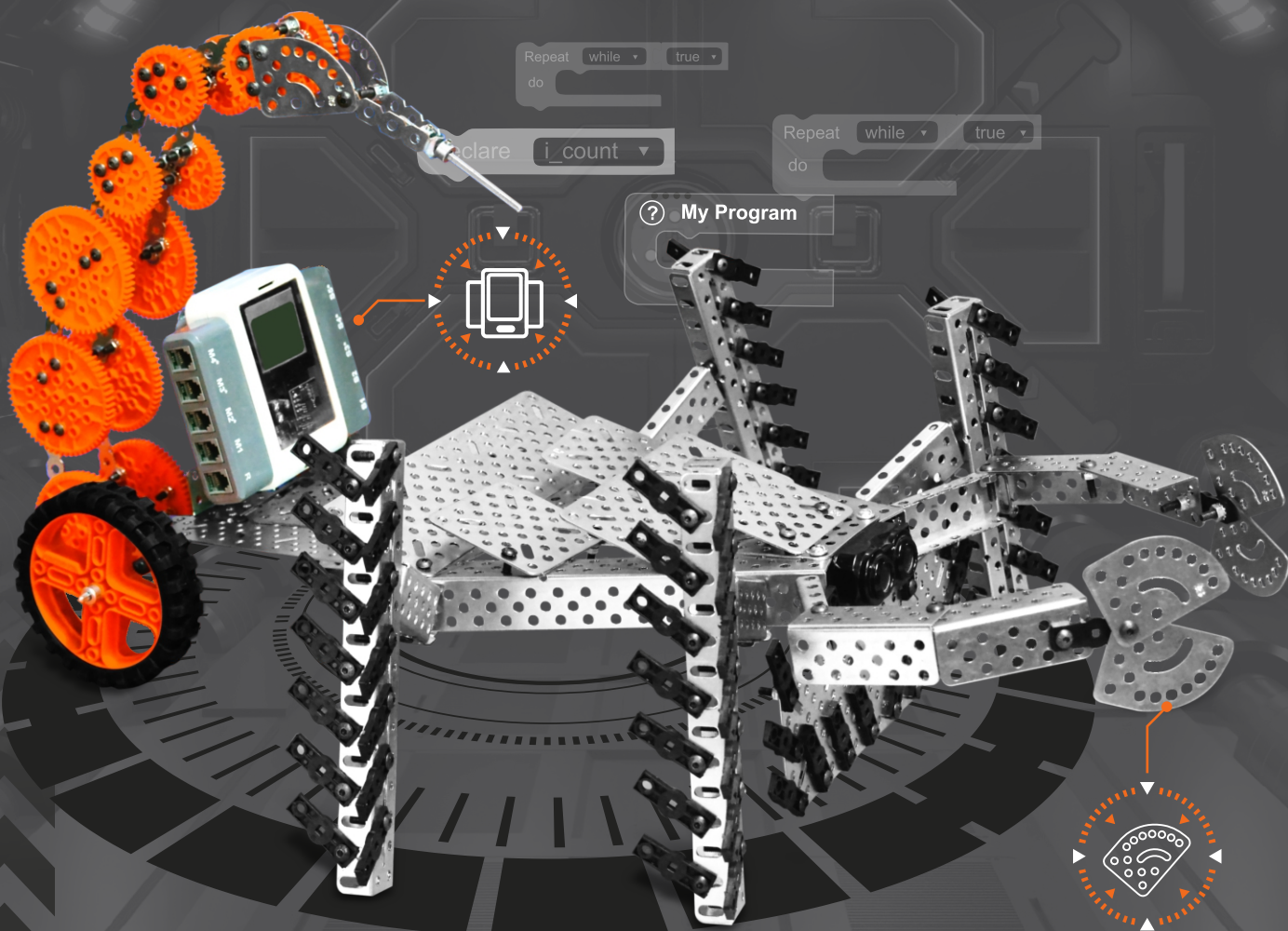


Complete Toolkit to
Build Programmable Robots

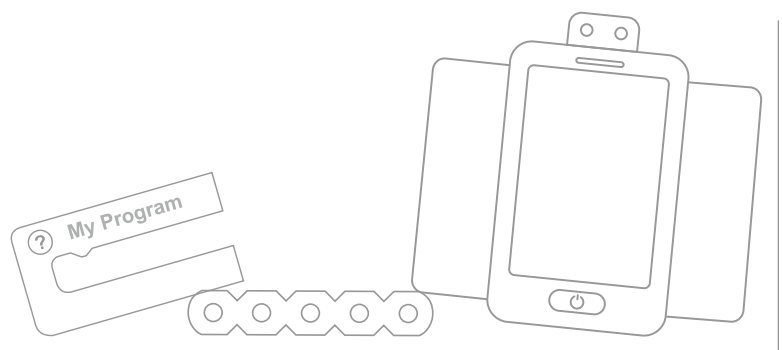


“I never dream
about success.
I work for it.”



Sneak Peak

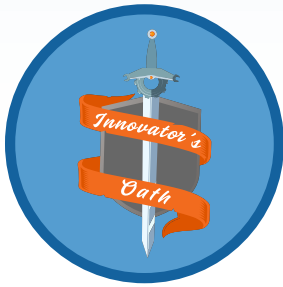
Make The Most Of Your Kit	01
Armour Check	03
Deep Dive Into Robotics	
Object Follower	08
The Color Sorter	21
Smart Dustbin	29
Vending Machine	37
Register Your Kit	50
Join Let's Avishkaar	51



Make The Most Of Your Kit

Innovate

Take The Innovator's Oath



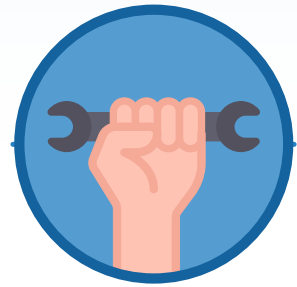
Take the oath written inside your kit and share a photo in **Let's Avishkaar Community**.
(fb@LetsAvishkaar)

Familiarize With Your Kit



Use "**Armour Check**" section to check all the parts of your kits.

Build Your Bot



Follow detailed instructions in this manual to build exciting robots.

Share

Win

Register Your Kit



Scan the QR code, register your kit and get access to additional project tutorial videos.

Join Let's Avishkaar



Join Let's Avishkaar to share your innovative projects, attend free webinars and know about the latest updates in the tech world.

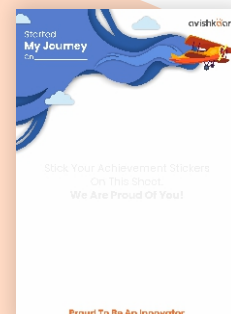
Participate in Innovator of the Month



Participate in the next Innovator of the Month challenge and **get a chance to win grand prizes.**

Celebrate Your Achievements

Use the 'My Achievements' sheet and the stickers provided to track your innovator journey. Paste the relevant sticker on the achievement sheet.



Armour Check

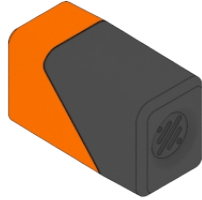
All (s)heroes need their super-weapons. Let's familiarize you with yours.

3 Different Sensors

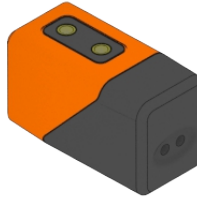
Various sensors to allow children to code and make fully automated robots like line follower, obstacle avoiders etc.



Touch Sensor x 1



Sound Sensor x 1



IR Sensor x 2



Color Sensor x 2



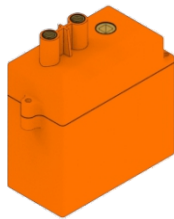
Ultrasonic Sensor x 1

Programmable Brain & Remote

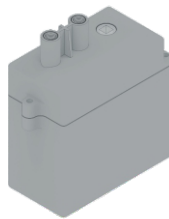
Avishkaar Robotics Brain is a control panel that allows you to control motors and sensors in the kit and connect a remote controller too.



Full Brain x 1



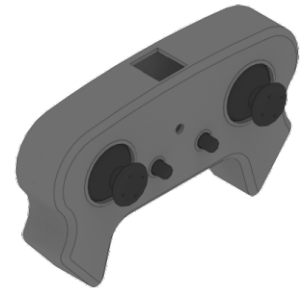
High Speed Motor x 2



High Torque Motor x 2



Battery x 1



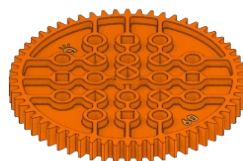
Remote Controller x 1

Plastic & Metal Parts

A complete metal and plastic design system allows you to make from easy to complex mechanical bot designs.



Wheels x 4



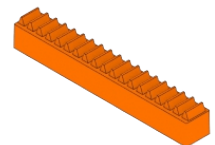
Big Spur Gear x 2



Medium Spur Gear x 2



Small Spur Gear x 2



Rack Gear x 2



Caster Wheel x 2



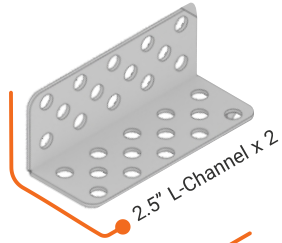
Allen Key x 1



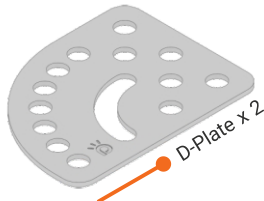
Plastic Hook x 1



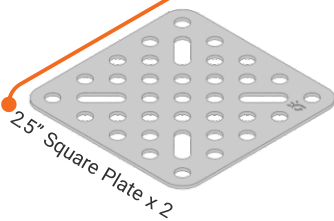
Spanner x 1



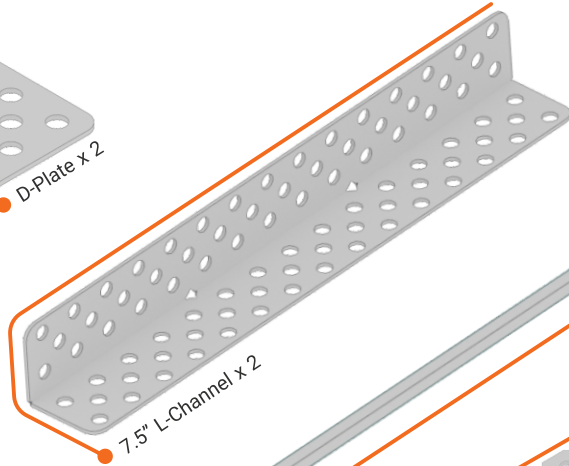
2.5" L-Channel x 2



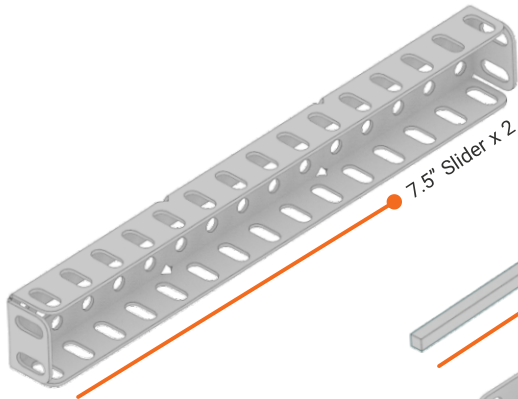
D-Plate x 2



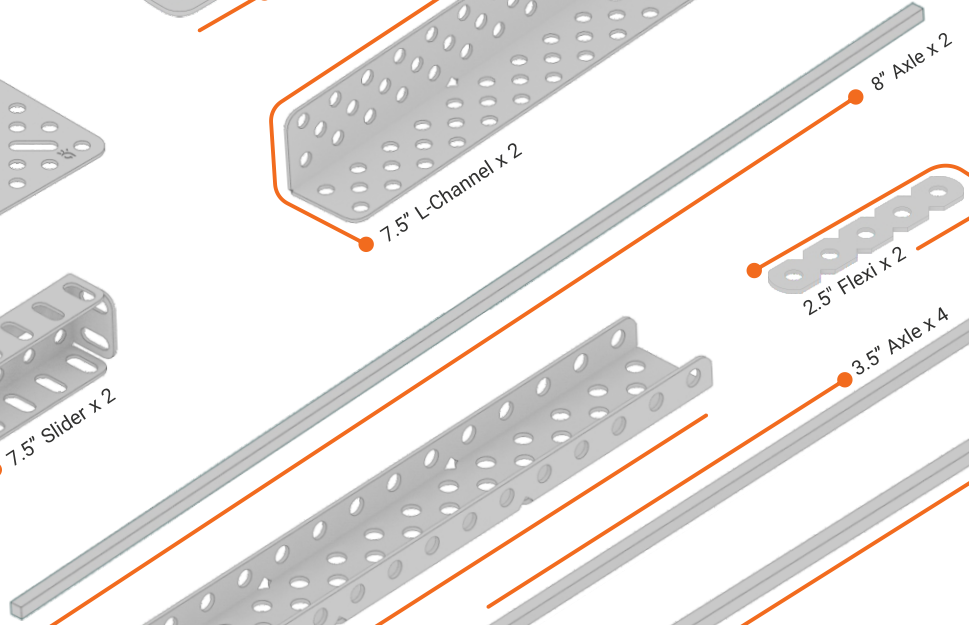
2.5" Square Plate x 2



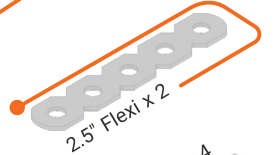
7.5" L-Channel x 2



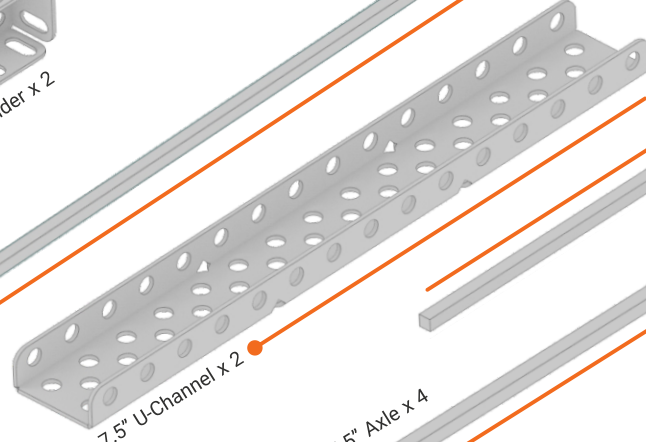
7.5" Slider x 2



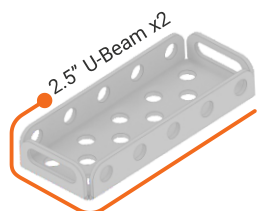
8" Axle x 2



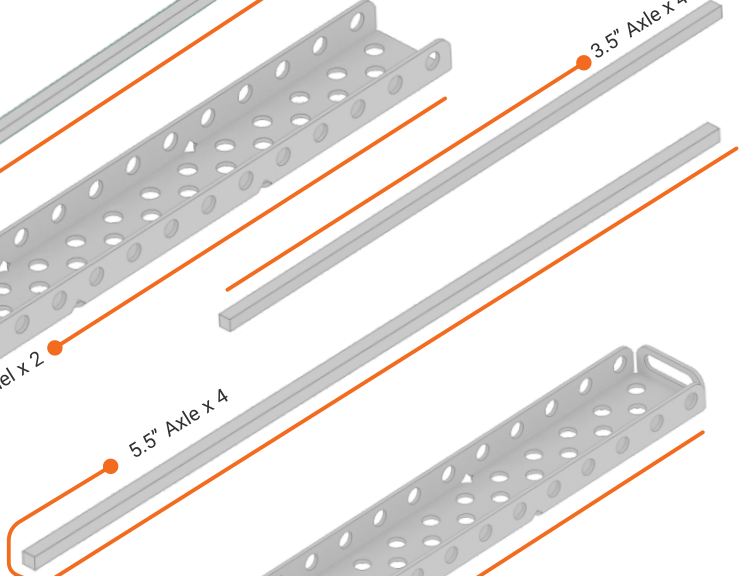
2.5" Flexi x 2



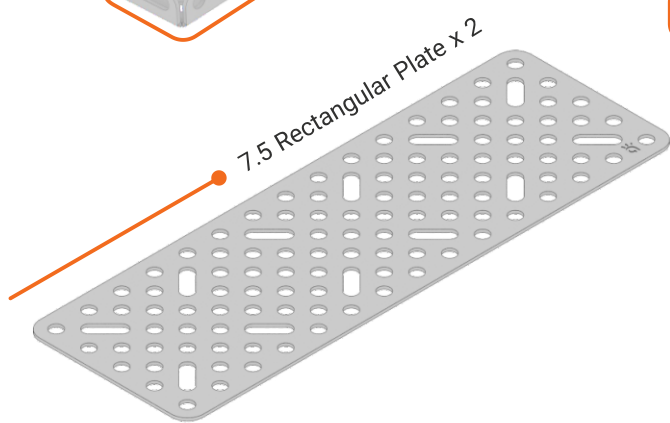
7.5" U-Channel x 2



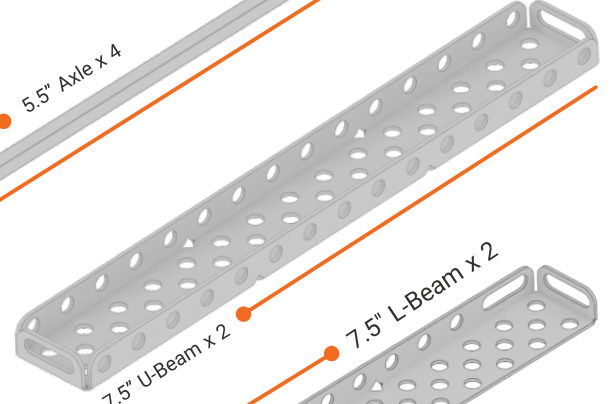
2.5" U-Beam x 2



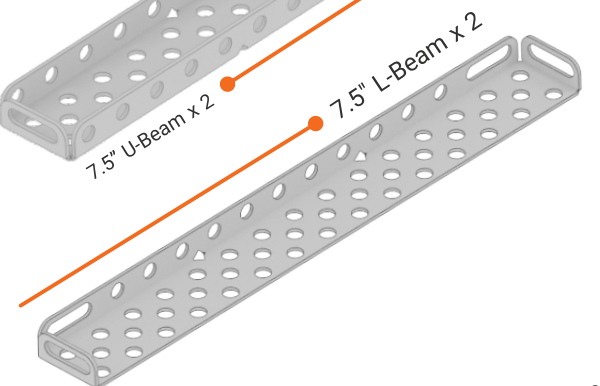
5.5" Axle x 4



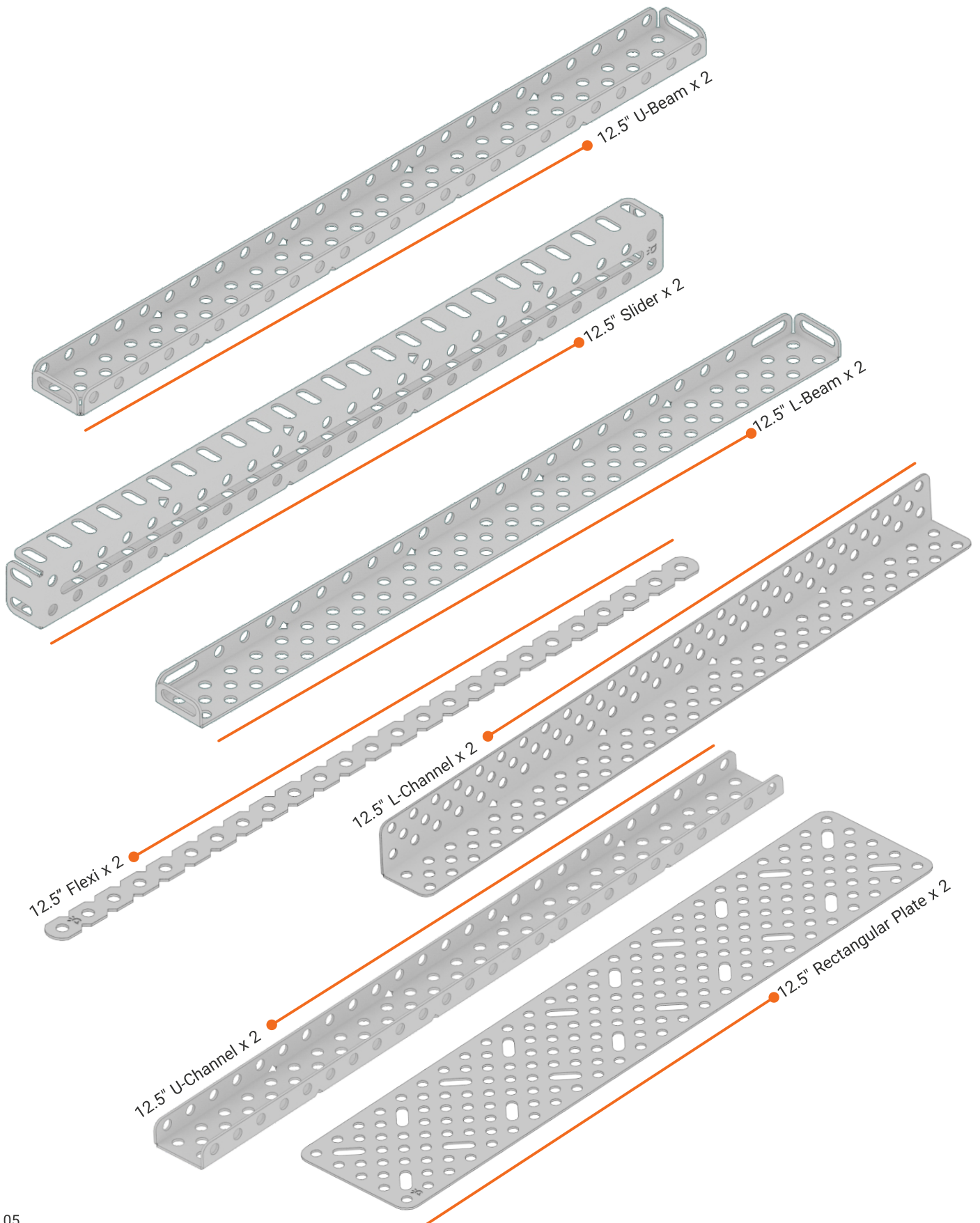
7.5" Rectangular Plate x 2



7.5" U-Beam x 2



7.5" L-Beam x 2



Nuts & Bolts (Advanced)

ER-Series Bolts and K-Nuts with a strong metal and easy-to-use design for strong joints of your grand robots.



K-Nuts



40mm, 8mm & 6mm Bolts



Axle Lock



3-Hole Connector



Filler



Axle Couplers

Cables

Set of RJ-11 cables to connect the Motors, Sensors and the Remote Controller to the brain of the robot and a USB-Cable to burn programs onto the brains of your robots



Long Cable



Cables



USB Cable



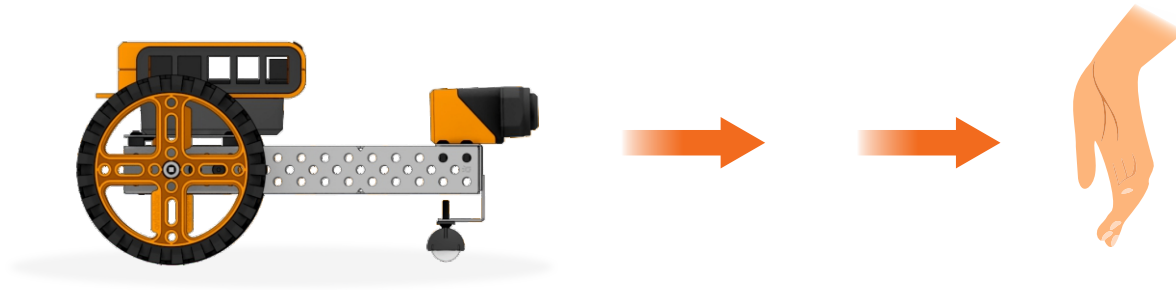
Congrats!

Give yourself the 'Familiarize with your Kit' sticker on your Achievement Sheet.



DEEP DIVE INTO ROBOTICS

The Object Follower



An Object Follower robot is a smart machine which follows any object (placed in front of it) while maintaining a distance.

What is our task?

We need to build a robot with a mechanical chassis & an Ultrasonic Sensor. The robot should follow any object placed in front of it.

What will you learn?



Interfacing of ultrasonic sensor



Sequencing of code



Conditional statements



Input to output transformation



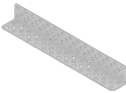
Mechanical chassis design

Interesting Facts

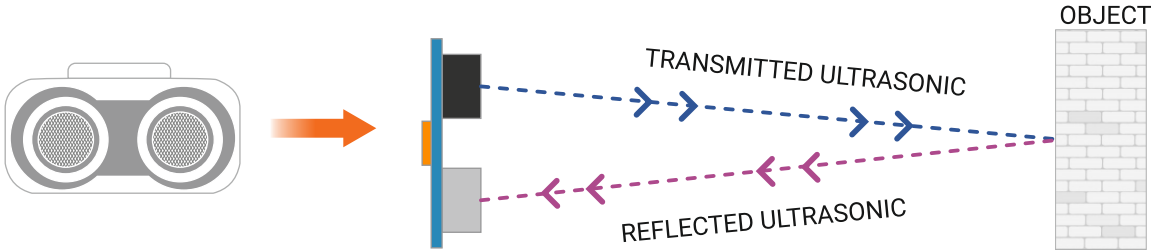
Cowa Robot is a Smart Travel bag that follows you automatically.



What will you need?

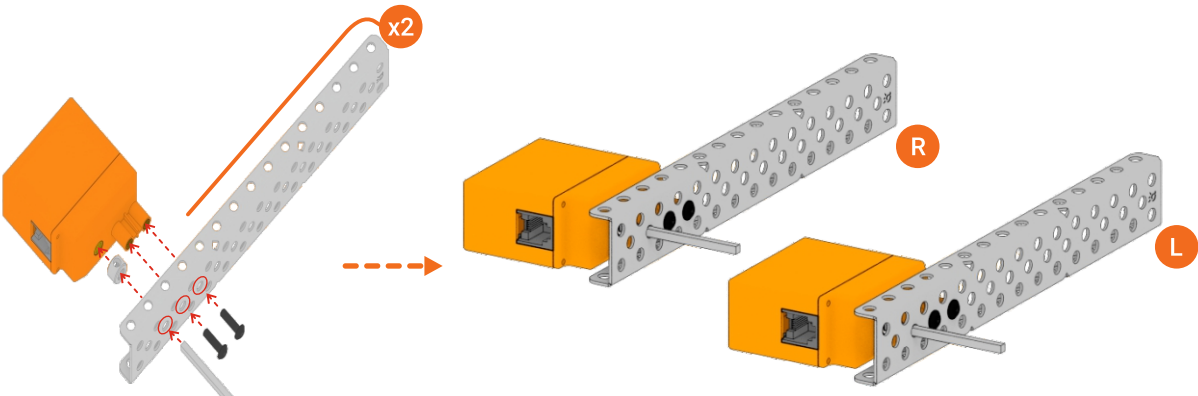
 Full Brain x 1	 Battery x 1	 Ultrasonic Sensor x 1	 High Speed Motor x 2
 Caster Wheel x 1	 Cables x 3	 Nuts and Bolts	 Big Wheels x 2
 Programming Cable x 1	 7.5" Rectangular Plate x 1	 7.5" L-Channel x 1	 7.5" U-Channel x 2
 2.5" L-Channel x 1	 3.5" Axle x 2		

How does Ultrasonic Sensor work?

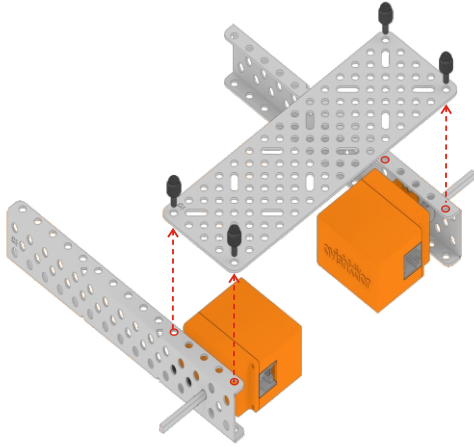


Let's Build!

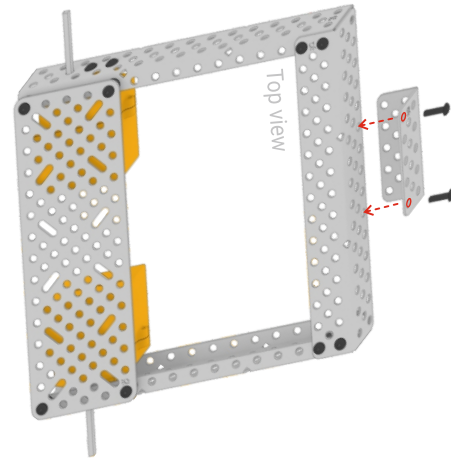
- 1
- Take one High Speed Motor and join it with a 7.5" U-Channel at holes 2, 3 and 4 in the middle row. Make two such assemblies.



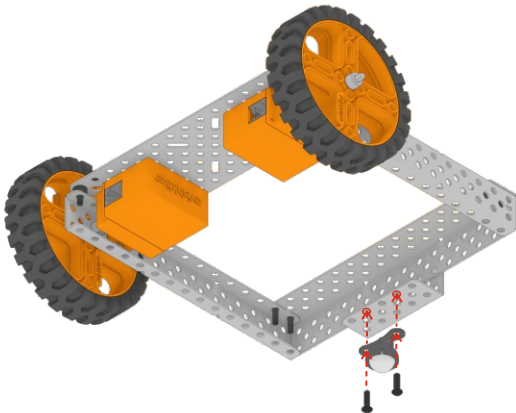
- 2 Join both the U-Channel arrangements with a 7.5" Plate at all corner holes.



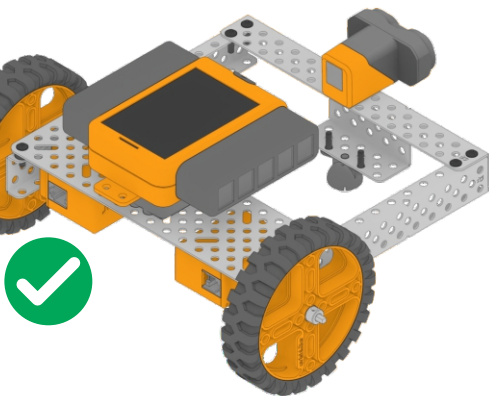
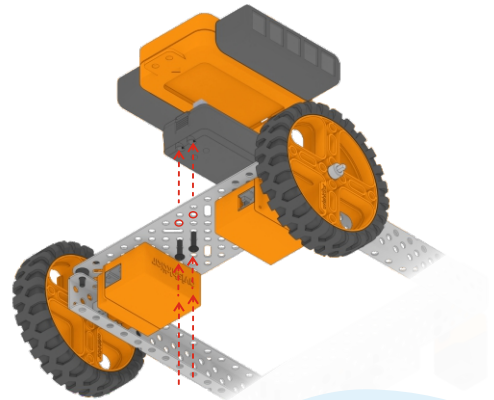
- 3 Attach one 7.5" L Channel & one 2.5" L-Channel in front of the chassis .



- 4 Attach Caster wheel in front on the chassis and 2 wheels on the motors with fillers.

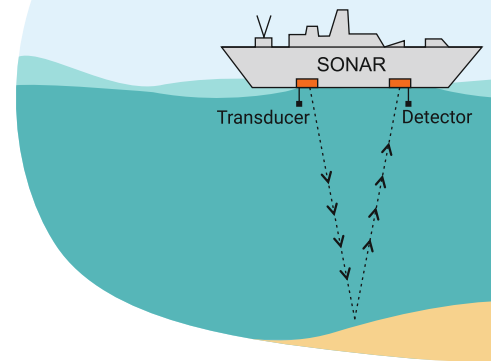


- 5 Attach brain and battery assembly on the 7.5" Plate at holes 8 and 9 and the ultrasonic sensor in the center of the 7.5" L-Channel.



Looking Around You

Various Industries use these kinds for surveillance purposes.

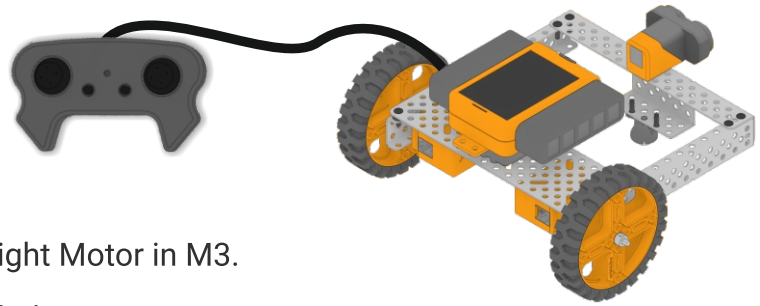


Woohoo your first bot is ready!

Time to code it with logic to run and solve problems on it's own.

How to play – With Controller

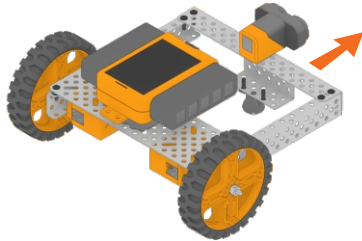
You can use the remote controller to control your robot.
Follow the instructions below to know various ways you can use it.



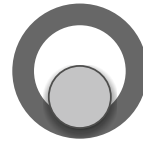
- Connect the Left motor in M4 and Right Motor in M3.
- Connect Remote Cable in Port Labeled as R.
- Switch on the brain and keep your Object Follower in open space and use your Remote's Right and Left panel Joystick for movement of the robot.



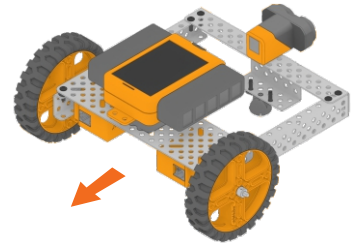
Right Joystick



When we push Right Joystick forward, the bot moves forward.



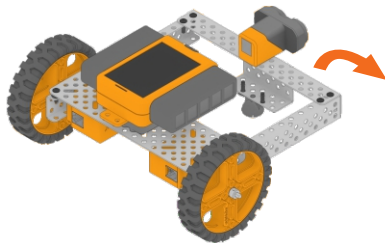
Right Joystick



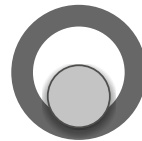
When we push right joystick backward, the bot moves backward.



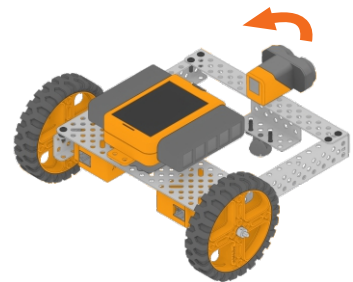
Right Joystick



When we push the & right joystick towards right, the bot moves right.

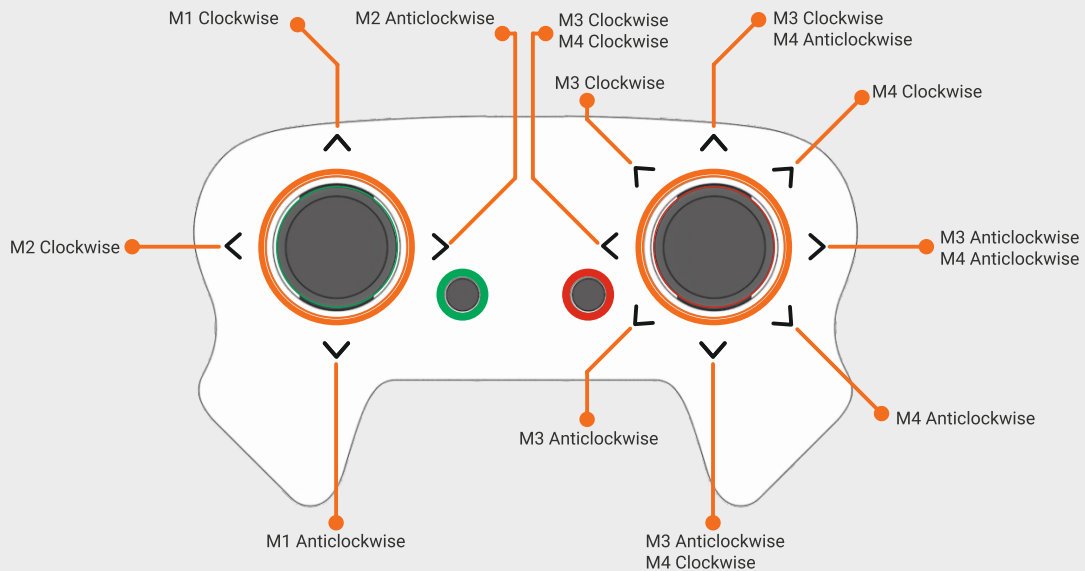


Right Joystick



When we push the & right joystick towards left, the bot moves left.

Here's a detailed mapping of the joysticks in the remote controller to the various motor ports in the Full Brain.



Congrats!

Give yourself the 'First Project Badge' sticker on your Achievement Sheet.

How to play - With Avishkaar Remote Controller (ARC)



The Powerful **Avishkaar Remote Controller (ARC)** allows for wireless control of robots built with Avishkaar FULL Brain. Connecting wirelessly children can maneuver their robots' actions in a variety of fun ways.

Let's Start

- 1 Begin by installing the ARC app on your phones using the QR codes alongside.

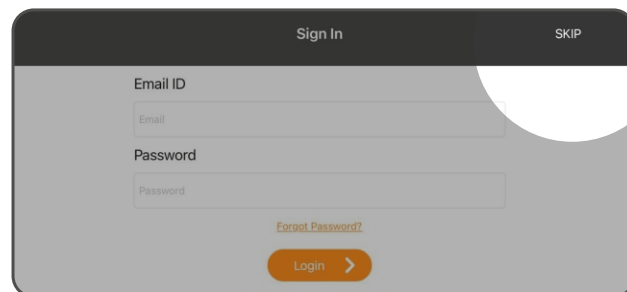
Available on



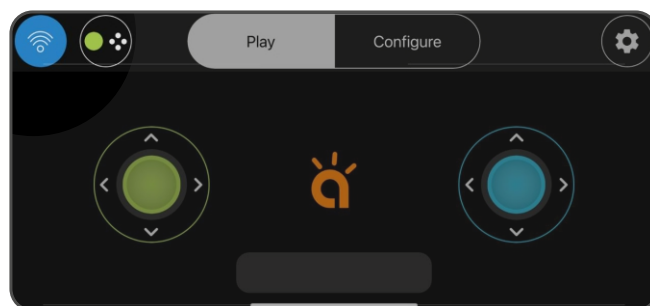
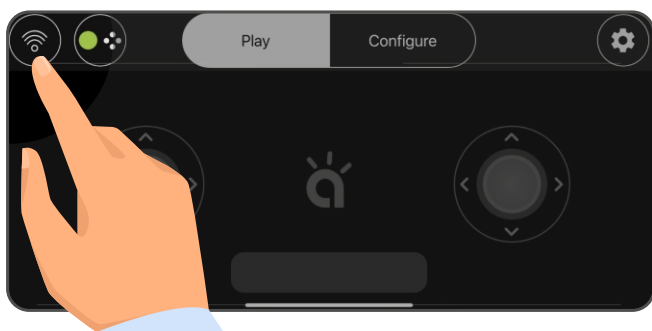
- 2 Turn ON the brain (press once, it will take 2-3 seconds to turn ON) and connect to the Full Brain's WiFi module by going to the WiFi Settings in your phone. You can find the mac address and the password for the Brain's WiFi on the sticker on top of the brain.



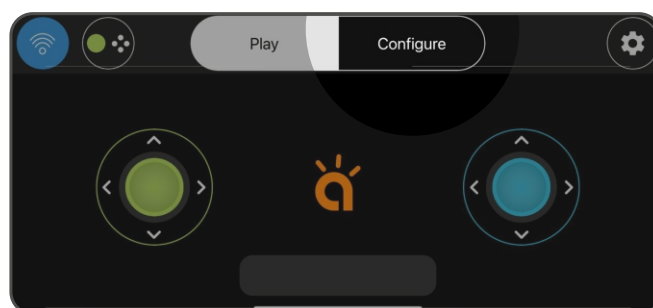
- 3 Open the app. You can skip the sign-in/login page.

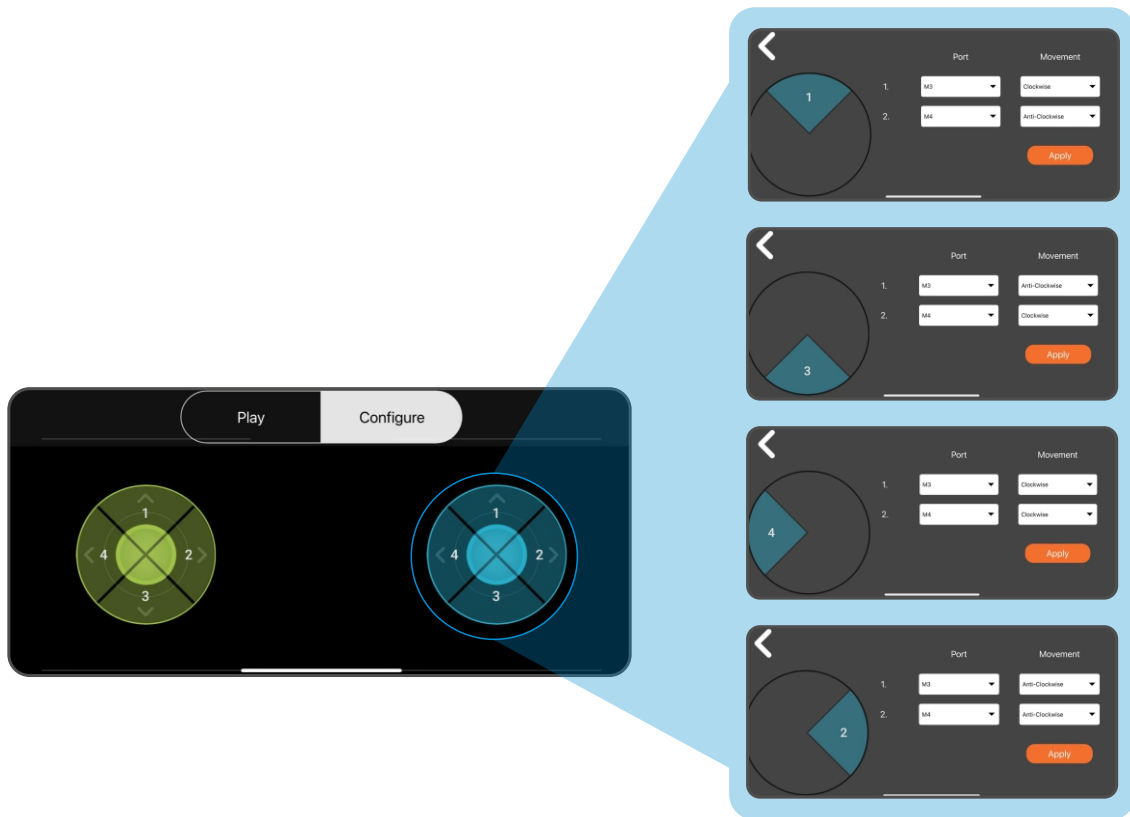


- 4 Click on the WiFi button on top-left. If it turns blue, it means the app has successfully connected to the brain.



- 5 Click on 'Configure'. Then set the left joystick's forward direction to M1 clockwise and left joystick's backward direction to M1 anti-clockwise.

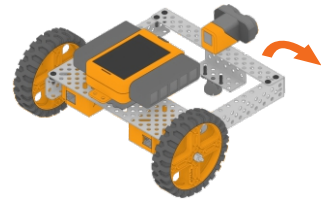
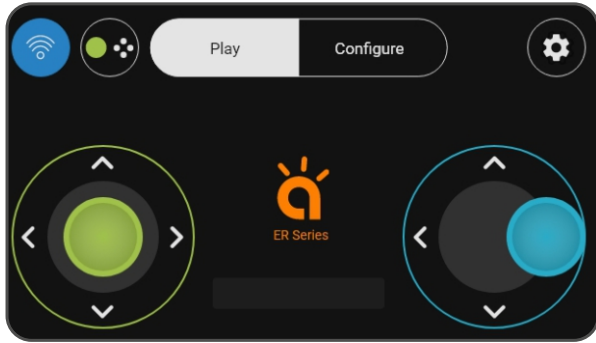




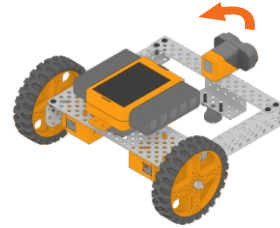
Let's Play With Object Follower

When we push the right joystick forward, the bot moves forward.

When we push the right joystick backward, the bot moves backward.



When we push the right joystick, towards right, the steering turns right.



When we push the left joystick, towards left, the steering turns left.

How to play - With AMS

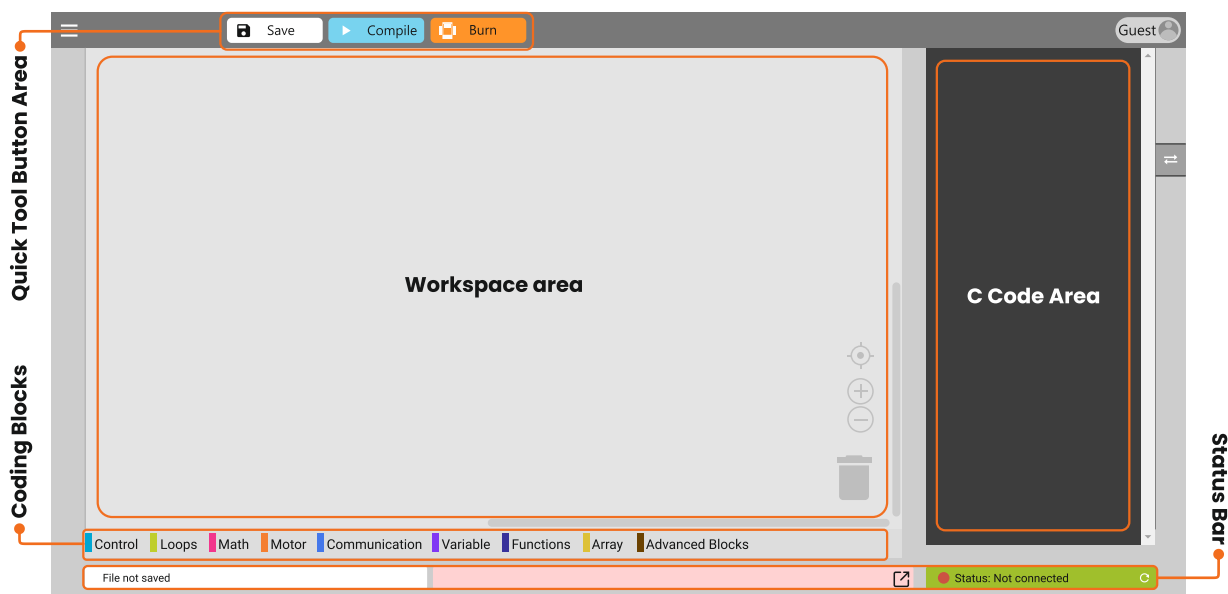
To program your robot you will need to use the software, Avishkaar Make Studio. Let's learn how to use it.



Avishkaar Maker Studio (AMS) is a block-based visual programming software to program all of Avishkaar's products. This nifty software allows children to code using a simple drag-n-drop interface, making programming a lot of fun.

Download AMS from www.avishkaar.cc/softwares/maker-studio

Understanding AMS Interface



• **Workspace Area**

This is the area where coding blocks will be dragged to develop any logic.

• **Coding Blocks**

This section is where all the blocks according to their use will be selected.

• **Status Bar**

This section will show the status of program, whether it is saved, compiled or burnt and the status of brain, Connected or Not-connected.

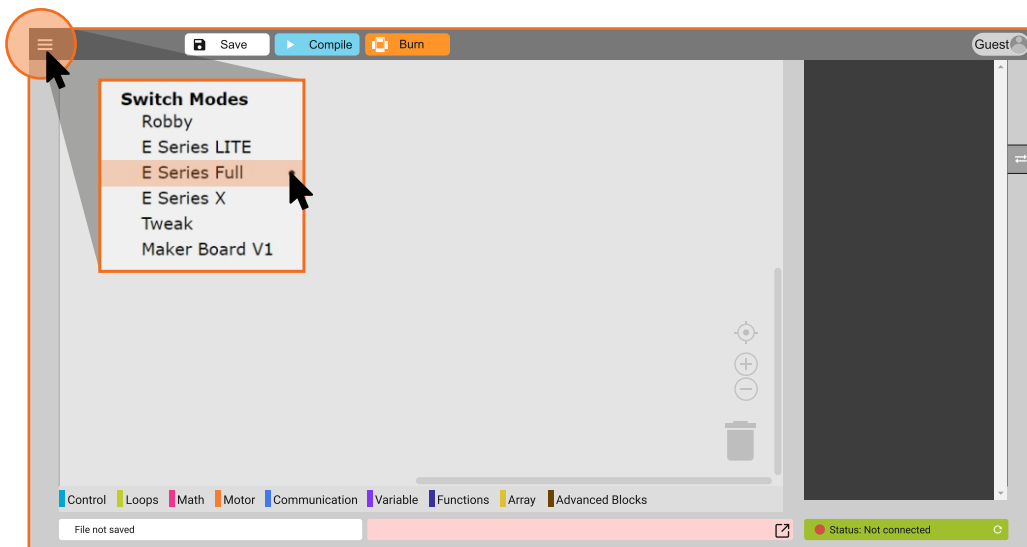
• **C-Code Area**

This section shows the program in C-Code Language, equivalent to the one made on workspace area using blocks.

Go ahead and develop any code of your choice in AMS following the examples shown in the sample projects ahead.

Set Mode

Open the App and switch mode to E-Series FULL.



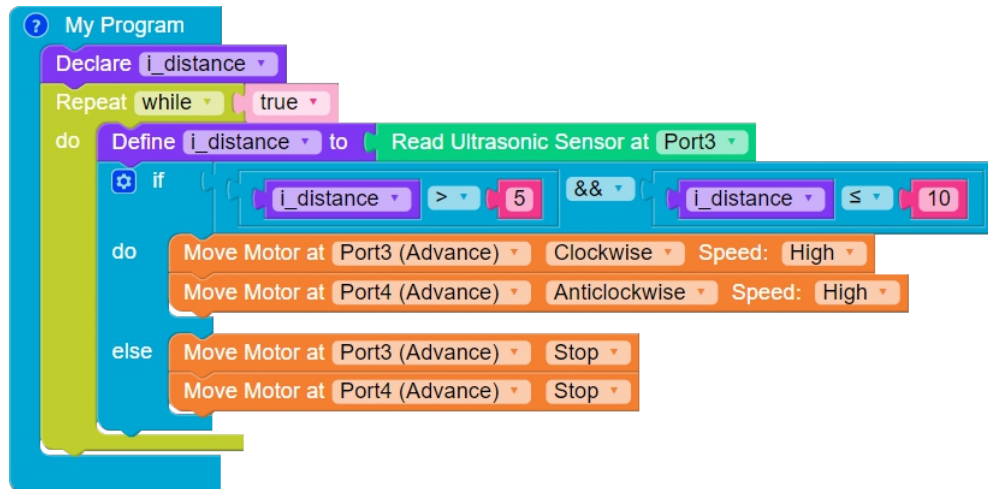
Write Code

Your robots will always have a problem statement. We write to code to make your robot do that.

Our problem statement here is that if the robot senses any object in the vicinity, it should follow it. Open your AMS and drag blocks to form the following code.

Understanding the code

The code simply reads the distance returned by the Ultrasonic Sensor. If the distance is greater than 5 and less than or equal to 10, the object is close and motors should move the bot forward. Else, the motors will stop.



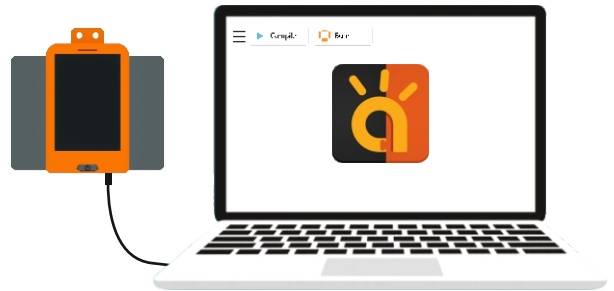
Burn Program on the Brain

01



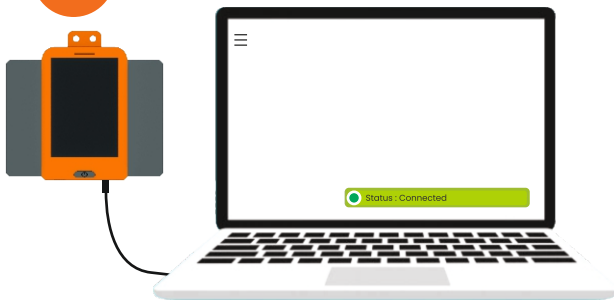
Click on SAVE.

02



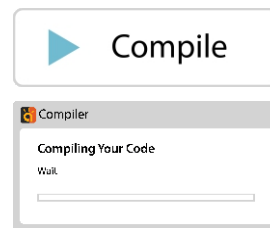
Connect the Full Brain to your laptop.

03



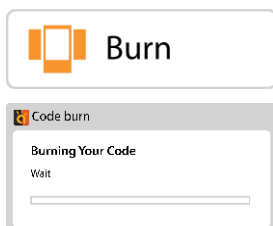
If the brain connected successfully then the STATUS will turn green show Connected.

04



Click on COMPILE.

05

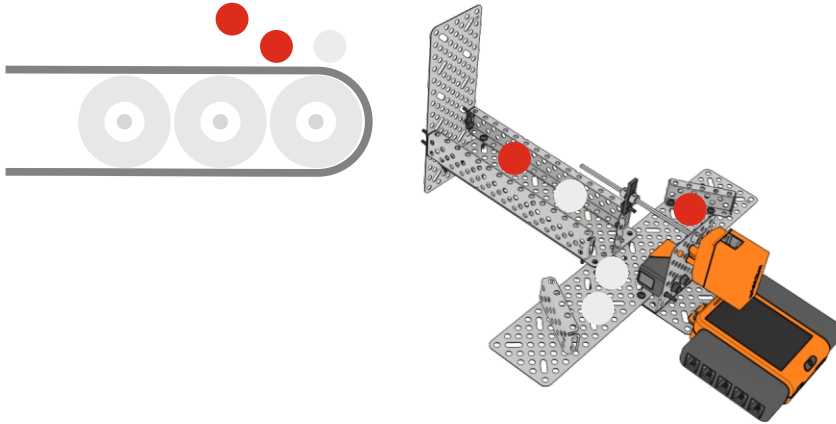


How to play?

Cables Connection

1. Connect ultrasonic sensor to S3 using a cable, connect left motor to M4 and right motor to M3.
2. Turn ON the brain
3. Put your hand in front of the sensor and the bot will follow your hand

The Color Sorter



What is color sorting?

A color sorter machine is a machine which automatically segregates items based on their color.

What is our task?

A color sorter bot will be the one that will detect the color of any item and segregate them. In this, the machine will have a feeding mechanism, a color detecting sensor & an arm which will move the items.

What will you learn?



Interfacing of
Color sensor



Sequencing of
code



Conditional
statements



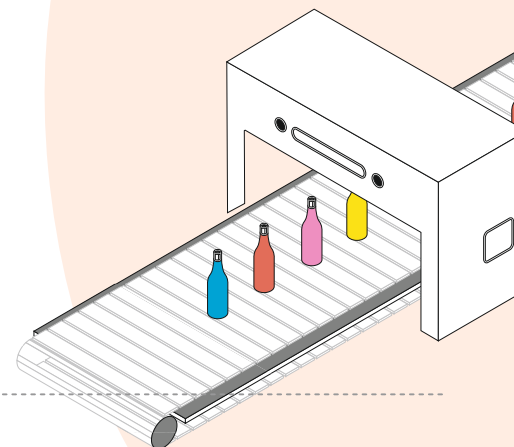
Input to output
transformation



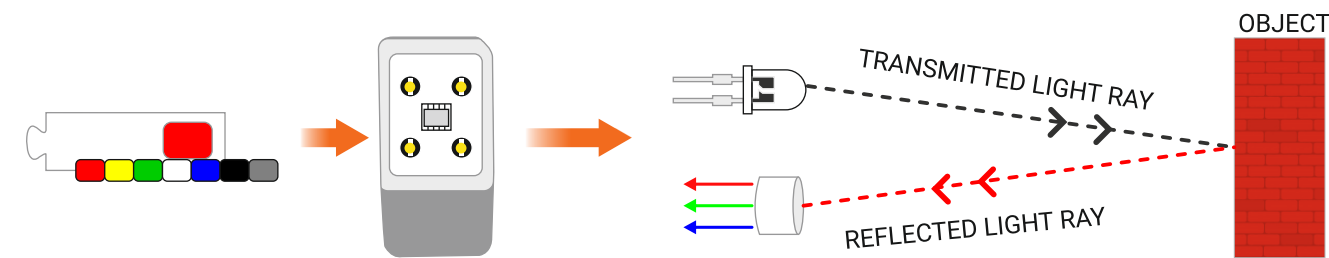
Smart System
design

Did You Know?

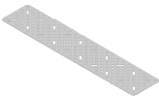
Color sensors are often
used in recycling
industries.



How does color sensor work?

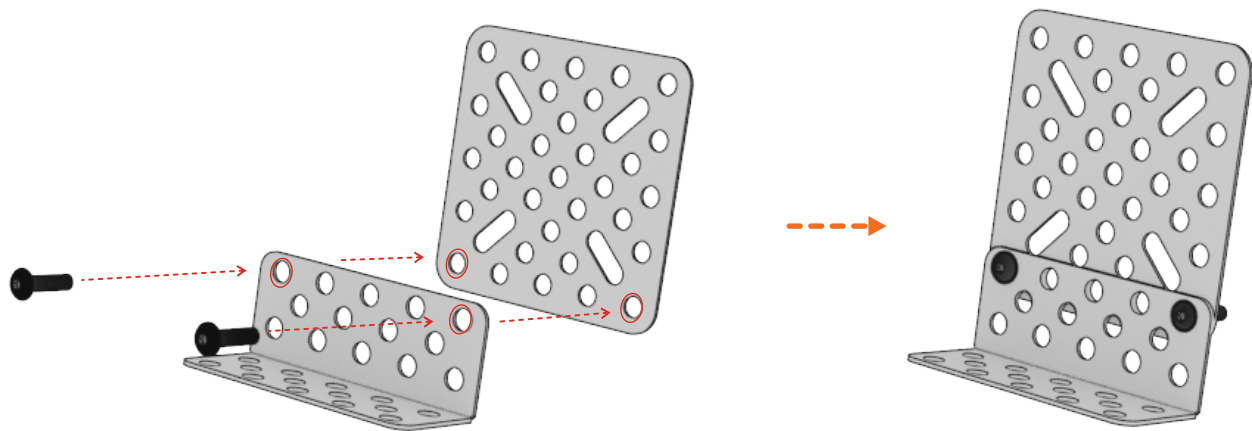


What will you need?

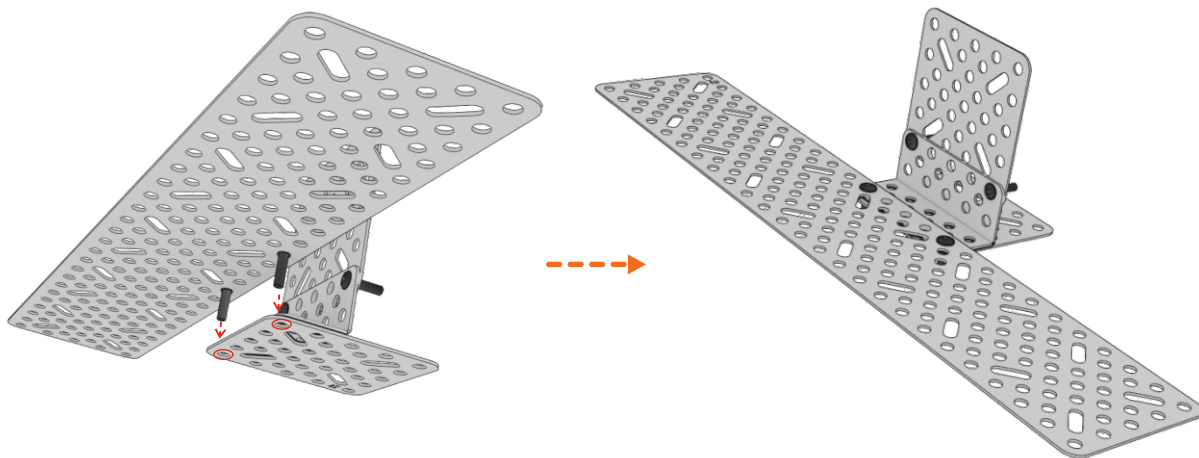
 Full Brain x 1	 Color Sensor x 1	 Cable x 2	 Nuts and Bolts
 High Speed Motor x 1	 5.5" Axle x 1	 Programming cable x 1	 12.5" Rectangular Plate x 1
 2.5" Square Plate x 2	 7.5" U-Beam x 2	 2.5" Flexi x 1	 7.5" Rectangular Plate x 2
 2.5" L-Channel x 1	 2.5" U-Beam x 2		

Let's Build!

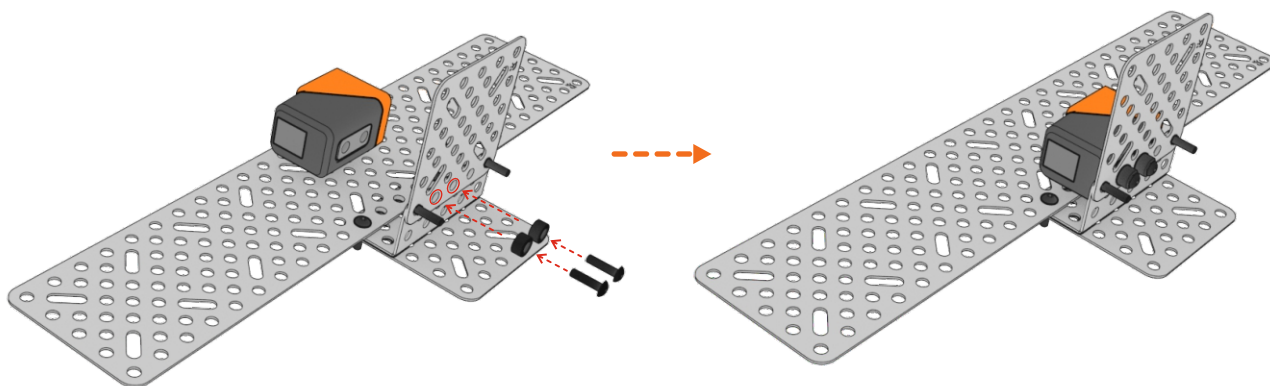
- 1
- Take 2.5" Square Plate and a 2.5" L-Channel and join them on corners as shown in the figure.



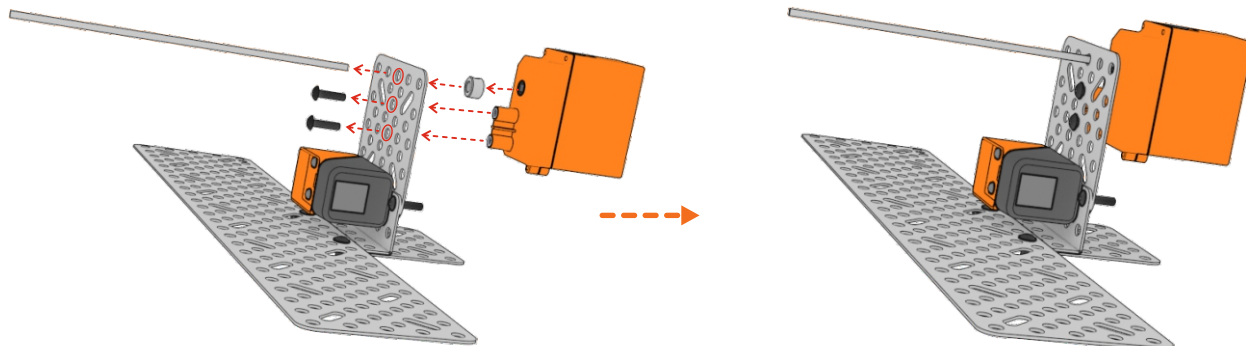
- 2 Connect a 12.5" Rectangular Plate and a 2.5" Square Plate to this assembly.



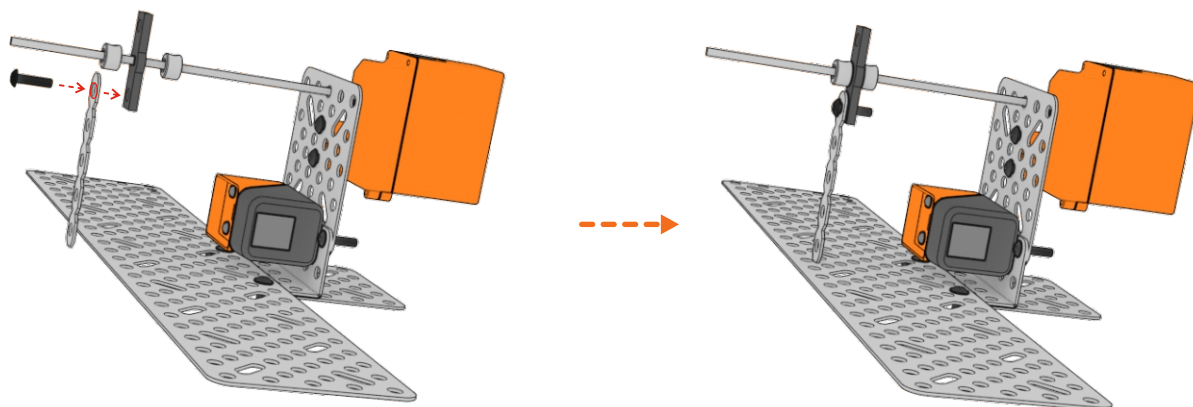
- 3 Connect a Color Sensor on this assembly.



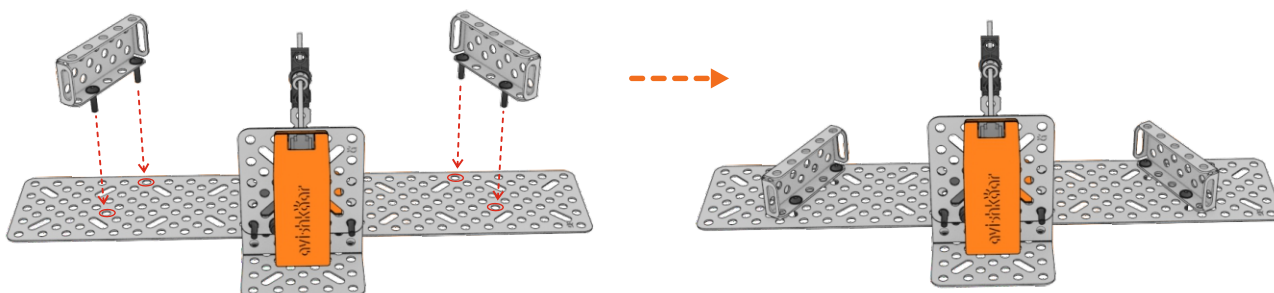
- 4 Connect a High Speed Motor to this assembly using a 5.5" Axle and two 6mm Bolts.



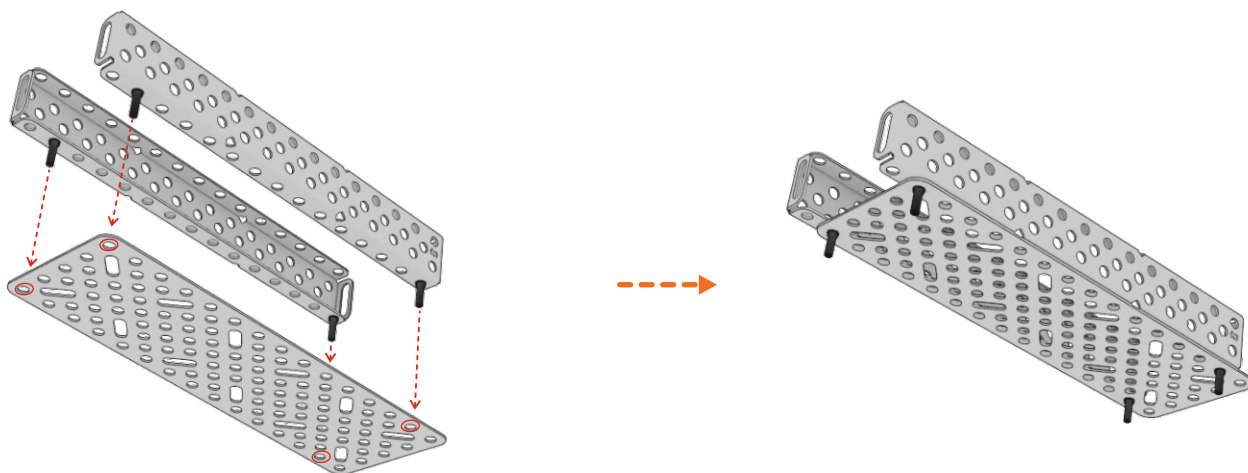
- 5 Connect a 2.5" Axle on the motor using a 3-Hole Connector and two Axle Locks.



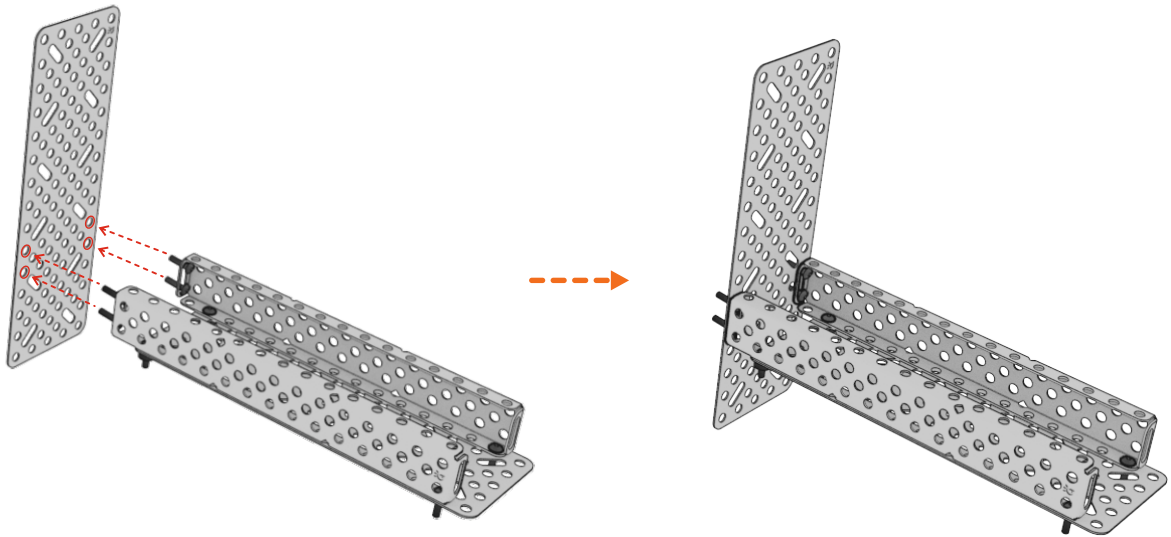
- 6 Connect two 2.5" U-Beam on the main assembly.



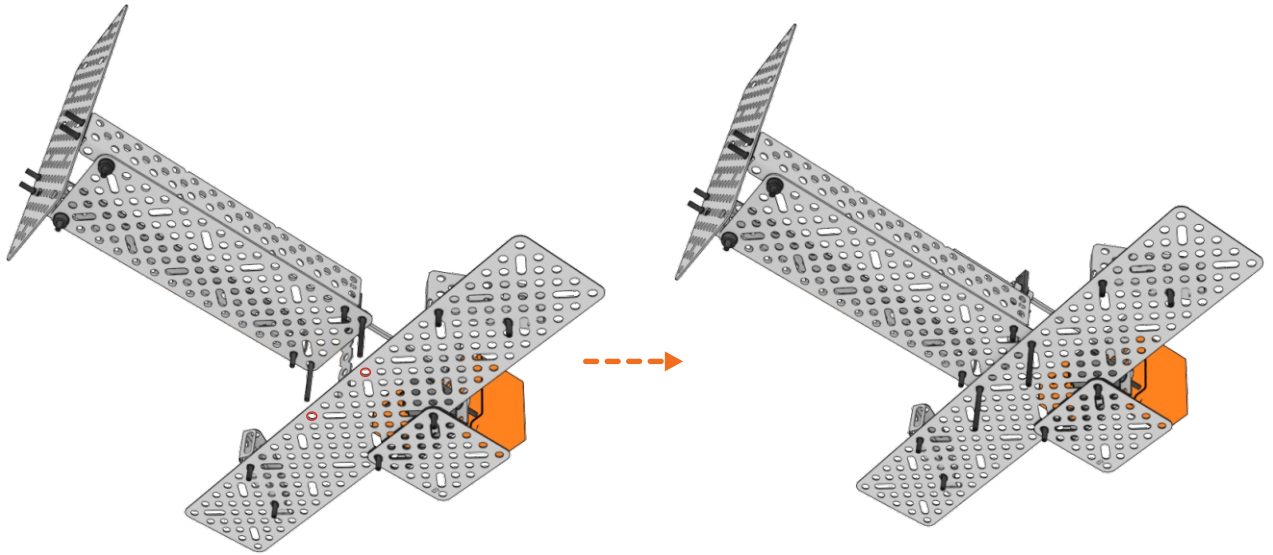
- 7 Make a sub-assembly using two 7.5" U-Beam and 7.5" Rectangular Plate



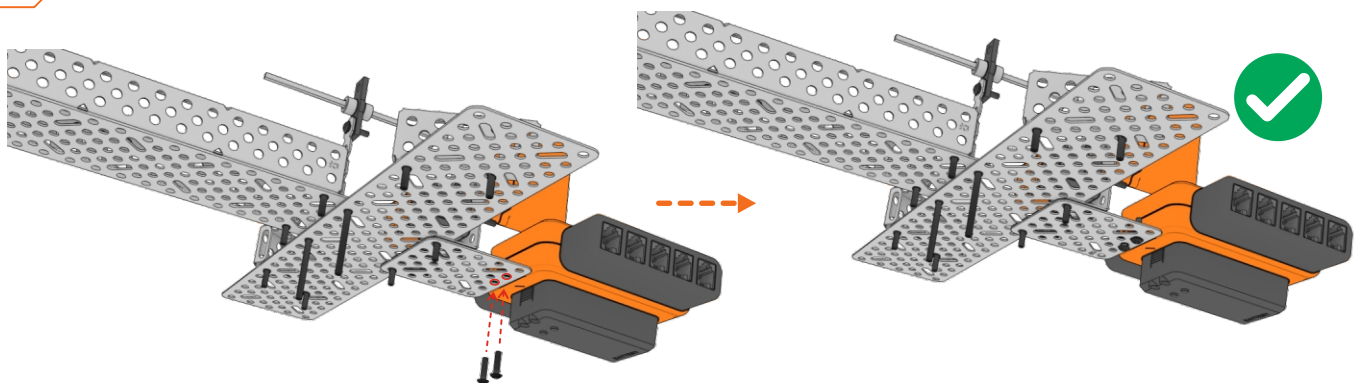
8 Connect a 7.5" Rectangular Plate on this sub-assembly as shown in the figure.



9 Connect both the sub-assemblies.



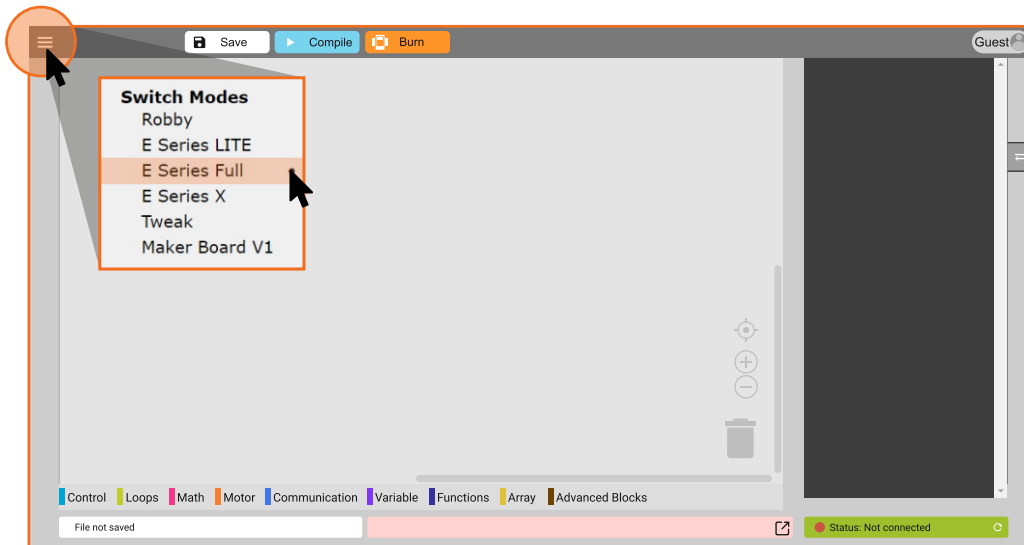
10 Connect the Full Brain to the bot!



How to play -with AMS

Set Mode

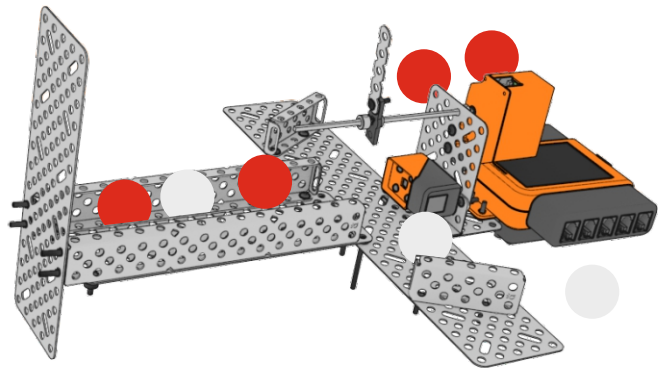
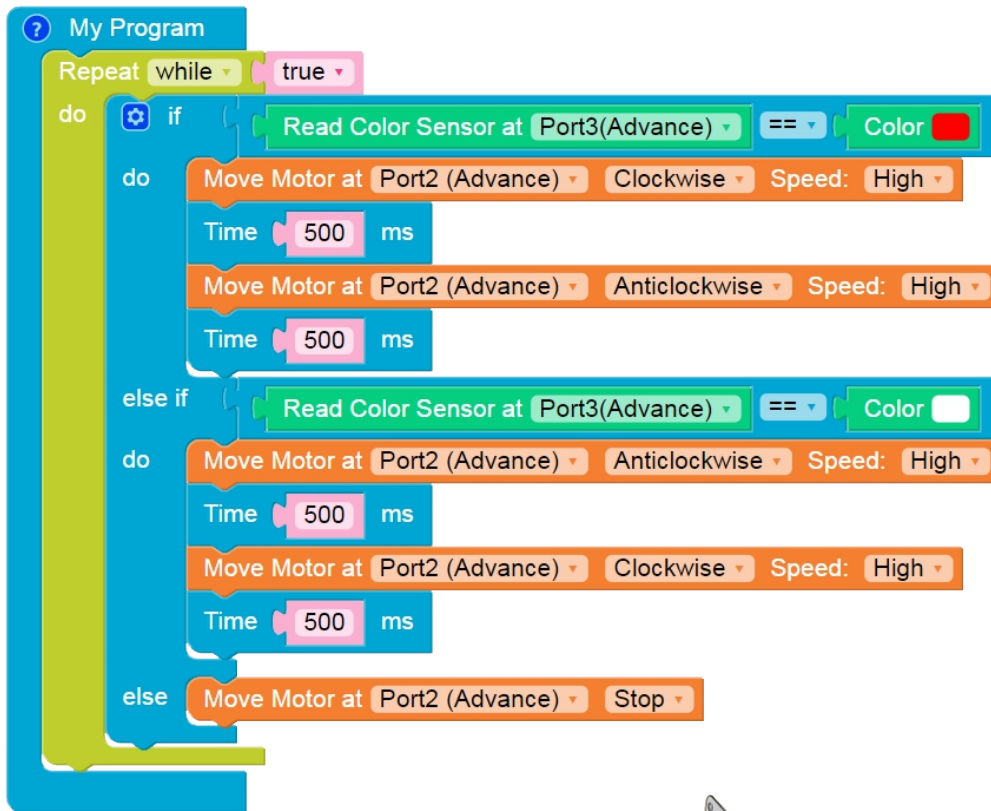
Open the AMS App and switch mode to E-Series FULL.



Write Code

Understanding the code

This code will sort red and white balls. Inside a repeat while loop, we read the value returned by the color sensor. On sensing the read color, the motor movement is first clockwise and after 500ms it turns anticlockwise to flick the ball on one side. If however, the color sensor senses white, the movement is reversed to flick the ball on the other side. If any other color is sensed the motor stops. This code will sort red and white balls. Inside a repeat while loop, we read the value returned by the color sensor. On sensing the read color, the motor movement is first clockwise and after 500ms it turns anticlockwise to flick the ball on one side. If however, the color sensor senses white, the movement is reversed to flick the ball on the other side. If any other color is sensed the motor stops.



Congrats!

You are one bot away from getting
your 'Three Project Badge'.

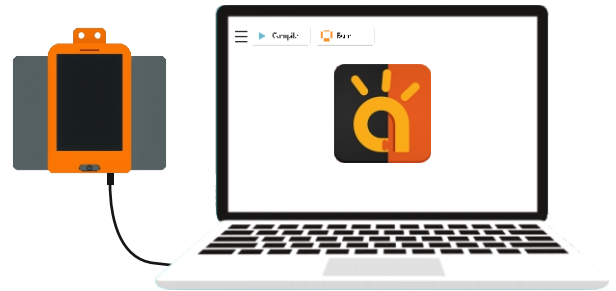
Burn Program on the Brain

01



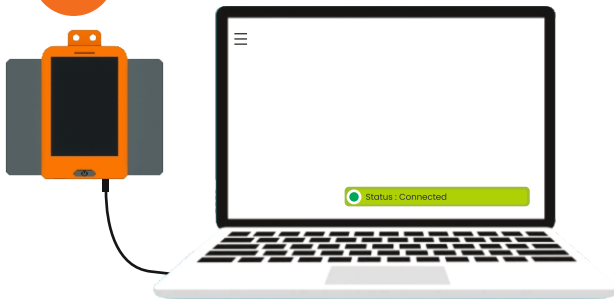
Click on SAVE.

02



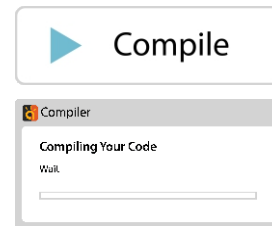
Connect the Full Brain to your laptop.

03



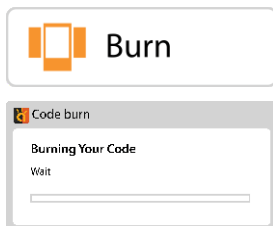
If the brain connected successfully then the STATUS will turn green show Connected.

04



Click on COMPILE.

05



How to play?

Cables Connections

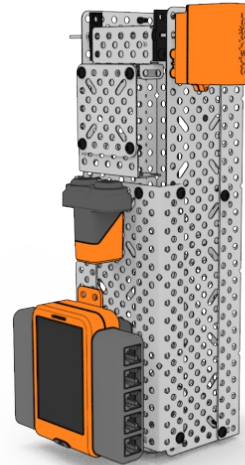
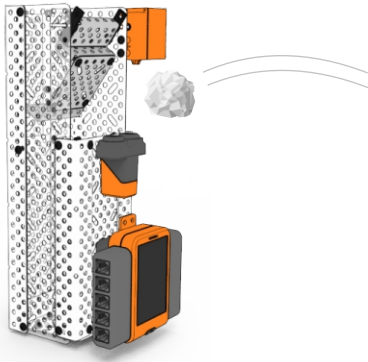
1. Connect motor at M2.
2. Connect sensor at S3.

Step 1 : Align the sorter on top

Step 2 : Turn ON the brain

Step 3 : Feed red & white ping-pong balls one by one

The Smart Dustbin



Dustbins (or garbage bins or trash cans) are small plastic or metal containers that are used to store trash (or waste) before it is collected by waste management teams. A smart dustbin is a contactless dustbin based on sensors.

What is our task?

We must design a Smart Dustbin that it uses an ultrasonic sensor to automatically sense trash brought close to it and opening up the lid to allow trash thrown in.

What will you learn?



Interfacing of
IR Sensor



Sequencing of
code



Conditional
statements



Arithmetic
Operations



Input to output
transformation



Smart System
design

Did you know?

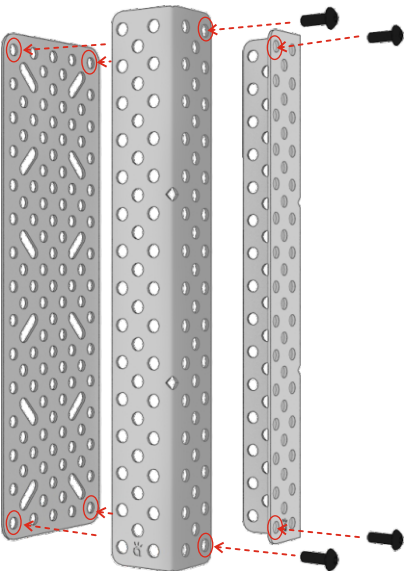
In the times of Corona virus, a contactless closed dustbin helps curb the spread of germs.

What will you need?

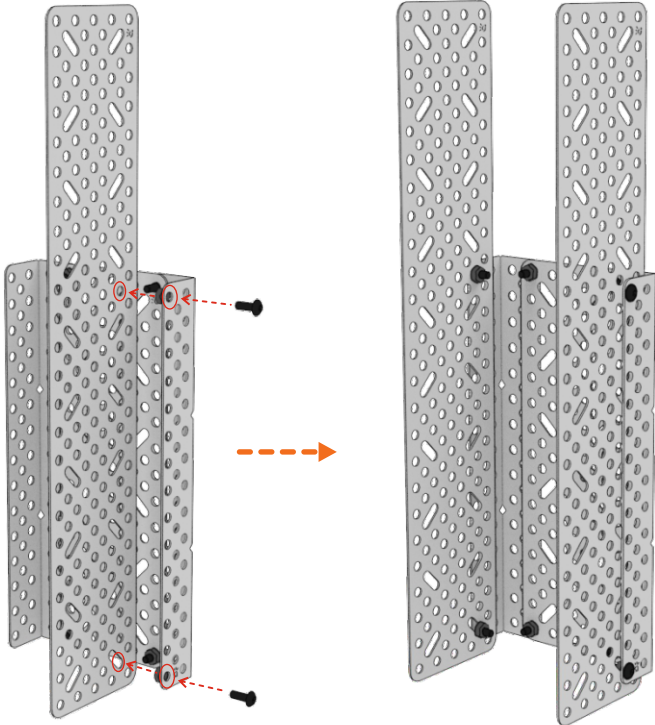
 Full Brain x 1	 Battery x 1	 Ultrasonic Sensor x 1	 High Speed Motor x 1
 Nuts and Bolts	 Programming Cable x 1	 Cables x 2	 2.5" Square Plate x 2
 7.5" Rectangular Plate x 2	 2.5" L-Channel x 2	 2.5" U-Beam x 2	 7.5" U-Beam x1
 12.5 L-Channel x 2	 12.5" Rectangular Plate x 2	 7.5" L-Channel x 2	 5.5" Axle x 1
 3-Hole Connectors x 2			

Let's Build!

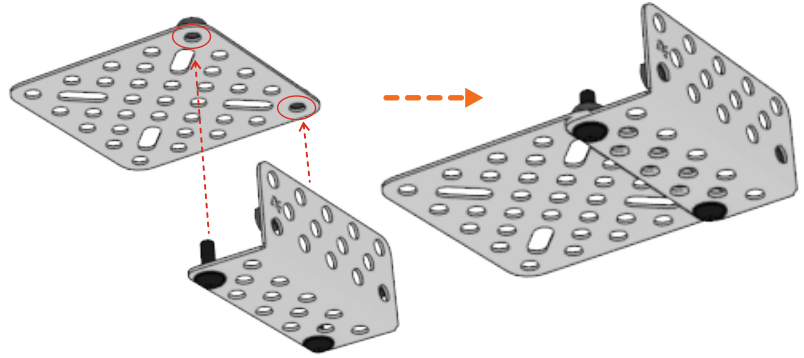
1 Connect 7.5" Rectangular Plate with two 7.5" L-Channels on the corners.



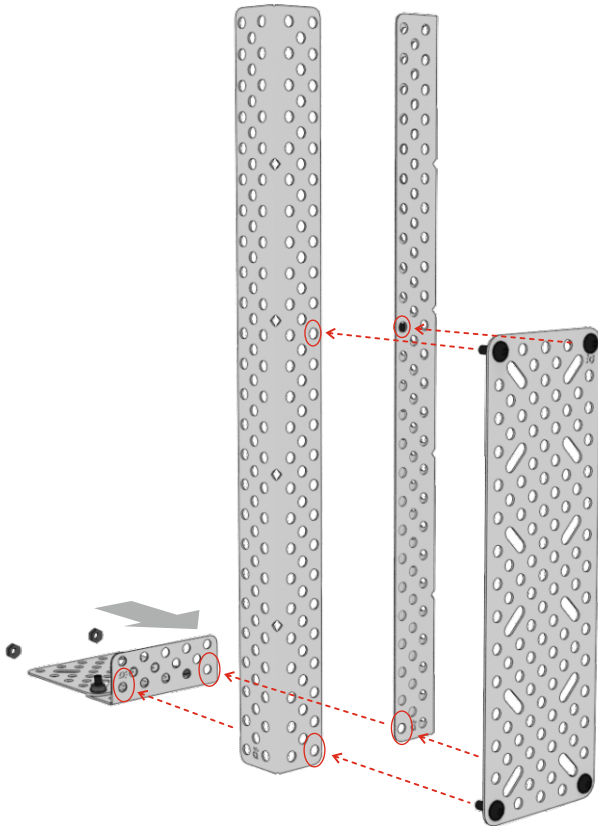
2 Connect 12.5" Rectangular Plate with 7.5" L-Channel and repeat the same for another side to make an enclosed structure.



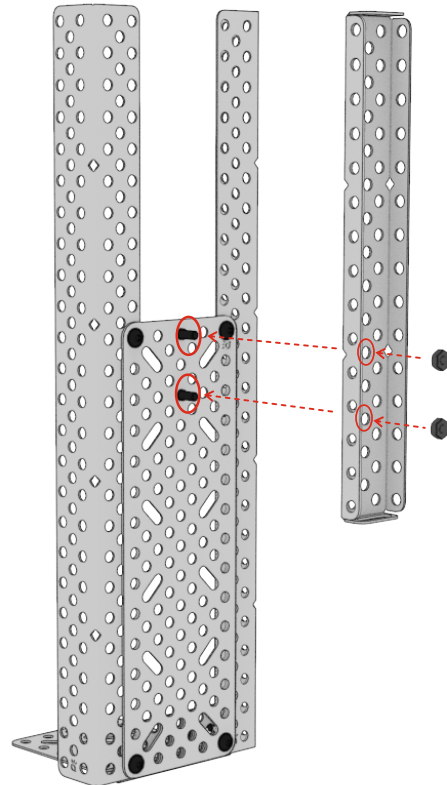
- 3** Connect a 2.5" Square Plate with 2.5" L-Channel on the corners.



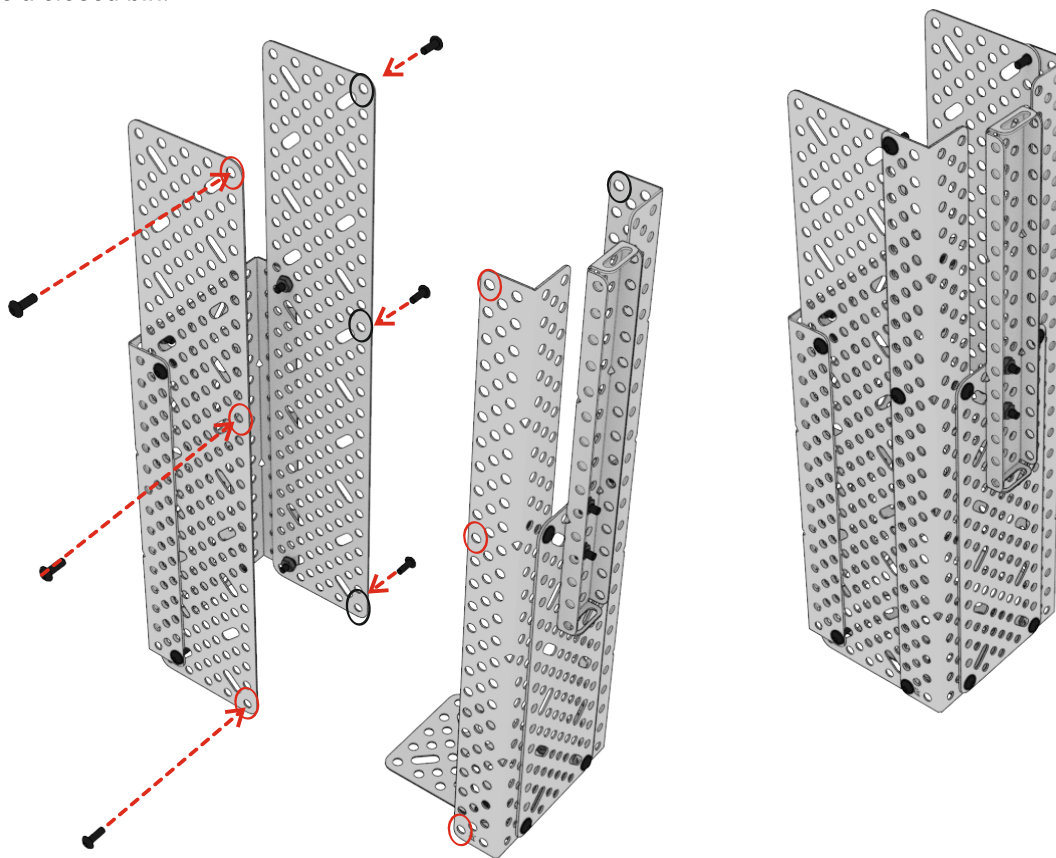
- 4** Connect 7.5" Rectangular Plate with 12.5" L-Channel and 2.5" L-Channel at the ends.



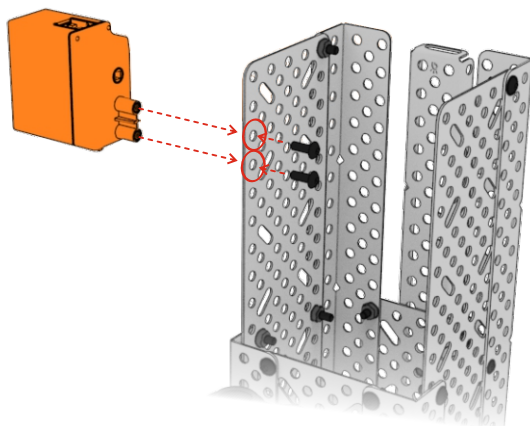
- 5** Connect 7.5" U-Beam with the 7.5" Rectangular Plate of the assembly from step 4 in the middle as shown in the figure.



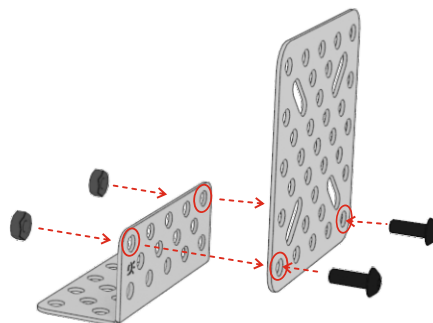
- 6 Connect both the 12.5" L-Channels with 12.5" Rectangular Plates to make a closed bin.



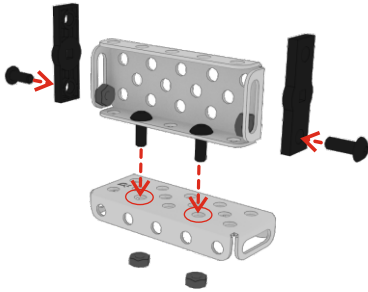
- 7 Connect the high speed motor with the 12.5" Rectangular Plate on one side.



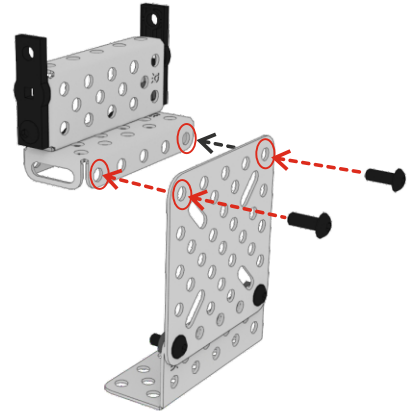
- 8 Make one more assembly of 2.5" Square Plate with 2.5" L-Channel.



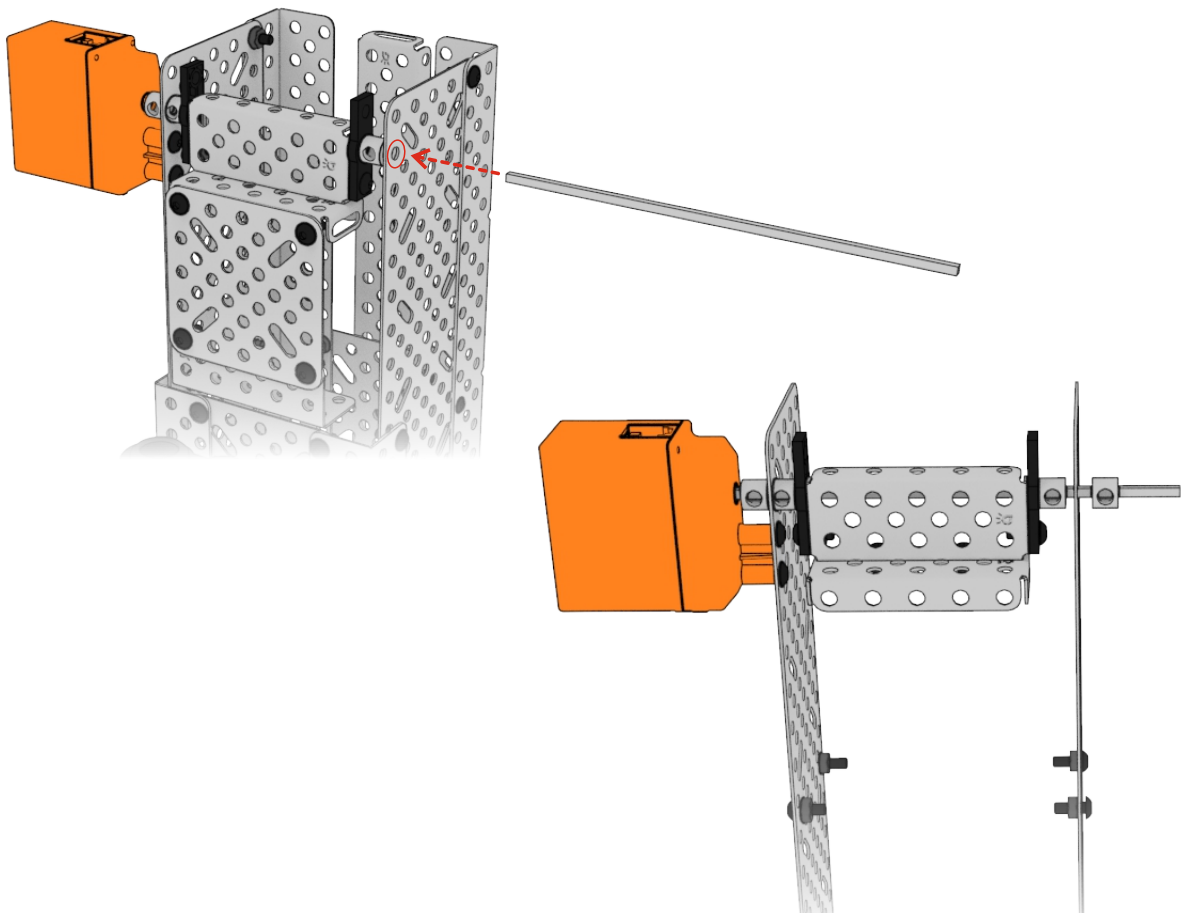
- 9** Connect two 2.5" U-Beams at perpendicular and connect 2 three hole connectors on either side.



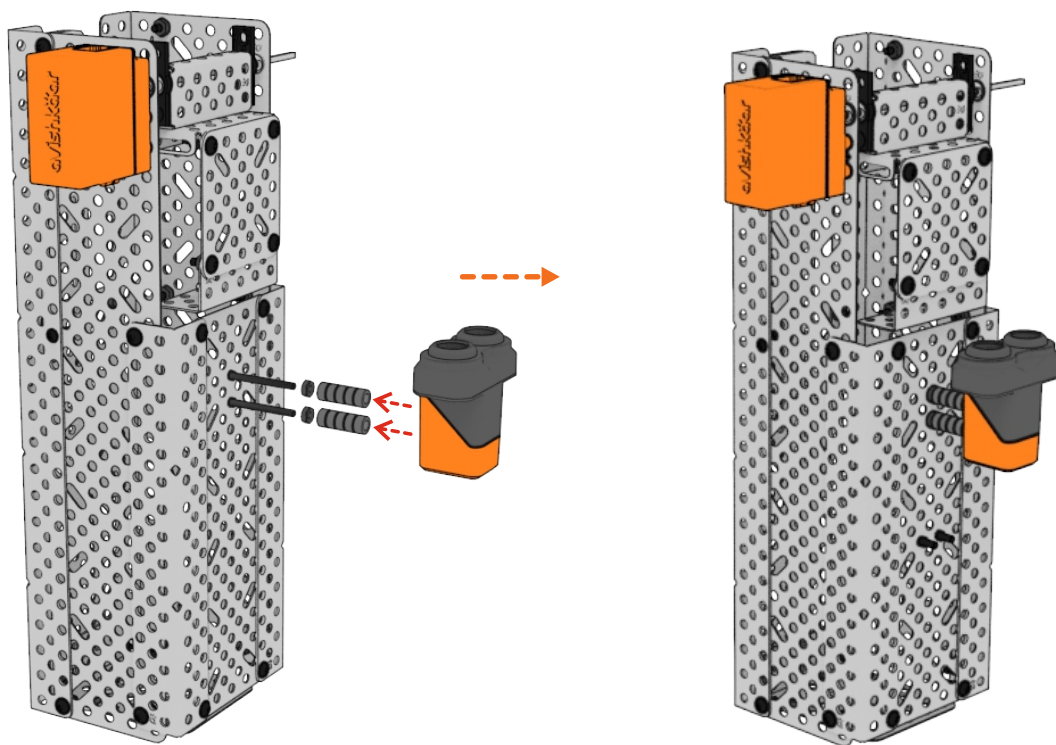
- 10** Connect the assemblies done in step 8 and 9 together on corners as shown to create the dustbin lid.



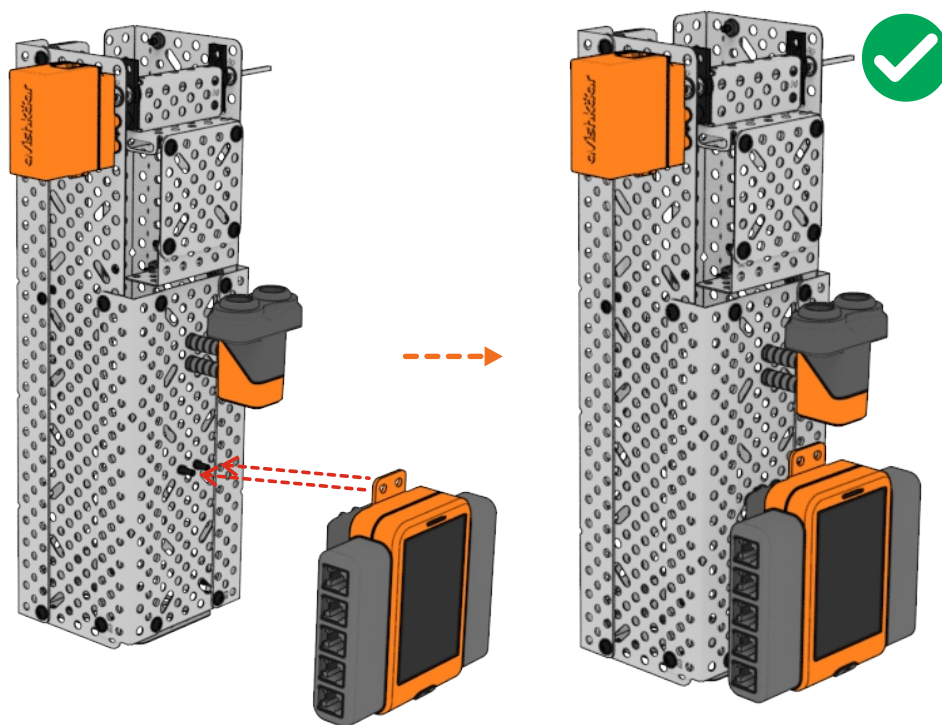
- 11** Now align the three hole connectors with motor holes and insert a 5.5" Axle Shaft in the motor holes.



- 12 Connect the Ultrasonic Sensor with the 7.5" Rectangular Plate of the bin assembly.



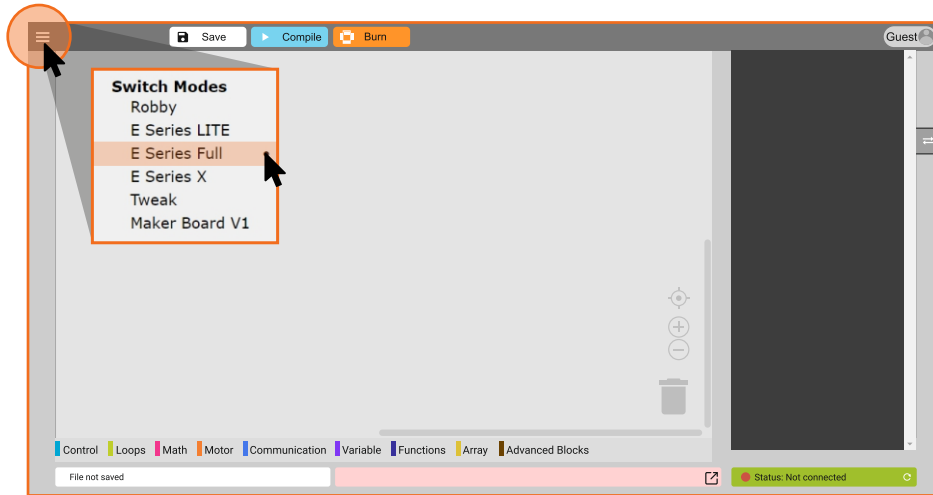
- 13 Attach the Brain with the Battery.



How to play -with AMS

Set Mode

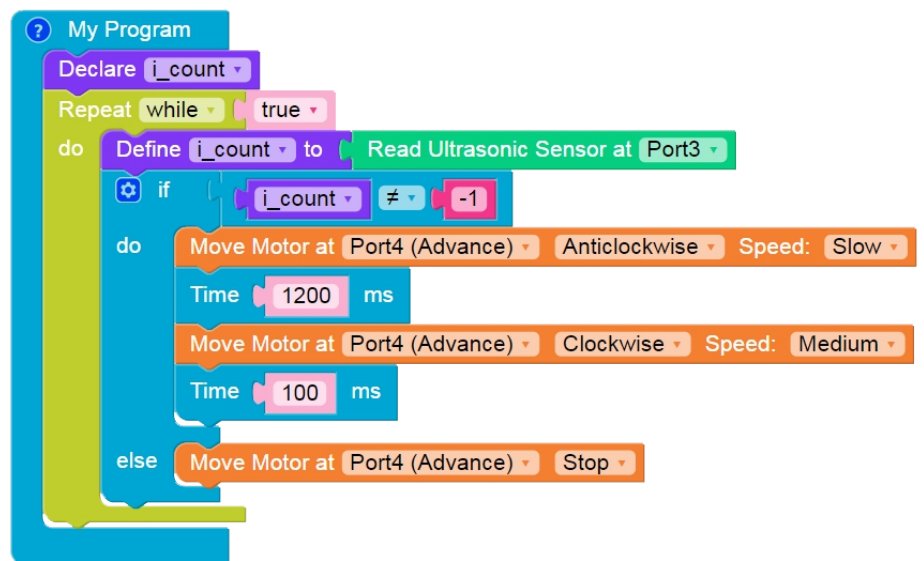
Open the App and switch mode to E-Series FULL.



Write Code

Understanding the code

We are reading the value returned by the Ultrasonic sensor connected at Port 3 in a repeat while loop. Any value returned other than -1 means the ultrasonic sensor is sensing a hand/trash. In this case, it moves the motor first in anticlockwise direction, to open the lid, waits for about 1.2 seconds for the garbage to be thrown in and then closes the lid by moving the motor in other direction for 100ms. In case of a value returned other than -1, there is no object close by and hence motor is stopped.

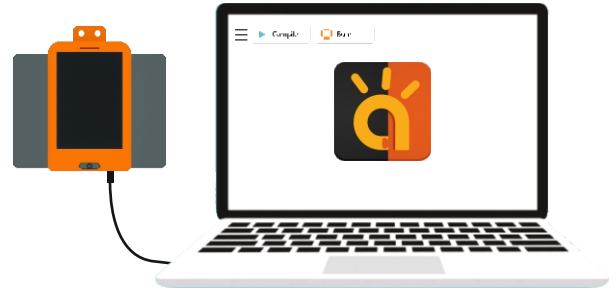


01



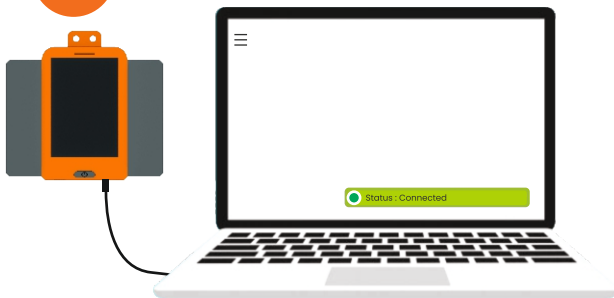
Click on SAVE.

02



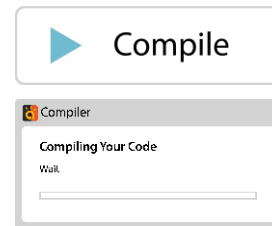
Connect the Full Brain to your laptop.

03



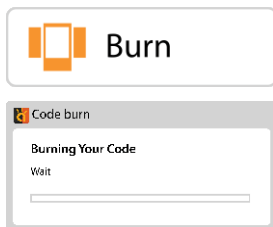
If the brain connected successfully then the STATUS will turn green show Connected.

04



Click on COMPILE.

05



Take your hand above the Ultrasonic Sensor, and the sensor will detect your hand which will open the lid of the dustbin. Throw your garbage inside it.

How to play?

Cables Connection

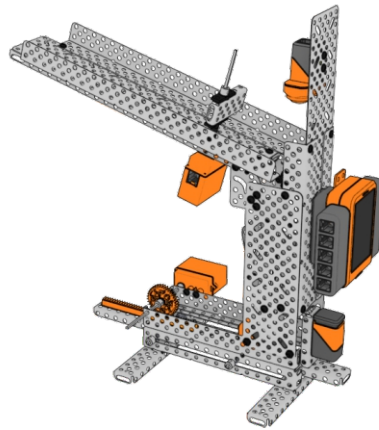
1. Connect motor at M4.
2. Connect sensor at M3.



Congrats!

Give yourself the 'Third Project Badge' sticker on your Achievement Sheet.

The Vending Machine



A vending machine is an automated machine that provides items such as snacks and beverages to consumers after cash, a credit card, or a specially designed card is inserted into the machine.

What is our task?

Our task is to make students understand how to make a robot work automatically without any human effort. In this project, we are going to make a vending machine robot which will be opened automatically by sensing the touch.

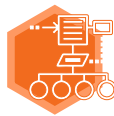
What will you learn?



Sequencing of code



Computational thinking



Algorithm



Infinite loop



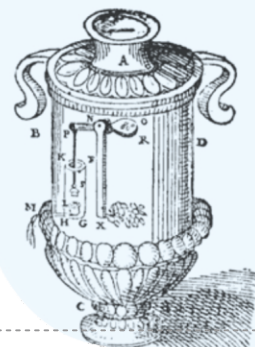
Count with loop



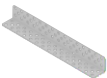
Motor Programming

Did you Know

The world's first vending machine was invented in Ancient Egypt in 215 BCE. It reportedly sold holy water in the Temple in Alexandria.



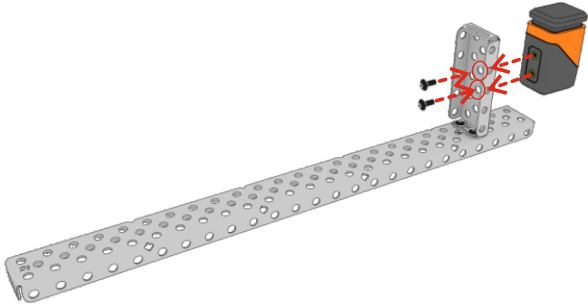
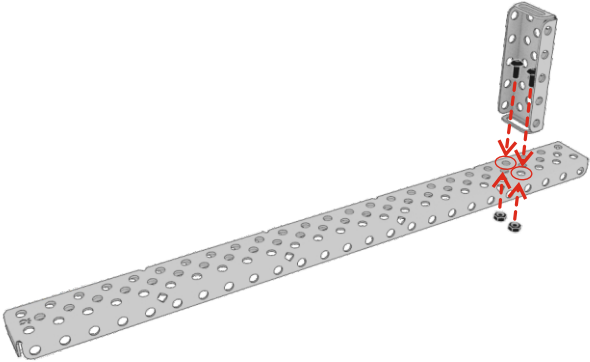
What will you need?

 Brain x 1	 Battery x 1	 Ultrasonic Sensor x 1	 IR Sensor x 1
 Touch Sensor x 1	 High Speed Motor x 2	 Nuts and Bolts	 Programming Cable x 1
 Cables x 4	 Medium Spur Gear x 1	 Rack Gear x 2	 2.5" U-Beam x 2
 2.5" L-Channel x 2	 3.5" Axle x 1	 3-Hole Connector x 2	 7.5" U-Beam x 2
 7.5" L-Beam x 2	 5.5" Axle x 2	 7.5" L-Channel x 2	 7.5" Rectangular Plate x 2
 12.5" U-Beam x 1	 12.5" Rectangular Plate x 2	 Square Plate x 2	 12.5" L-Beam x 2
 12.5" L-Channel x 2	 D-Plate x 2	 7.5" L-Beam x 2	 7.5" Slider x 2

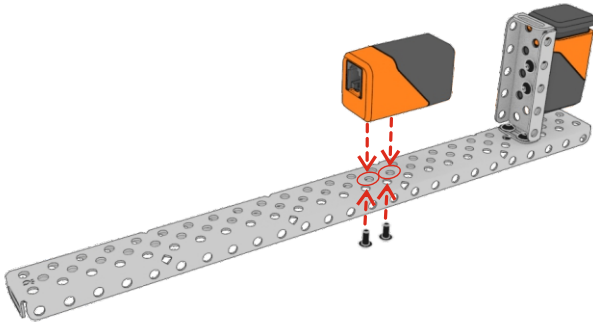
Let's Build!

1 Connect a 2.5" U-Beam with a 12.5" U-Beam in perpendicular, leaving three holes from the side.

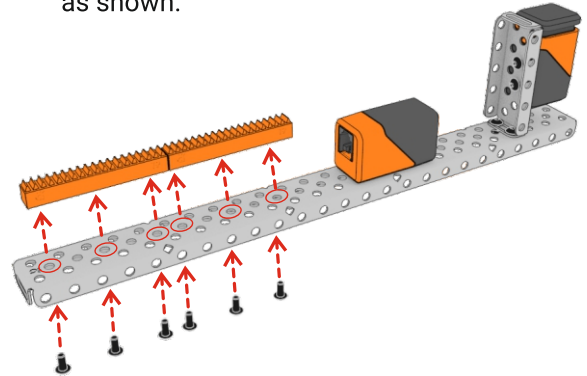
2 Connect the Touch Sensor with the 2.5" U-Beam.



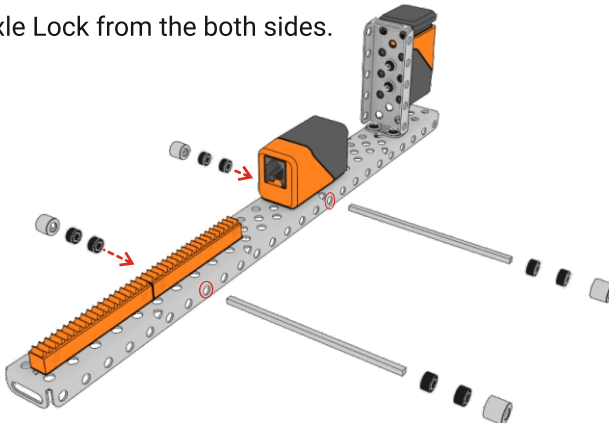
- 3 Connect an IR sensor with 12.5" U-Beam leaving 4 holes from the 2.5" U-Beam.



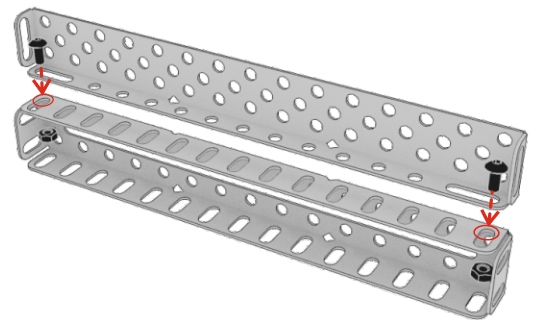
- 4 Connect two rack gears, side by side, with the 12.5" U-Beam in the middle row of holes as shown.



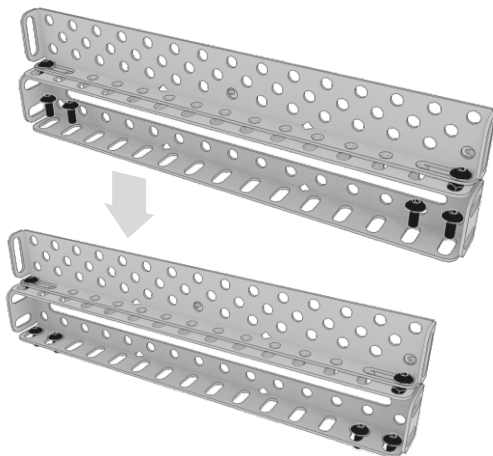
- 5 Insert two 3.5" Axle Shaft from the side of the 12.5" U-Beam leaving 8 holes from the side. Secure with with 2 fillers and an Axle Lock from the both sides.



- 6 Take two 7.5" Sliders and two 7.5" L-Beams and connect them one on top of the other as shown, this will make two such assemblies.



- 7 Secure the assemblies as shown in the figure.

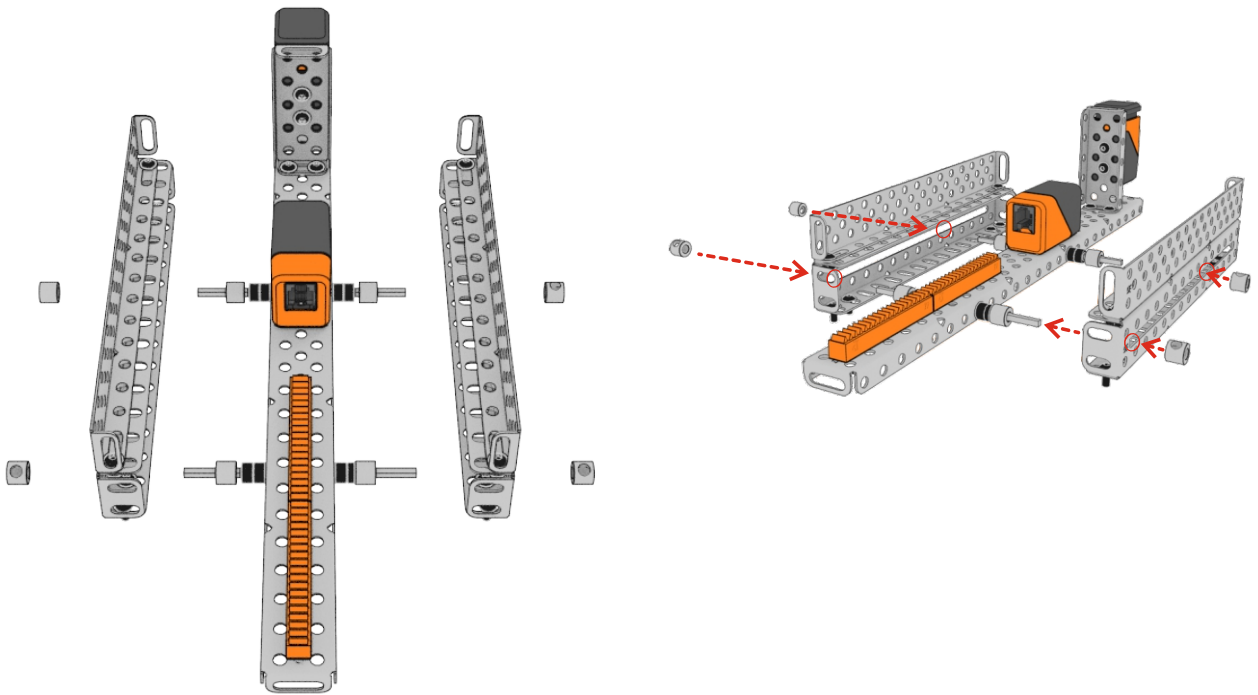


Real-life Examples

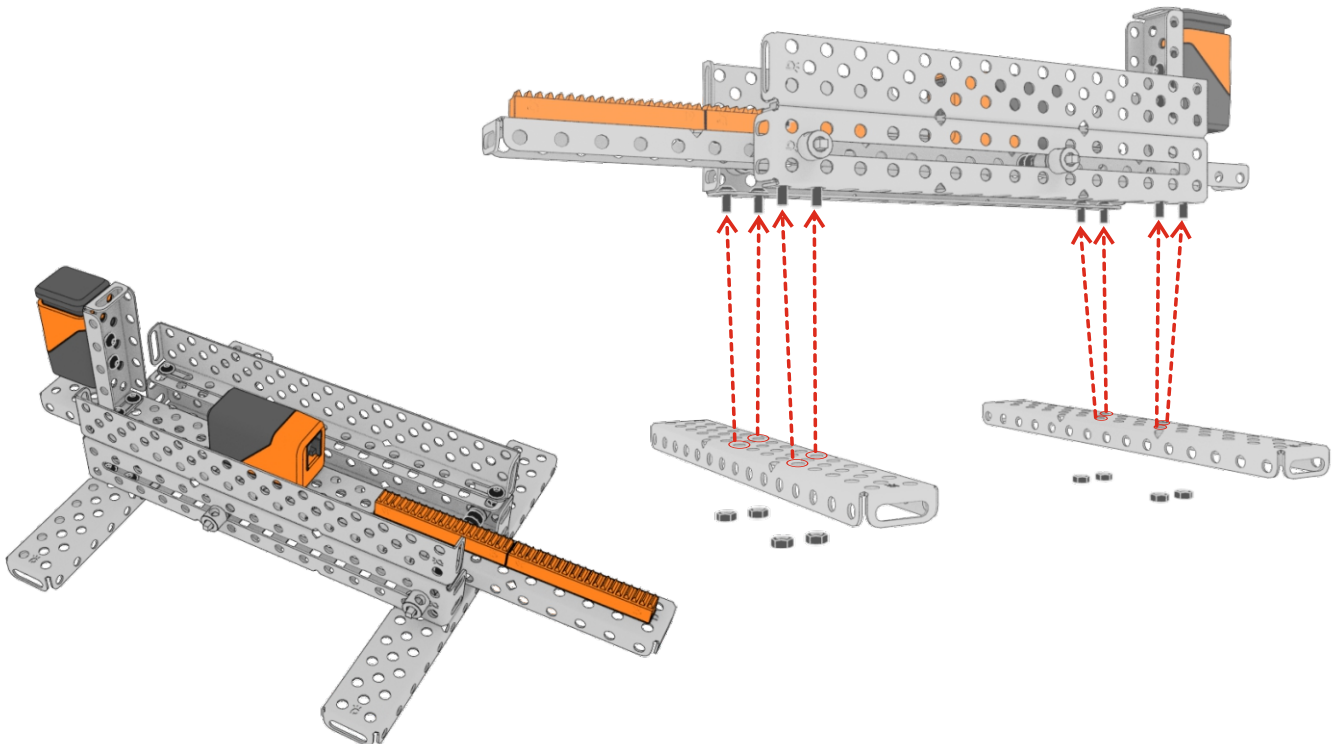
Coffee Vending Machines - Coffee is one of the most popular items being sold in vending machines in the world. In fact, over 8 million cups of coffee are being sold in the UK alone on a daily basis.



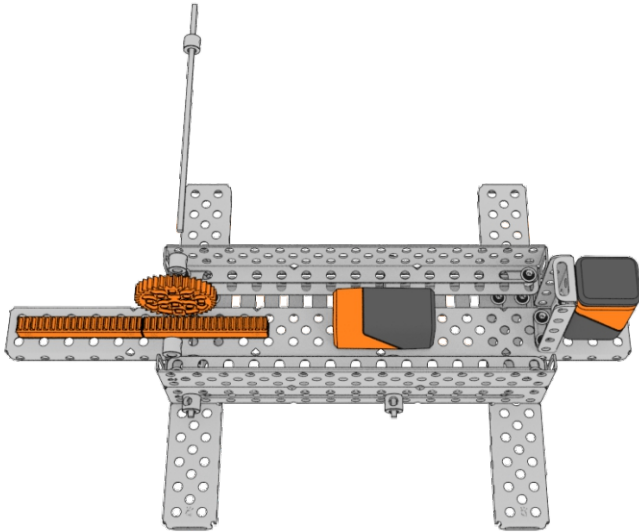
- 8 Connect the assemblies created in step 7 to the 3.5" Axle Shafts already added in step 5. Secure these from the other side with axle locks.



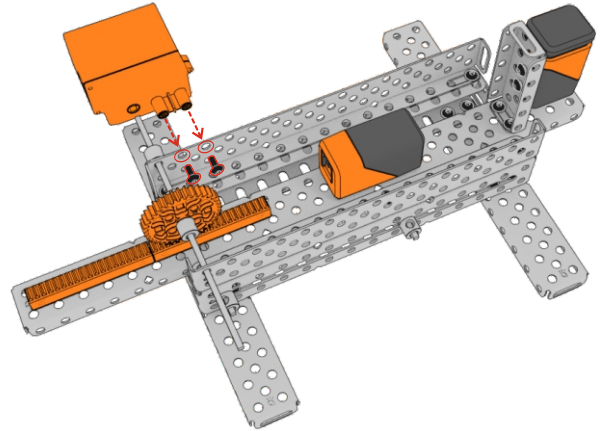
- 9 Now connect, two 7.5" U-Beams with the 7.5" sliders as shown with 4 bolts on each side.



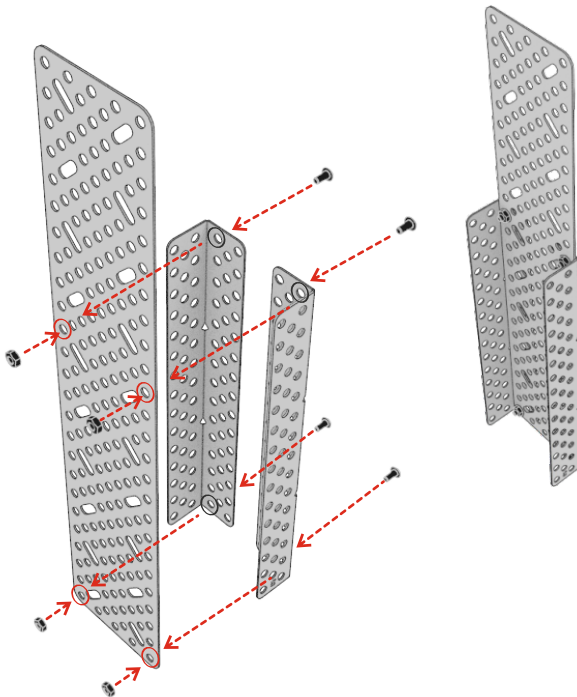
- 10** To make the fixture with rack gear over up and down we mesh a medium spur gear with Rack Gear. We use a 5.5" Axle Shaft moving through the spur gear and the two L-Beams as shown. Secure it with Axle Locks.



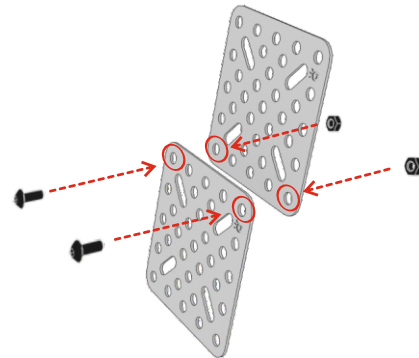
- 11** Connect the High Speed Motor to this shaft and the 7.5" L-Beam.



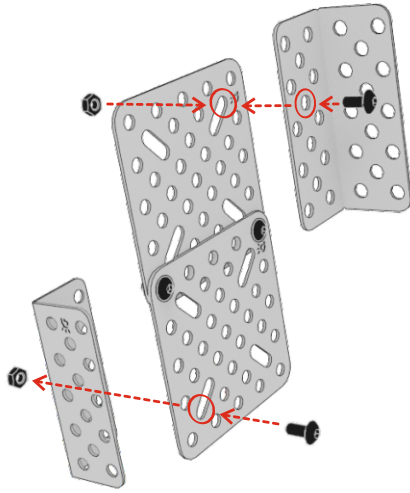
- 12** To make the vending machine body, connect two 7.5" L-Channels with one 12.5" Rectangular Plate on all corners of the L-Channels.



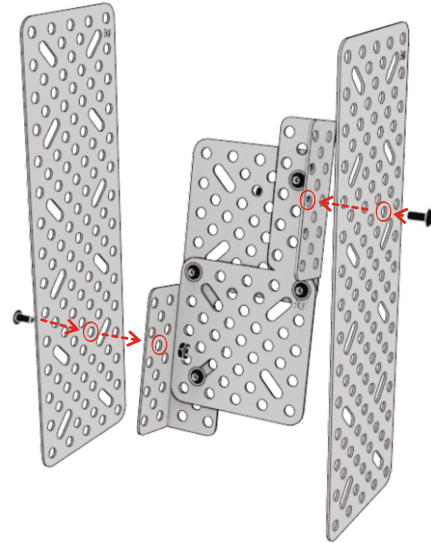
- 13** Connect two 2.5" Square Plate as shown in the figure.



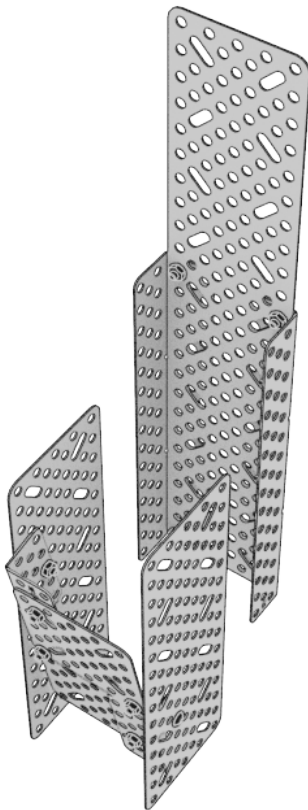
- 14** Connect two 2.5" L-Channels to these Square Plates on either end on holes as marked in the figure.



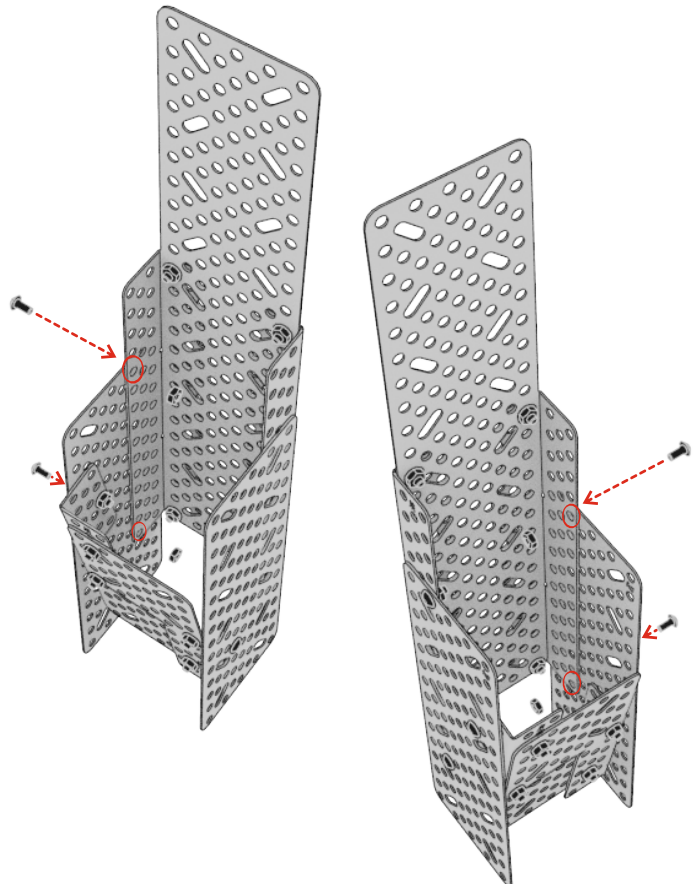
- 15** Take two 7.5" Rectangular Plates and connect them with the 2.5" L-Channels of the assembly made in step 14 at holes marked. It connects at a slight angle.



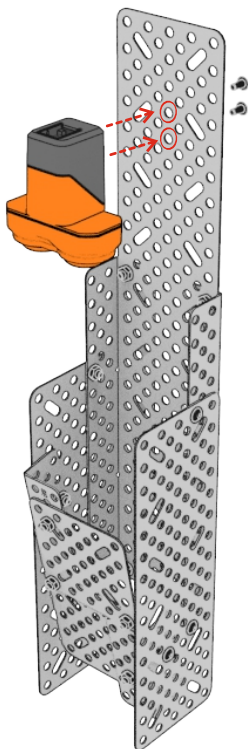
- 16** Connect the two structures to form an enclosed silo structure at holes marked as shown.



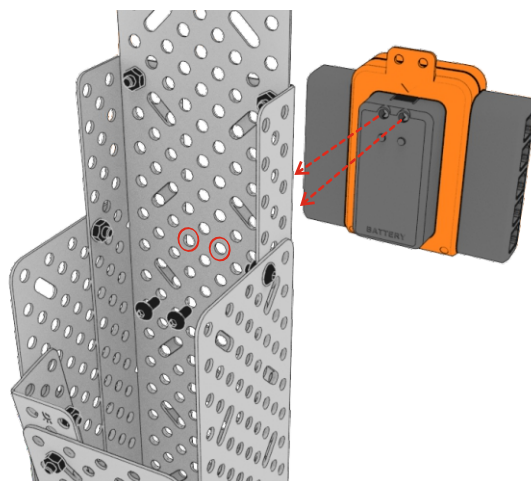
- 17** Secure the holes with bolts.



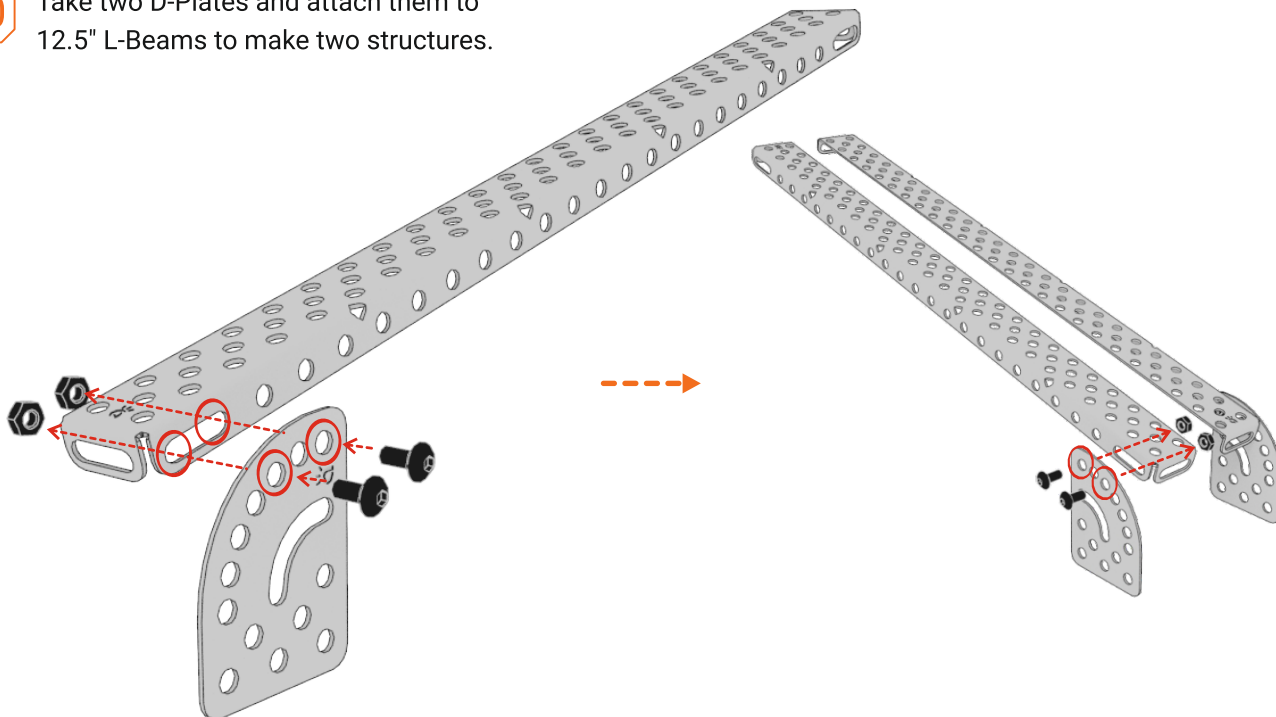
- 18** Connect an Ultrasonic Sensor with 12.5" Rectangular Plate in the middle column in the holes as marked.



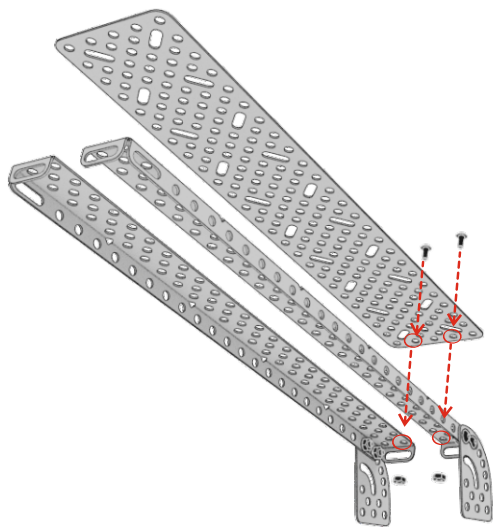
- 19** Connect the Brain and Battery with the 12.5" Rectangular Plate from the outside of the silo structure.



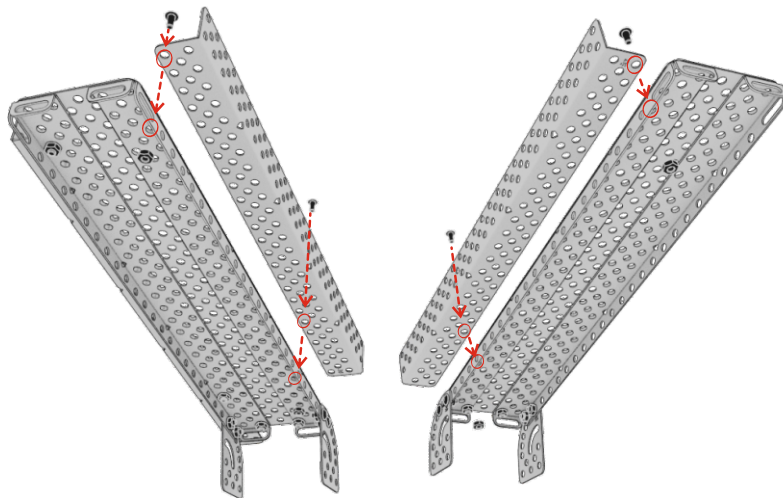
- 20** Take two D-Plates and attach them to 12.5" L-Beams to make two structures.



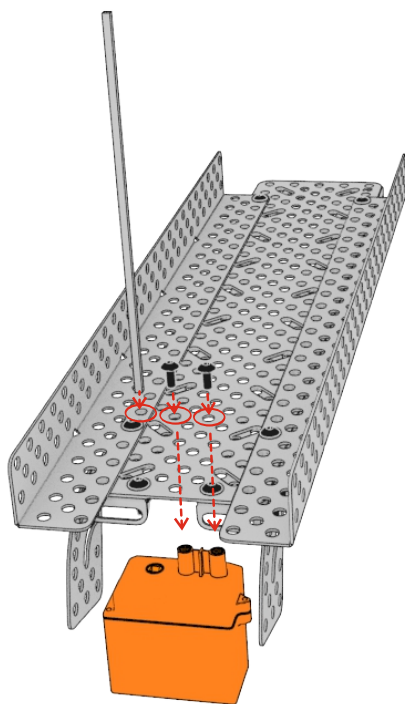
21 Take one 12.5" Rectangular Plate and connect the two assemblies made in step 20.



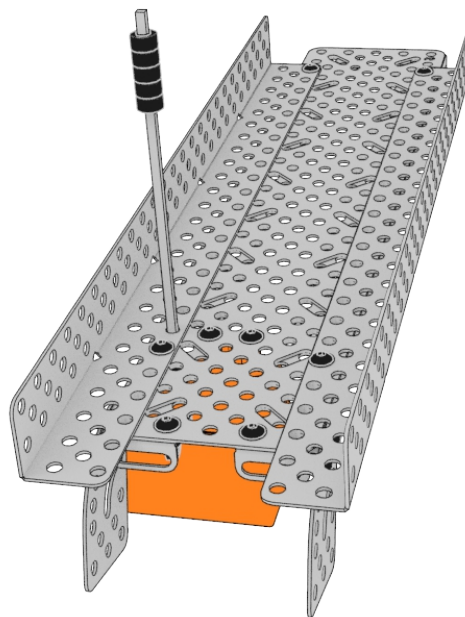
22 Take two 12.5" L-Channels and connect it with a 12.5" Rectangular Plate.



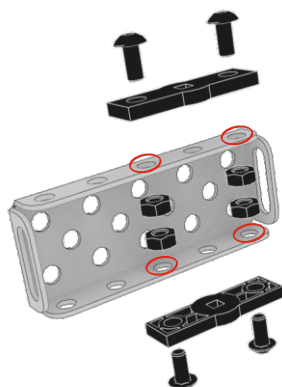
23 Connect a 5.5" Axle Shaft with a High Speed Motor and connect the Motor on one of the 7.5" L-Beam of the structure from step 22.



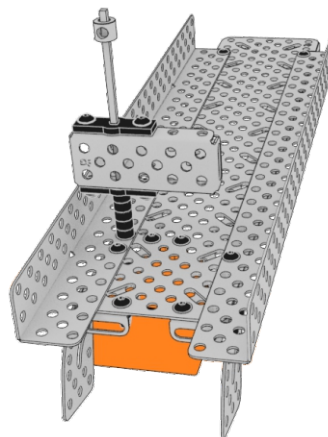
24 Add 5 Fillers in 5.5" Motor Shaft.



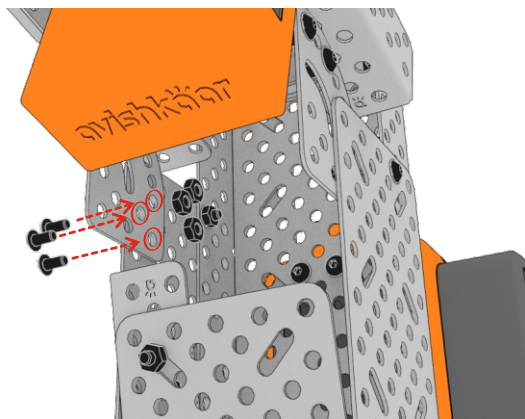
- 25** Add 2 three hole connectors on a 2.5" U-Beam on holes as marked.



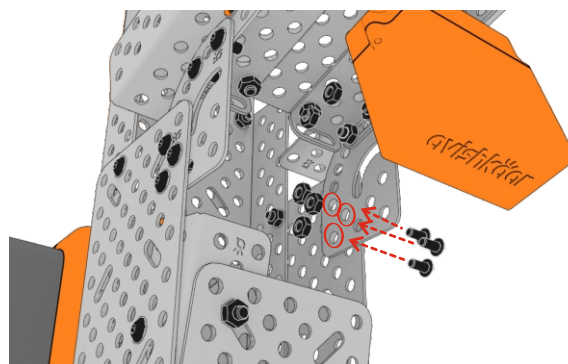
- 26** Connect this assembly with the 5.5" Axle Shaft



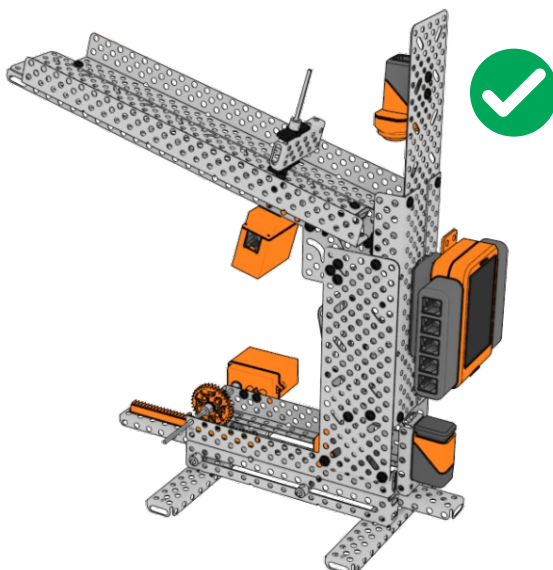
- 27** Connect the D-Plate of this assembly to the silo structure on one side.



- 28** Connect the other D-Plate of this assembly to the silo structure as shown and secure with bolts. This makes the feeder mechanism.



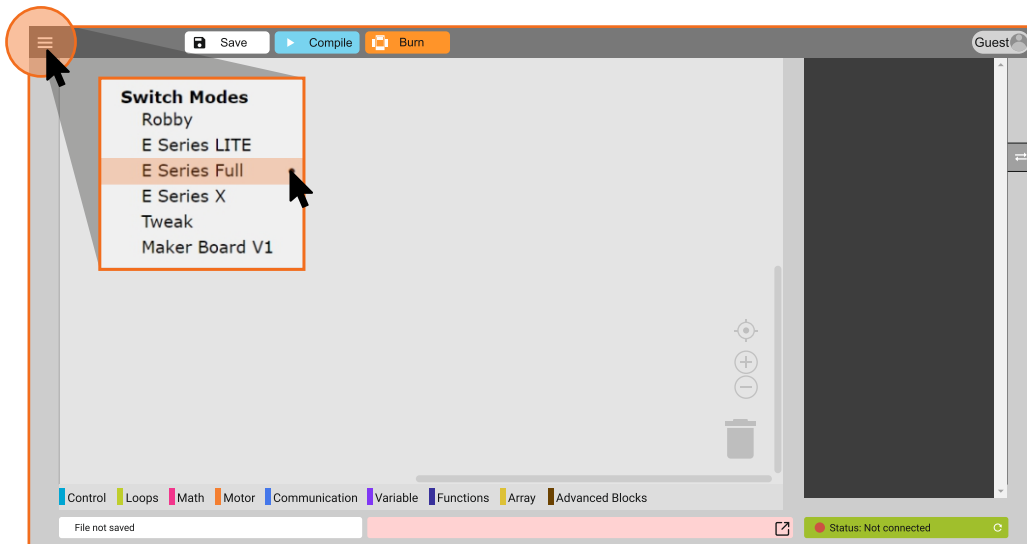
- 29** Your bot is complete!



How to play -with AMS

Set Mode

Open the App and switch mode to E-Series FULL.



Write Code

These blocks should be on the top of the Workspace Area.

Declare `i_count`
Declare `i_count2`
Declare `i_count3`
Declare `i_s`
Define `i_s` to 0

to fullstorage

```
if (i_count > 350 && i_count3 ≤ 6)
do
  Move Motor at Port2 (Advance) Anticlockwise Speed: High
  Time 300 ms
  Move Motor at Port2 (Advance) Stop
  Time 300 ms
  Define i_s to i_s - 1
```

to opengate

```
if (i_count < 350 && i_count3 > 6)
do
  Move Motor at Port2 (Advance) Clockwise Speed: High
  Time 300 ms
  Move Motor at Port2 (Advance) Stop
  Time 1000 ms
  Define i_s to i_s + 1
```

to vendingmechanism

```
if (i_count2 > 750)
do
  Move Motor at Port3 (Advance) Anticlockwise Speed: High
  Time 1000 ms
  Move Motor at Port3 (Advance) Stop
  Time 500 ms
  Move Motor at Port3 (Advance) Clockwise Speed: High
  Time 1000 ms
  Move Motor at Port3 (Advance) Stop
```

```

? to readsensor
  Define i_count to Read IR Sensor at Port1 (Basic)
  Define i_count2 to Read Touch Sensor at Port2 (Basic)
  Define i_count3 to Read Ultrasonic Sensor at Port3

```

```

? My Program
  Repeat while true
  do
    readsensor
    if i_s == 0
    do
      Repeat while true
      do
        readsensor
        vendingmechanism
        if i_s > 0
        do
          break out of loop
        else
          opengate
      fullstorage
      vendingmechanism

```



Congrats!

You are one step away from your 5 badge sticker. Register your kit using the steps on page 2 to access more project tutorials and complete all your badges.

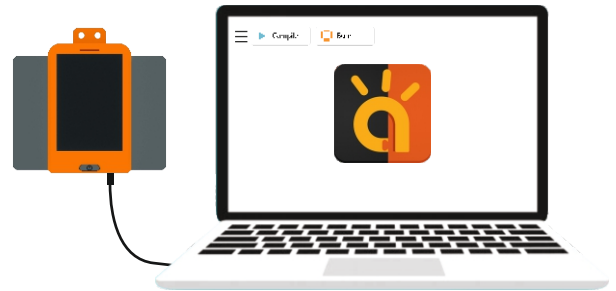
Burn Program on the Brain

01



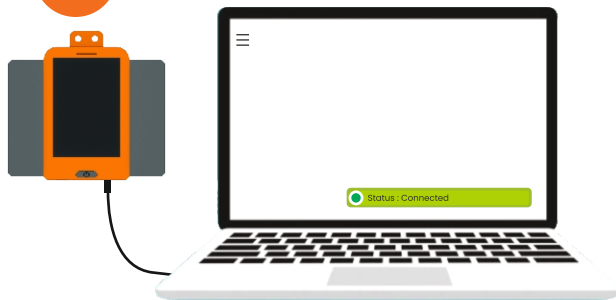
Click on SAVE.

02



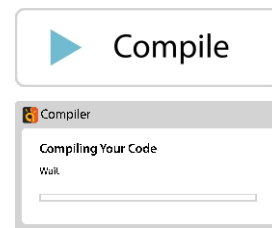
Connect the Full Brain to your laptop.

03



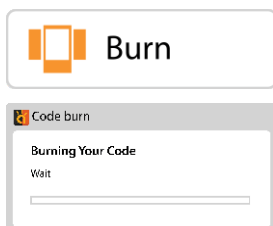
If the brain connected successfully then the STATUS will turn green show Connected.

04



Click on COMPILE.

05



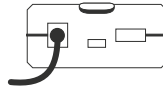
How to play?

1. Connect the top motor of the feeder ramp at M3.
2. Connect the motor of vending mechanism at M2 using remote cable(long cable).
3. Connect IR sensor at S1.
4. Connect Touch sensor at S2.
5. Connect ultrasonic sensor at S3.
6. Feed ping pong balls in the feeder ramp.
7. Turn ON the Full Brain.
8. Press the Touch sensor in the vending mechanism to extract a ball.

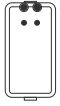
Troubleshooting



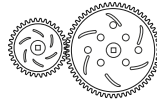
Check if you have connected the ports as mentioned in the chapter.



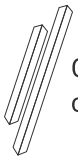
Check whether the wire is connected properly or not.



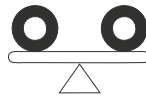
Check if the battery is connected properly to the brain or not.



Check if gears are meshed properly or not.



Check if the axle shaft is properly connected.



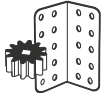
Check your structure is stable or not.



Check if the sensor is working properly or not by using LCD Display.



Check if your sensor is connected at proper height or not.



Check if any of the gear is not stuck with any plate.

In case the suggestions don't work,
do reach out to us:



+91- 8506931515



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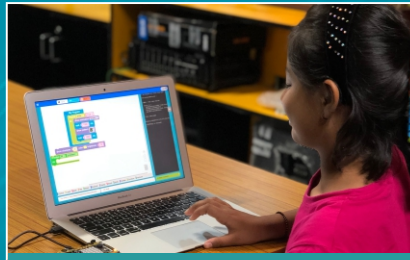


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