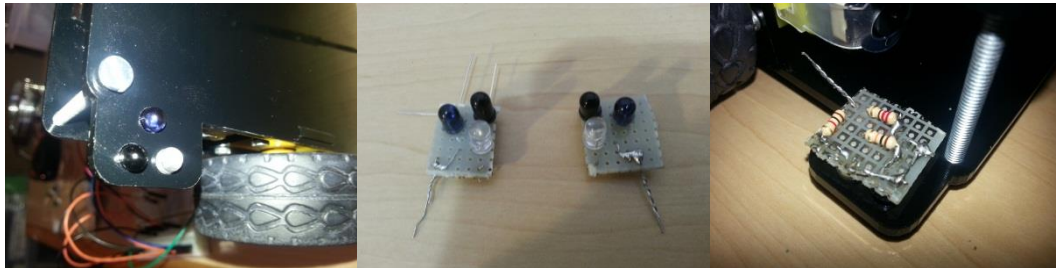


# Binaryspace SumoBot **Light Sensor** Tutorial

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This tutorial shows how to build a simple IR Light Sensor for your SumoBot. You will need to build 4 sensors like these, two exactly the same and two others with a different pin layout for the other side of the SumoBot.

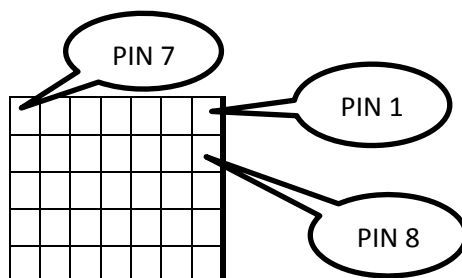


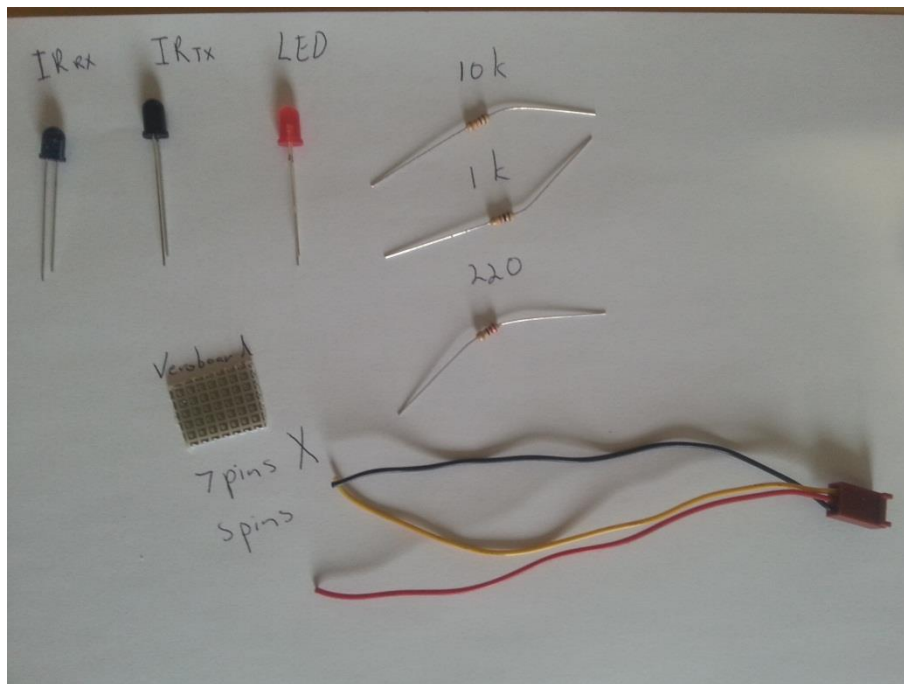
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## Components

- 1x 7pin by 5 pin cut Vero board (VB)
- 1x IR Transmitter (Tx)
- 1x IR Receiver (Rx)
- 1x LED (Any colour)
- 1x 10k Resistor
- 1x 1K Resistor
- 1x 220 Resistors
- 3x 0.2mm wire (red, black and any colour for signal in this example we used Yellow for signal)

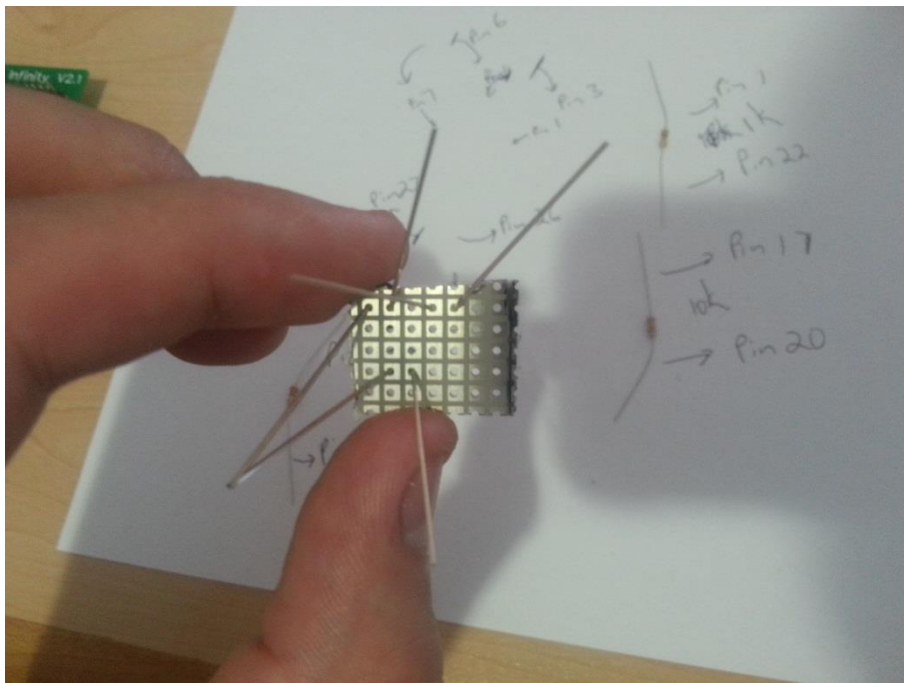
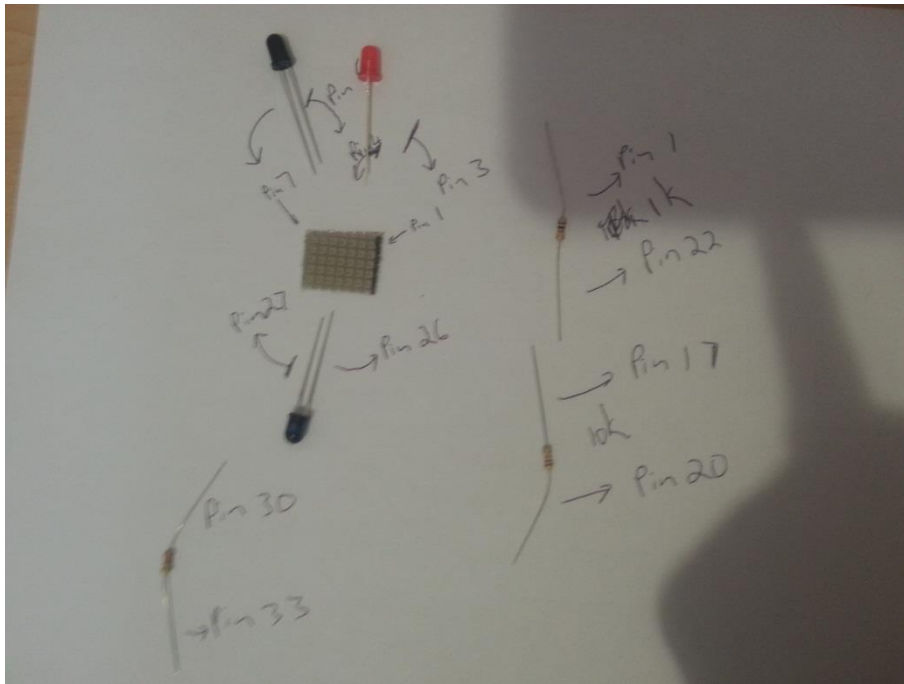


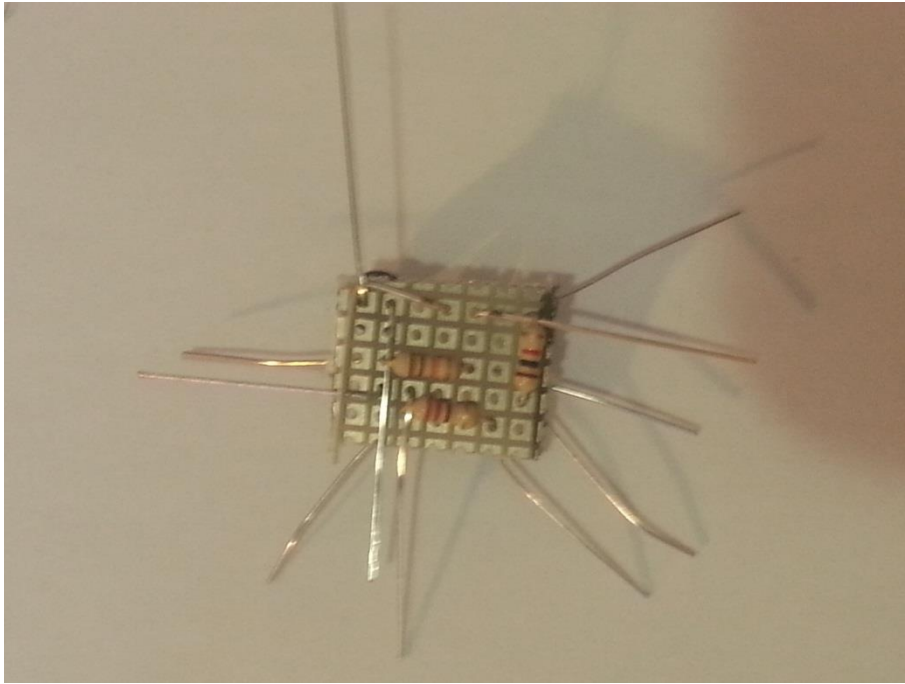


## Placing

Place the components in the following matter on the VB (see Images).

- IR Tx
  - Long Leg > Pin 7
  - Short Leg > Pin 6
- IR Rx
  - Long Leg > Pin 26
  - Short Leg > Pin 27
- LED
  - Long Leg > Pin 3
  - Short Leg > Pin 4
- 1K Resistor
  - Pin 1, 22
- 10K Resistor
  - Pin 17, 20
- 220 Resistor
  - Pin 30 ,33

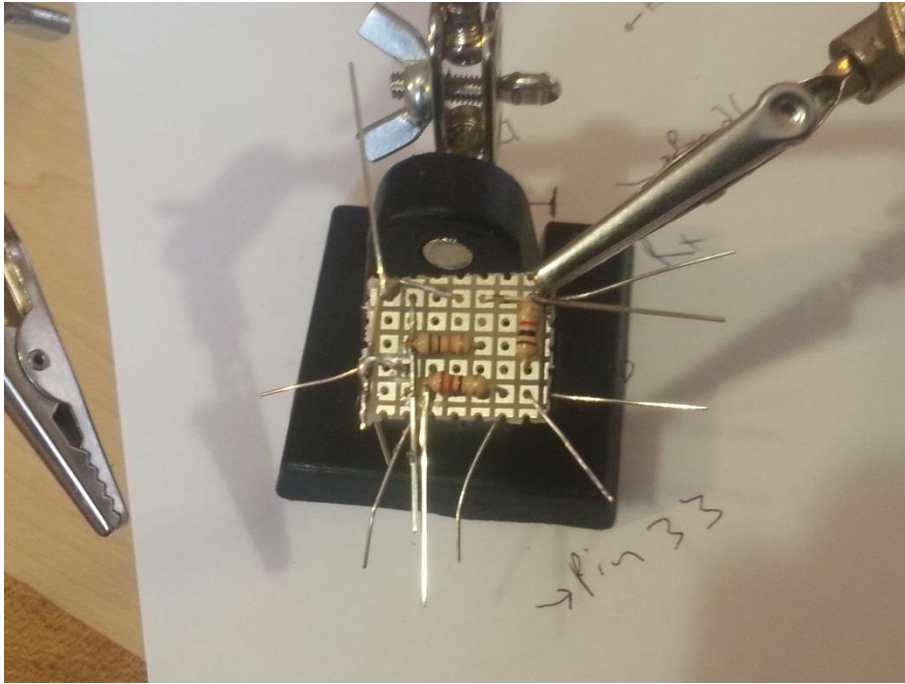




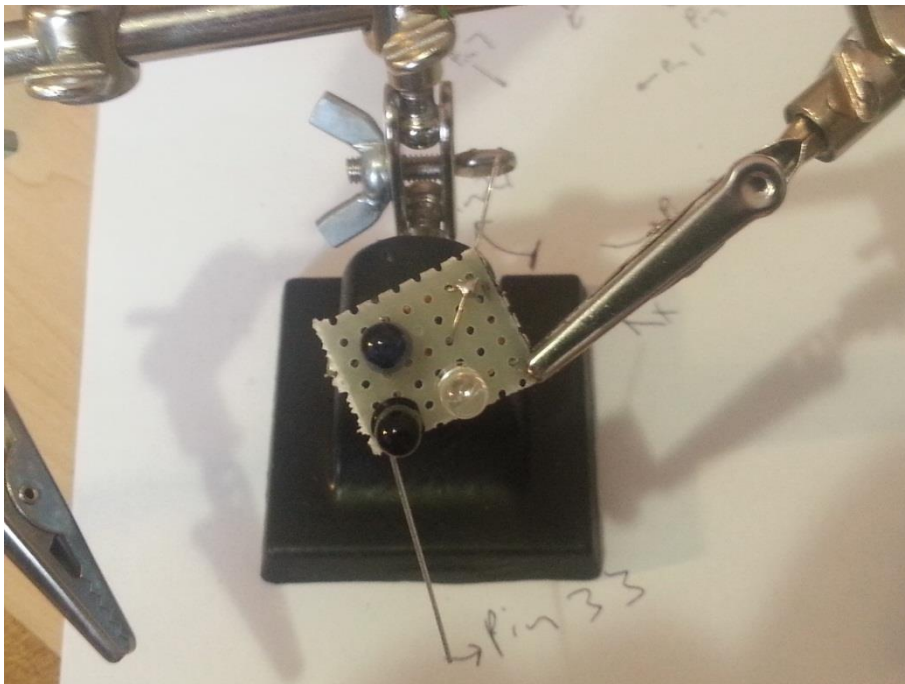
## Soldering and Connecting

Connect and solder the components in the following matter on the VB (see Images).

- Solder together Pin 4, 7, 27 this will be GND.
- Solder together Pin 17, 22, 30 this will be V5+.
- Connect and solder:
  - Pin 1 to Pin 3
  - Pin 6 to Pin 20
  - Pin 26 to Pin 33



You can pull on of the Pins 17, 22, 30 through Pin-hole 29 and solder the other two at the back.

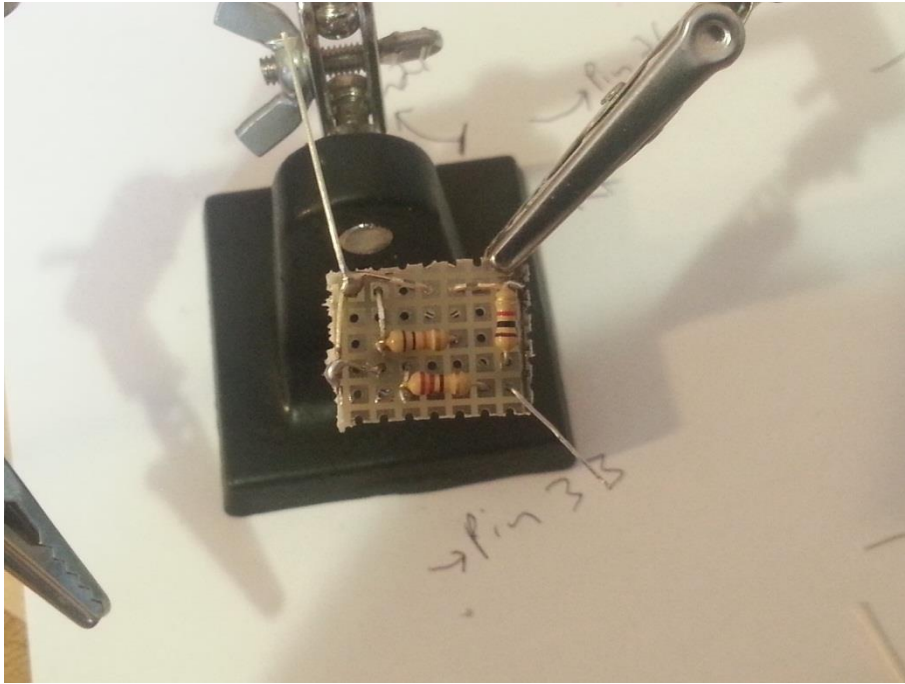


## Cutting and Cleaning

Cut away all excess wire leaving:

- The pulled thru wire on pin 29.
- One of the Pin 4, 7, 27 wires.

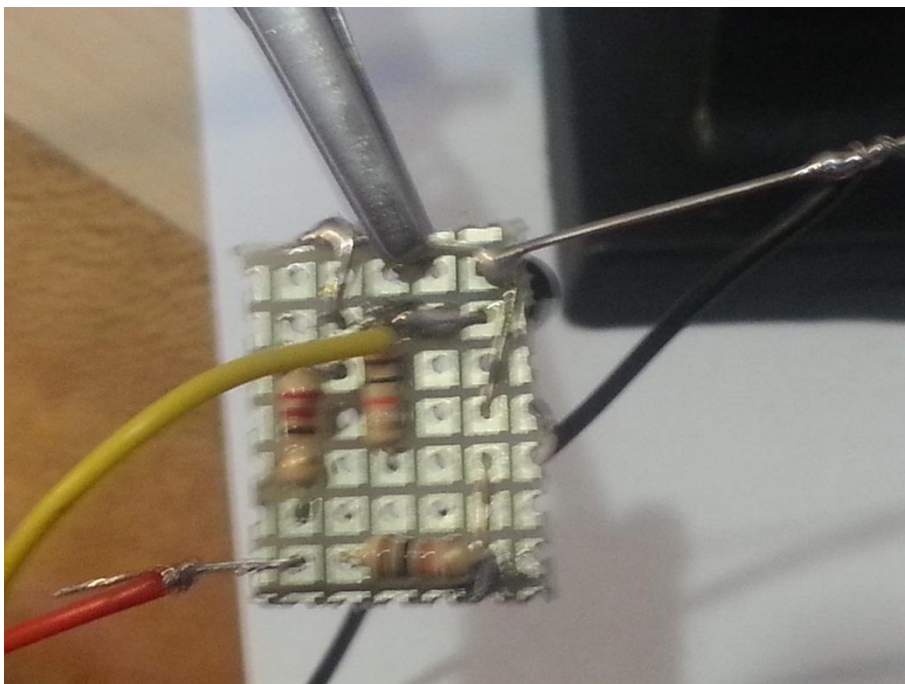


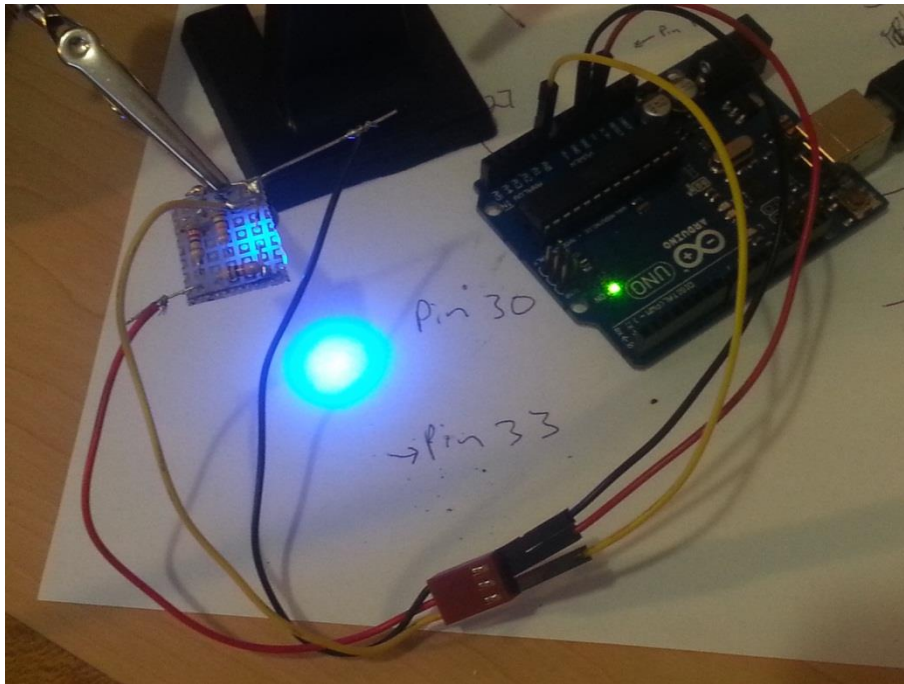


## Hook-up Wiring

Use your three 0.2mm wire (Red, Black, and Yellow) and connect them as follows:

- Connect Red wire to wire on Pin 29 and connect it to Arduino V5+.
- Connect Black wire to one of the Pin 4, 7, 27 wires and connect it to GND.
- Connect Yellow wire on the wire running between Pin 6 and Pin 20 and connect it to Arduino A0 or whichever one (A1-A5) you want to use for the sensor.





## Programming

Use the following code to test the sensor:

```
/////////////////////////////////////////////////////////////////
int sensorPin = A0; // select the input pin for the potentiometer
int sensorValue = 0; // variable to store the value coming from the sensor

void setup() {
  Serial.begin(9600);
}
void loop() {
  // read the value from the sensor:
  sensorValue = analogRead(sensorPin);
  Serial.println(sensorValue);
  delay(10);
}
/////////////////////////////////////////////////////////////////
```

## Testing

When testing the sensor use a black and white piece of plastic, paper, etc.

### DEFAULT AND BLACK MATTER

By default (point to nothing) and **BLACK** surfaces will present you with a high analogue value for the sensor of above 900, in our case it was about 995-996.

