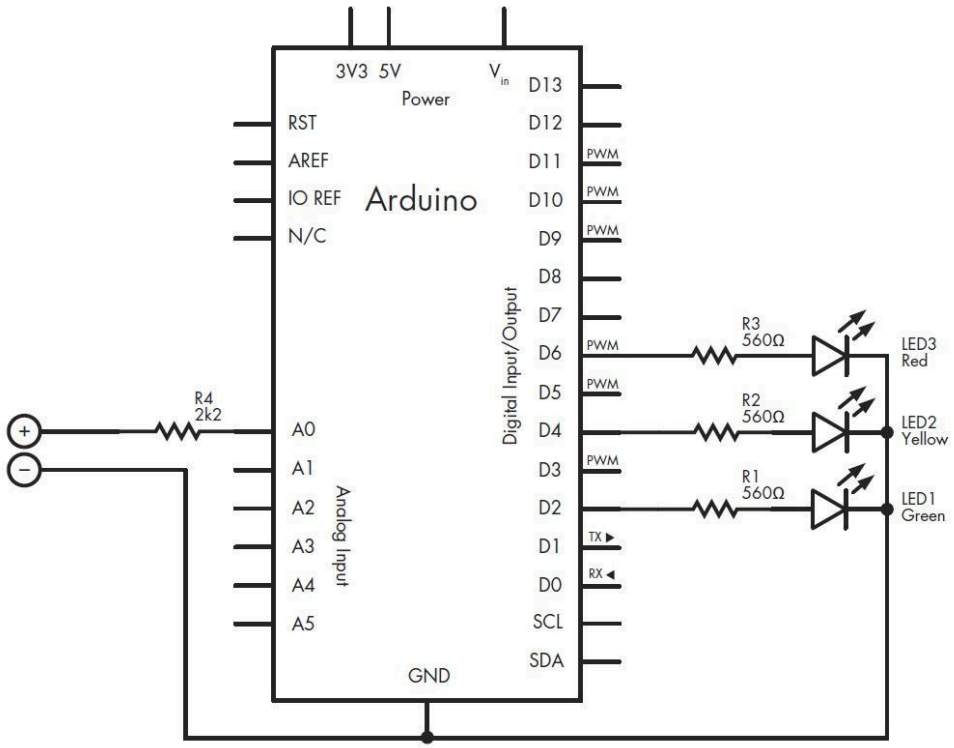
BATTERY TESTER ASSIGNMENT

Schematic retrieved from online *Arduino Workshop Project #6*, John Boxall, 2013.

Required Materials for each student: (1) diffused red LED, (1) diffused green LED, (1) diffused yellow LED, (3) current-limiting resistors (560Ω), (1) 2.2KΩ resistor, (1) breadboard, (1) Arduino microcontroller, Jumper Wires

For this assignment, you are to use the above materials to construct a single-cell battery tester (for AA, AAA, C, or D). The included diagram can be used as a guide for how things might be wired.



Fresh single-cell batteries such as those listed above usually start with a voltage of 1.6 V. This voltage stays nearly constant as the battery is used with only a slight drop in voltage. Eventually, the battery can no longer maintain its voltage and can no longer supply the necessary electric potential to power an item.

Your job: create a battery tester that does the following:

1. Can test all four sizes of single-cell batteries.
2. Prints the measured and converted float voltage to the Serial Monitor, along with a printed line to separate individual readings.
3. Turns the green LED on if the voltage is greater than or equal to 1.6 V.
4. Turns the yellow LED on if the voltage is greater than 1.4 V and less than 1.6 V.
5. Turns the red LED on if the voltage is less than or equal to 1.4 V.
6. The LED stays on for two seconds and then turns off.
7. Is wired as shown in the diagram.
8. Uses Else-If statements.

To use your tester, be sure that the positive side of the battery to be tested is connected to the wire indicated with a "+" in the diagram (the wire connected to the 2.2kΩ resistor). The negative end of the battery should be connected to the wire labelled with a "-" in the diagram. **DO NOT MEASURE ANYTHING HAVING A VOLTAGE LARGER THAN 5.0 V. DO NOT CONNECT POSITIVE TO NEGATIVE OR VICE VERSA. DOING SO CAN DAMAGE THE ARDUINO.**

WHAT GETS TURNED IN:

1. A flow chart listing the algorithm you will use in your code.
2. A hardcopy of your properly commented working code.
3. The initials of your instructor who has seen your battery tester work. These initials should be placed on the sheet having your flow chart.
4. A response to this question: When you don't have a battery connected to your tester, the LED's might come on and go off in a random fashion? Why do you think this occurs? What might you do to eliminate this? (Hint: think about what Pin A0 senses when it isn't connected to anything.)