***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_***

1. Describe the safety precautions you must exercise when using, building, altering, or repairing electronic devices.

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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.

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| Resistor: |  |
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| Capacitor: |  |
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| Transistor: |  |
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| Integrated circuit: |  |
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| Other?: |  |
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3. Do the following:

⬜a. Show the right way to solder and desolder.

⬜b. Show how to avoid heat damage to electronic components.

c. Tell about the function of a printed circuit board.

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Tell what precautions should be observed when soldering printed circuit boards.

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4. Do the following:

⬜ a. Discuss each of the following with your merit badge counselor,

⬜ i. How to use electronics for a control purpose.

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⬜ ii. The basic principles of digital techniques

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⬜ iii. How to use electronics for three different audio applications.

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⬜ b. Show how to change three decimal numbers into binary numbers and three binary numbers into decimal numbers.

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⬜ c. Choose ONE of the following three projects. For your project, find or create a schematic diagram. To the best of your ability, explain to your counselor how the circuit you built operates.

⬜ i. A control device

⬜ ii. A digital circuit.

⬜ iii. An audio circuit.

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5. 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.

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Name three types of test equipment. Tell how they operate.

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| 3. |  |  |
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6. Find out about three career opportunities in electronics that interest you.

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| 1. |  |
| 2. |  |
| 3. |  |

Discuss with and explain to your counselor what training and education are needed for each position.

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| 1. | Training: |  |
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|  | Education: |  |
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| 2. | Training: |  |
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|  | Education: |  |
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| 3. | Training: |  |
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|  | Education: |  |
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**When working on merit badges, Scouts and Scouters should be aware of some vital information in the current edition of the *Guide to Advancement* (BSA publication 33088). Important excerpts from that publication can be downloaded from** [**http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf**](http://usscouts.org/advance/docs/GTA-Excerpts-meritbadges.pdf)**.**

**You can download a complete copy of the *Guide to Advancement* from** [**http://www.scouting.org/filestore/pdf/33088.pdf**](http://www.scouting.org/filestore/pdf/33088.pdf)**.**