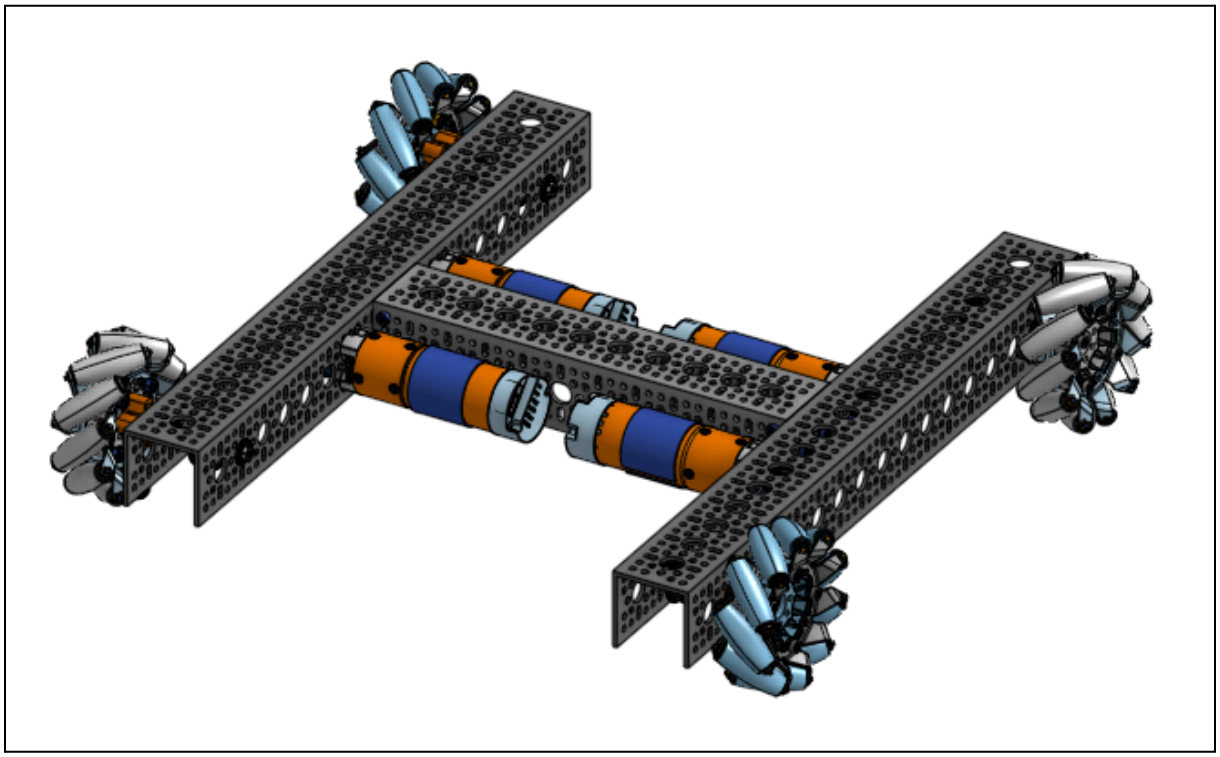
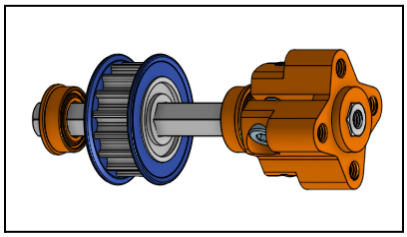
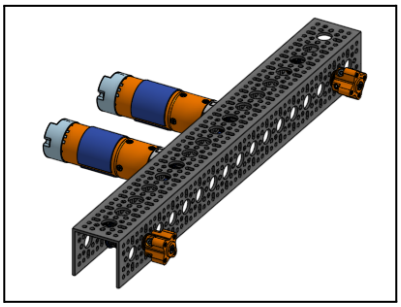
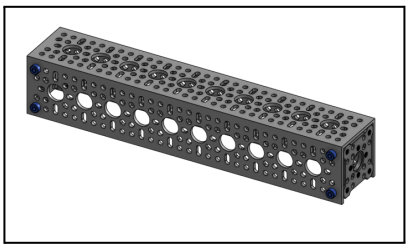
Directions Belt Chassis V2025.1
Building Directions
Marist Robotics

Description:

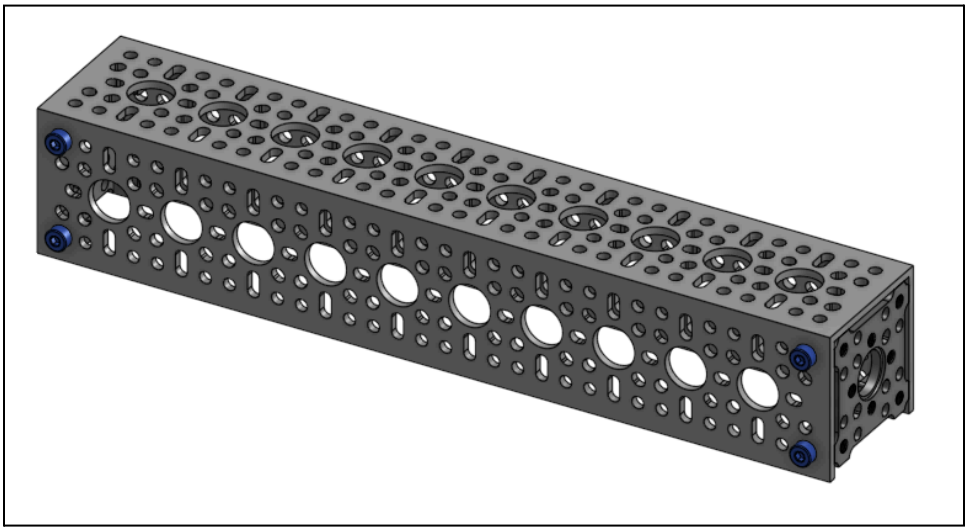




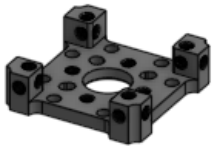




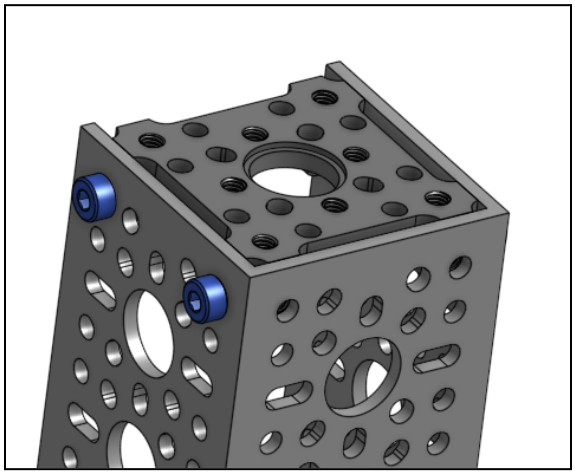
Process: Creating the Cross Beam Assembly:

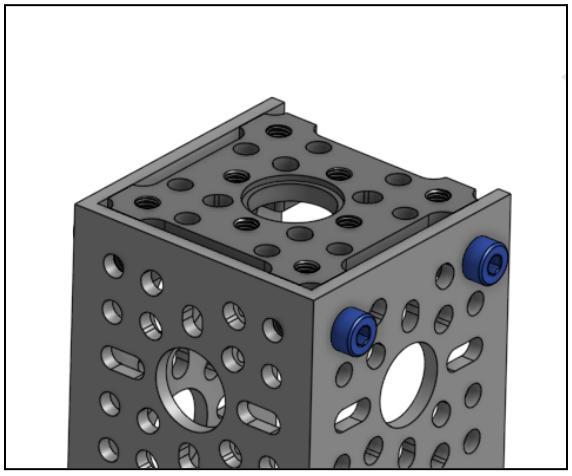


1. We will need the following parts for this Assembly:

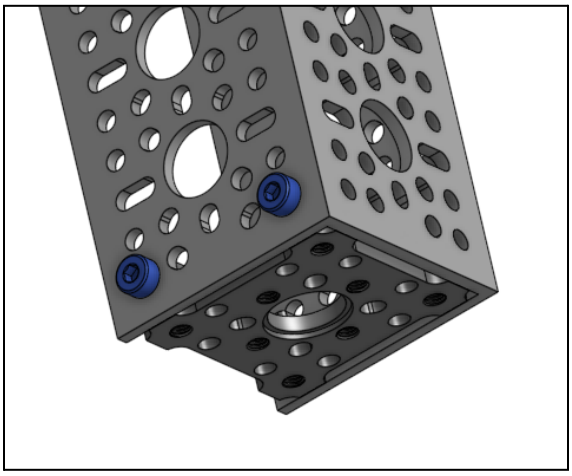
Part Number	Name	Image
1100-0010-0264	10 Hole U Channel	
1201-0043-0002	Quad Block (2x)	
2800-0004-0008	6mm Bolt (8x)	

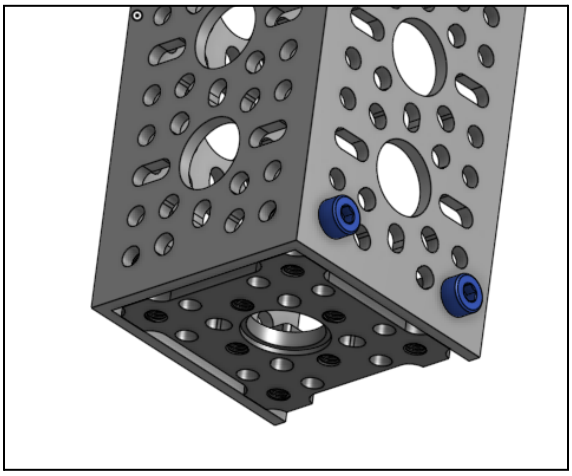
2. Use the 3mm Bolt Driver and attach the quad blocks for four bolts (2 on either side) of the 10 Hole U Channel.





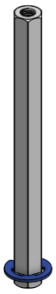
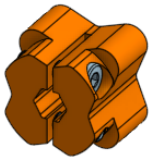
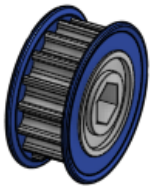
3. Repeat the process for the bottom of the U Channel:



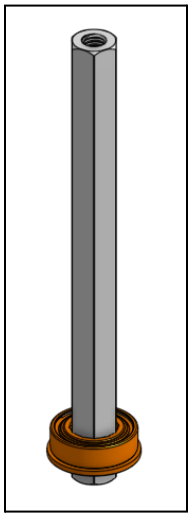


Creating the Axle Assembly (4x)

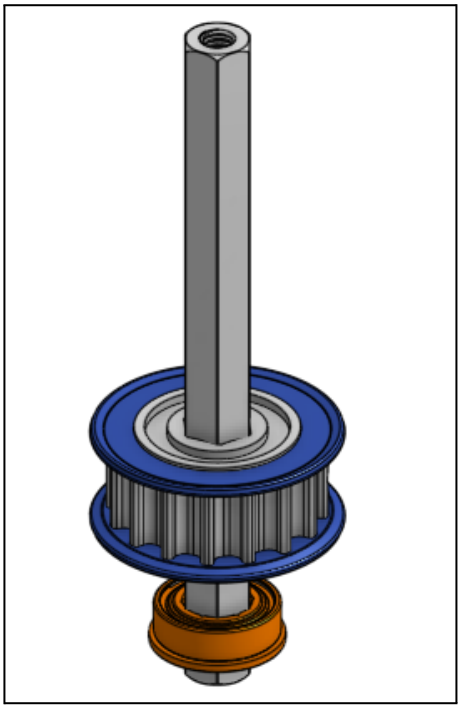
4. The Axle Assembly is made of the following parts.

Assemblies		
Part Number	**Name**	**Image**
2106-4008-0800	80mm Axle	
1310-0016-4008	Hyper Hub	
1611-0514-0006	Flanged Bearing (2x)	
3417-4008-0016	16 tooth pulley	

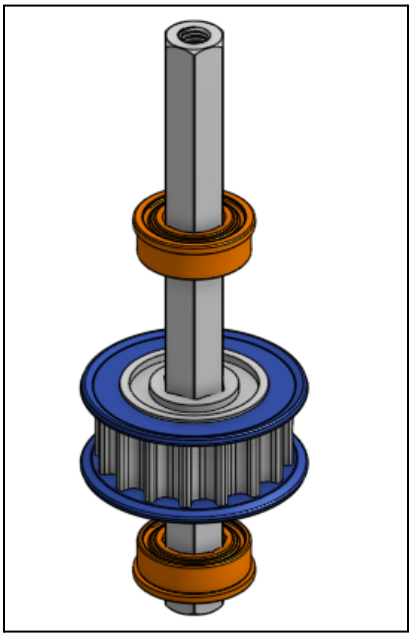
5. Slide the Flanged Bearing down to the end of the clip side of the Axle



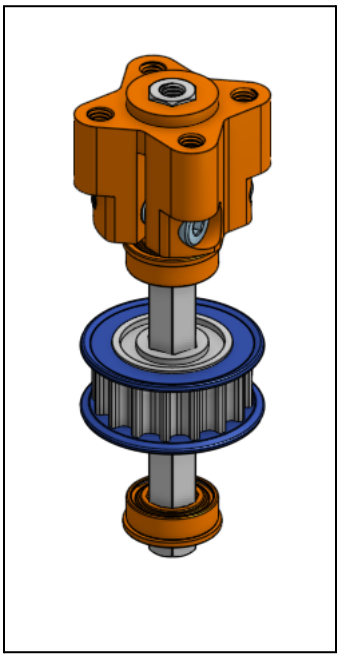
6. Slide the 16 tooth pulley onto the Axle:



7.Slide the 2nd Flange bearing onto the axle:

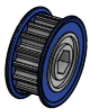
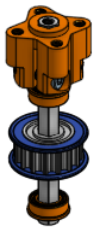


8. Secure the Hyper Hub to the top of the Axle. You will need to make four of these parts.

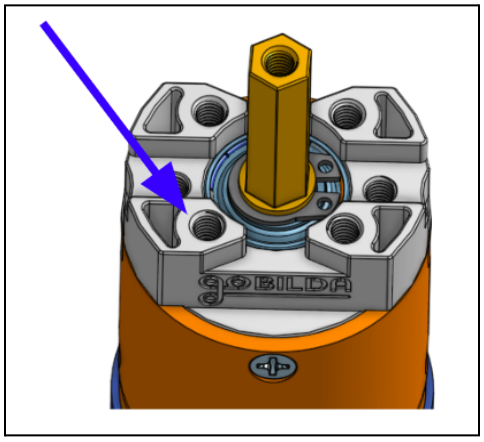


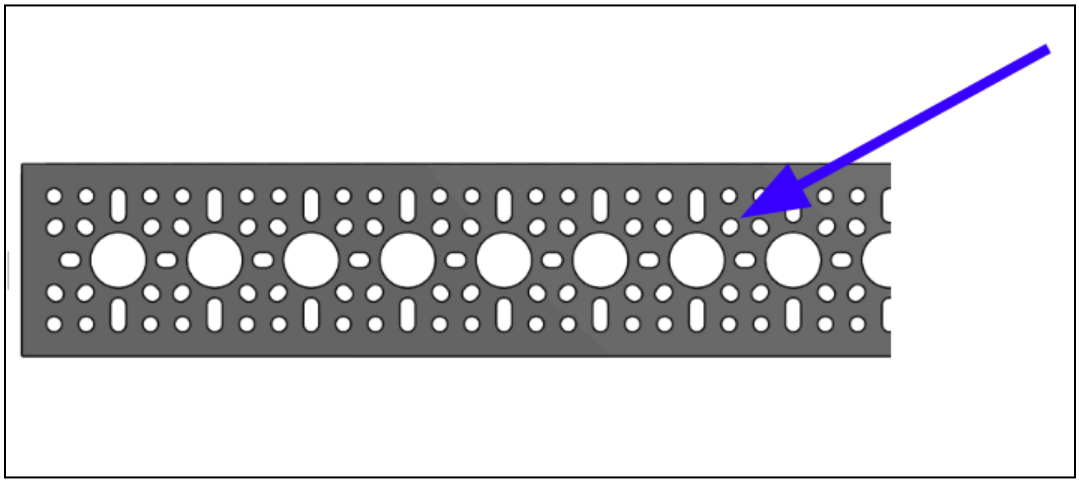
Creating the Rail Assembly (2x)

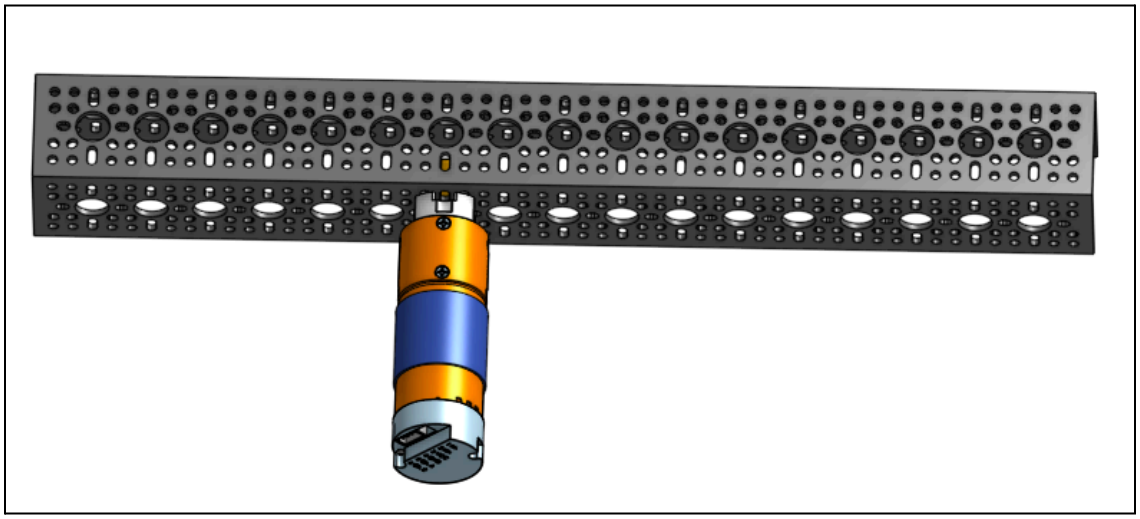
9. The following parts make up the Rail Assembly

Parts		
Part Number	**Name**	**Image (Rotated)**
1100-0017-0432	17 Hole U Channel	
2800-0004-0008	8mm Bolt (8x)	
Assemblies		
Part Number	**Name**	**Image**
5203-2402-0019	19:1 DC Motor (2x)	
3417-4008-0016	16 Tooth Pulley (2x)	
1611-0514-4008	Flanged Bearing (2x)	
Current Document Tab	Wheel Axle Assembly (2x)	

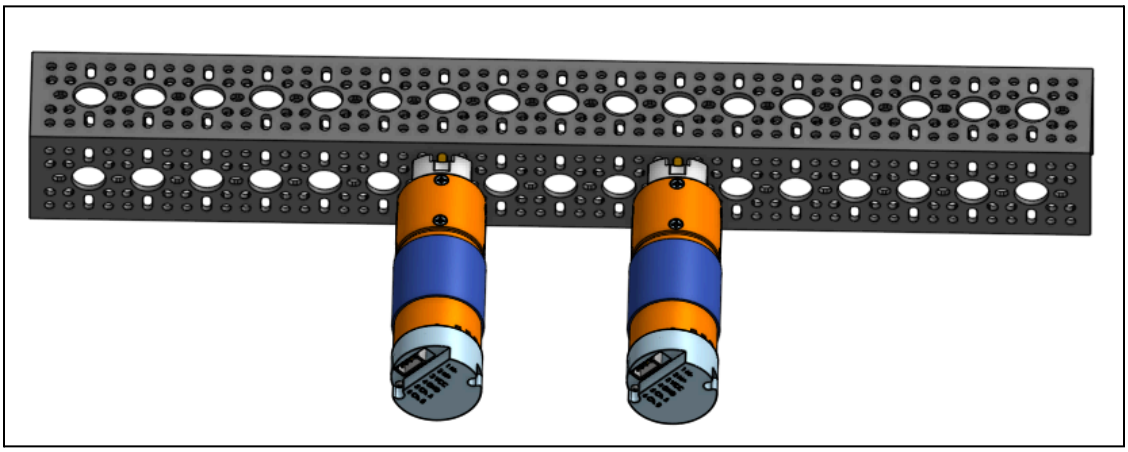
10. Attach the DC motor to the 7th hole from the end of the U Channel. Use the bolt hole on the motor and the small hole in the “1 o’clock” position on the U Channel.



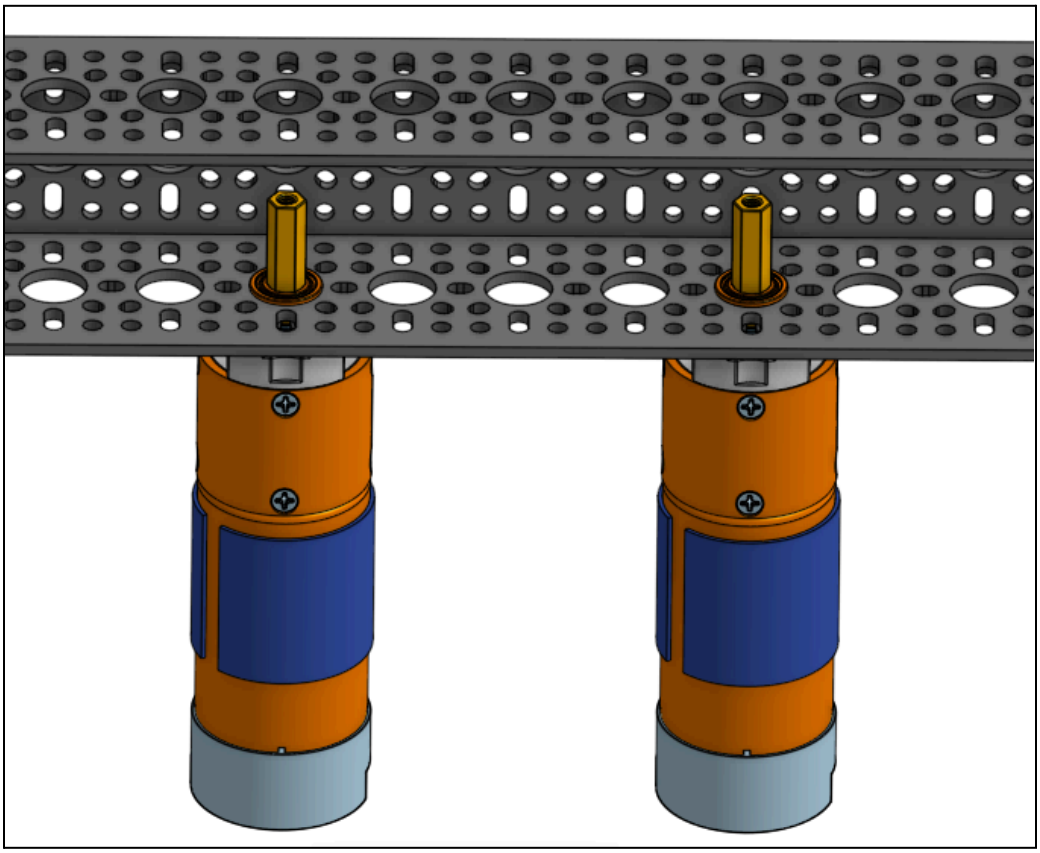




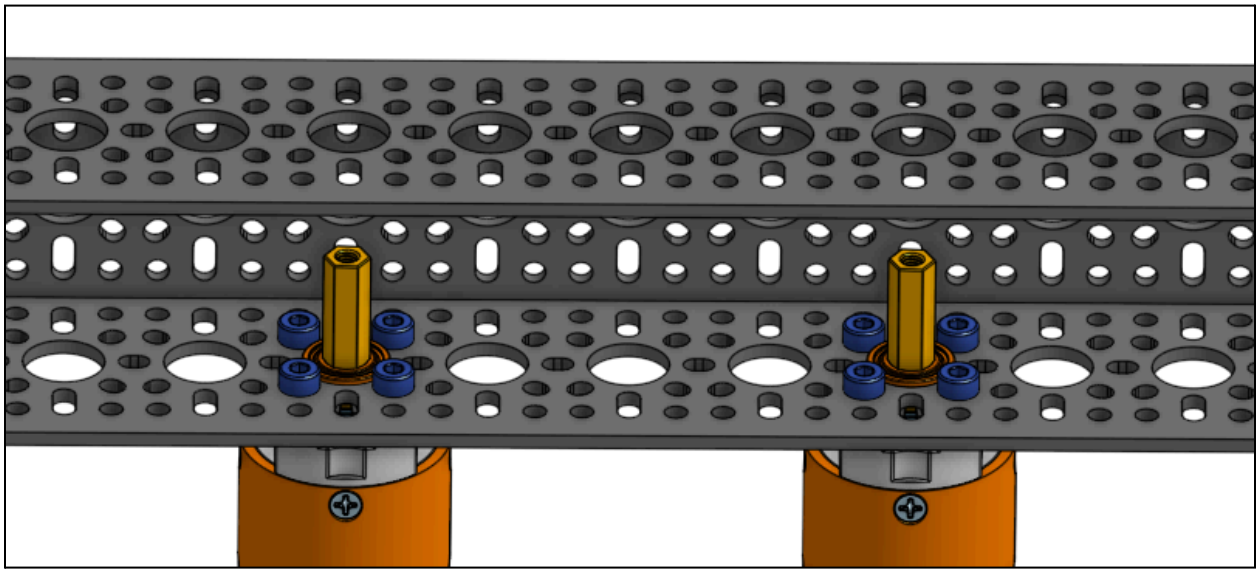
11. Repeat the process and attach the second DC motor 7 holes back from the other end of the U Channel.



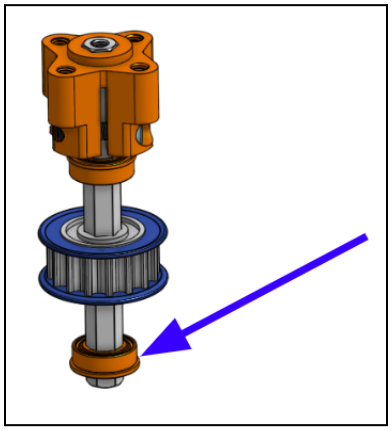
12. Attach the two flanged bearings to the U channel where the motor axles pass through the U channel.

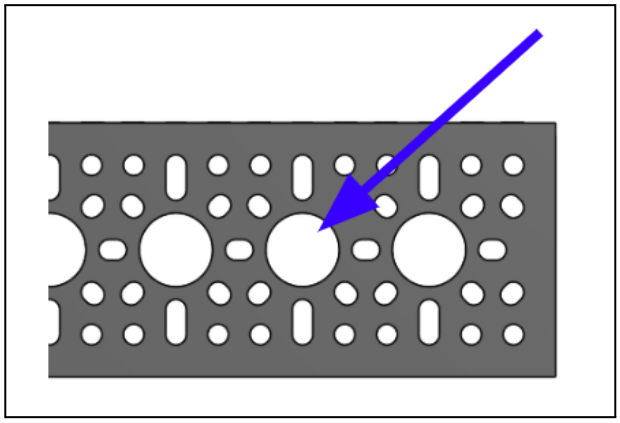


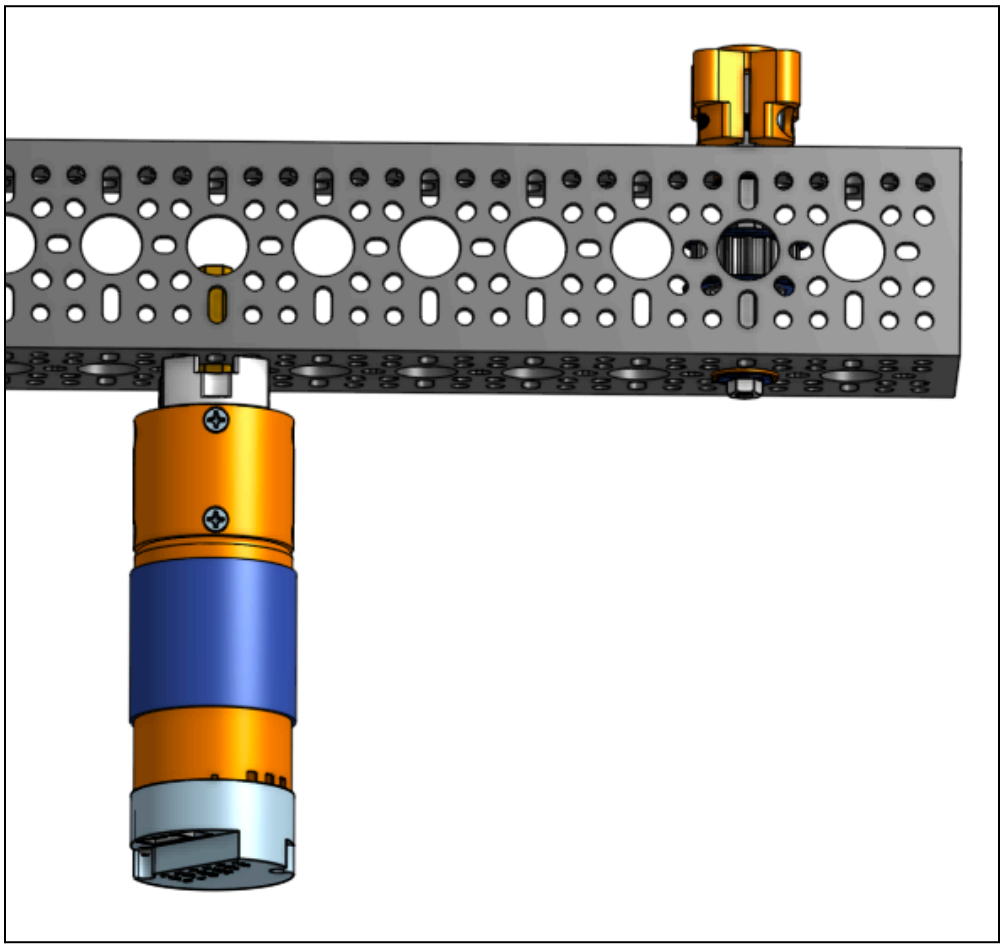
13. Attach the 8mm bolts (8x) to the two motors on the inside of the U Channel.



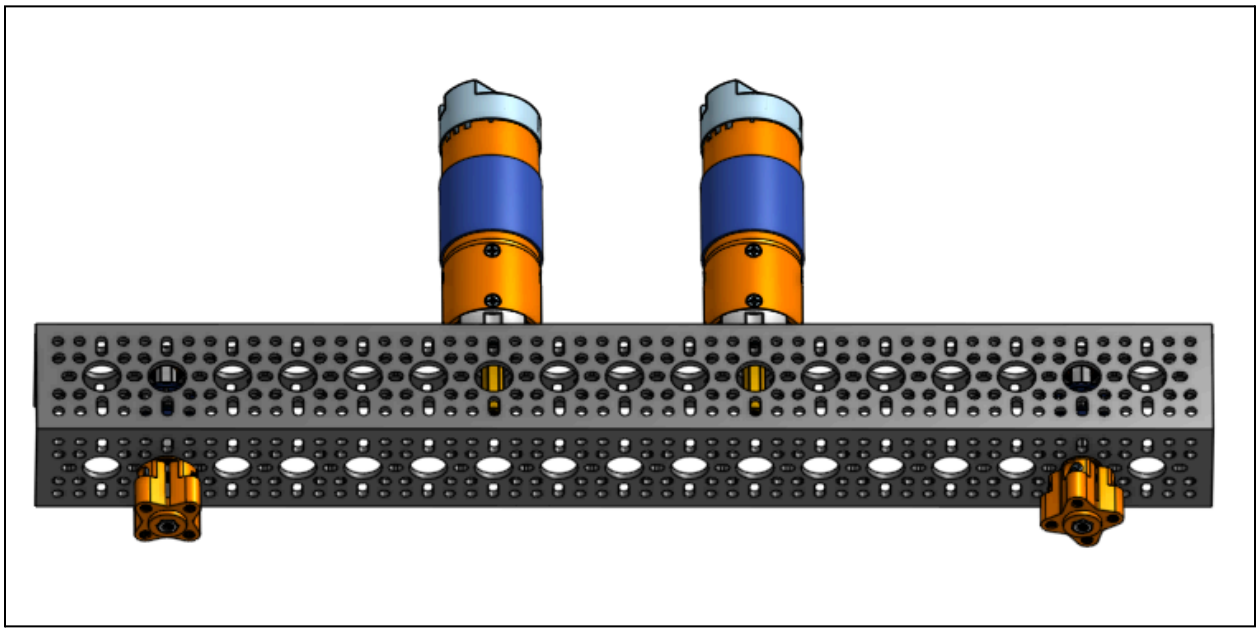
14. Attach an Axle assembly to the second hole from the end of the U Channel. You will need to disassemble the Axle assembly and then reassemble. Place a 55 or 64 tooth belt over the pulley before finalizing the assembly



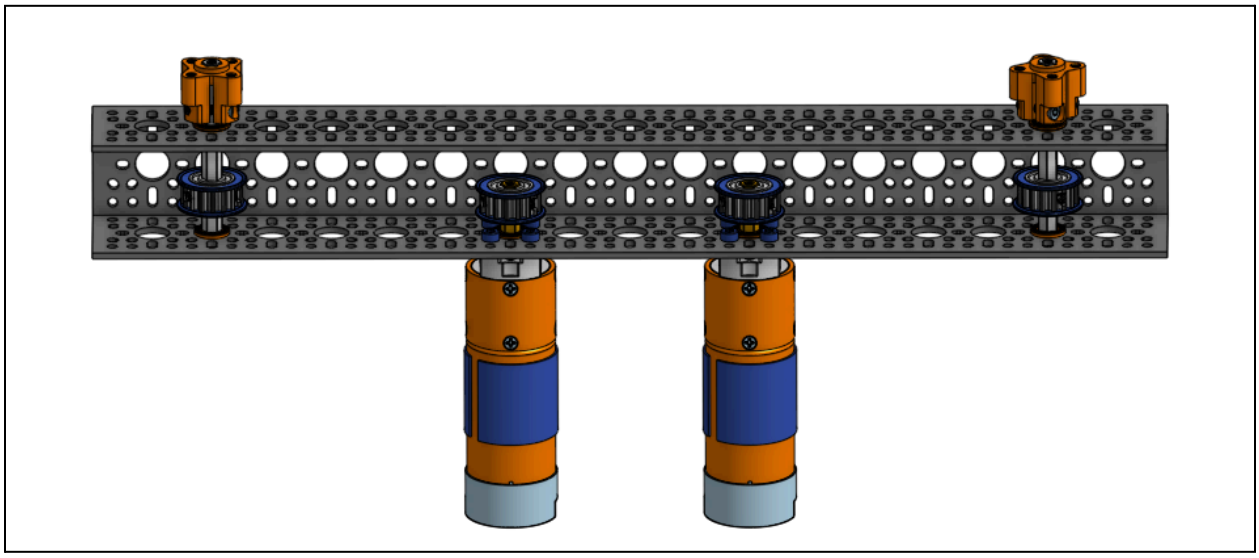




15. Repeat the process and attach the 2nd WheelAxle to the 2nd hole from the end of U Channel.

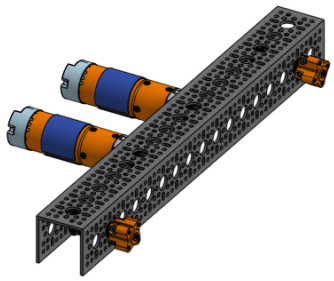
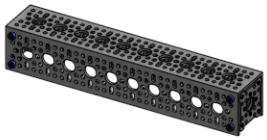
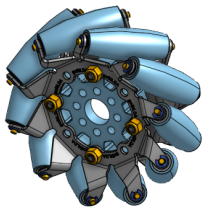
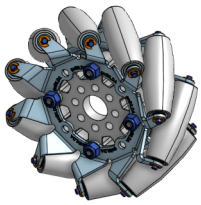


16. Attach two pulleys to the motors and tighten with the set screws using the 2.5mm Bolt Driver. (The belts are not shown below)

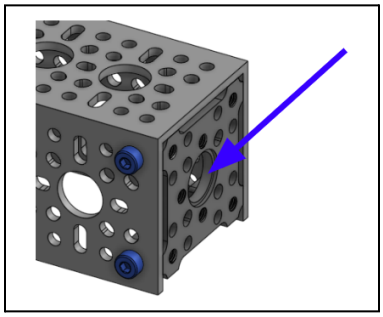


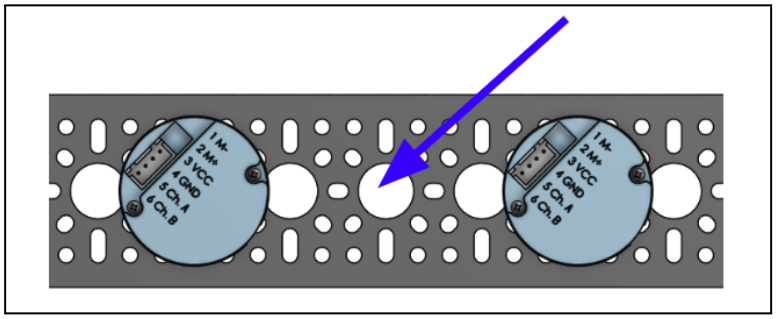
Assembling the Chassis

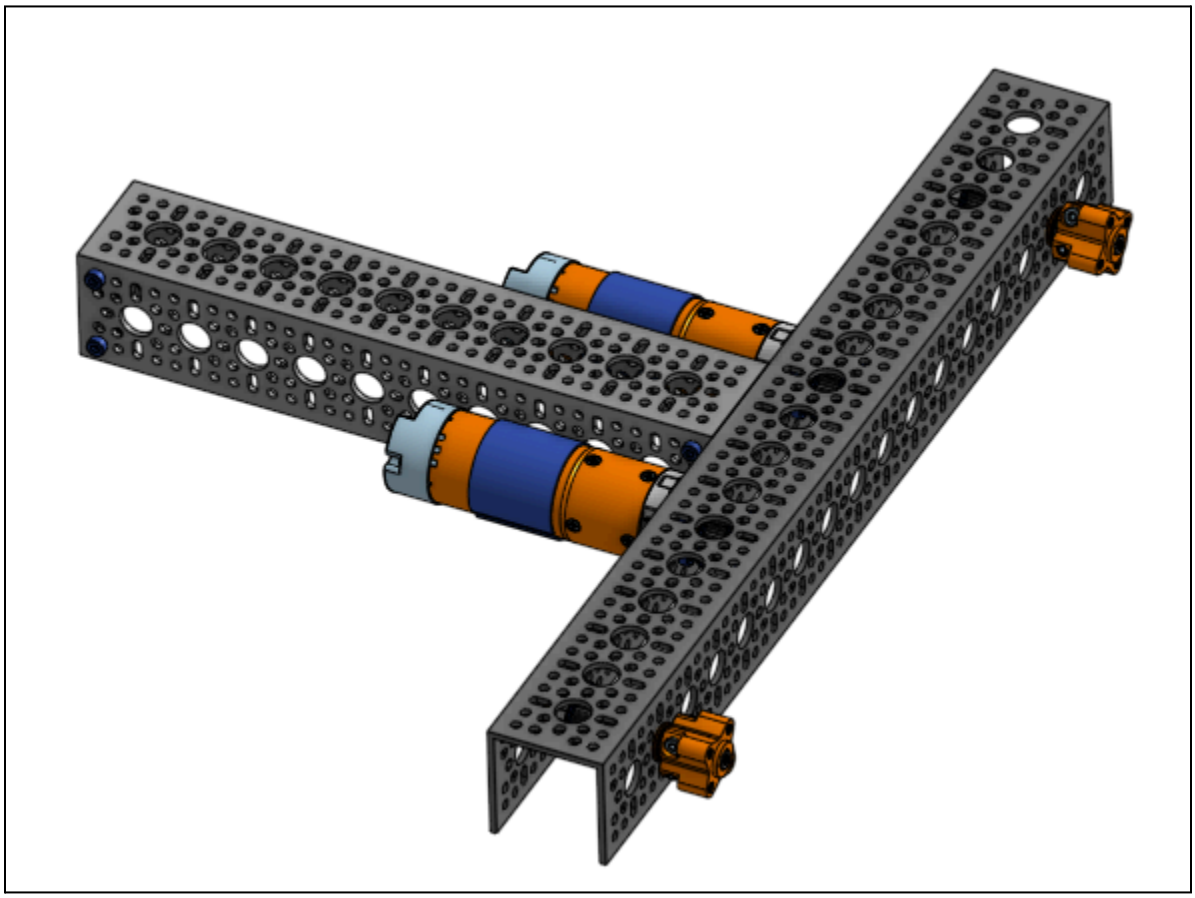
17. Use the two rails, the cross beam, and wheels to complete this step. Regular drive wheels may be substituted for the mecanum wheels.

Assemblies		
Part Number	**Name**	**Image**
N/A (From Current Document)	Rail (2x)	
N/A (From Current Document)	Cross Beam	
3606-0000-0096	Blue Mecanum Wheel (2x)	
3606-0100-0096	White Mecanum Wheel (2x)	
Parts		
2800-0004-0008	8mm Bolt (8x)	

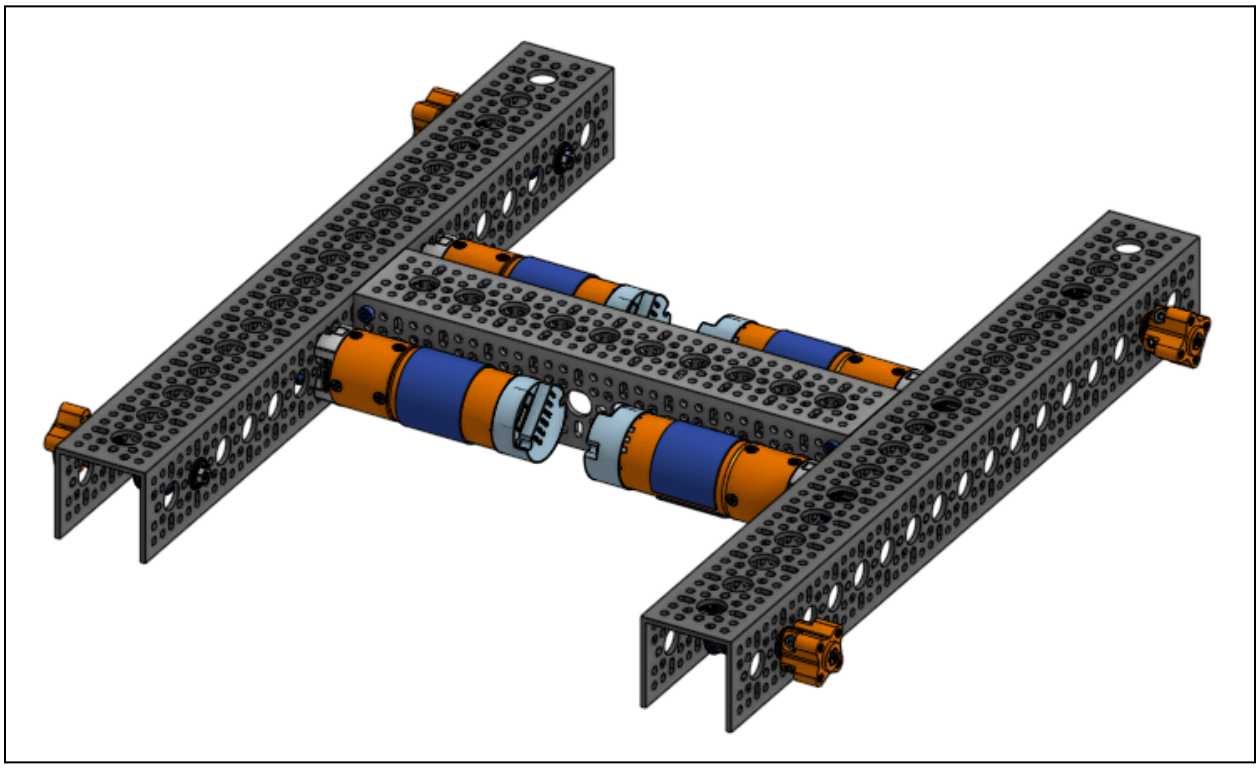
18. Attach the cross beam to the middle hole on the U Channel between the motors. You will be attaching the large hole on the quad block to the center hole of the 17 hole U Channel.



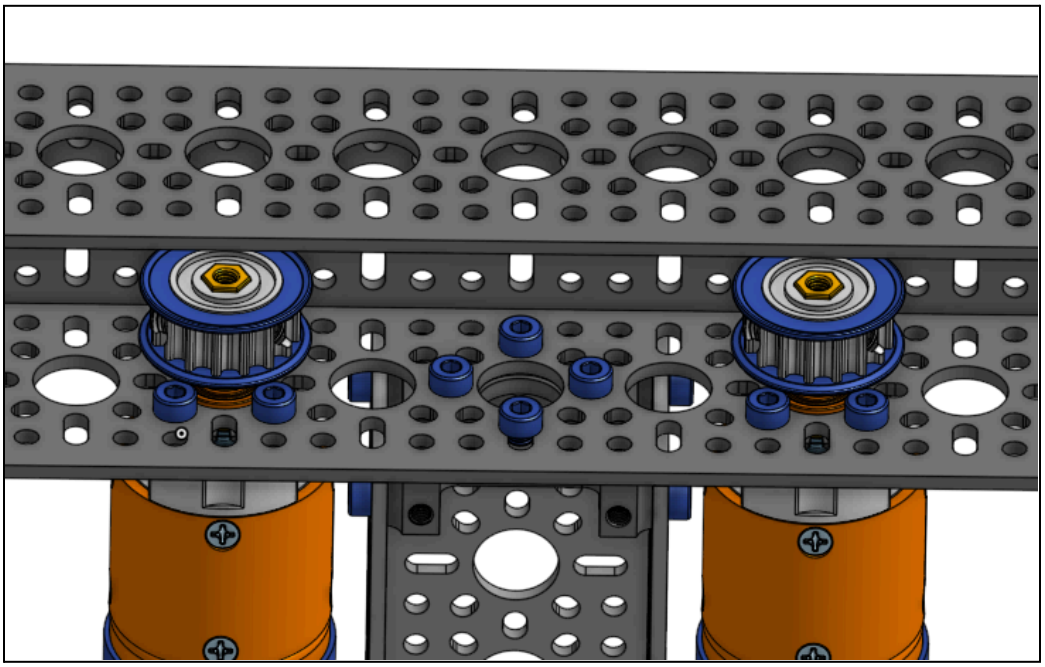




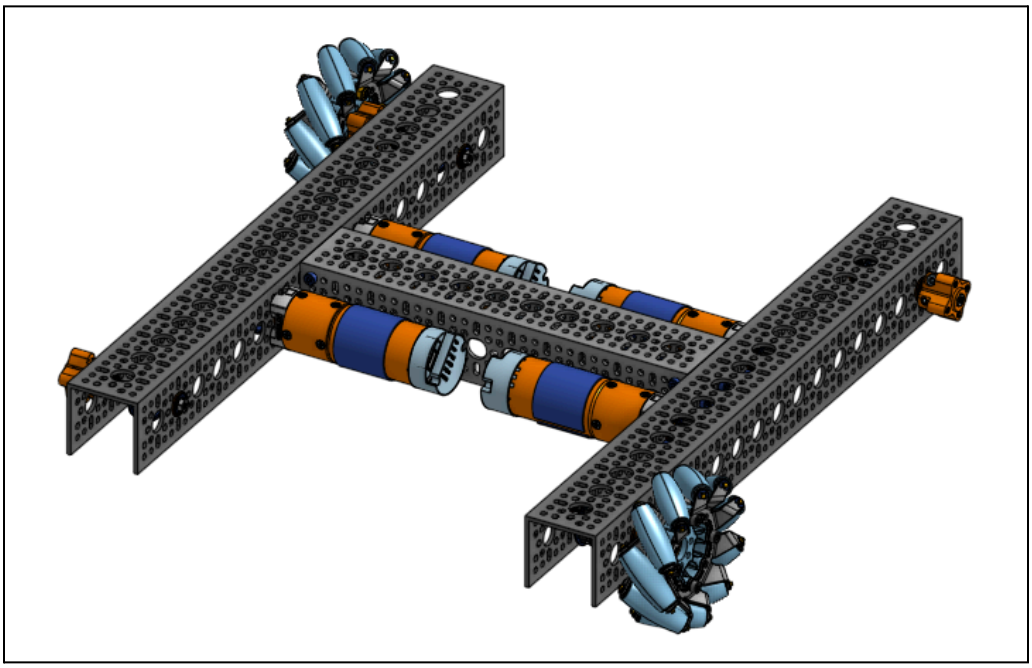
19. Repeat the process and attach the center hole of the 17 U channel to the other side of the Cross Beam Assembly.



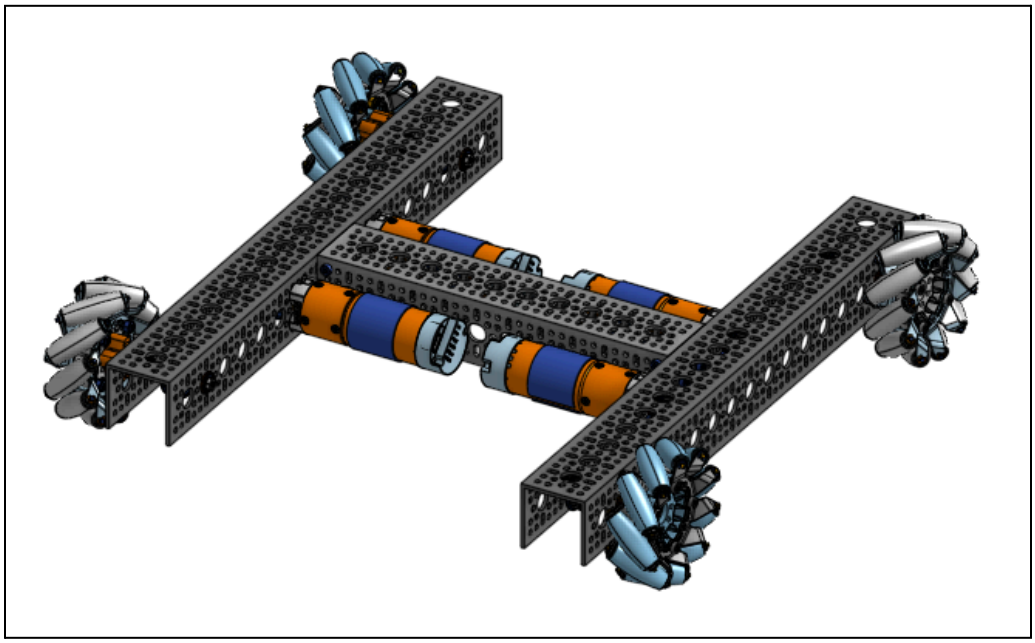
20. Use the 8x bolts and attach the Crossbeam Quad block to the Rails. (Both left and right side)



21. We will now attach the mecanum wheels to the chassis. First, we will attach the Blue Wheels on opposite corners. Attach the shallow side of the Mecanum wheel to the Hyper Hub.



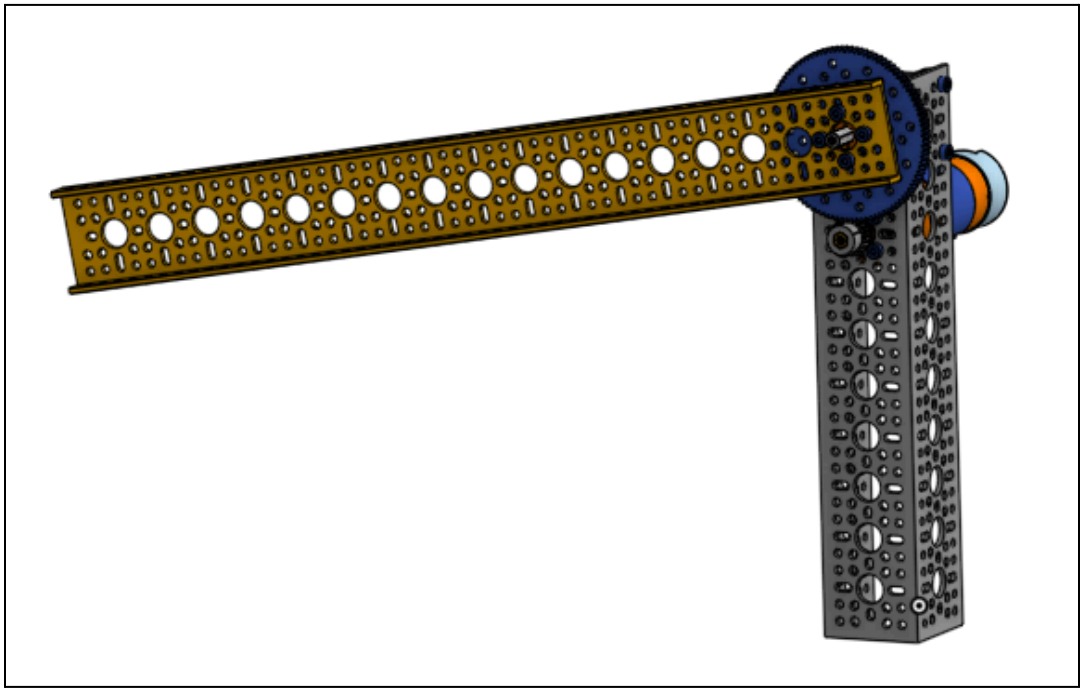
22. Repeat the process and attach the white mecanum wheels to the opposite corners of the chassis.



Directions Arm V2025.1
Marist Robotics

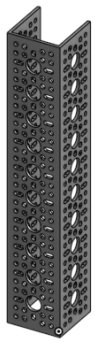
Description:

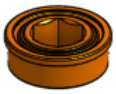
These directions will work through creating a CAD of a 5:1 gear ratio arm commonly used for actuators for FTC robots. Variations of this design using the 20 tooth pinion gear and the 100 tooth arm gear allow robots to reach and lift. The goal of these directions is to provide guidance, sequence, and parts lists for building variations of the 5:1 arm.



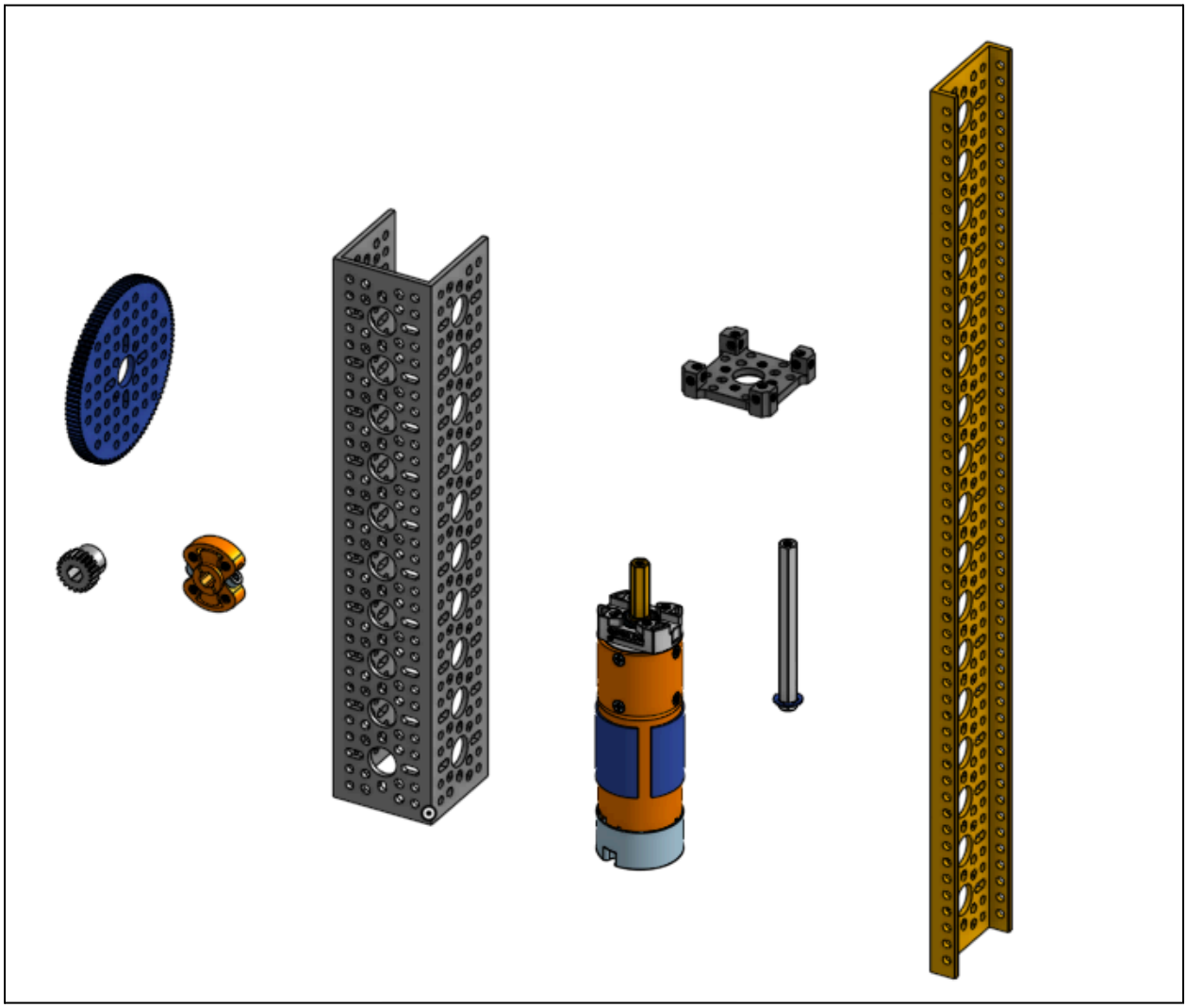
Process:

1. Gather the following parts and assemblies.

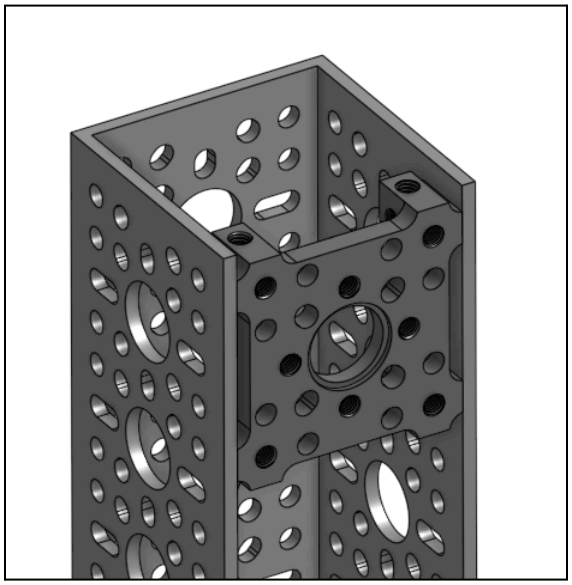
Parts		
Part Number	**Name**	**Image**
1100-0010-0264	10 Hole U Channel	
1201-0043-0002	Quad Block	
2302-0014-0100	Large Gear 100 Tooth	
1107-0017-0432	17 Hole shallow U Channel	
2800-004-0010	10mm Bolt (You will need 12 total)	

Assemblies		
Part Number	**Description**	**Image**
2106-4008-0800	8mm REX Shaft with clip 80mm	
1309-0016-4008	Sonic Hub	
5203-2402-0019	19:1 DC Motor	
2303-4008-0020	20 Tooth Pinion Gear	
1611-0514-4008	Flanged Bearing 8mm (You will need three total)	

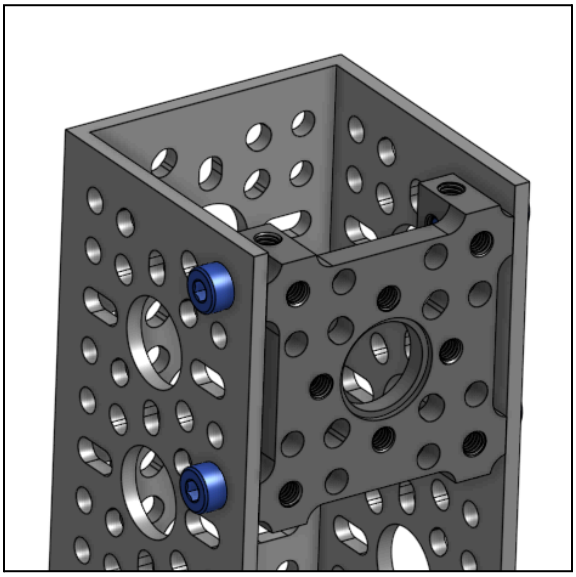
Collection of Parts (10mm bolts and flanged bearings not shown)

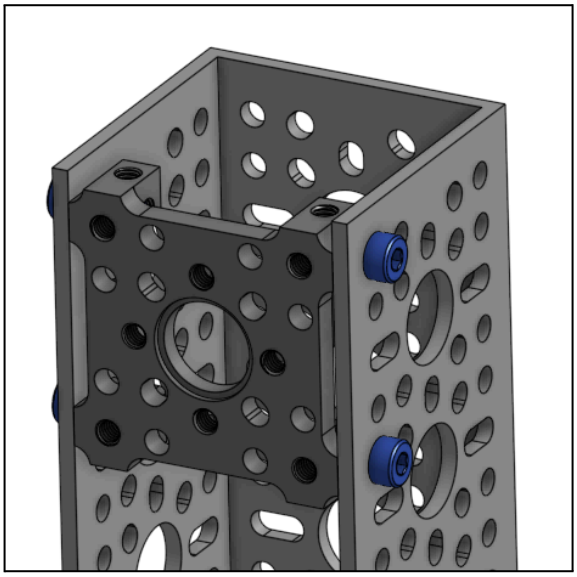


2. Place the Quad block on the top of the 10 Hole U Channel.

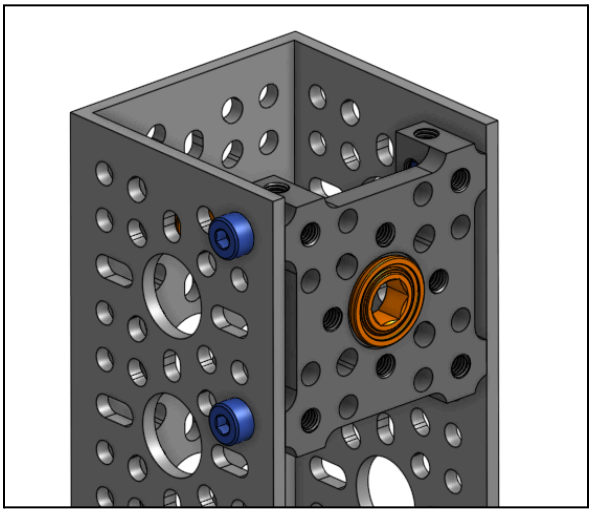


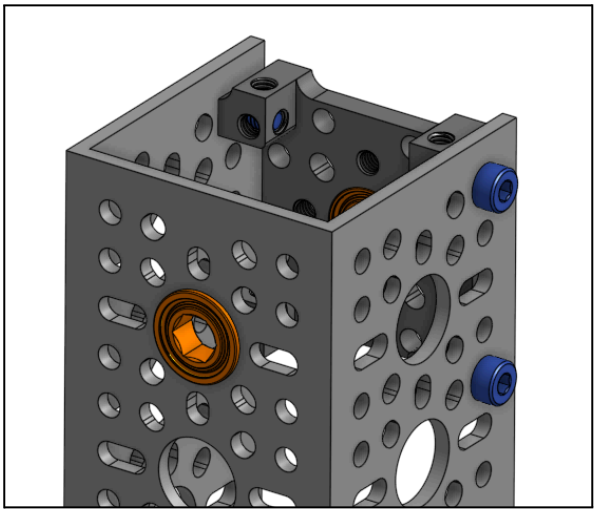
3. Place 4x 10mm Bolts to secure the Quad block. (Two bolts on each side)



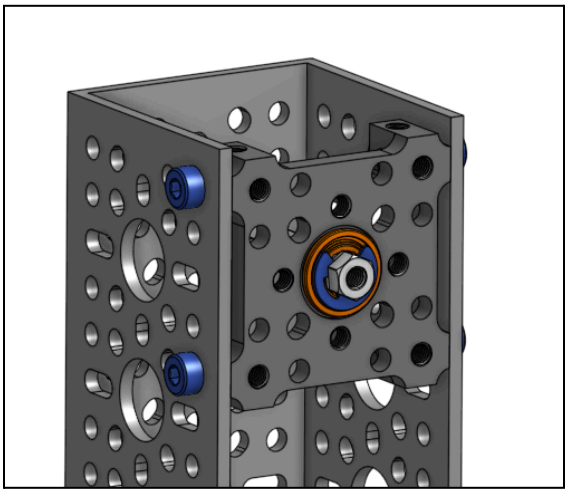


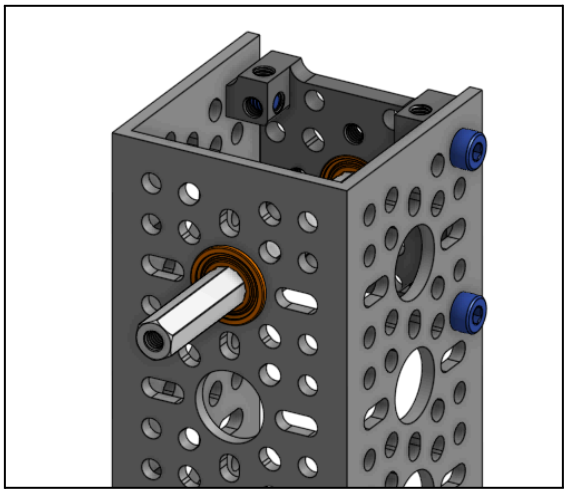
4. Attach the flanged bearings to the front and rear of the top portion of the 10 hole U channel with quad block:



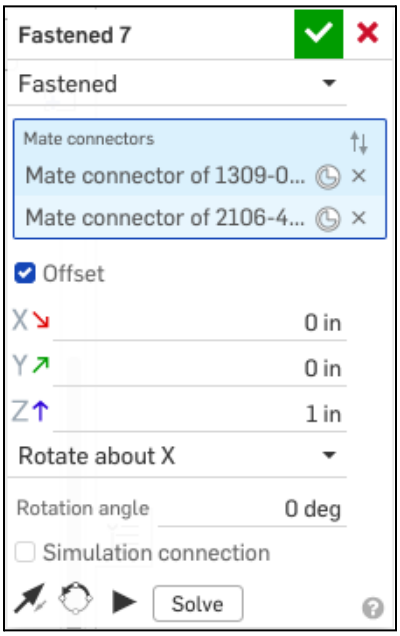


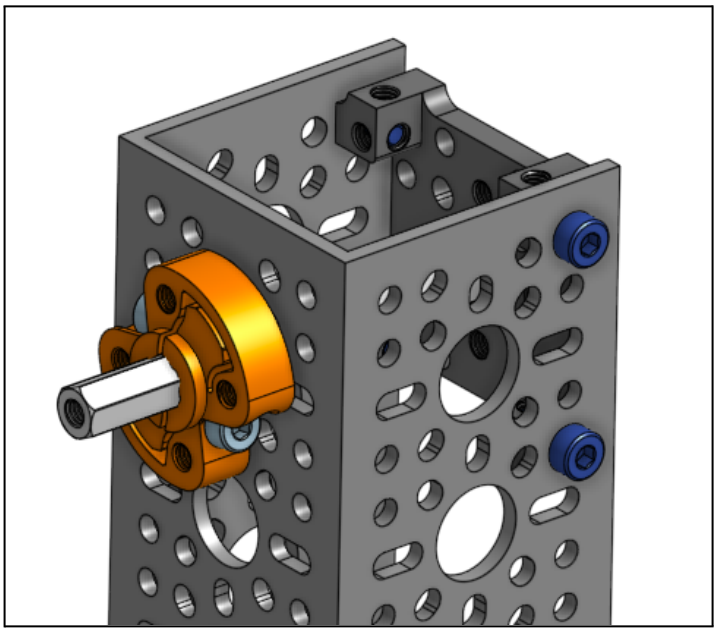
5. Fasten the 80mm REX axle to the flanged bearing in the Quad block. Use the mate connector on the REX axle for the connecting point.



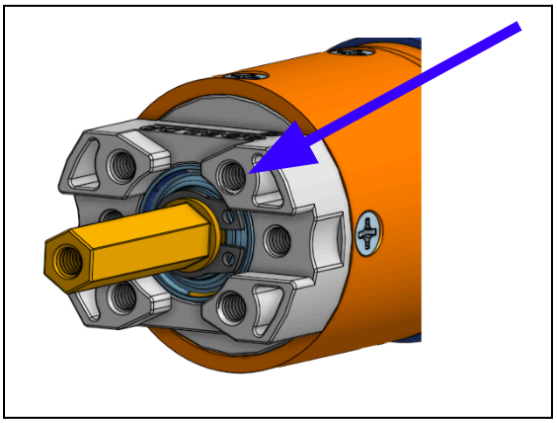


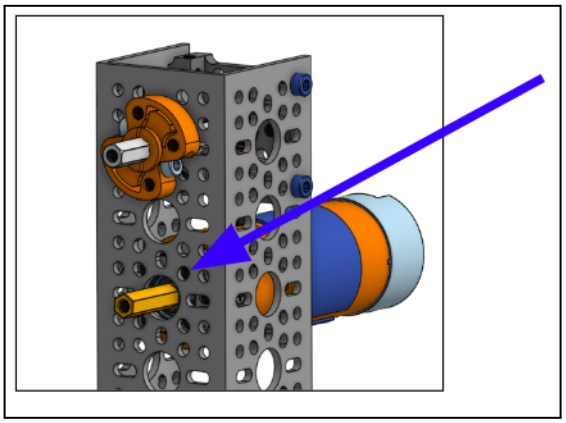
6. Attach the Sonic Hub to the end of the REV axle. In the example an offset of 1 inch on the Z axis was used.



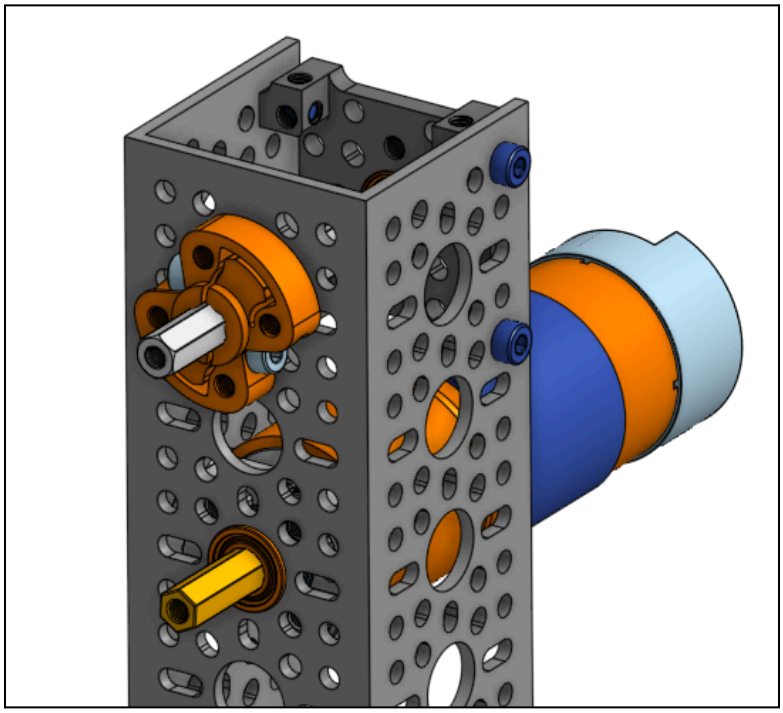


7. Attach the DC Motor to the third hole down from the top. Use the bolt opening on the DC motor and connect to bolt hole on the U channel for the best results.

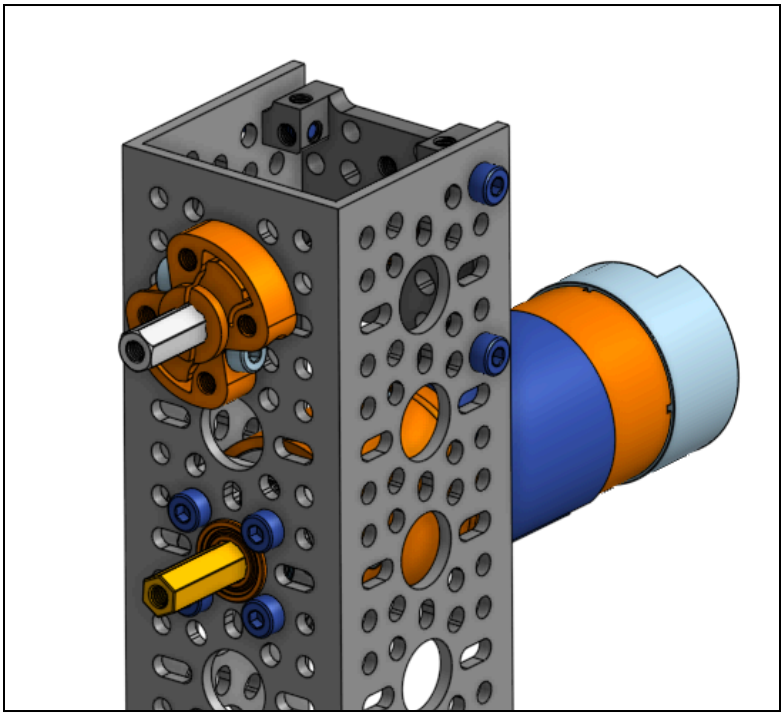




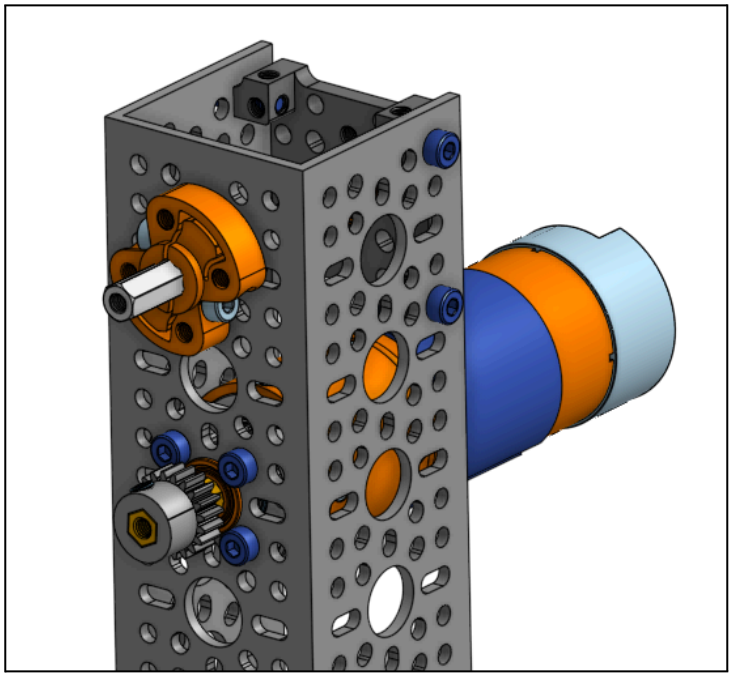
8. Attach the flanged bearing to the opening where the motor shaft extends out of the U channel.



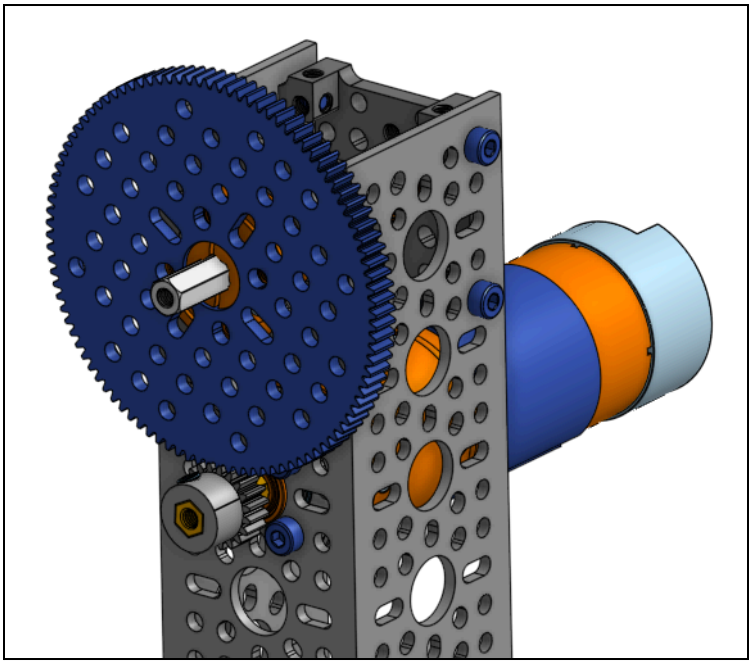
9. Use 4x 10mm bolts to bolt the motor to the U channel.



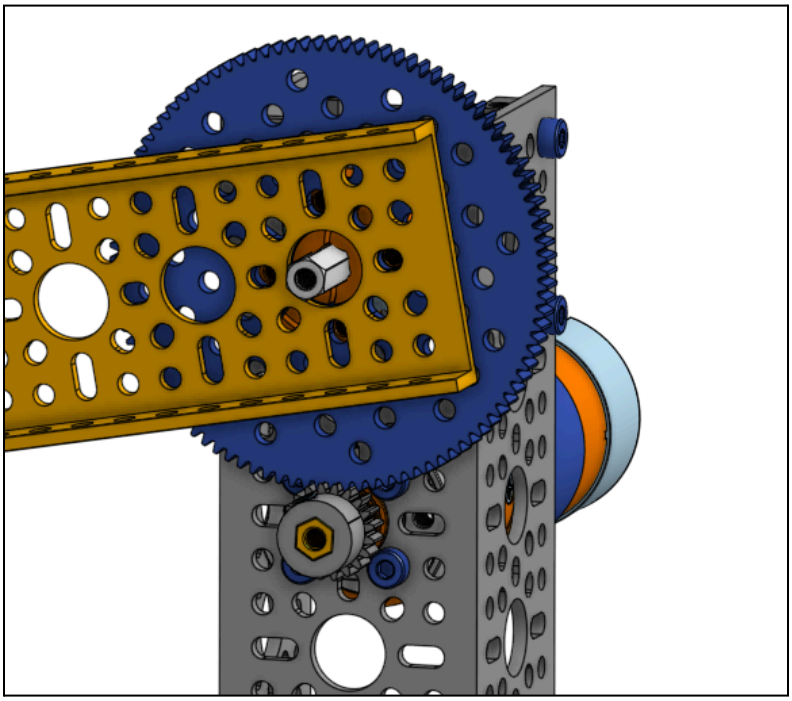
10. Attach the pinion gear to the motor shaft. Note the pinion gear is “reversed” on the axle with the narrow end facing out.



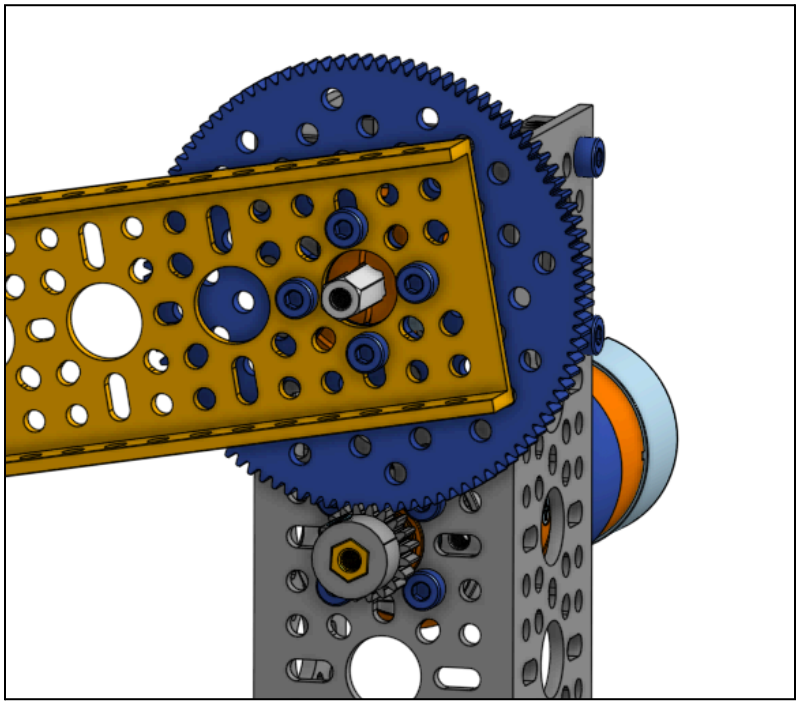
11. Attach the 100 tooth gear to the Sonic Hub.



12. Attach the 17 hole shallow U channel to the 100 tooth gear.



13. Use 4x 10mm bolts and fasten them to the U Channel.



14. The finished Arm should look like: