PURDUE EXTENSION
INDIANA 4-H

Electric Level 5

Looking for Voltage

What's it all About?

Voltage (V) is the energy force in wires or conductive material. Voltage is the difference in electric potential between two points, for example between the positive and negative ends of a battery, or between a hot wire and ground. There are several different tools that you can use to test for the presence of voltage. This project sheet will help you explore different tools to find voltage safely and correctly.

Keys to Remember

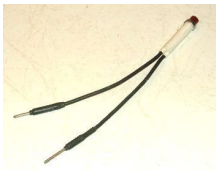
- Follow safety precautions around all circuits that you are testing for voltage. Ask an adult for help if you are unsure how to test safely.

For the Project

- Various tools to test for voltage
- Electric circuits to test, include pictures, drawings, or diagrams
- Include test data and notes for each conductor tested
- Record sheet
- 4-H Exhibit Skills and Knowledge Sheet

Tools You Can Use

1. Light Bulb Tester
   Light bulb testers are simple, low cost ways for finding voltage. Some electricians use a 240V bulb instead of a 120V bulb. If the bulb is bright, the voltage is 240V; if it is dim, it is 120V. The bulb can be screwed into a fuse socket. If the bulb lights, it indicates a load on the circuit. If not, the circuit is open. A disadvantage to this tool is ease of breaking the bulb.



2. The "Wiggy" (trademark name)
   The Wiggy is a voltmeter. It measures all volts, AC or DC. It is not a precision meter and will not give an exact reading, however will "hum" if it detects voltage.

3. Plug-In Circuit Analyzer
   This tool lights up when voltage is detected on a circuit. The prongs on the tool can plug directly into a wall outlet and let you know if the outlet is wired correctly.

4. Non-Contact Voltage Detector

This tool will let you know if voltage is present without physical contact and can detect varying levels of voltage. Test the detector by rubbing it through your hair or on a cloth to create a static electrical charge. You can also insert it into a wall outlet you know is hot. It will light up and beep when it finds voltage. By knowing how it works, you can use it on an unknown circuit to see if the circuit is energized or not.

5. Multimeter

   For more precise voltage readings, you will need a digital (multimeters) or moving coil meter. Some are made to measure very small voltages. Multilmeters require batteries. Moving coil meters do not need batteries for reading voltage. (Batteries are needed for the ohms scale only.) Read the instruction that come with the meter for proper use. (See the project sheet on “Voltage Meter Basics” to learn more about precisely measuring voltage on a circuit.)

Final Note

- Technicians approach most troubleshooting situations knowing how a circuit should function in a normal situation.