

Chain & Omnis Drivetrain Build Instructions



Before you start, make sure you have all needed parts. It may be helpful to have all the parts that you are going to need ready and separated from the rest of the kit.

20 or 30 - 1x1
Connector pegs



8 - 1x2 Connector pegs



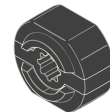
8 - Thin washers



20 - Thick
washer/spacers



16 - Rubber shaft collar



12 - Large Chassis
Corner Connector



4 - Wide, 2x2 Double
Offset Corner
Connectors



2 - 2x Wide, 2x2 Corner
Connector



4 - 2x2 locking plates
(square hole in middle)



4-5 feet of chain



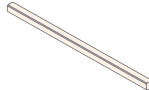
4 - 2x2 clamping shaft
collar plate



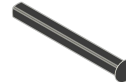
4 - Clamping shaft collar
outside



4 - 6x Metal Shafts



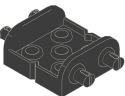
2 - 3x Plastic Shafts



2 - 3x Motor Shaft



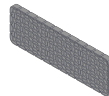
2 - Worm bracket



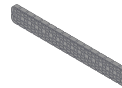
8 - 16 tooth sprockets



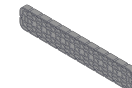
4 - 4x12 plates



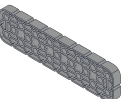
4 - 2x16 beams



1 - 2x12 beam



2 - 2x8 beams



4 - Omni wheels



2 - Smart Motors



Robot Battery



Controller (joystick)



Robot Brain

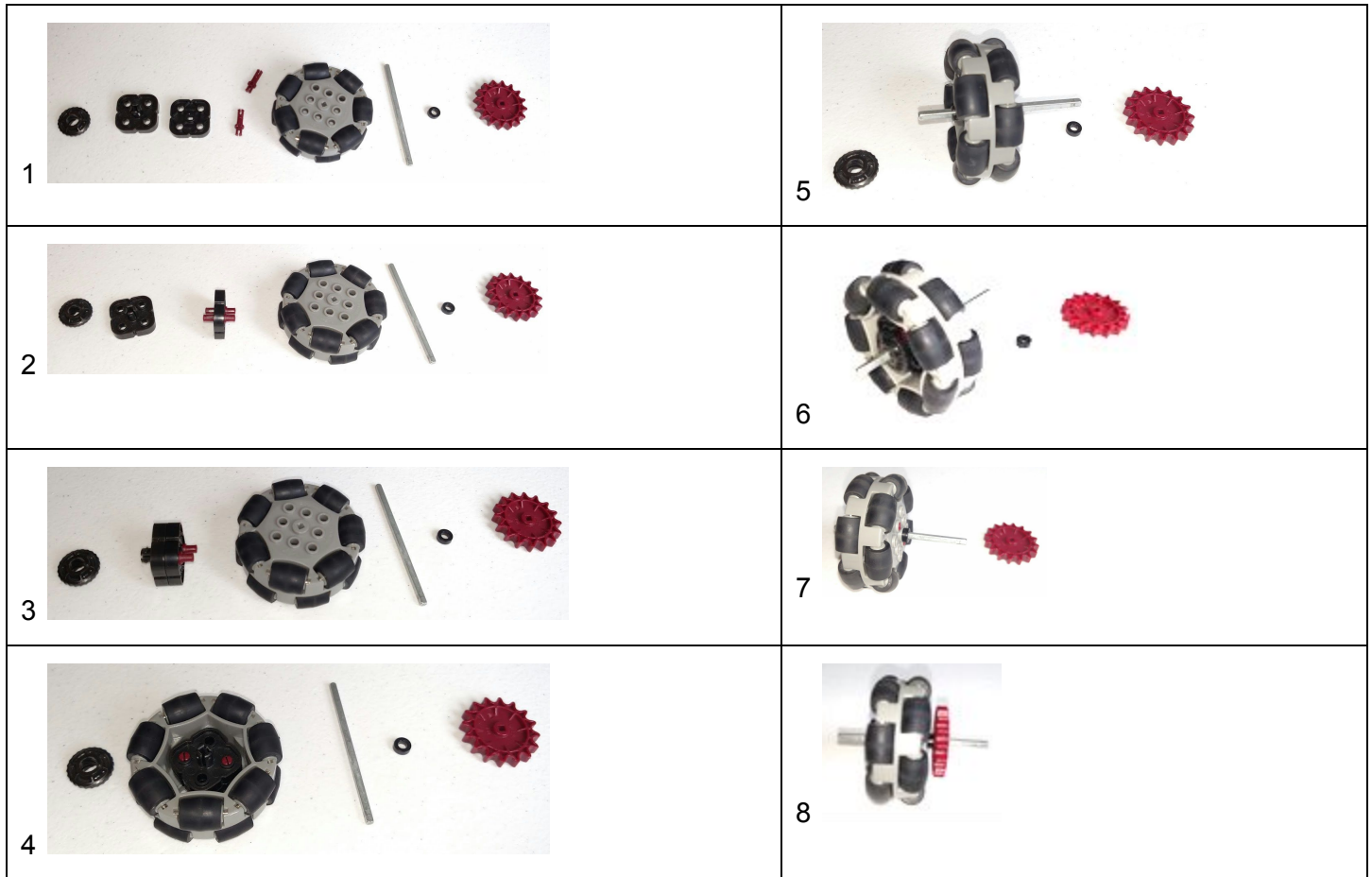


2 - Smart Cables
medium length



Step 1 Build Wheels

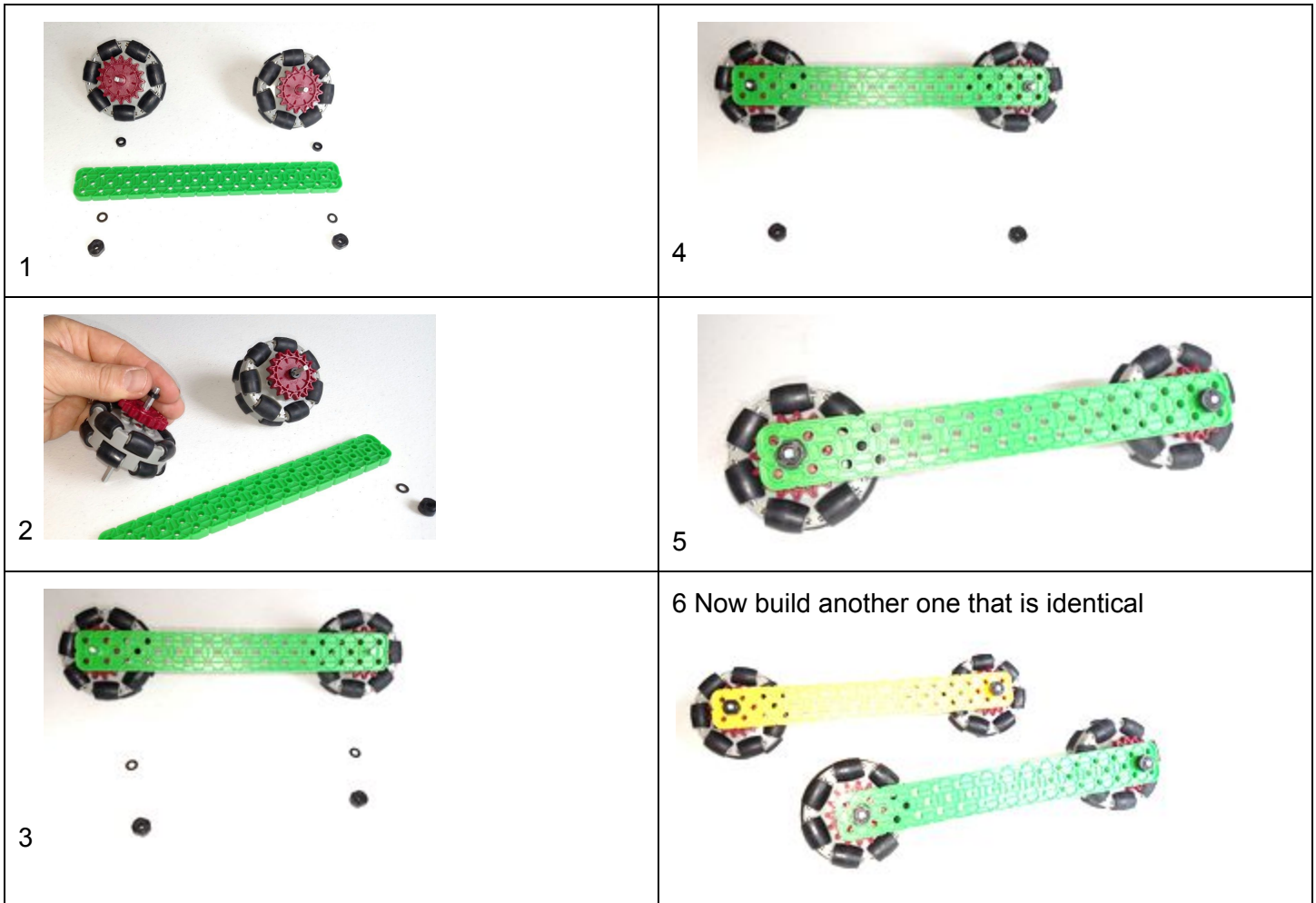
Parts needed for 1 wheel: Shaft Collar, Shaft Collar Bracket, 2x2 locking plate, (2) 2x3 pegs, omni wheel, metal shaft, thick spacer/washer, and sprocket.



Now make 3 more exactly the same.

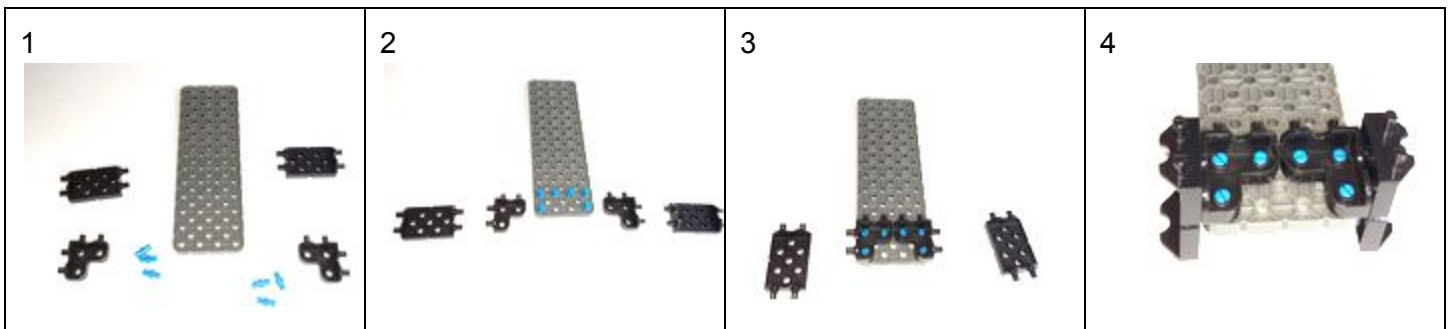
Step 2 - Build Outside Drivetrain

Parts needed for one side: (2) wheel assemblies, (2) thick spacer washers, (1) 2x16 beam, (2) thin washers, and (2) rubber shaft collars



Step 3 - Build Outside Towers




Parts needed for 1 side: (2) wide 2x2 double offset corner connectors, (1) 4x12 plate, (6) 1x1 pegs, (2) large chassis corner connector



Make another outside tower exactly the same for the other side.


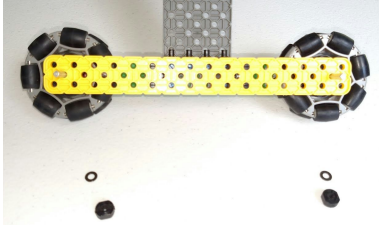
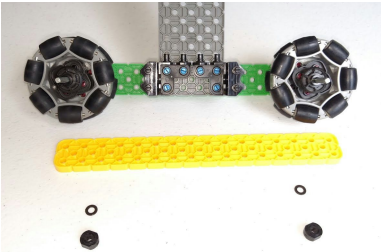
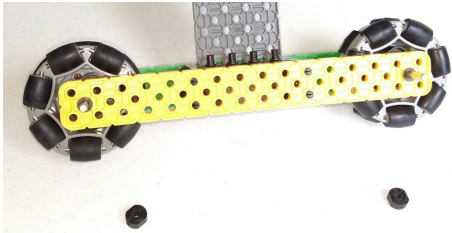
Step 4 - Connect outside towers to outside drivetrains

Parts needed for 1 side: outside tower assembly, outside drivetrain assemblies.

<p>1</p> 	<p>2b Close up</p> 
<p>2 Center tower on beam, count the number of holes on the beam and make sure both ends are the same</p> 	<p>3 Do the other side exactly the same way</p>




Step 5 - Inside beam of drivetrain


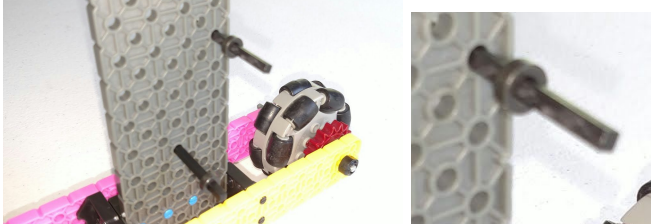

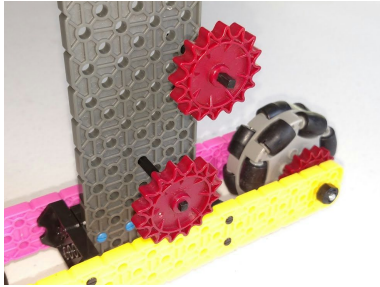

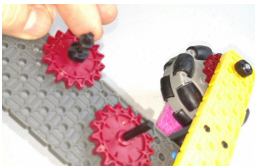

Parts needed for 1 side: outside tower and drivetrain assembly, (2) thick washer/spacer, (1) 2x16 beam, (2) thin washer, (2) rubber shaft collar

<p>1 Place thick washer/spacer on each shaft</p> 	<p>3</p> 
<p>2</p> 	<p>4</p> 
	<p>5 Place a rubber shaft collar on end of each shaft</p>

Step 6 - Sprockets

Parts needed for 1 side: (1) plastic shaft with end, (1) plastic motor shaft, (4) thick washer/spacer, (2) 16 tooth sprocket, (2) rubber shaft collar, tower and drivetrain assembly

<p>Parts</p> 	<p>When finished the left and right</p>  <p>Left</p>	<p>will be mirror images of each other</p>  <p>Right</p>
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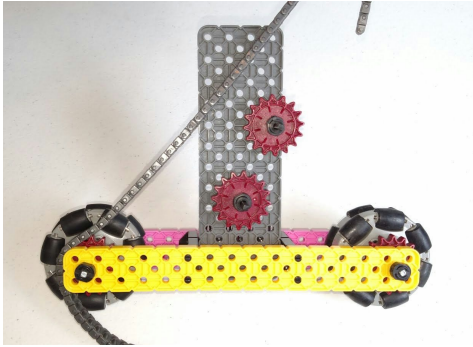
<p>1. Plastic motor shaft goes in the 5th hole down on the left.</p>  <p>(Note for the other side put the shaft in the 5th hole down on the <u>right</u>.)</p>	<p>3. Turn assembly around and place thick washer/spacer on the end of each shaft</p> 
<p>2. Insert plastic shaft with end into 3rd visible hole from the bottom and in the middle</p> 	<p>4</p> 
<p>2b. Here's how it should look so far</p> 	<p>5 Add rubber shaft collars</p>  <p>6 Add thick washer/spacers</p> 

Step 7 - Chains

Parts needed for 1 side: (about 2 feet) chain, left and right assemblies

Note: be careful not to let the spacers at the end of each shaft fall off

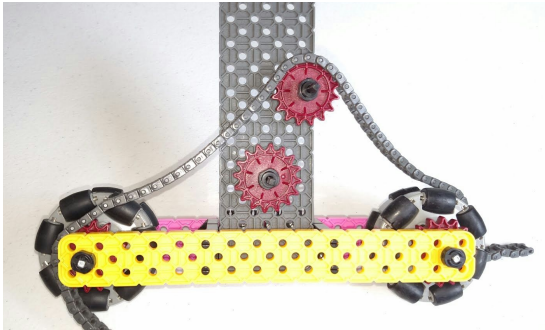
1 Start by running chain around one wheel



5 Remove extra chain links



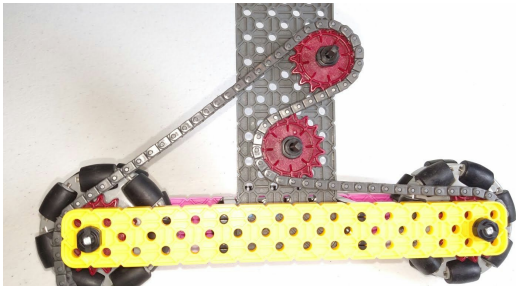
2 Run the chain over the top gear



6 Connect ends of the chain together



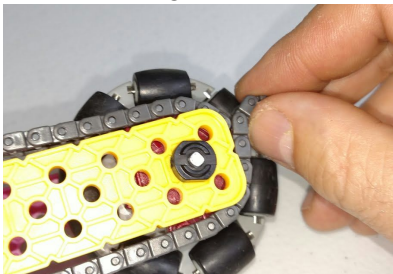
3 Run the chain between the sprockets to make an S shape



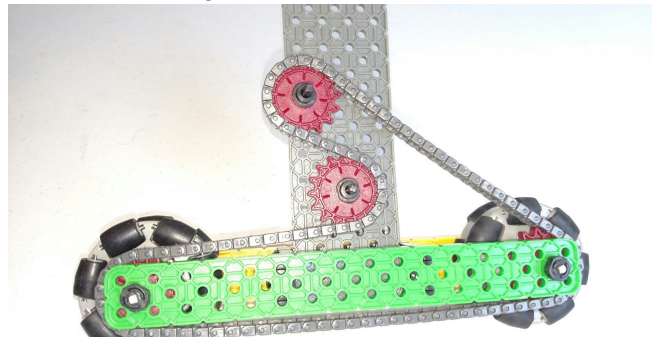
7 Left side is done



4 Bring the one end of the chain to where the other end left off. The chain should be a little long. (If not add links to make it too long). Pull the chain to make it taut, and note which link should be removed to make it the right size.



8 Now do the right side. It will look like this



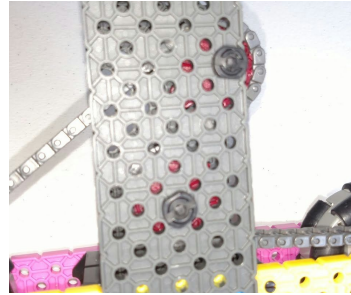
Step 8 - Inner tower plate

Parts needed for 1 side: (1) 4x12 plate, (4) 1x1 pegs, (2) rubber shaft collars

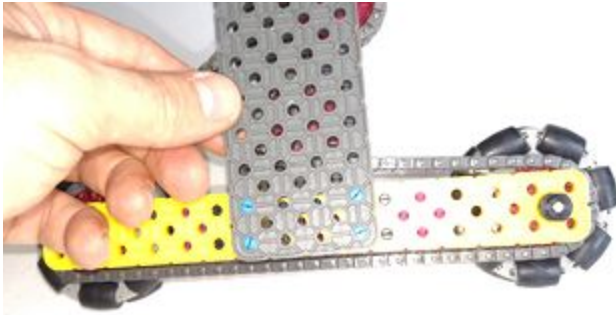
1



4. Add shaft collars



2 Center plate on beam



5. Now make the other side.



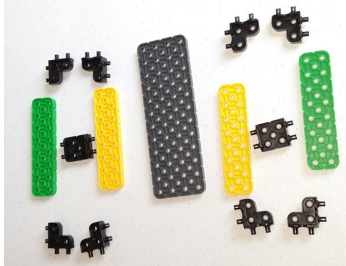
3 The shafts that hold the sprockets should stick through the plate once connected. Again, the motor shaft should be in the 5th hole down on one side, and the other shaft should be in the middle in the 3rd visible hole.



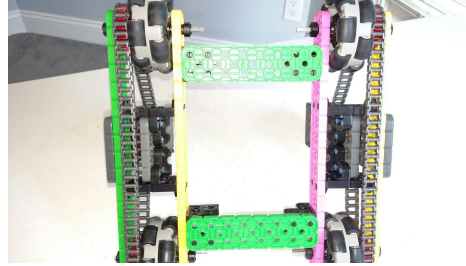
Step 9 - Cross supports

Parts needed: (4) 2x8 beams, (8) large chassis corner connectors, (2) worm brackets

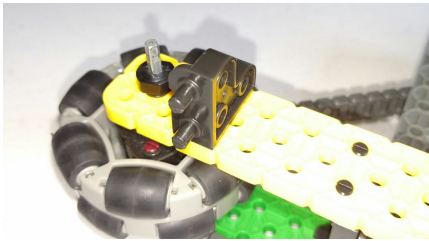
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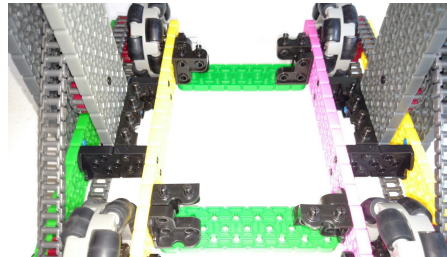
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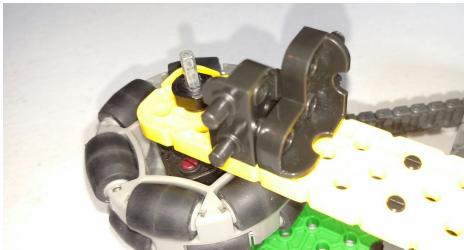
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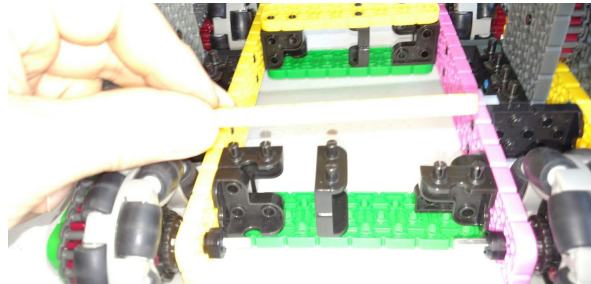
7. Flip robot back upright



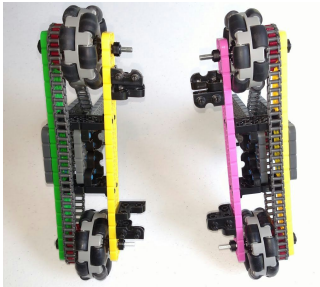
3. Attach two corner connectors next to each wheel



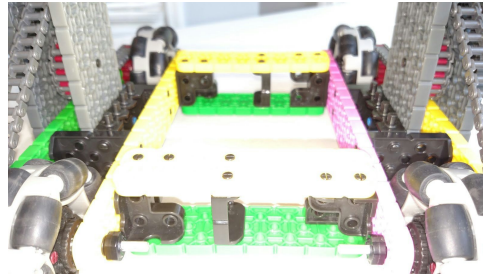
8. Attach top brackets



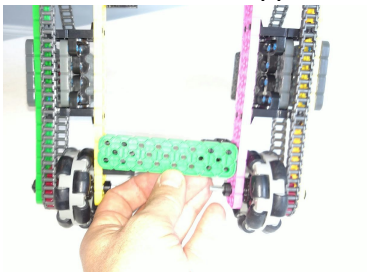
4. Tip assemblies back to view bottoms



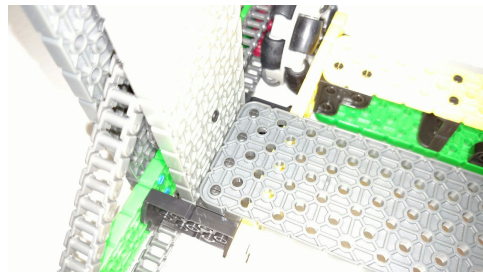
9



5. Attach bottom support



10



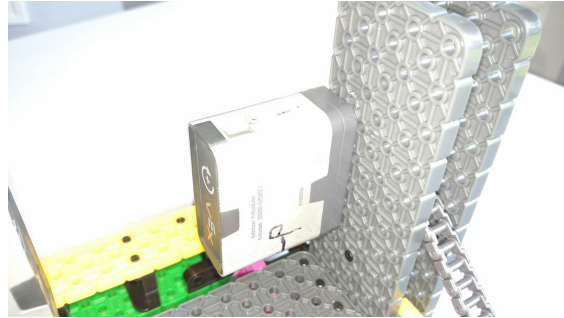
Step 10 - Mount Motors

Parts needed: (2) motors, (6) 1x1 pegs

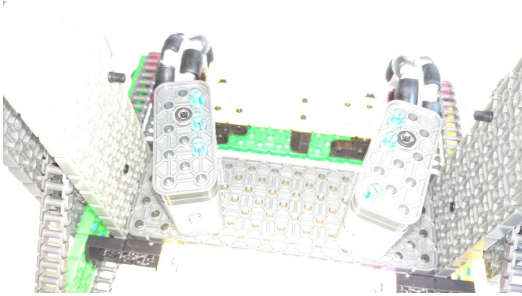
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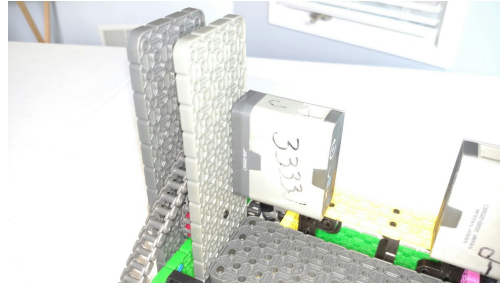
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2

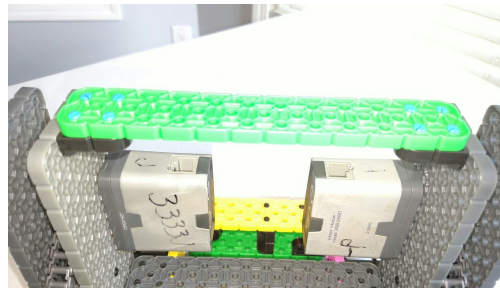
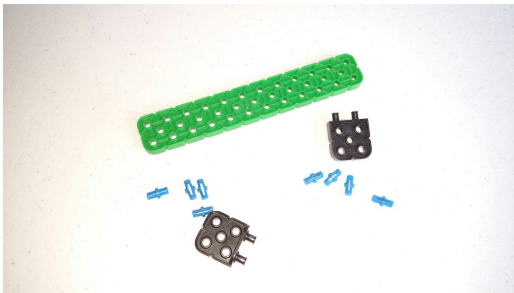


4



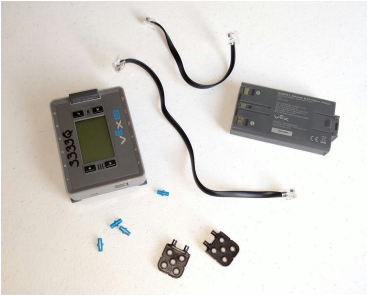


Step 11 - Top support

Parts needed: (1) 2x12 beam, (2) 2x wide 2x2 corner connector, (8) 1x1 pegs

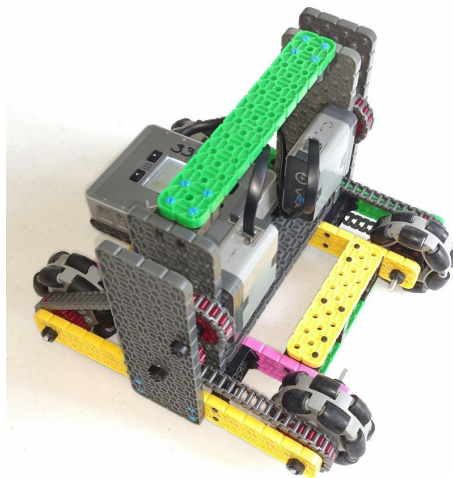


Step 12 - Mount Brains

Parts needed: (2) Smart cables, (2) 2x wide 2x2 corner connector, (4) 1x1 pegs, brain, battery

	
	<p>Connect other end of cables to motors</p>

The robot is now build. You can use driver control or follow the next step to program it using ModKit.



Step 13 - ModKit Program

Parts needed: (1) Chain & Omnis Robot, (1) Computer running ModKit, (1) USB Cable

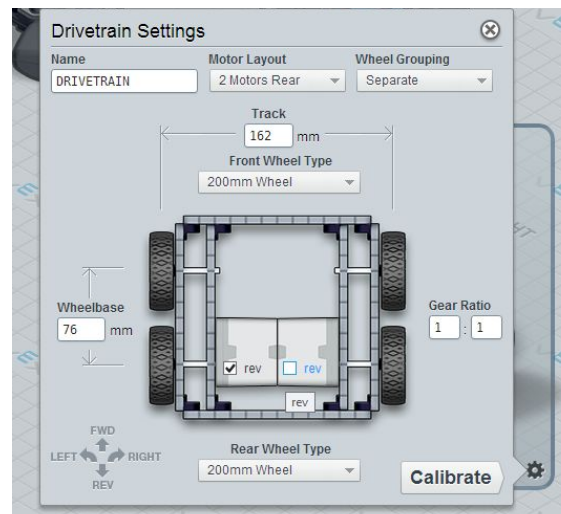
1. Create a new project and then add Controller and Drivetrain to it. Once you do it should look like this:



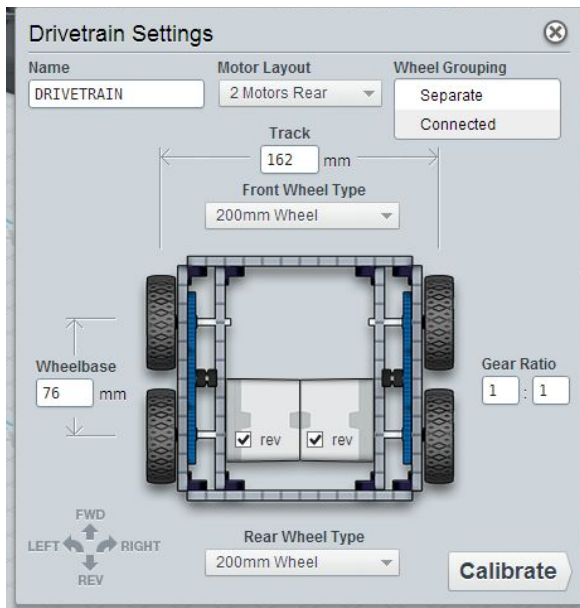
2. Configure the ports for the drivetrain. Which ports do the wires from the motors go into the brain? You can use any ports you want. But if you use ports 6 & 7 then the Driver Control program will work too.



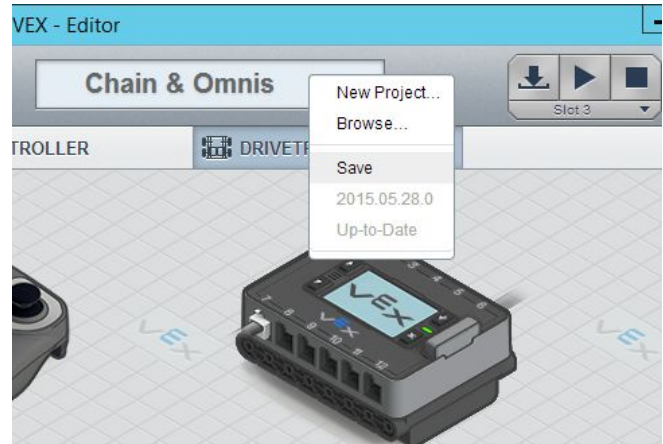
3. If you want the back of the robot to where the brain is then reverse the direction of the motors. Click on the gear icon (configure) and then click the “rev” checkbox on each motor.



4. For the Wheel Grouping section select "Connected". You can optionally measure and input the wheelbase, but the program will work without that setting. Calibrate is optional too.



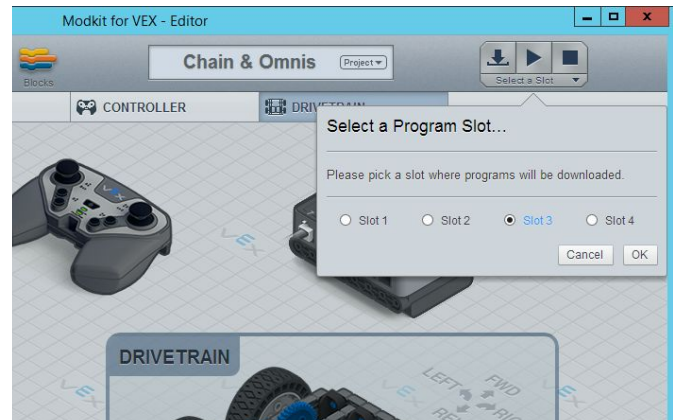
6. Give your program a name and save it.



5. Configure the controller actions for the drivetrain.



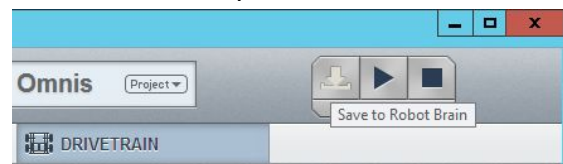
7. Select a slot for the program on the brain.



6. Only the A and C joystick settings need to be set.



7. Save program to the brain. Make sure your USB cable is hooked up first



Step 14 - Test Robot

Slot 3 on the brain should now have your program. Fire it up and try it out!