General Troubleshooting Guide for Arduino Uno Kits
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Common Port Reference

1. Resistors Color Coding

   a. Red | Red | Brown | Gold = 220Ω
   b. Green | Blue | Brown | Gold = 560 Ω
   c. Yellow | Purple | Red | Gold = 4,700Ω
   d. Brown | Black | Red | Gold = 1,000Ω
   e. Brown | Black | Orange | Gold = 10,000Ω
   f. Brown | Black | Green | Gold = 1,000,000Ω
   g. Brown | Black | Blue | Gold = 10,000,000Ω

2. LED Lights: Shorter Leg = Ground; Longer Leg = Positive


4. DC Motor: Black wire = Ground; Red Wire = Positive
5. Capacitors
Basics: Breadboard

- The Arduino Uno Kit comes with a breadboard to create a circuit draft

![Breadboard Diagram]

*Figure 1. Each node are connected as shown by the red lines.*

- The positive and negative ports does not necessarily need to be plugged with corresponding charges
- Powering node 1a will power nodes 1b thru 1e but not 1f thru 1j
How to use the Oscilloscope Equipment?

1. First, understand that the Oscilloscope is used to read frequency, amplitude, and other wave characteristics that your circuitry produces.
2. Assuming that your circuitry is built correctly, determine the **Output** ports of the circuitry.
   a. If you need help on building a circuitry that produces signals, please refer to the complementary Arduino Book, or ask the electronics specialist available in the makerspace.

Figure 2. Pre-built Analog Producing Signal Project

Figure 3. Oscilloscope Equipment, channel ports are located in the bottom.
3. Looking at figure 2, the 220Ω Resistor is the output port. Connect the wiring end (it has a hook end) of the oscilloscope to the output port of the circuit board as shown in the figure.

4. Connect the BNC (it has a circular end that locks when you twist it) end cable to one of the channels on the oscilloscope.

5. Adjust the graph using the vertical and horizontal positioning of the graph by turning the knobs on the right side of the oscilloscope as shown in Figure 3.

6. If any specific reading is desired, use the setup button in the top right or ask the electronics specialist in the makerspace to set it up for you.
How to use the Multimeter equipment?

1. First, assemble your desired breadboard and connect it to power
2. Turn on the multimeter and set it to desired units that you wish to measure
3. As shown below, the multimeter has a few options in order starting from off button: Voltage (AC), Voltage (DC), Resistance (Ohms), Diode Check, Voltage difference by differing temperature, Direct Current, and micro Direct Current.

4. Connect the corresponding ports to the desired board and read the measurement as shown below.
Common Troubleshooting Questions

1. How do I use some of the Arduino Parts?
   a. For any specific usage of circuitry (i.e. Resistors, Motors, etc.), please refer to the common ports section or the complementary Arduino Book.
   b. We also have electronics specialist working in the makerspace, feel free to ask them questions regarding specific parts

2. How come the LED light is not coming on?
   a. Make sure that the wiring is perfectly connected
   b. Check if each LED ports are connected to correct charge port
   c. Check if the LED light is broken by replacing the LED light