# FLOAT Beijing Tutorial

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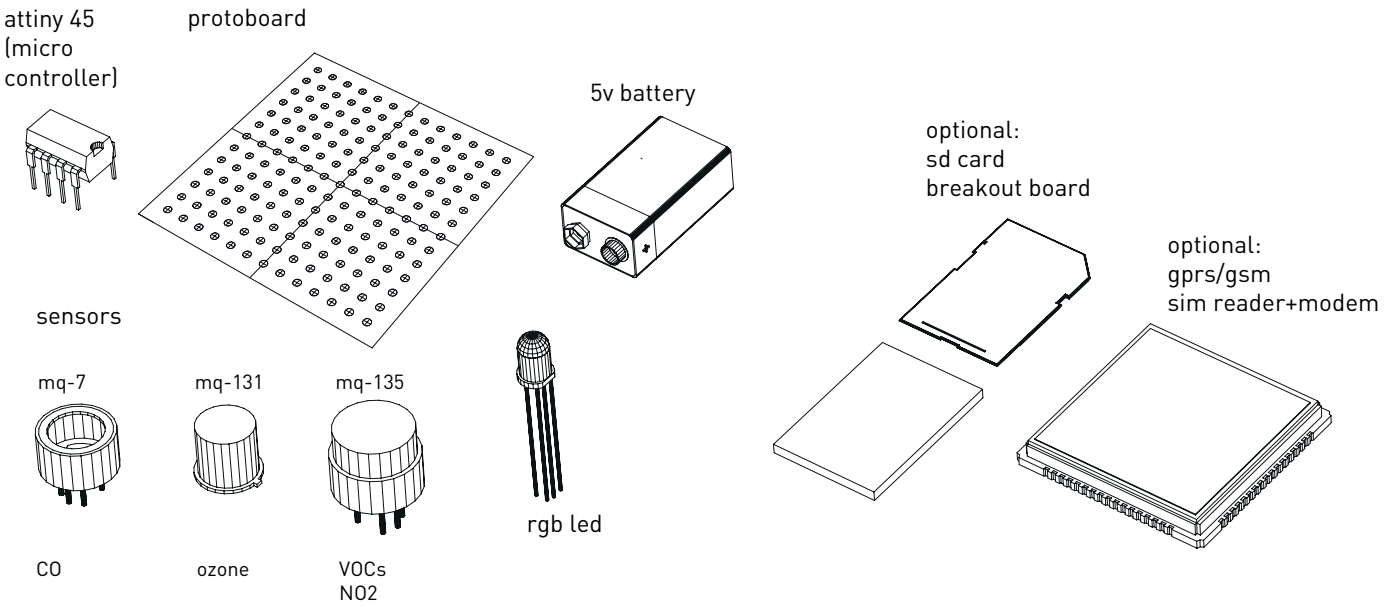
## Materials



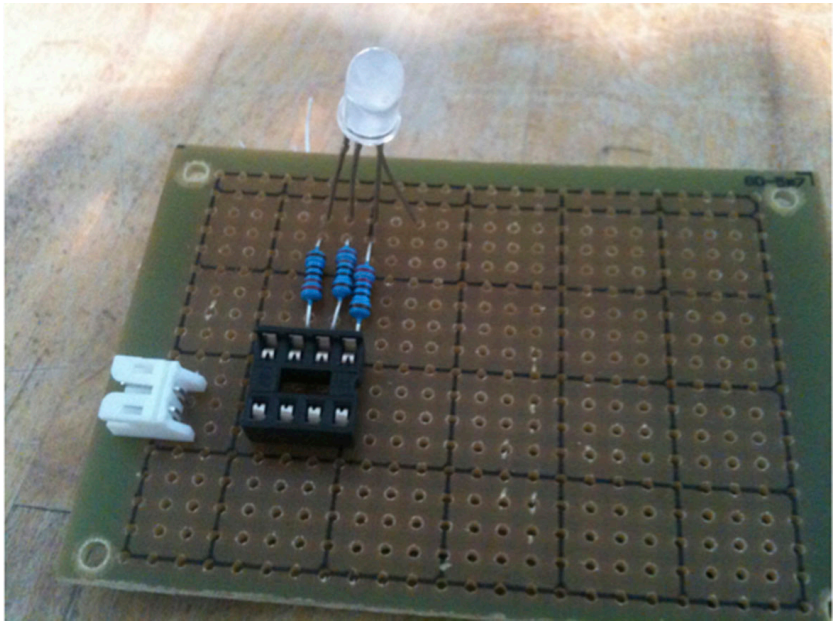

7 items:

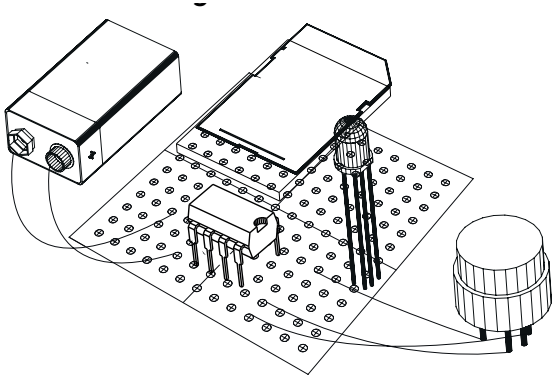
- RGB LED
- AtTiny45/85 chip and socket
- Protoboard
- Lithium polymer battery +holder
- Preheated sensor + breakout board
- 220 ohm resistors
- Jumper wires

Step 1: Prepare the basic layout of the board by soldering the socket in a central location on your board and the battery connector near the edge in a stable location

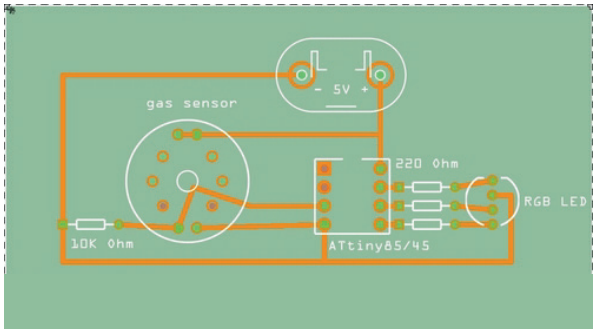
Step 2: Insert three 220-ohm resistors from the bottom 3 pins on the right side of the socket on one end and a few holes further (in a row) on the other end.

Step 3: Insert your LED such that the common cathode (longest) pin is bent out and the other three pins align with the other side of the resistors such that the bottom pin is the side with one pin after the cathode. Insert the cathode in a row further down from the socket





Wiring scheme



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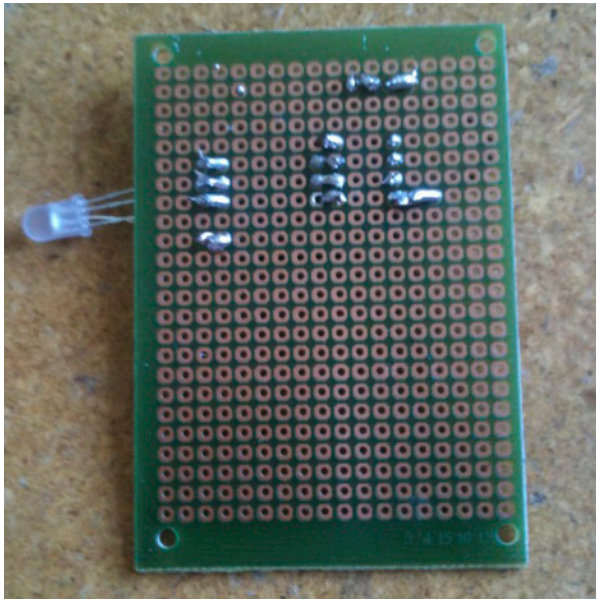
Step 4: Turn over your board and solder the connections such that one side of each resistors is joined to the pin on the DIP socket and the other side is joined the LED



Step 5: Prepare 3 short pieces of jumper wire and attach them as follows:
One from the left side of the battery socket to the bottom left pin on the DIP socket

One from the right side of the battery socket to the top right pin on the DIP socket

And lastly, one from the bottom left pin of the DIP socket to the cathode pin of the LED

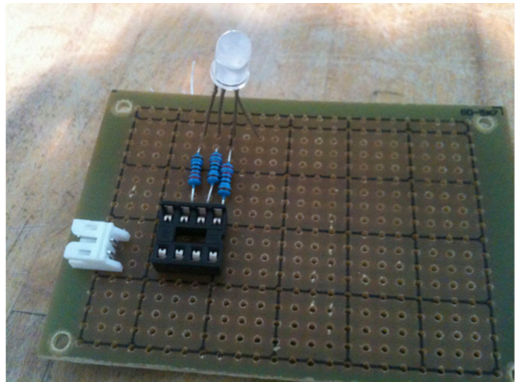
Step 6: attach the sensor and breakout board with 3 pieces of jumper wire as follows:
A wire from the GND pin or hole on the board to the bottom left pin on the DIP socket
A wire from the +5V pin or hole on the board to the top right ping on the DIP socket
A wire from the OUT or Aout pin/hole on the board to the 3rd pin on the left side of the DIP socket

Step 7: Insert the programmed ATTiny chip such that the dot on the chip aligns with the top left pin on the socket

There is a tutorial for programming an AtTiny chip with Arduino as ISP here (http://highlowtech.org/?p=1695) and here (http://www.instructables.com/id/Program-an-ATtiny-with-Arduino/) The code is at the end of this pdf and available on our github.

Step 8: plug in the battery and wait a few minutes for the sensor to calibrate, you should be ready to go!

Things to check if it does not work: power connections, chip orientation, battery level



```
// ATMEL ATTINY85
//
// +-\/-+
// PB5 1| |8 VCC
// (AI 3) PB3 2| |7 PB2 (AI 1)
// (AI 2) PB4 3| |6 PB1 PWM
// GND 4| |5 PB0 PWM
//
//to load connect VCC to 5V and GND to GND
int REDPin = 2; // RED pin of the LED to PWM pin 4
int GREENPin = 1; // GREEN pin of the LED to PWM pin 5
int BLUEPin = 0; // BLUE pin of the LED to PWM pin 6
int sensor= 0;
void setup()
{

 //rgb led pins
 pinMode(REDPin, OUTPUT);
 pinMode(GREENPin, OUTPUT);
 pinMode(BLUEPin, OUTPUT);
 }
void loop()
{
 //sensor values
 sensor= analogRead(2);
//the threshold values will vary based on your sensor, it is best to
//calibrate them and compare to other data. This is a
//helpful study: //http://www.staceyk.org/airSensors/sensoroutput.php
if (sensor < 100){ //turn LED green VOC

 digitalWrite(REDPin, LOW);
 digitalWrite(GREENPin, HIGH);
 digitalWrite(BLUEPin, LOW);
 }

if (500< sensor< 530){ // yellow VOC
 digitalWrite(REDPin, HIGH);
 digitalWrite(GREENPin, LOW);
 digitalWrite(BLUEPin, HIGH);
 }

 if (100< sensor< 120){ //red VOC

 digitalWrite(REDPin, HIGH);
 digitalWrite(GREENPin, LOW);
 digitalWrite(BLUEPin, LOW);
 }

 if (sensor> 120){ // pink VOC

 digitalWrite(REDPin, LOW);
 digitalWrite(GREENPin, LOW);
 digitalWrite(BLUEPin, HIGH);
 }
}
```