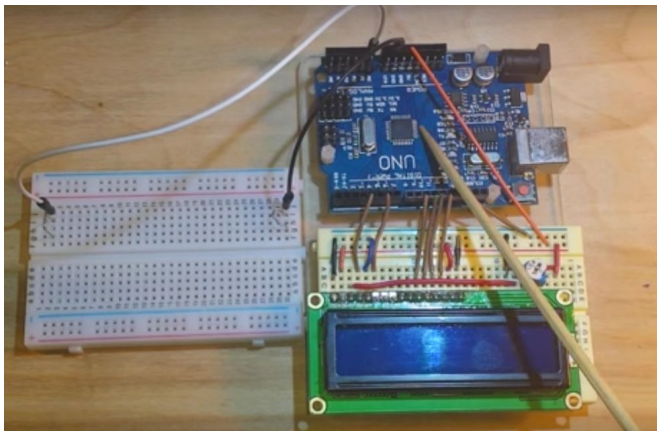
Arduino 18650 Battery Charge Gauge

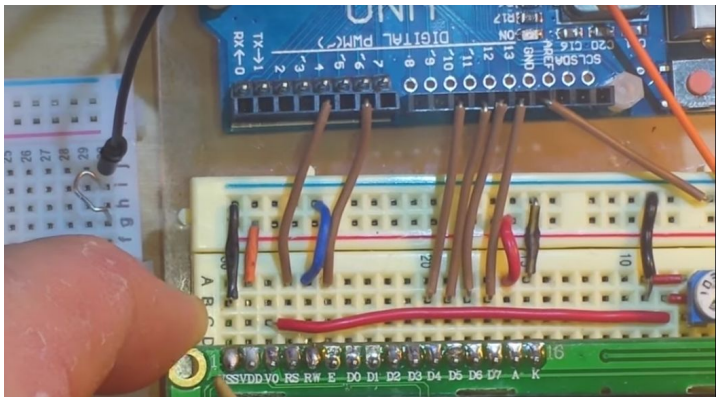
This is a specific battery checker shows the voltage and the percentage and a bar graph indicator .

What I used :

- Arduino Uno
- 16x 2 lcd screen.
- 2x bread boards
- 10k potentiometer

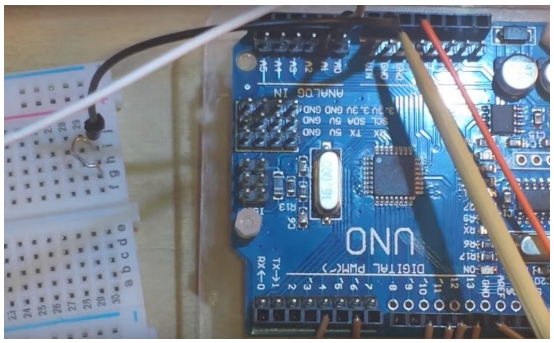
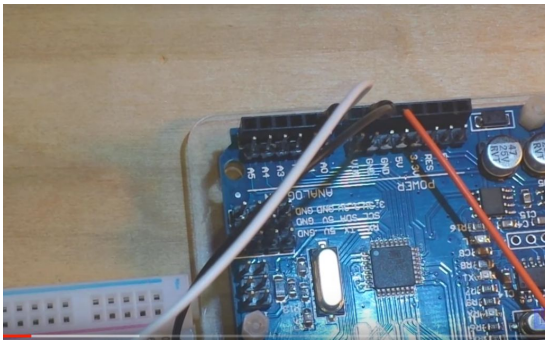
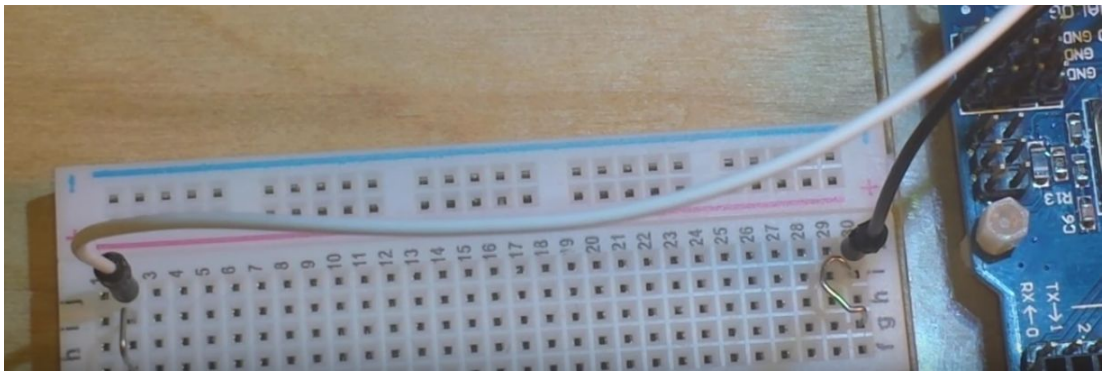


Hooking up the LCD:



- Vss is your ground connect to ground
- Vdd is your 5v connect to 5v
- RS is your right select connects to pin 4
- Rw is read write connect to ground
- E connect to pin 4
- D0, D1, D2, D3 are not used in this case.
- We are only going to use 4 data lines
    - ➔ D4 connects to 10
    - ➔ D5 connects to 11
    - ➔ D6 connects to 12

    - ➔ D7 connects to 13
- For the Back light
    - ➔ A anoid connect to 5v
    - ➔ K kapoid connect to ground
    - ➔ V0, you want a 10k potentiometer one side going to ground the other side going to 5v and the middle going to V0 (used to adjust contrast).
- We are going to bring 5v to the 5v rail, and the ground to the ground rail.

- For the battery connection bent a few pieces of wire as a cradle for the 18650 battery.
- We bringing negative ground to ground.
- The Positive to A0.

The Code behind it all:

```
#include <LiquidCrystal.h>                    //we need the library for the lcd display

LiquidCrystal lcd(4, 6, 10, 11, 12, 13);      //we need to tell the arduino which pins to use with the lcd

float rawV = 0.0;                             //a variable with a decimal point to hold battery volt voltage
int batC = 0;                                 //a variable with no decimal point to hold battery percentage
int graph = 0;                                //a variable with no decimal point to hold the value for the graph

void setup() {                                //only runs when the Arduino is powered on reset

  lcd.begin(16, 2);                           //start lcd with 16 columns & 2 rows
  lcd.clear();                                //clear any garbage from screen
  pinMode(A0,INPUT);                          //we will use analog pin 0 to read voltage from 18650

}

void loop() {                                 //runs over and over
```

```
  rawV = (analogRead(A0)*4.98)/1024;          //figure out the battery voltage (4.98 is the actual reading of my 5V
pin)
```

//some logic to set values

Estimated remaining capacity

Voltage	Sanyo 18650 2600mAh (Red)	Panasonic CGR18650CH 2250mAh	Panasonic NCR18650B 3100/3400mAh
4.2	100%	100%	100%
4.1	91%	93%	94%
4.0	79%	84%	83%
3.9	62%	75%	72%
3.8	42%	64%	59%
3.7	12%	52%	50%
3.6	2%	22%	33%
3.5	0%	9%	15%
3.4	0%	0%	6%
3.3	0%	0%	0%
3.2	0%	0%	0%
Measured 1 hour after discharge min. of 1A & 3A			

```
  if (rawV <3.6){                             //battery @ 3.5V or less
  batC = 0;                                   //% = 0
  graph = 0;                                  //# of graph segments to light
  }

if(rawV > 3.5 && rawV < 3.7){                 //battery @ 3.6V
  batC = 2;
  graph = 1;
  }

if (rawV > 3.6 && rawV < 3.8){                //battery @ 3.7V
  batC = 12;
  graph = 4;
  }

if (rawV > 3.7 && rawV <3.9){                 //battery @ 3.8V
  batC = 42;
  graph = 7;
  }

if (rawV > 3.8 && rawV < 4.0){                //battery @ 3.9V
  batC = 62;
  graph = 10;
  }

if (rawV > 3.9 && rawV < 4.1){                //battery @ 4.0V
  batC = 79;
  graph = 13;
  }

if (rawV > 4.0 && rawV < 4.2){                //battery @ 4.1V
  batC = 81;
  graph = 15;
  }

if (rawV > 4.19){                             //battery @ 4.2V
  batC = 100;
  graph = 16;
  }


                                              //send all the values to the lcd
```

```
  lcd.setCursor(0,0);
  lcd.print("V:");
  lcd.setCursor(3,0);
  lcd.print(rawV);
  lcd.setCursor(10,0);
  lcd.print("%:");
  lcd.setCursor(13,0);
  lcd.print(batC);
  lcd.setCursor(0,1);
  for(int m = 0; m < graph; m++){            //draw the graph (light up m number of segments)
    lcd.write(255);
  }

delay(1000);                                 //wait one second to stabilize

lcd.clear();                                 //clear previous data from lcd



}
```

Reference : https://www.youtube.com/watch?v=Eg3p1XFAcG8