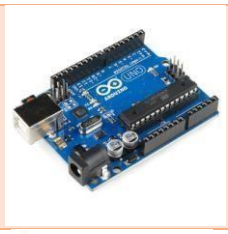
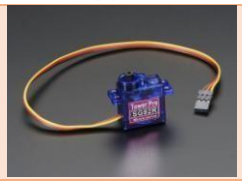
ARDUINO 2WD SMART ROBOT CAR KIT

Level: Beginner ***GK-KIT-003***

geeekÜs

PARTS LIST:

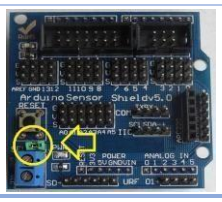
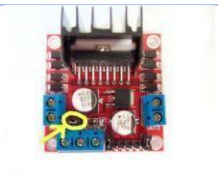
Please ensure that the following pieces are included in your kit!

Component	*Quantity*	*Image*	*Notes*
Arduino Sensor Shield	*1*		*Please see note about jumpers below*
L298N Dual H-Bridge Motor Driver	*1*		*Please see note about jumpers below*
Arduino Uno	*1*		*-*
40 Pin Breakable Headers	*1*		*Not Required for this Kit Free Gift!*
Servo Mounting Brackets	*1*		*Ignore the Top plate provided*
Servo Base	*1*		*Comes in same bag as Servo mounting Brackets*
Servo Motor (SG90)	*1*		*Comes in same bag as Servo mounting Brackets*

USB Cable	***1***		***Color and Length may vary***
HC-SR04 Ultrasonic Sensor	***1***		***-***
DC Motors	***2***	 	***-***
2.51” Rubber Wheels	***2***		***Comes wrapped with Motors***
Acrylic Robot Chassis	***1***		***Comes wrapped with Motors***
AA Battery Holder	***1***	 	***Comes wrapped with Motors***
Motor Mounting Brackets	***4***		***Comes wrapped with Motors***
Stranded 24AWG Wire Black and Red Set	***2***		***Comes wrapped with Motors***
ON-OFF Switch	***1***		***Comes wrapped with Motors***

M3 Screw, Spacer and Nut Set	*1*		*FIT0066*
Jumper Wire Set	*1*		*Rainbow wires*
Nylon Coasting Wheel	*1*		-

Advanced Note:

Ensure Both Motor board and Sensor Shield have the indicated jumper displayed with a yellow circle. If the pins are missing the jumper, feel free to short the pins by bending them to touch each other or use a breadboard wire.		

Recommended Tools:

Needle Nose Plier

Flush Wire Cutter (Optional)

Wire Stripper

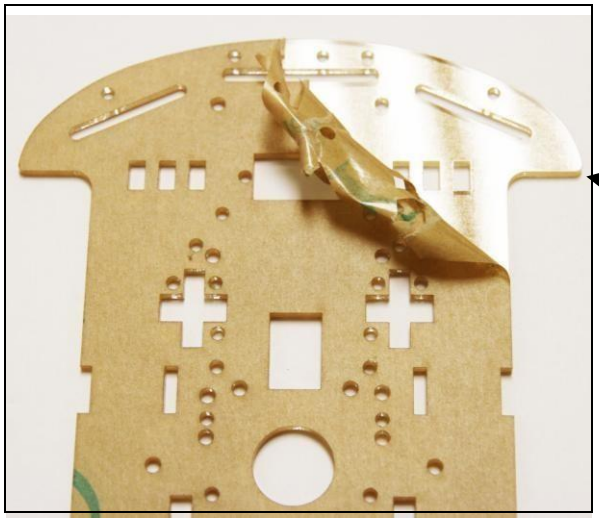
Heat Shrink (Optional)

Soldering Iron

Brass Sponge (Optional)

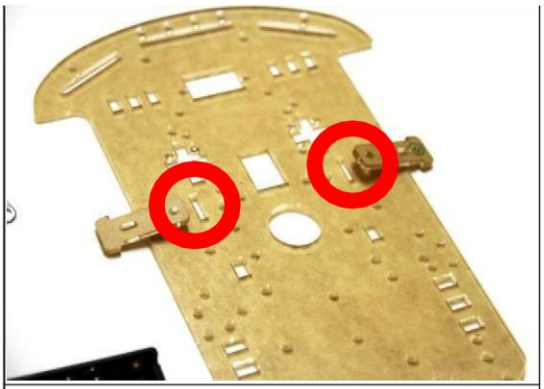
Screwdriver (+)

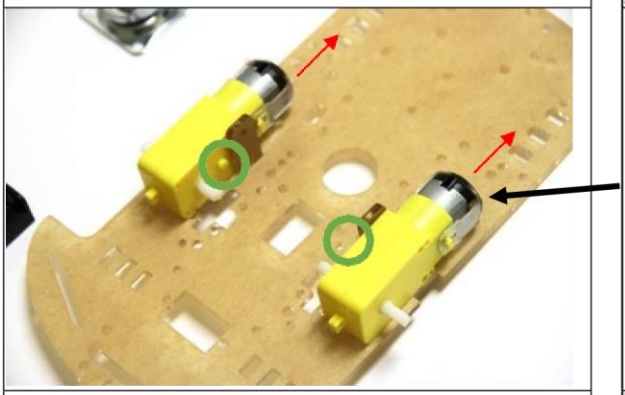
Frame Assembly:



- Unwrap the paper that has the frame, motor, battery holder and various components secured together.
- Peel both sides the acrylic paper. You can start from either side top corner and work your way down.
- For this manual I will only remove one side for ease in visual demonstration

- Motor Mounting Brackets are used to fix the DC motors to the frame.
- Slide the bracket into the slot indicated in the red circle and flip the unit to start mounting the motors!

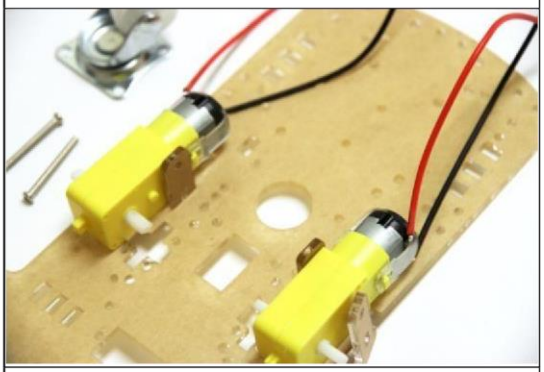


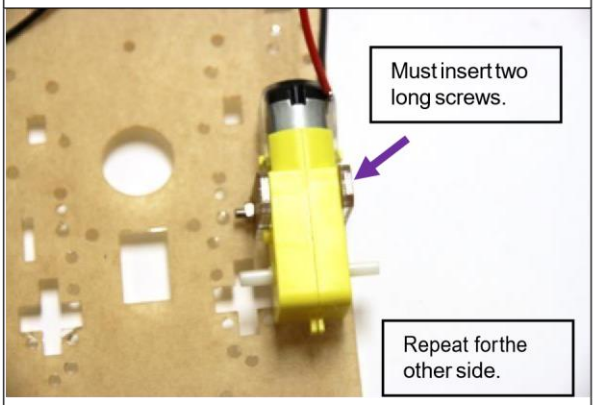


- Ensure the dot is facing inwards when assembling the frame to the chassis. Shown with a green circle.
- The wire leads will be facing outwards.
- The motors will be facing the bottom. Shown with the red arrow.

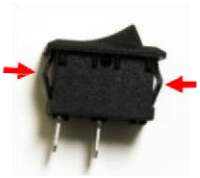
- Using a soldering iron, solder the red wire to the pin that is the farthest from the frame and the black cable to the pin that is the closest to the frame.

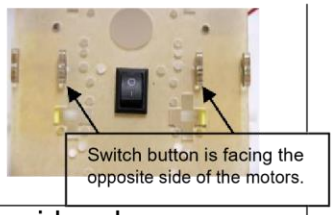
(You can also wire twist the cable onto the motor)





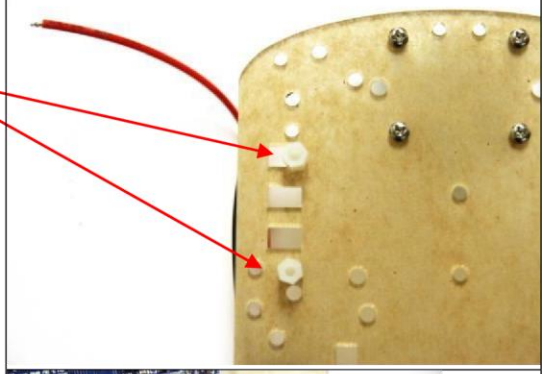
- Place another Motor Bracket on the outside, the grove will allow for the bracket to slide in.
- Using the long screw provided, slide it into the two brackets and motor.
- To fasten the nut, gently squeeze the motor and bracket and push the unit outwards. You may also use a needle nose to fasten the nut.





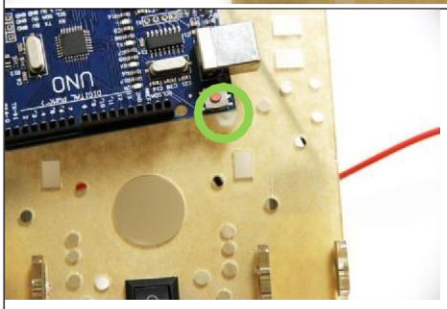
- Pinch horizontally indicated with red arrows.
- The switch should slide in smoothly without braking the frame.

- On the same side where you can see the switch markings I and O, install two nylon M3 standoffs indicated with red arrows. Use hex nuts provided with the standoffs on the other side.



- The area with the green circle, place a standoff and secure on the other side using another standoff. (Do not use a hex nut)

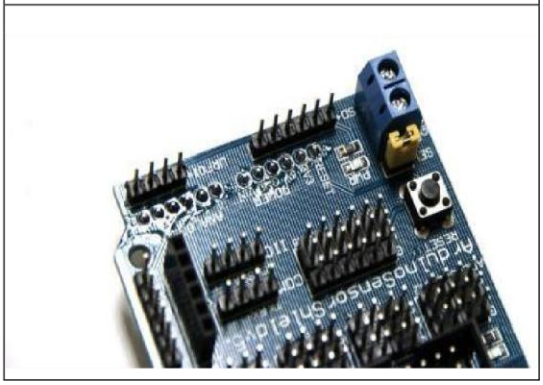
- This will act as a stress relief for the Arduino and a mount on the other side for the H- bridge.

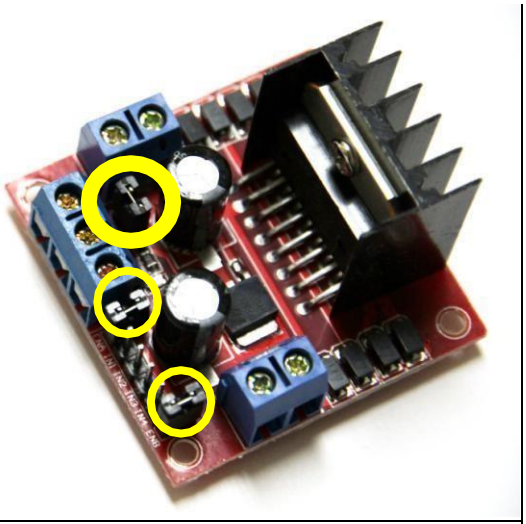


- Use two Philips screw to fasten the Arduino to the frame.
- This is the same side with the switch marking.

ENSURE THIS BOARD HAS THE JUMPER IN YELLOW IN IT.

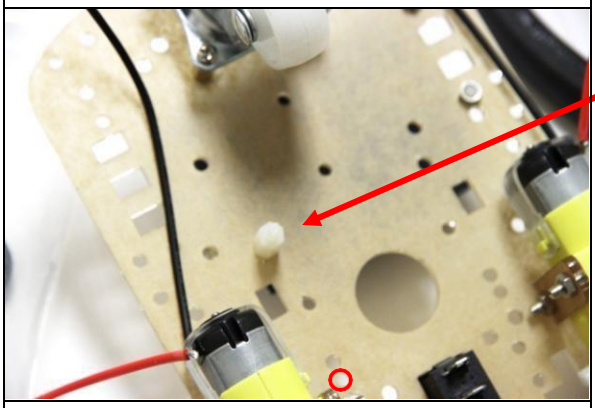
- Should you find that the jumper is missing, use one strand from the rainbow jumper wire set to make a short circuit or bend the pins to the point where they are touching each other.





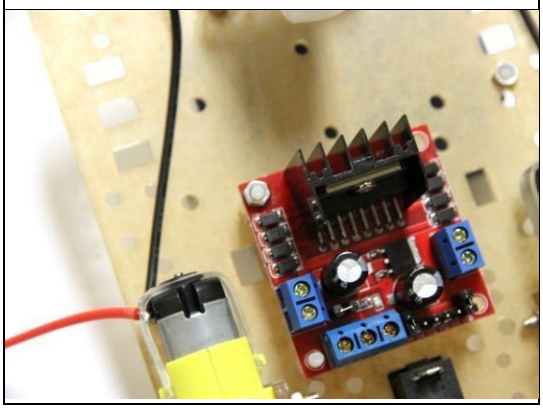
- Verify the jumpers located with the yellow circle are also attached.

- Place the Shield over the arduino microcontroller as shown.
- A section below will explain how this shield works.

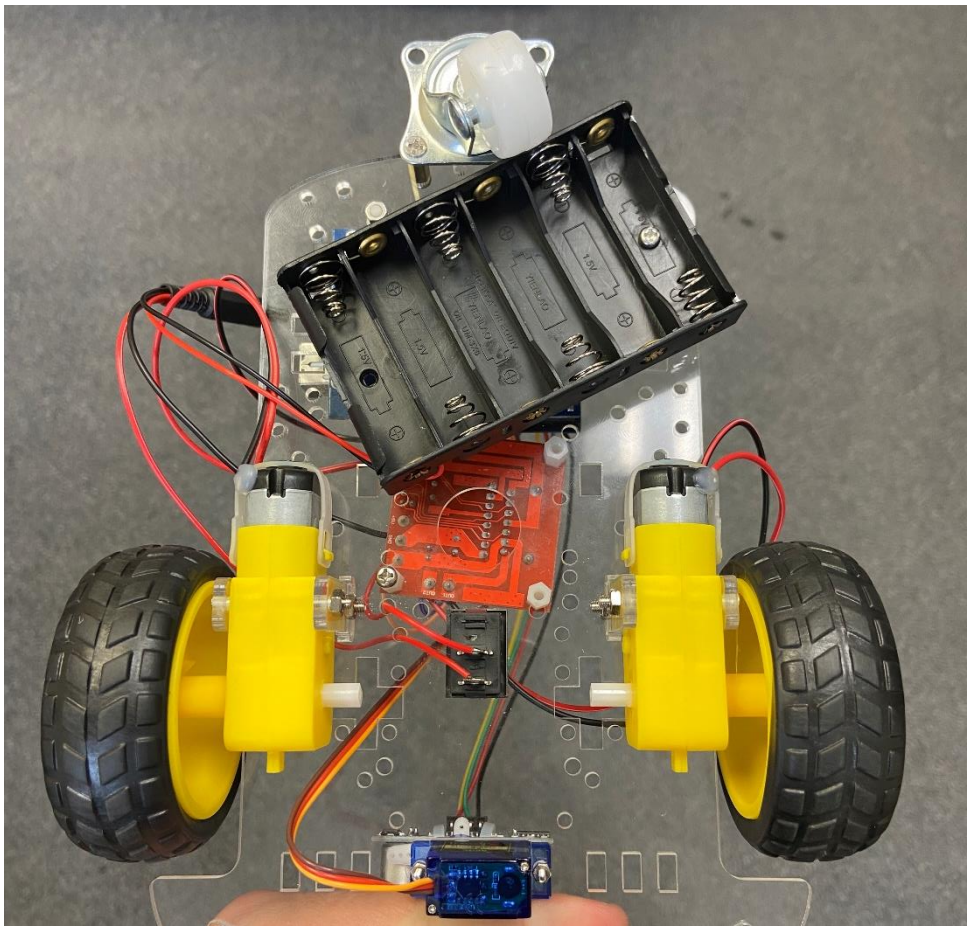


- Flip the car over where the motor and nylon wheels are located. You can see the nylon spacer for the h-bridge.
- Place another nylon spacer in the red circle and secure it on the other side with a Philips screw.

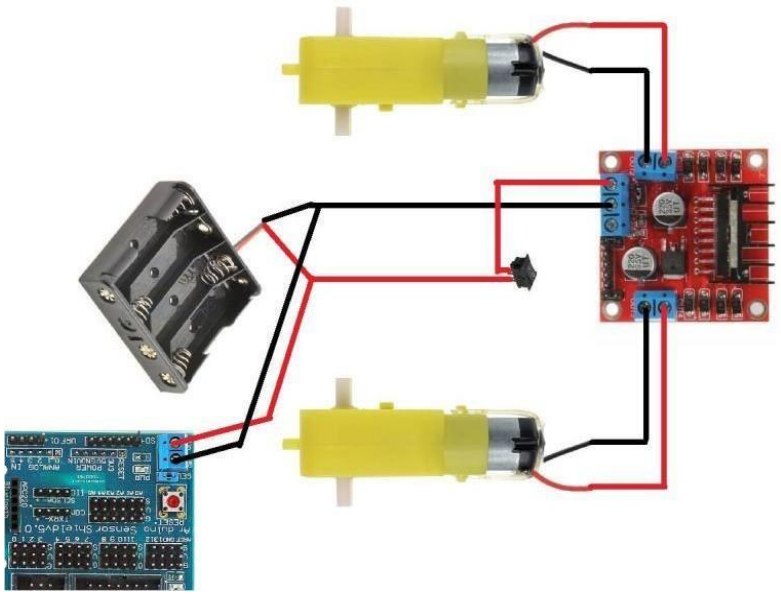
- It should look something like this when you place the h-bridge.
- Use only one hex screw to fasten the h- bridge to the chassis.



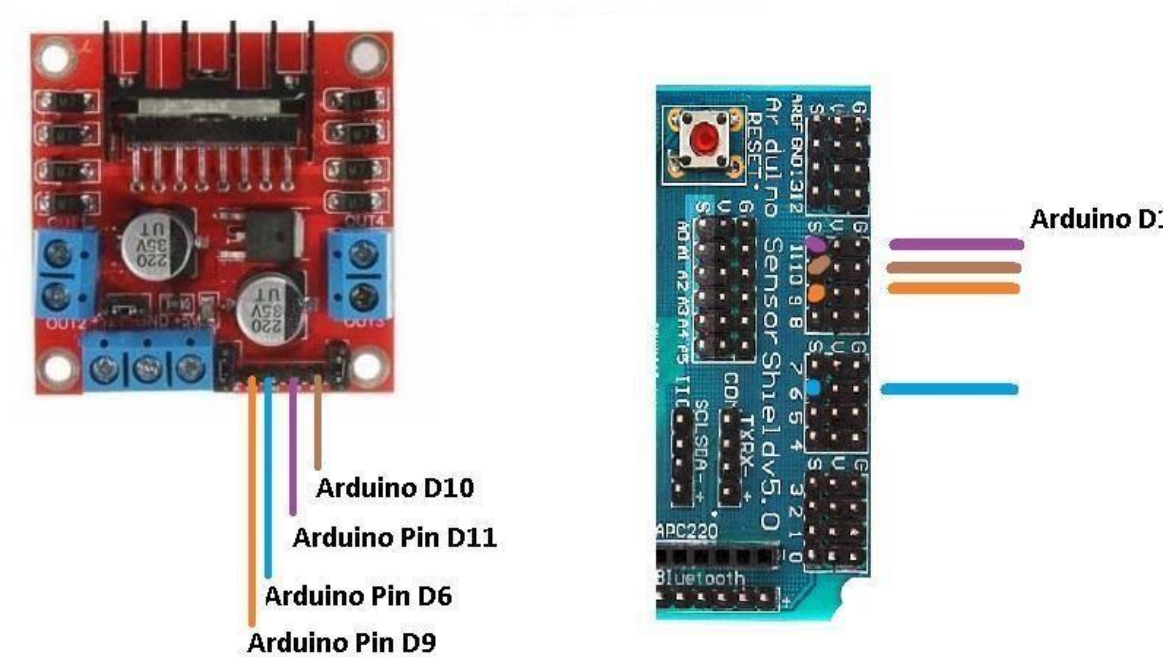
The underneath of the car should appear like this:

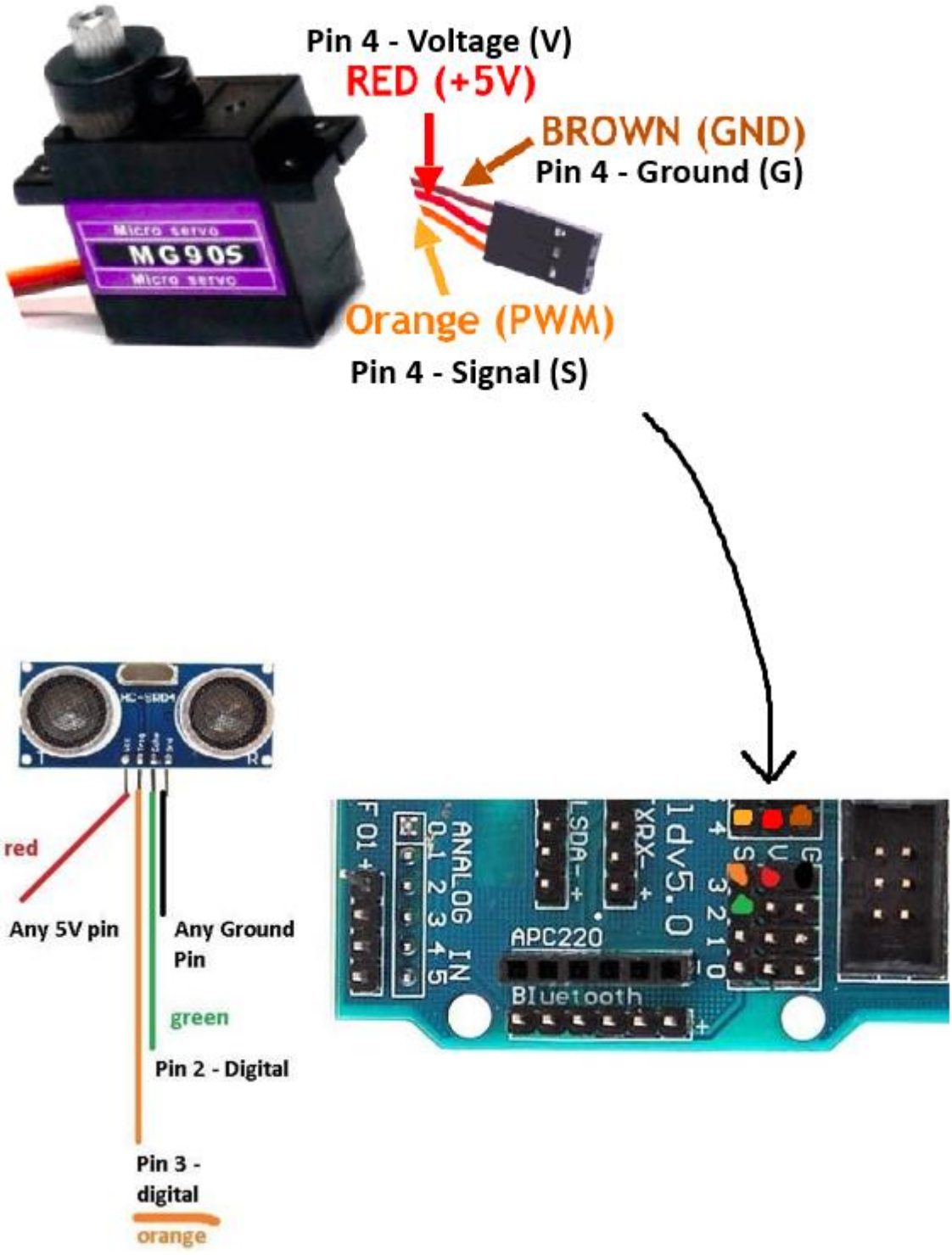


Wiring Guide:

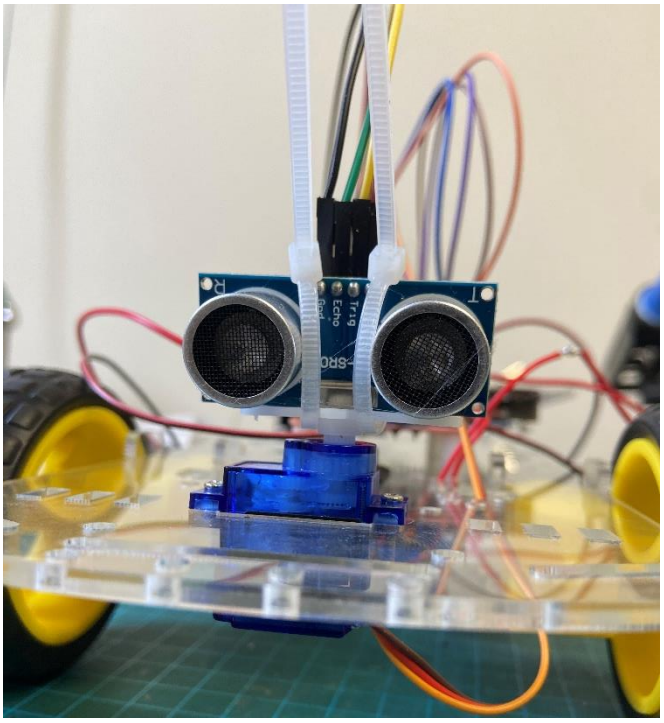


Note: You will need to solder one of the switch wires to the battery pack's red wire.

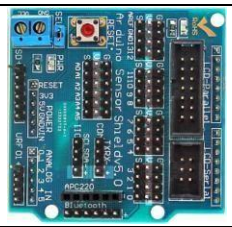




Tightly tie the Ultrasonic sensor with zip-tag to the servo mount's propeller.



How the Sensor Shield Works:

	• The select jumper allows the voltage from the terminal block to enter and become regulated to 5VDC for the Arduino microcontroller. • If the jumper is not present, you must connect a dc connector into the Arduino dc port.
• The highlighted column is referred to as the 5v bus. Instead of having multiple servos or sensors connecting into a single 5VDC port this bus reduces crowding and makes connections convenient.	
	• Same principal as the 5V bus, this is called the ground bus.

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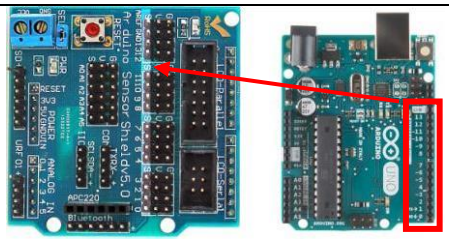
<td>  </td>
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Pinout on the left image highlighted are equivalent to the image on the right with the red box.
This is used for digital sensors.

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The highlighted section is for analog signals and is equivalent to the image on the right with the red box.

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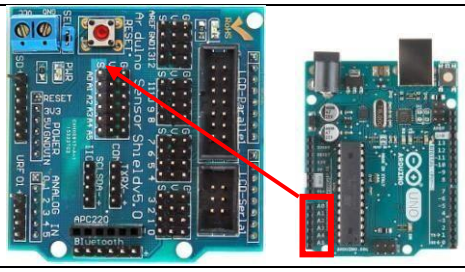
<td>  </td>
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Programming Arduino with the Code

1) Plug Arduino Microcontroller into computer using the blue USB cable provided
2) Install the Software to read and write program to the chip from ARDUINO.CC, the program is free! << https://www.arduino.cc/download_handler.php >>
3) Download the driver from this link: << http://sparks.gogo.co.nz/ch340.html >> For windows please download from here: << http://sparks.gogo.co.nz/assets/_site_/downloads/CH34x_Install_Windows_v3_4.zip >>

4) Open the Arduino software and select the com port to program the microcontroller.
5) Download our premade software from our website or following this link
   << https://abra-electronics.com/index.php?dispatch=attachments.getfile&attachment_id=134 >>
6) Extract the file and open one of the example codes, it will open in the arduino software, press upload and the car should be up and running.