# BOE SHIELD GAS DETECTION ROBOT

Instructions and Assembly Details

VERSION 1.0.0

| Mechanical Parts |
|---|

| Item Number | Item Name | Item Description | Qty |
|---|---|---|---|
| 1 | Wheels | 3” Plastic wheels | 2 |
| 2 | Sphere wheel | Plastic 1” | 1 |
| 3 | Frame | Metal frame 5” x 3” | 1 |
| | | | |

| Components |
|---|

| Item Number | Item Name | Item Description | Qty |
|---|---|---|---|
| 1 | Servo Clamps | Clamps to US Sensor | 1 |
| | | | |
| | | | |
| | | | |

| Electronic Components |
|---|

| Item Number | Item Name | Item Description | Qty |
|---|---|---|---|
| 1 | Servo | Parallax Continuous Rotation | 2 |
| 2 | Arduino | Arduino Uno | 1 |
| 3 | Shield | Parallax BOE shield | 1 |
| 4 | Wires | 1. Male to Male<br>2. Male to female<br>3. Female to female | ----- |
| 5 | Power Supply | AA Battery Pack Power supply | 1 |

| | | | |
|---|---|---|---|
| | | cable | |
| 6 | LED | LED Strip | 1 |
| 7 | Gas Sensors | MQ-2<br>MQ-5<br>MQ-8 | 3 |
| 8 | Resistors | 120 - 300 Ohm | ----- |
| 9 | Ultrasonic Proximity Sensor | HC-SR04P | 1 |
| 10 | Micro Servo | Micro Servo | 1 |

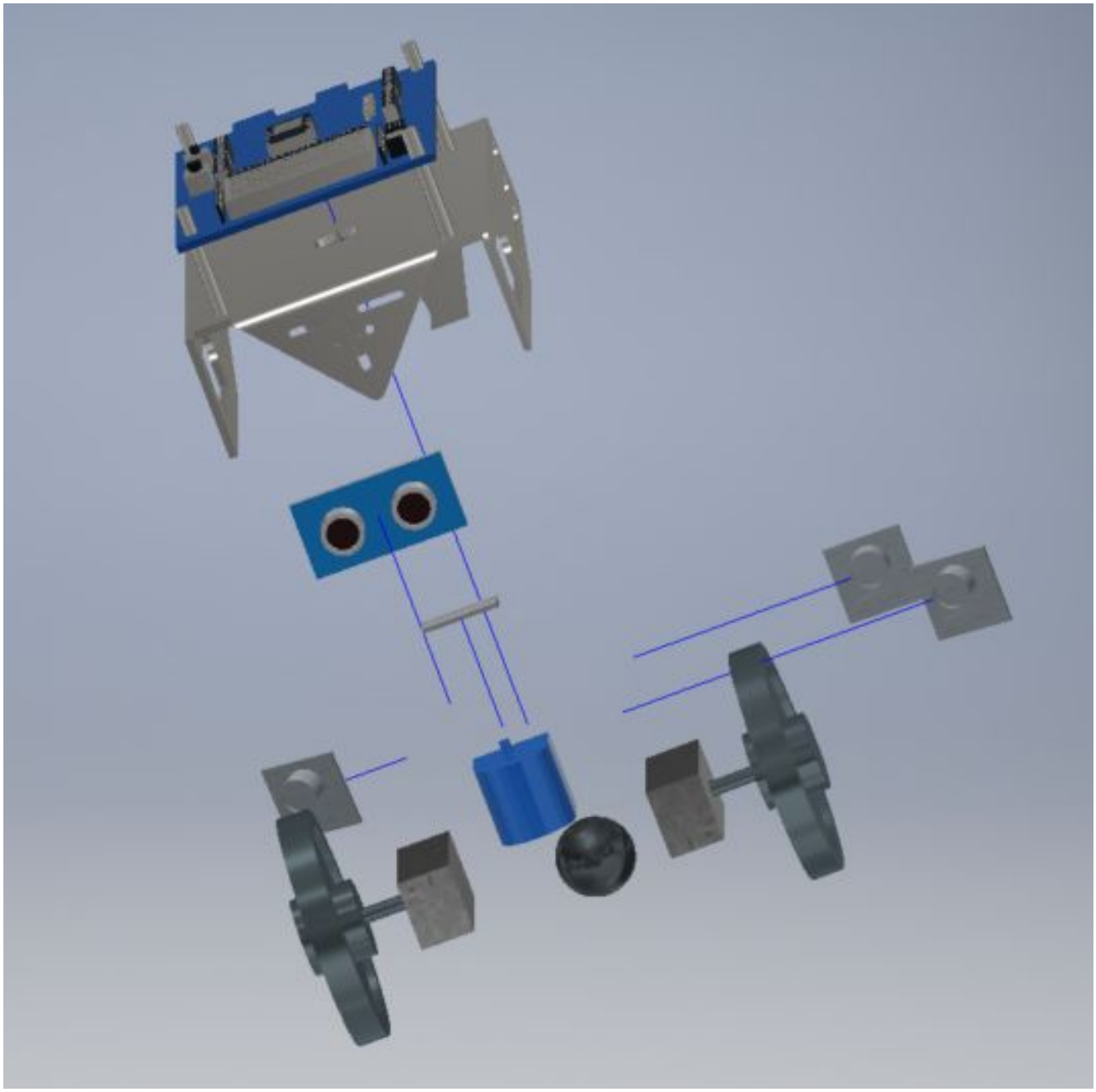
| **Tools** |
|---|

| **Item Number** | **Item Name** | **Item Description** | **Qty** |
|---|---|---|---|
| 1 | Screw Driver | BOE shield Driver | 1 |
| 2 | Screws | ½” Screws | 2 |
| 3 | Soldering Kit | ---------- | 1 |
| 4 | | | |

| **Acrylic Parts** |
|---|

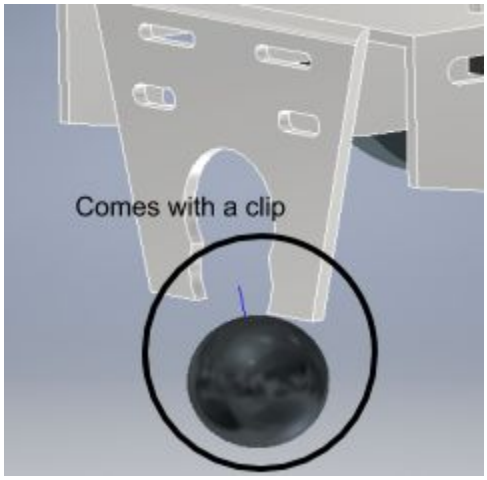
Mak put your parts here or even illustrator files

**Overall ROBOT Assembly Parts**



**Arduino BOE Assembly**

1.

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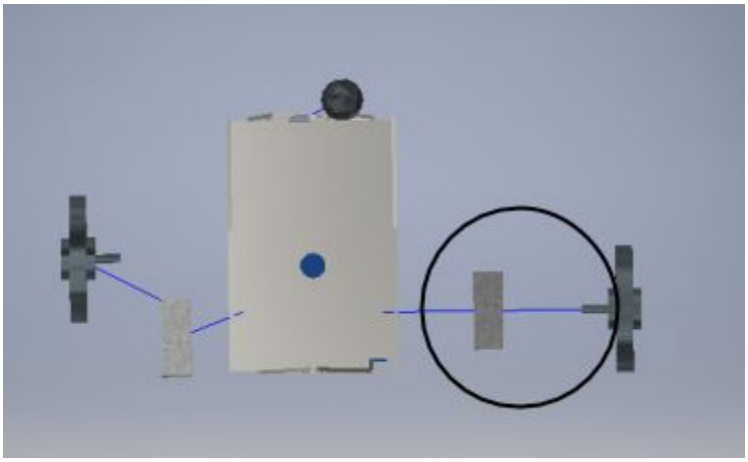

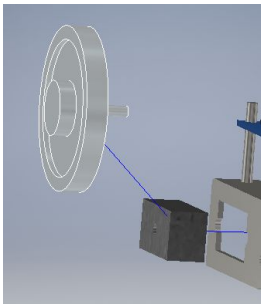

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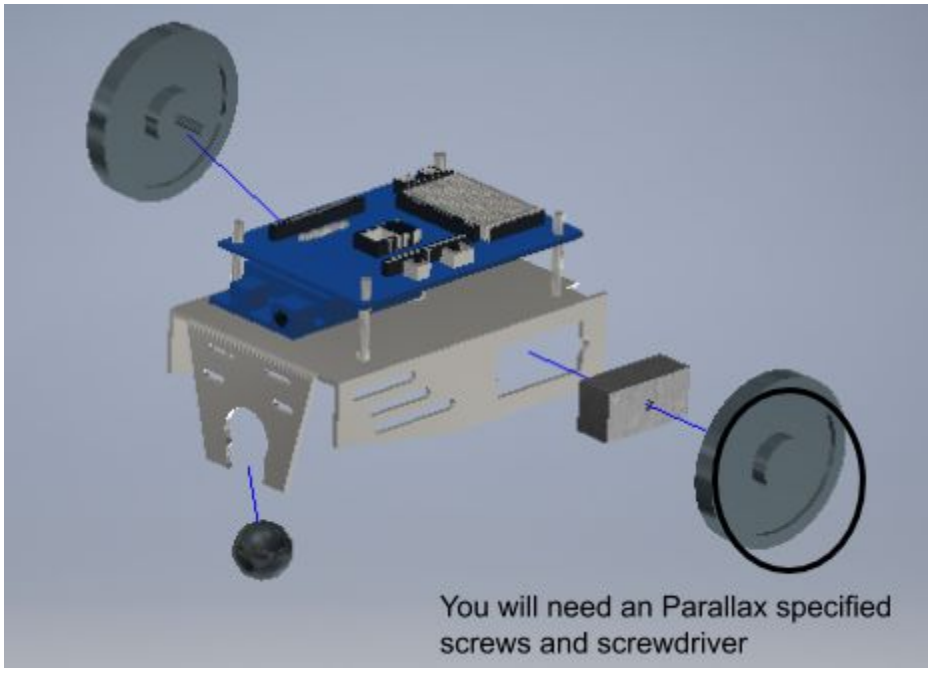
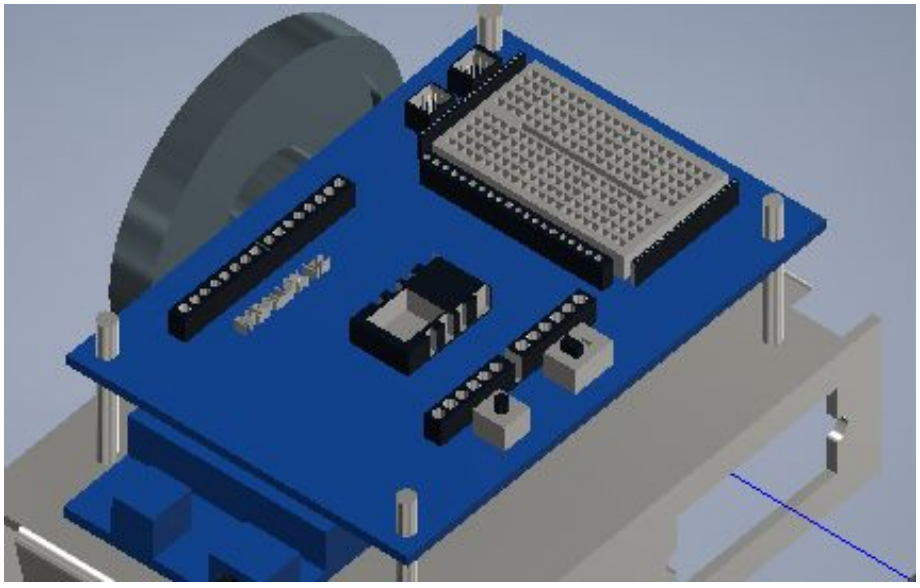
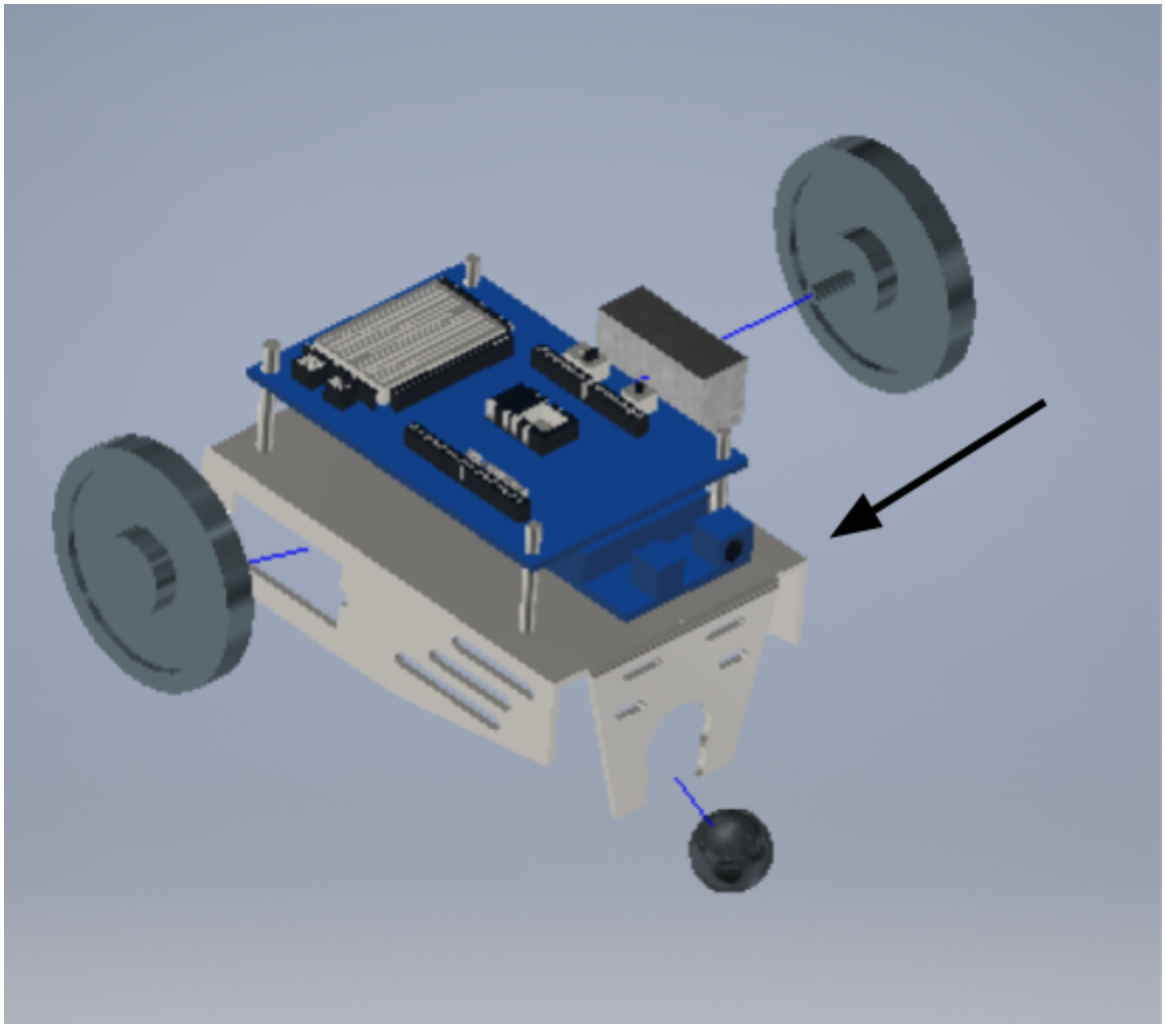
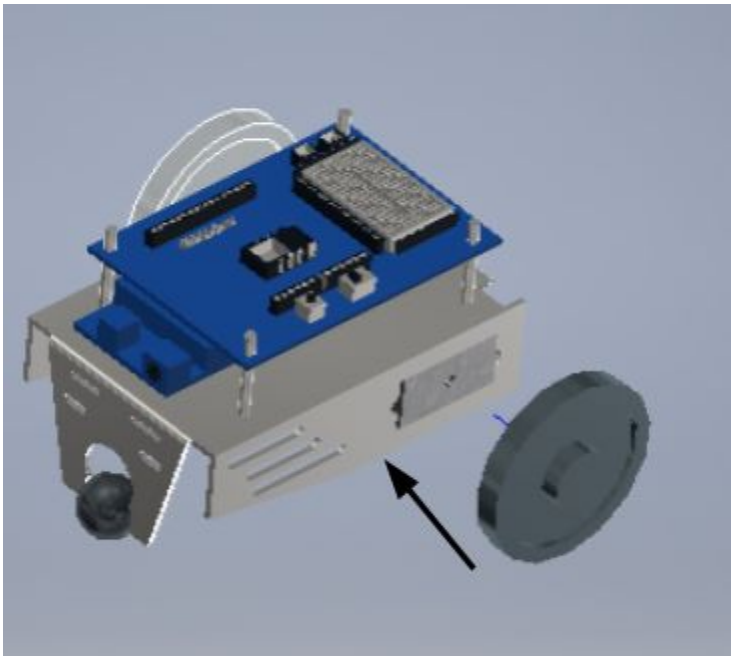
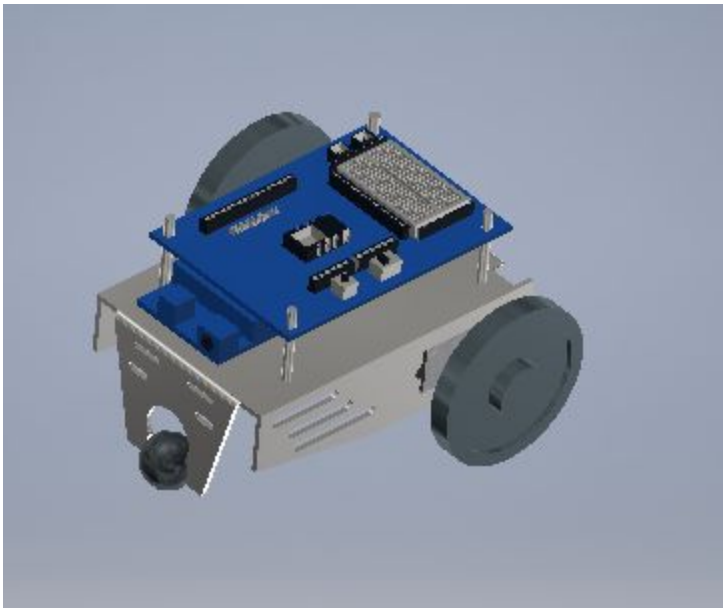

You will need an Parallax specified
screws and screwdriver









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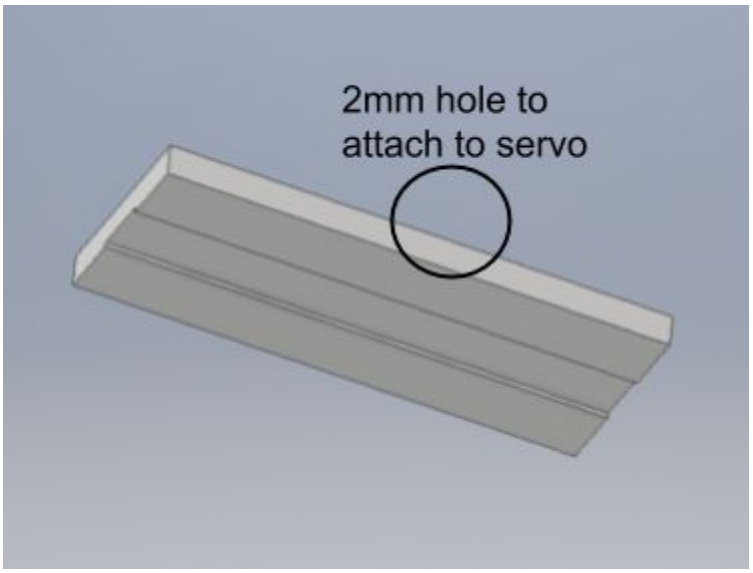
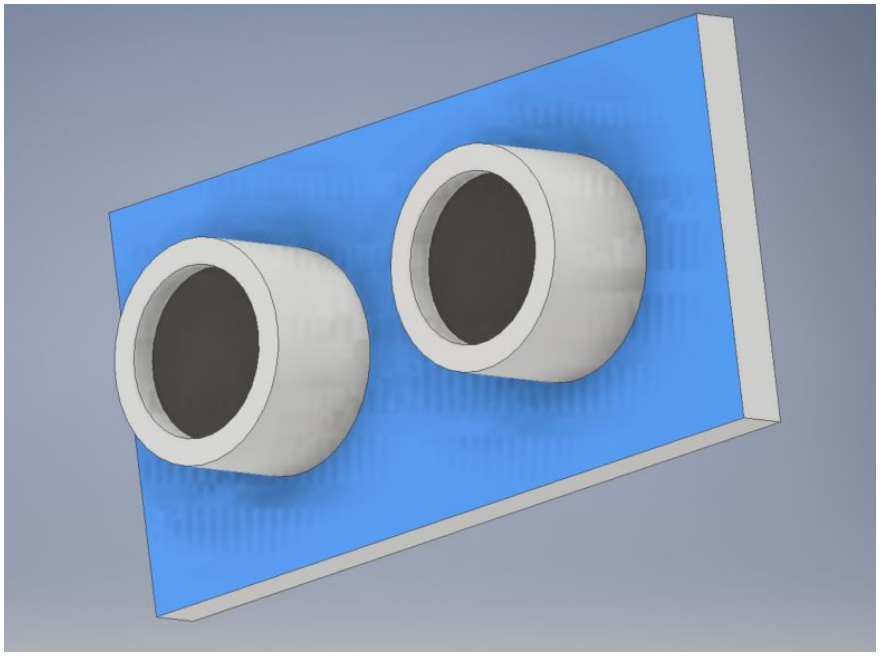
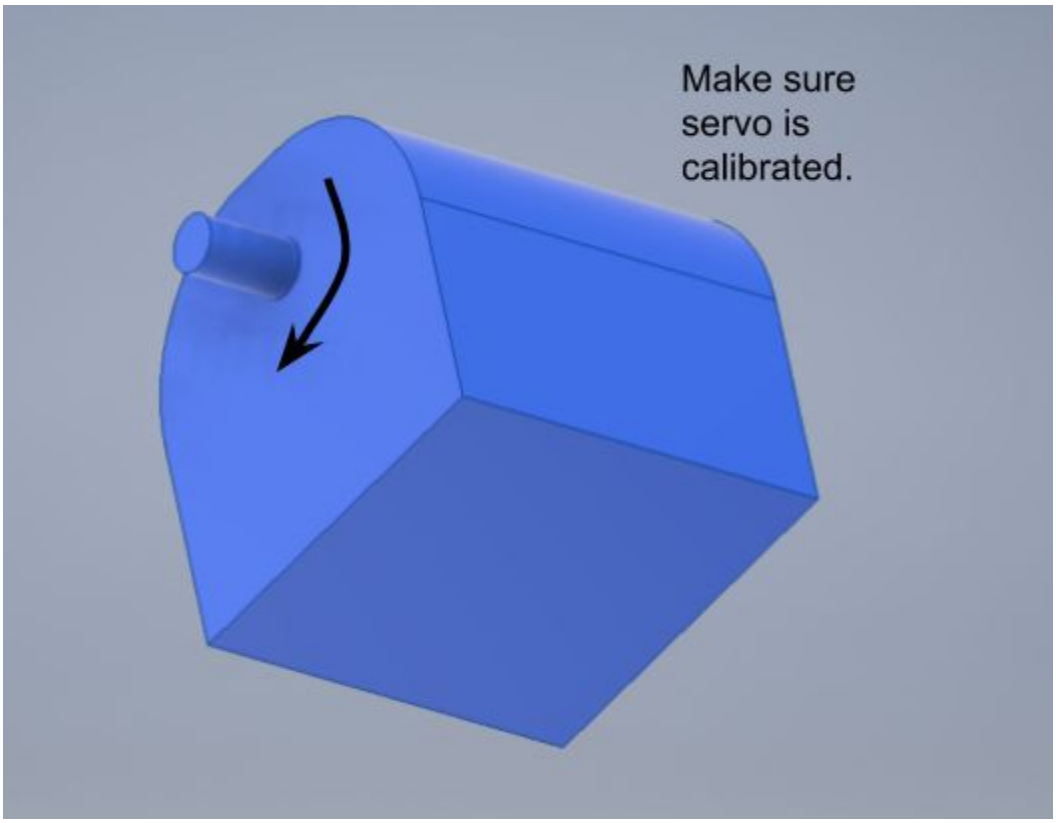



Micro Servo to Ultrasonic Sensor Attachment

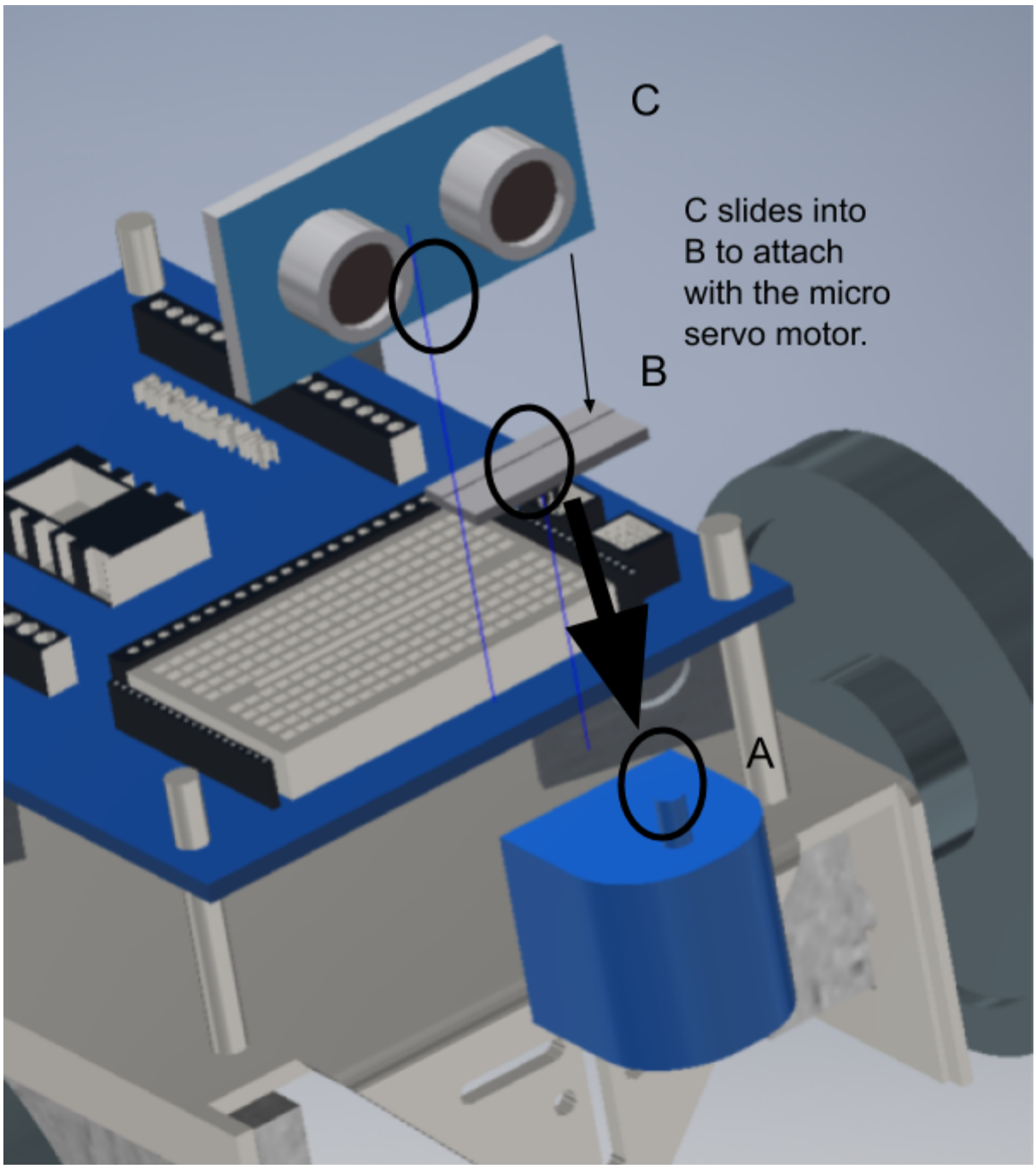


Ultrasonic Sensor




Micro Servo

5.



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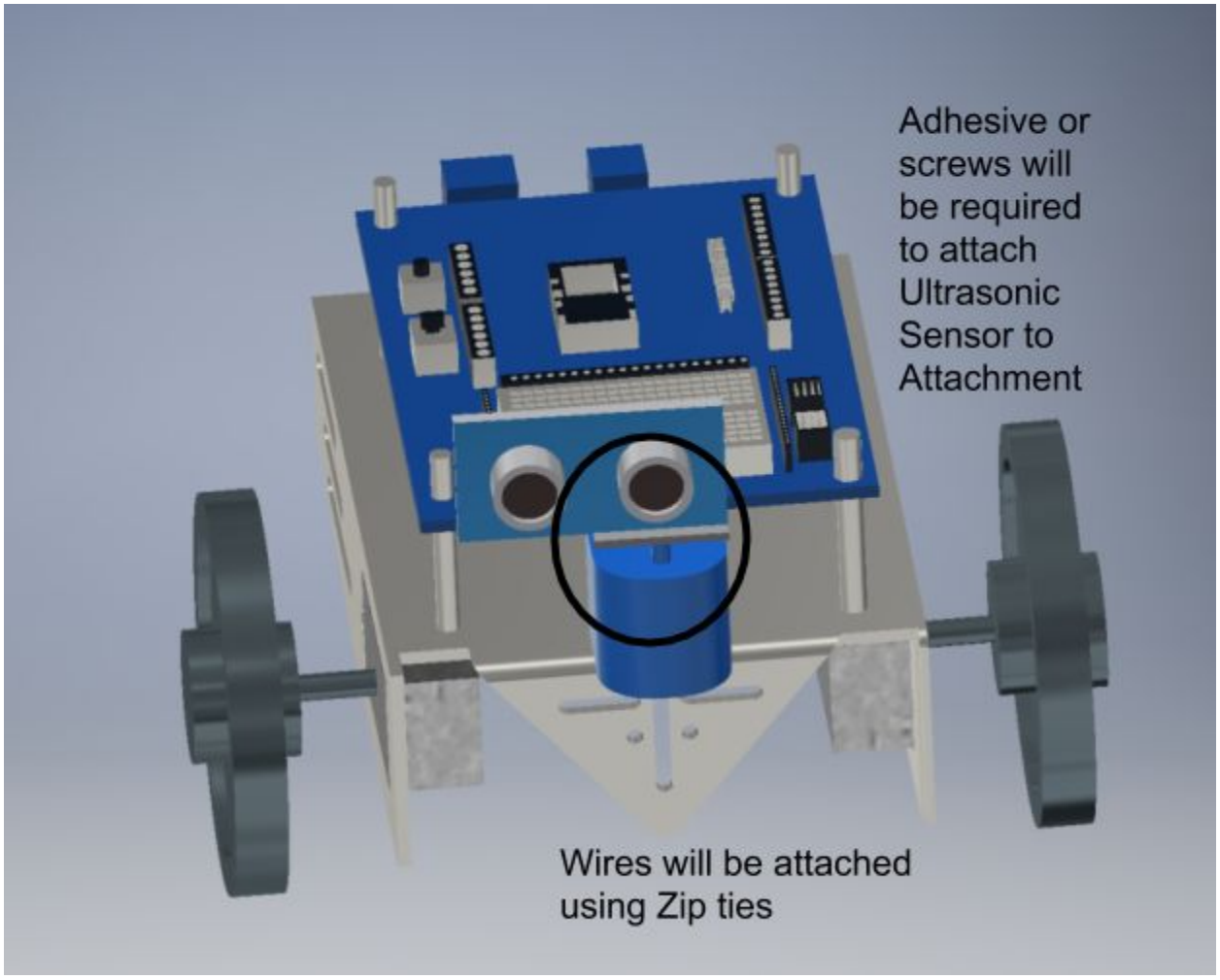
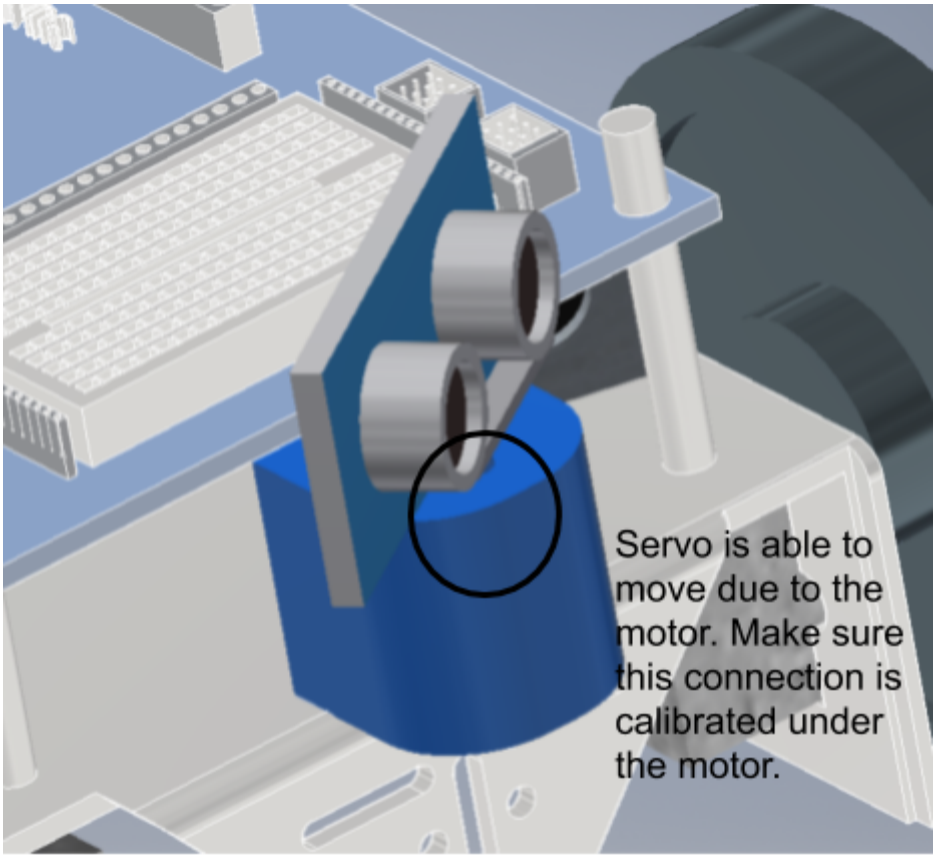
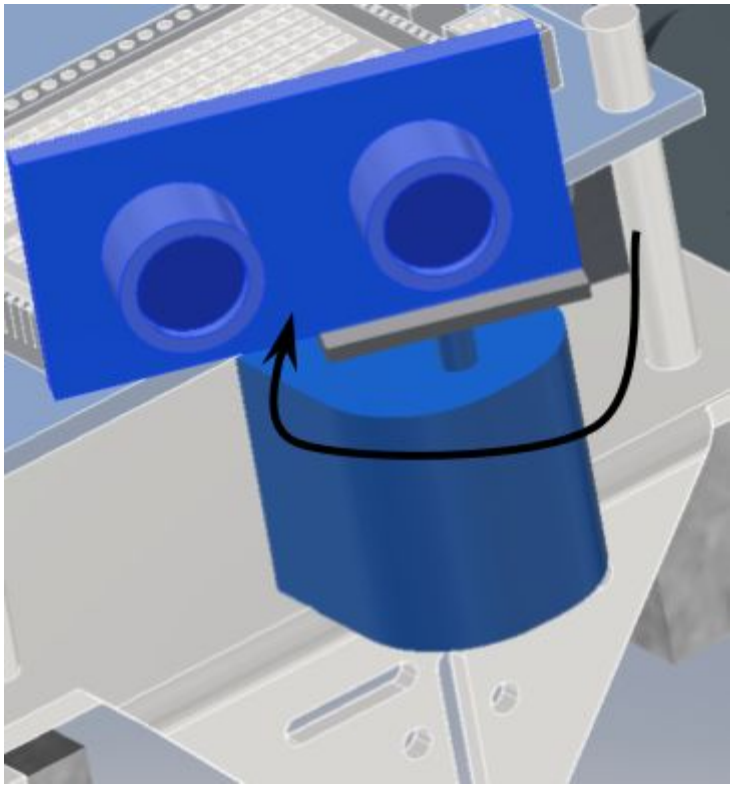

Adhesive or screws will be required to attach Ultrasonic Sensor to Attachment
Wires will be attached using Zip ties


Servo is able to move due to the motor. Make sure this connection is calibrated under the motor.



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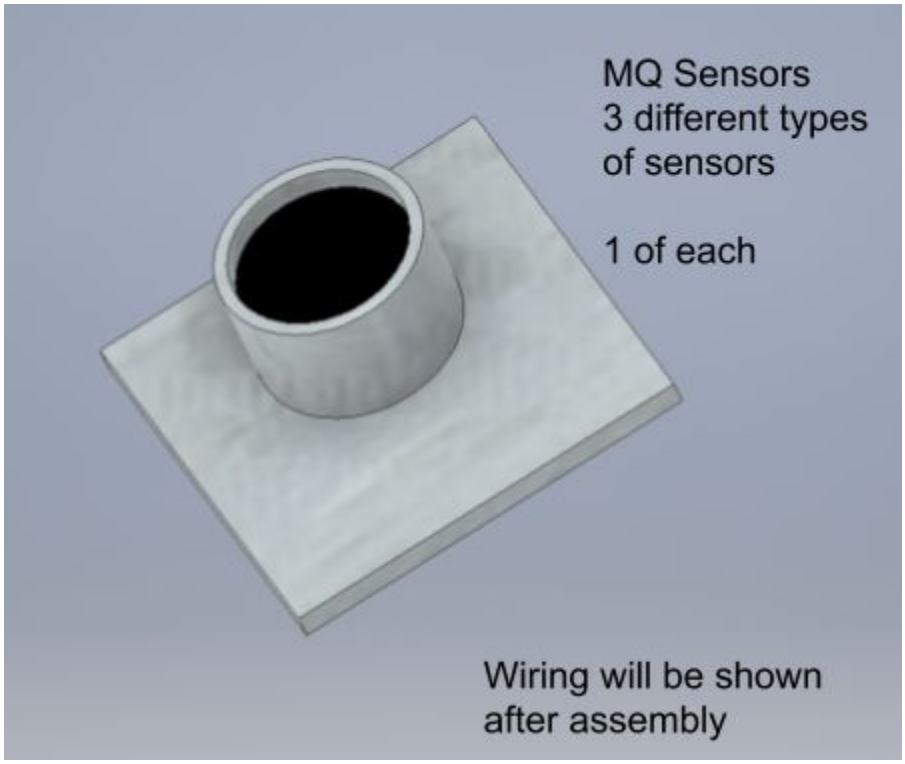
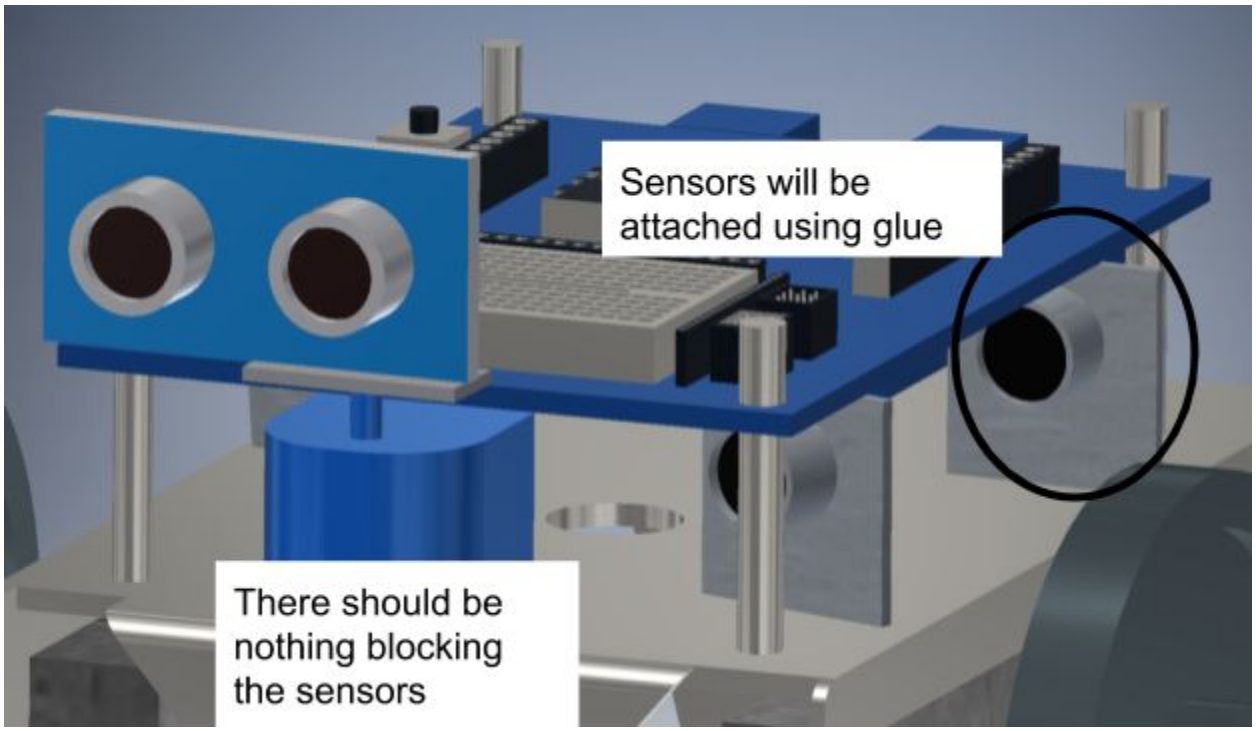
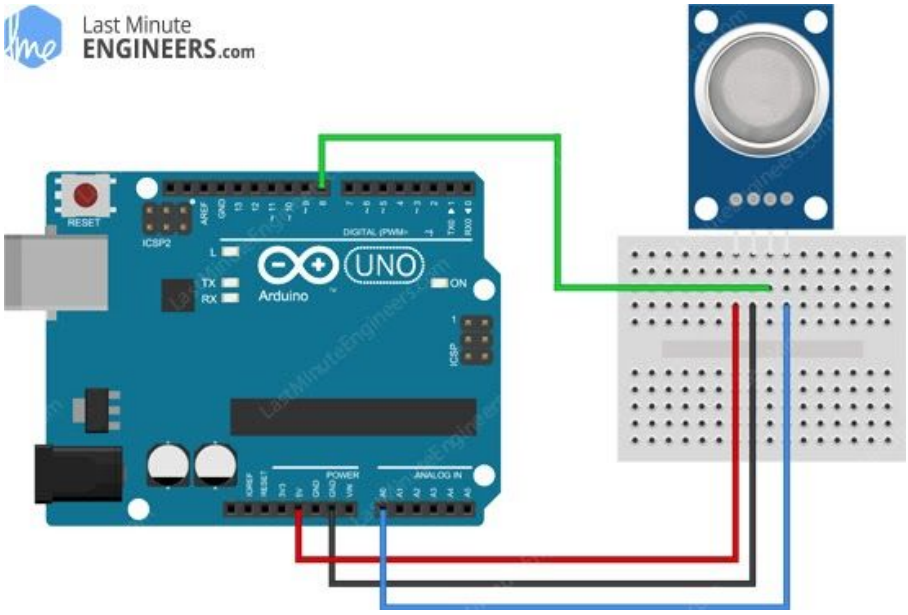


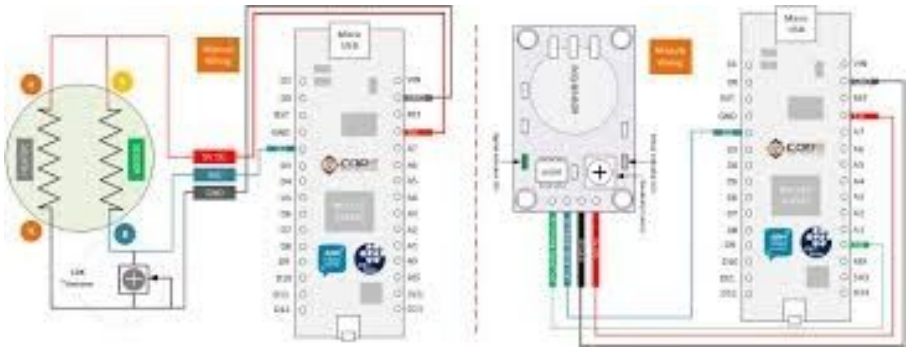



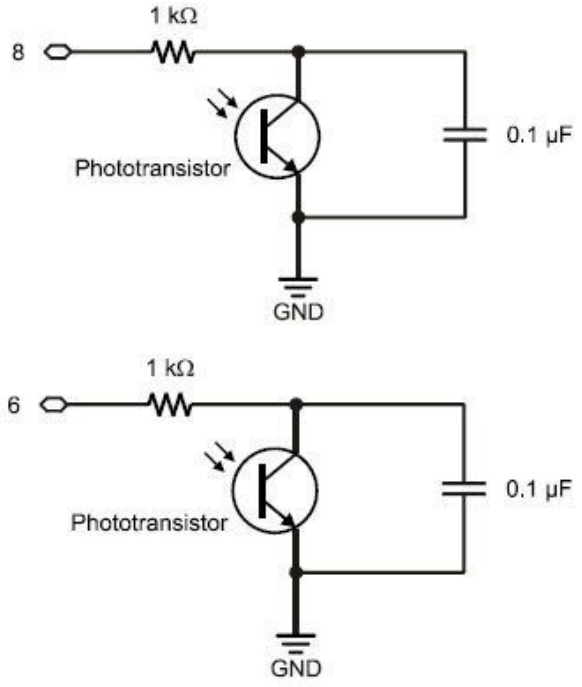

More coming soon…….

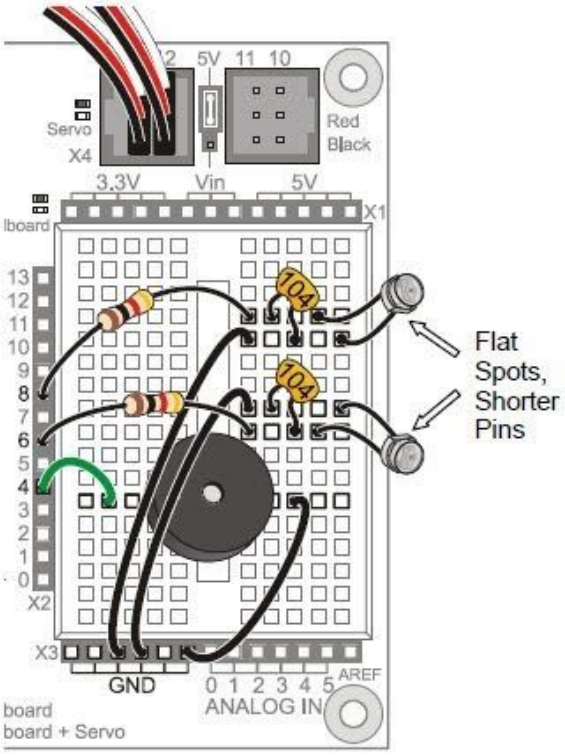
## Wiring Description

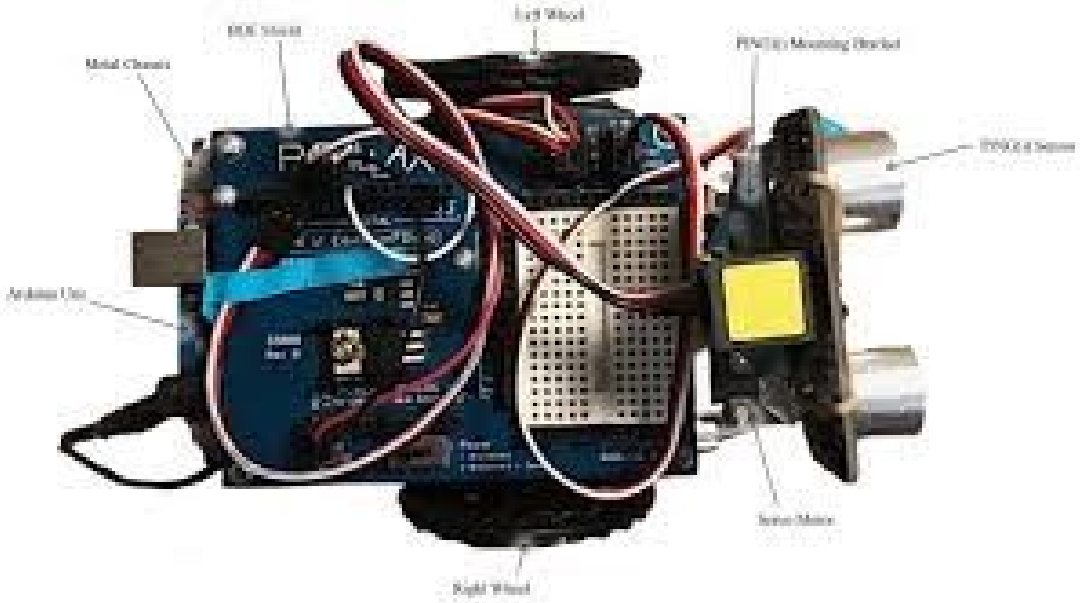
Online Examples:




1 kΩ
8
Phototransistor
0.1 µF
GND
1 kΩ
6
Phototransistor
0.1 µF
GND


2
5V
11
10
Servo
X4
Red
Black
3,3V
Vin
5V
X1
board
13
12
11
10
9
8
7
6
5
4
3
2
1
0
X2
X3
104
104
Flat
Spots,
Shorter
Pins
GND
0 1 2 3 4 5
ANALOG IN
AREF
board
board + Servo


Metal Chassis
Left Wheel
Right Wheel

**Sensor Description**

| Name: | Description |
| --- | --- |
| MQ-2 | Sensitive for Methane, Butane, LPG, smoke.<br>This sensor is sensitive for flammable and combustible gasses.<br>The heater uses 5V. |
| MQ-5 | Sensitive for Natural gas, LPG<br>The heater uses 5V. |
| MQ-8 | Sensitive for Hydrogen Gas<br>The heater uses 5V. |
| Ultrasonic Sensor | The HC-SR04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do. It offers excellent non-contact range detection with high accuracy and stable readings<br><br>(https://www.tutorialspoint.com/arduino/arduino_ultrasonic_sensor.htm) |

*-From Arduino.com*