaster for Troop 433 since 2006. I hold two college degrees. One is for Applied Electronics and Computer Technology and the other for Industrial Electrical and Electronics Technology.

My trail name is Montawagon which a lot of people call me. If you have been in Scouting for a long time I am sure our trails have crossed at some point and if you are a New Scout I look forward to our Trails crossing again soon after you have completed this years Merit Badge College.

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### Prerequisites.

Yeup.....that is right....you have to have some stuff done before you get to class.

1. You need to go online and download and PRINT out a copy of the Electricity Merit Badge Work Sheet. Make sure to put your name and troop number on it.
2. You need to bring a note book and a pen or pencil to class with you.
3. You need a Blue Card from your Scoutmaster.
4. A scientific Calculator. It needs to have the X-1 function
5. A positive Attitude and a smile. =o)

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### Fees

You will need \$10.00 for your Electronics Kit which you will be assembling in class.

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### Requirements needed before you start Class.

Requirements you need to complete on your work sheet before you get to class.

Requirement 1

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### Electronics MB

1. Describe the safety precautions you must exercise when using, building, altering, or repairing electronic devices.
2. Do the following:
  - a. Draw a simple schematic diagram. It must show resistors, capacitors, and transistors or integrated circuits, Use the correct symbols. Label all parts.
  - b. Tell the purpose of each part.
3. Do the following:
  - a. Show the right way to solder and de-solder.
  - b. Show how to avoid heat damage to electronic components.
  - c. Tell about the function of a printed circuit board. Tell what precautions should be observed when soldering printed circuit boards.
4. Discuss each of the following with your merit badge counselor, and then choose ONE of the following and build a circuit to show the techniques used:
  - a. Tell how you can use electronics for a control purpose, and then build a control device circuit.
  - b. Tell about the basic principles of digital techniques, and then build a digital circuit. Show how to change three decimal numbers into binary numbers, and three binary numbers into decimal numbers.
  - c. Tell about three audio applications of electronics, and then build an audio circuit.
5. Show how to read the schematic diagram of the project you choose and, to the best of your ability, explain to your counselor how the circuit you built operates.
6. Do the following:
  - a. Show how to solve a simple problem involving current, voltage, and resistance using Ohm's law.
  - b. Tell about the need for and the use of test equipment in electronics. Name three types of test equipment. Tell how they operate.
7. Find out about three career opportunities in electronics that interest you. Discuss with and explain to your counselor what training and education are needed for each position.