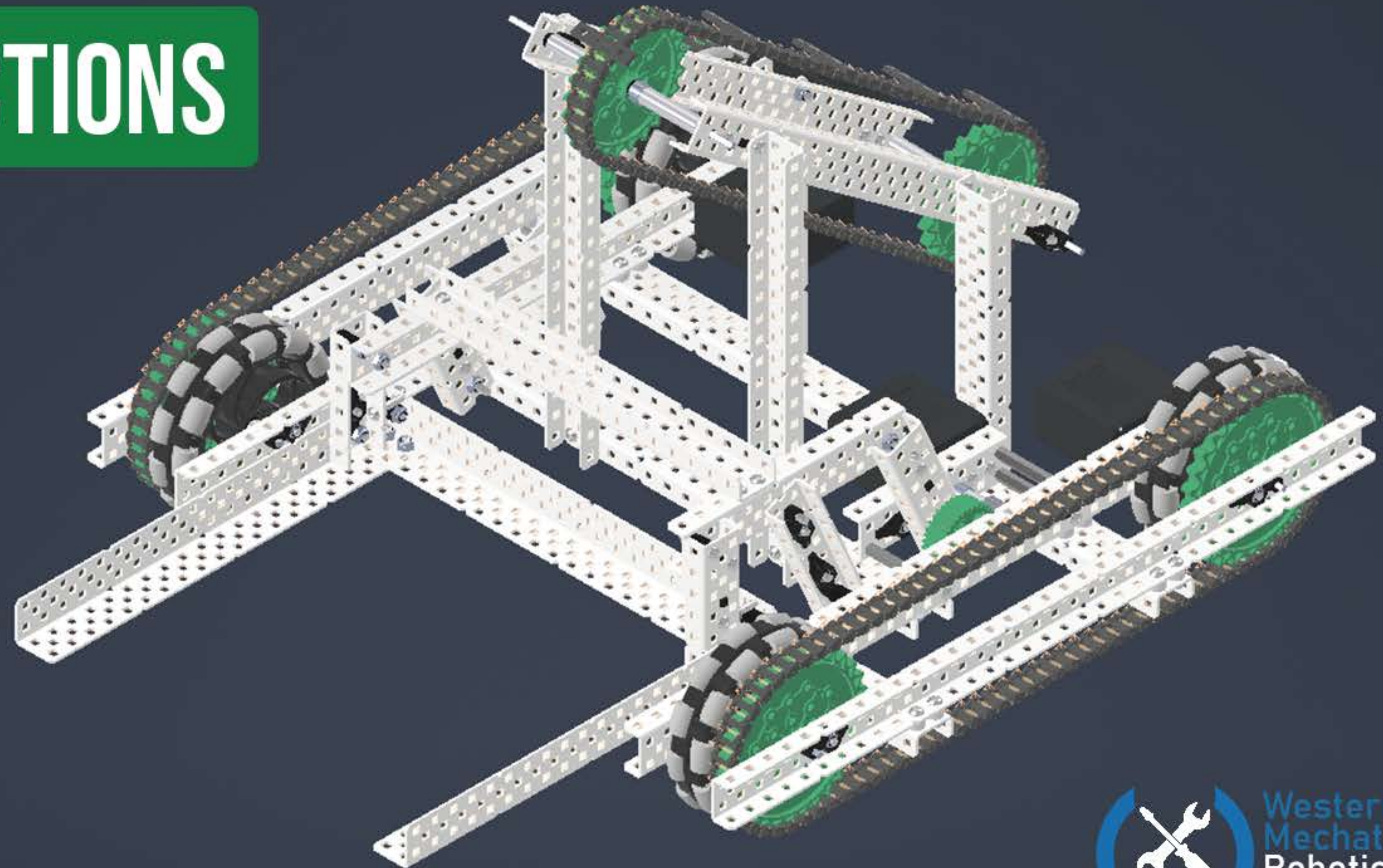


WESTERN MECHATRONICS 2021 SUMMER CAMP

ROBOT INSTRUCTIONS



ROBOT INSTRUCTIONS

DO THIS BEFORE YOU START BUILDING:

- **MAKE SURE YOU ARE IN THE 2021 WESTERN MECHATRONICS SUMMERCAMP DISCORD**
- **READ THE ROBOT RULES AND SAFETY PRESENTATION**
- **DOWNLOAD AND PRINT OFF THE MEASURING SHEET**
- **GET STARTED AND HAVE FUN!**

MEASURING SHEET

THE MEASURING SHEET IS AN OFFICAL VEX DOCUMENT THAT YOU CAN USE TO MEASURE THE LENGTH OF EACH PART. MAKE SURE YOU PRINT OFF THE SHEET AT 100% SIZE. IT IS ESSENTIAL THAT YOU USE THE RIGHT LENGTH SCREW/SPACER FOR EACH STEP. THE ROBOT WILL NOT WORK IF YOU USE THE WRONG LENGTH.

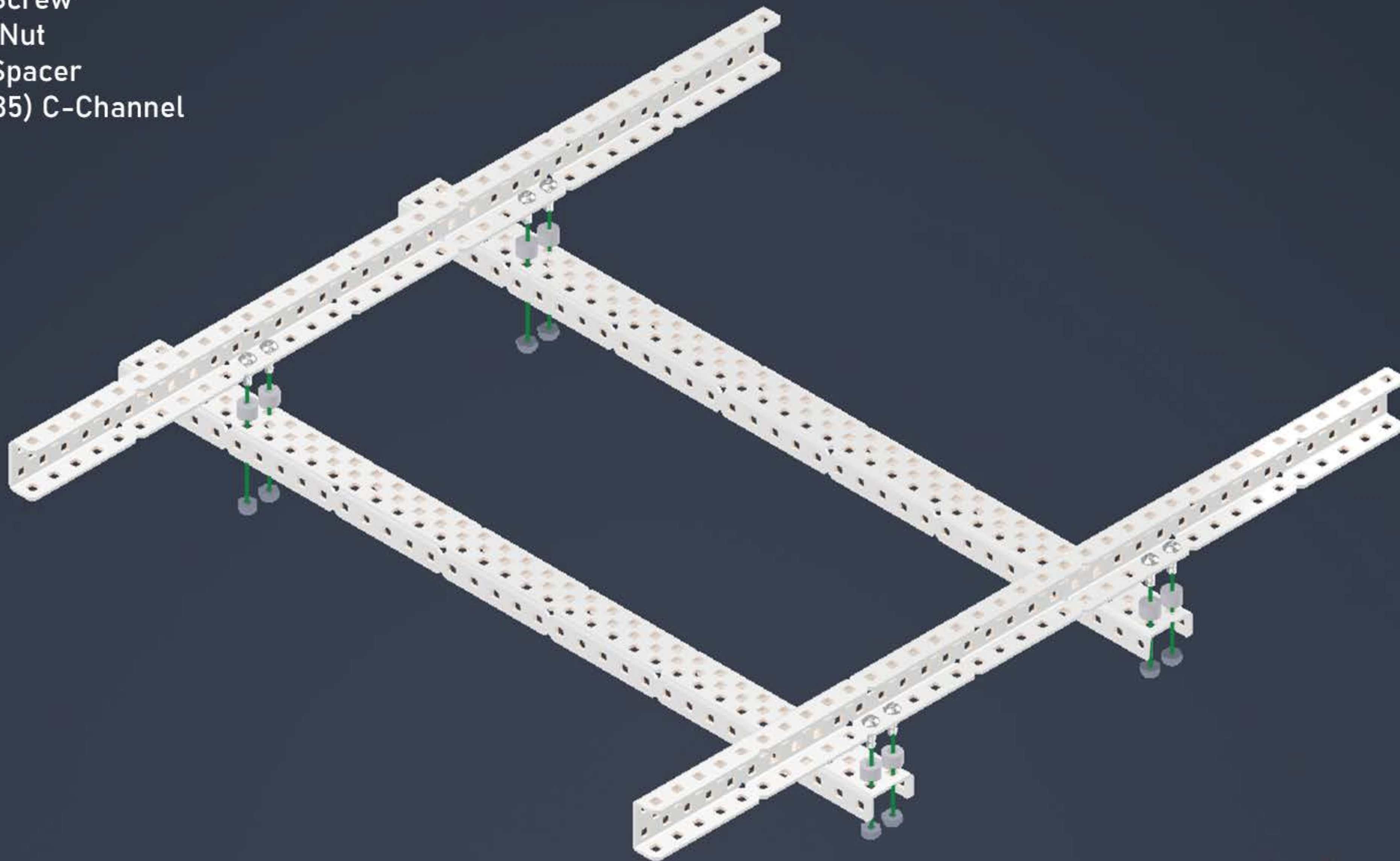
THIS IS A HIGH-LEVEL BUILD. THERE ARE STEPS IN THE BUILD WHERE IT MIGHT SEEM COMPLICATED AND CONFUSING. IF YOU EVER FIND YOURSELF IN A SITUATION WHERE YOU'RE UNSURE WHAT TO DO, PLEASE CONTACT THE TEACHERS. IT'S BETTER THAT YOU GET HELP INSTEAD OF POTENTIALLY DAMAGING SOMETHING OR HURTING YOURSELF.



**Western
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Camp 2021**

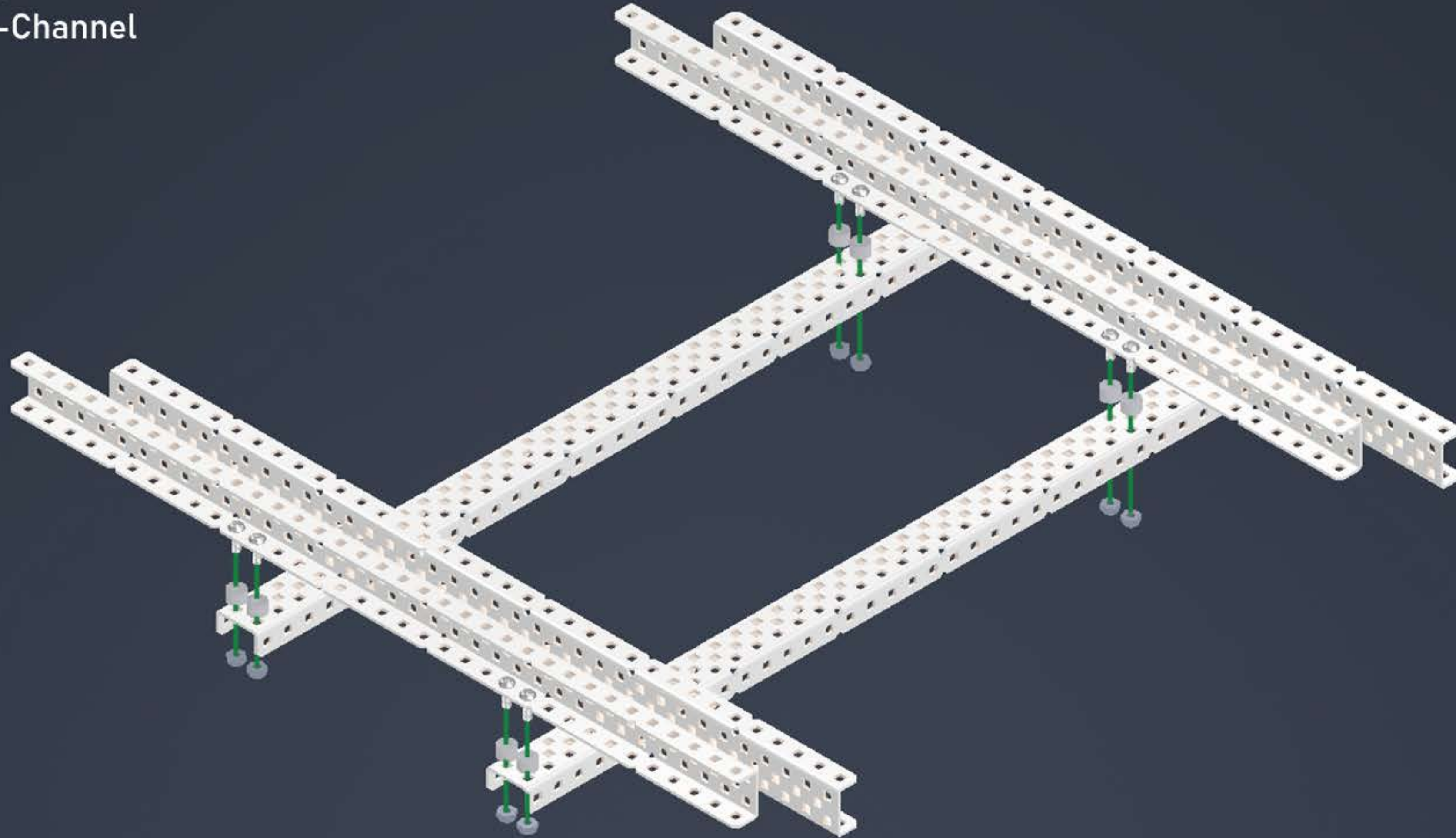
8x 0.500" Screw
8x Nylock Nut
8x 0.250" Spacer
4x (1x2x1x35) C-Channel

1



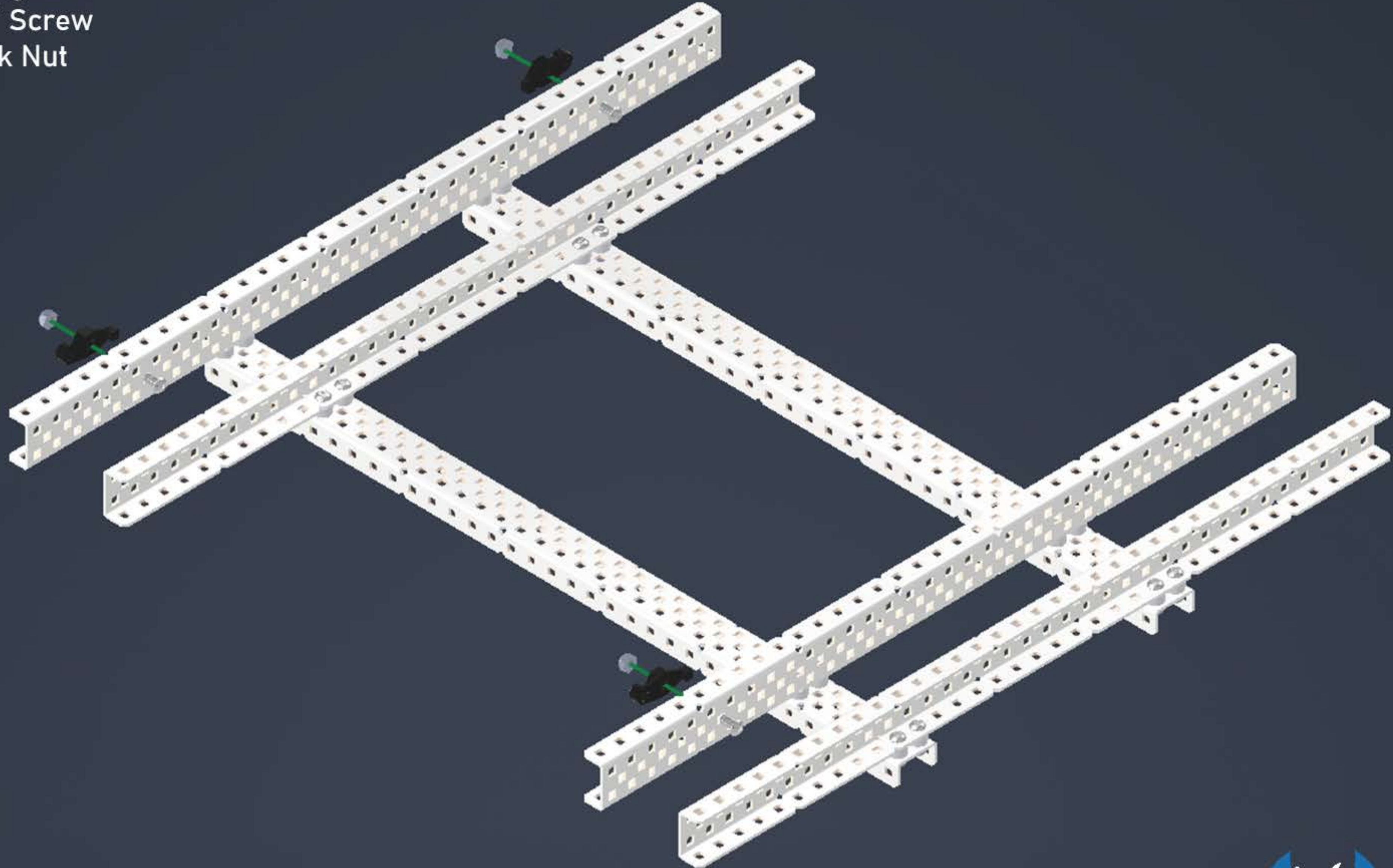
8x 0.500" Screw
8x Nylock Nut
8x 0.250" Spacer
2x 1x2x1x35 C-Channel

2



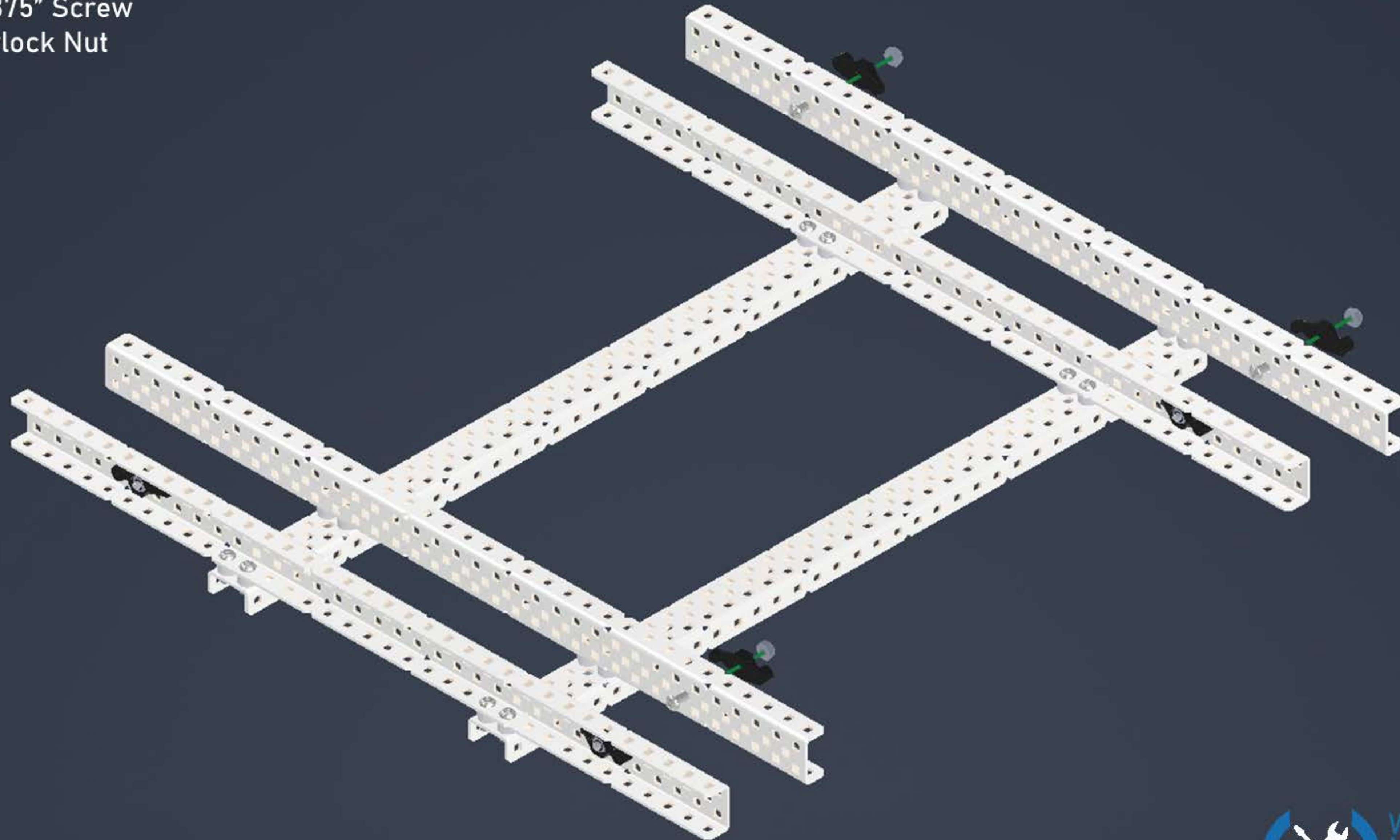
3x Bearing Flat
3x 0.375" Screw
3x Nylock Nut

3



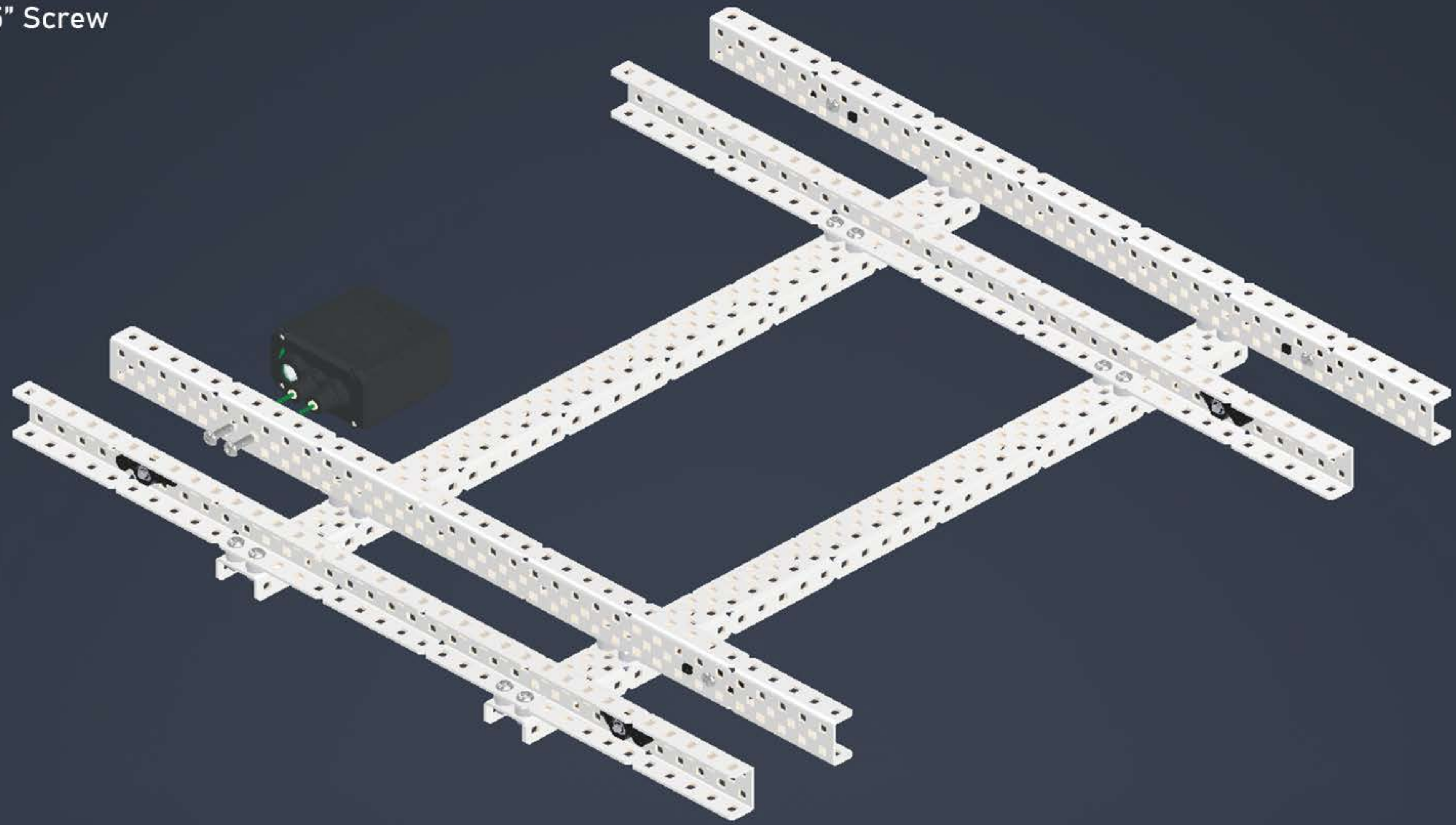
3x Bearing Flat
3x 0.375" Screw
3x Nylock Nut

4



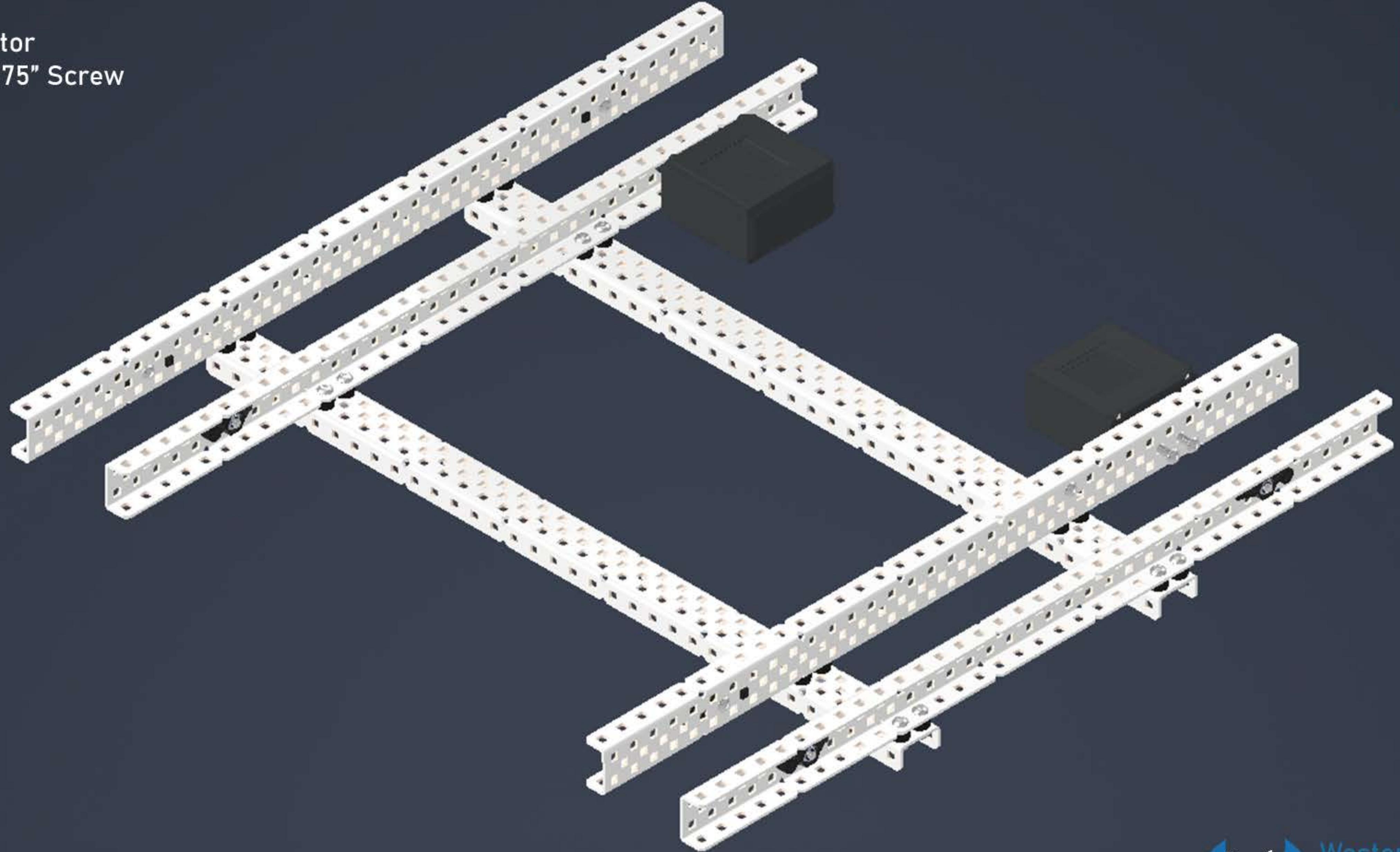
1x motor
2x 0.375" Screw

5

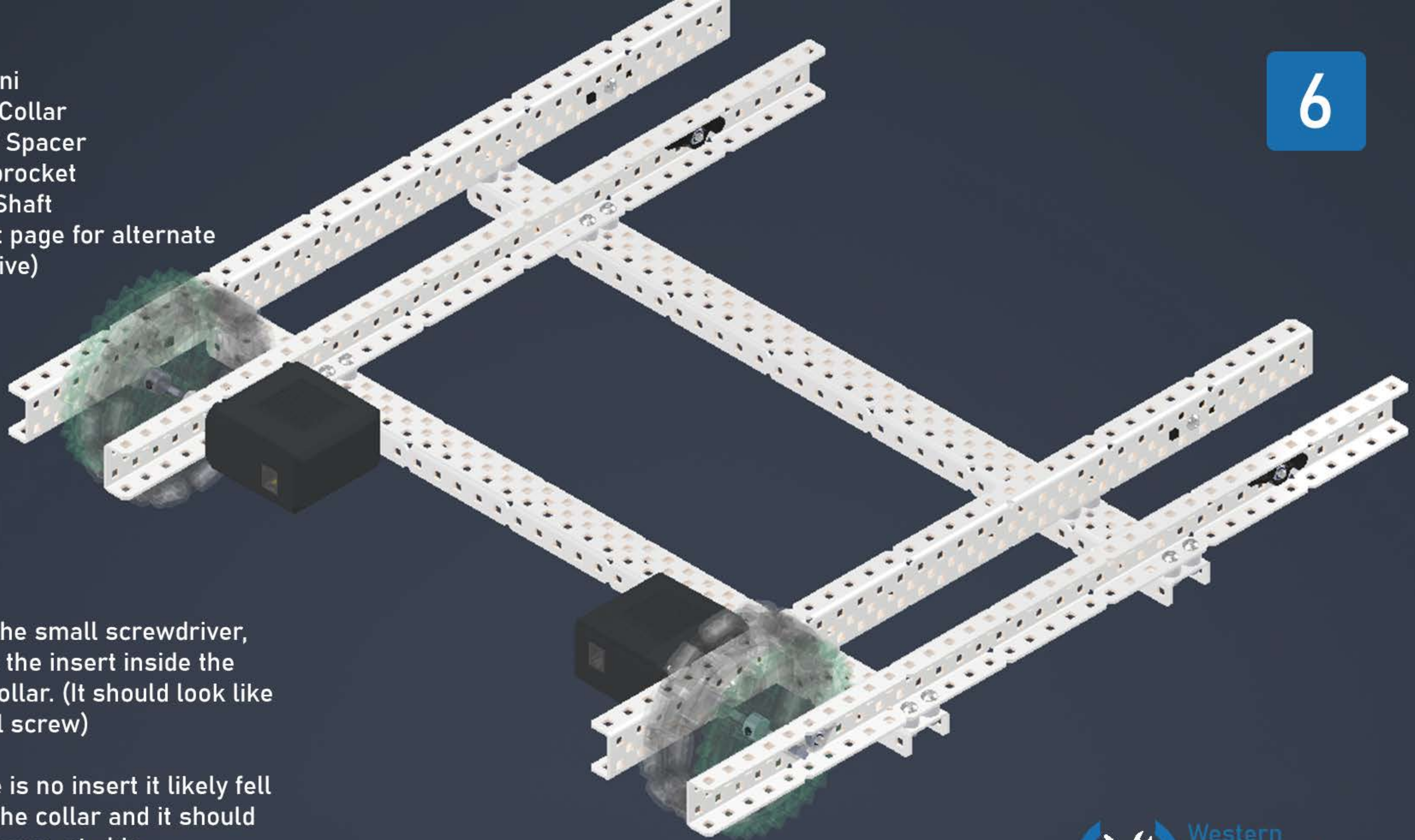


1x motor
2x 0.375" Screw

5.5



2x 4" Omni
2x Shaft Collar
2x 0.375" Spacer
2x 30t Sprocket
2x 3.25" Shaft
(see next page for alternate
perspective)



Using the small screwdriver,
tighten the insert inside the
shaft collar. (It should look like
a small screw)

If there is no insert it likely fell
out of the collar and it should
be in your parts bin.

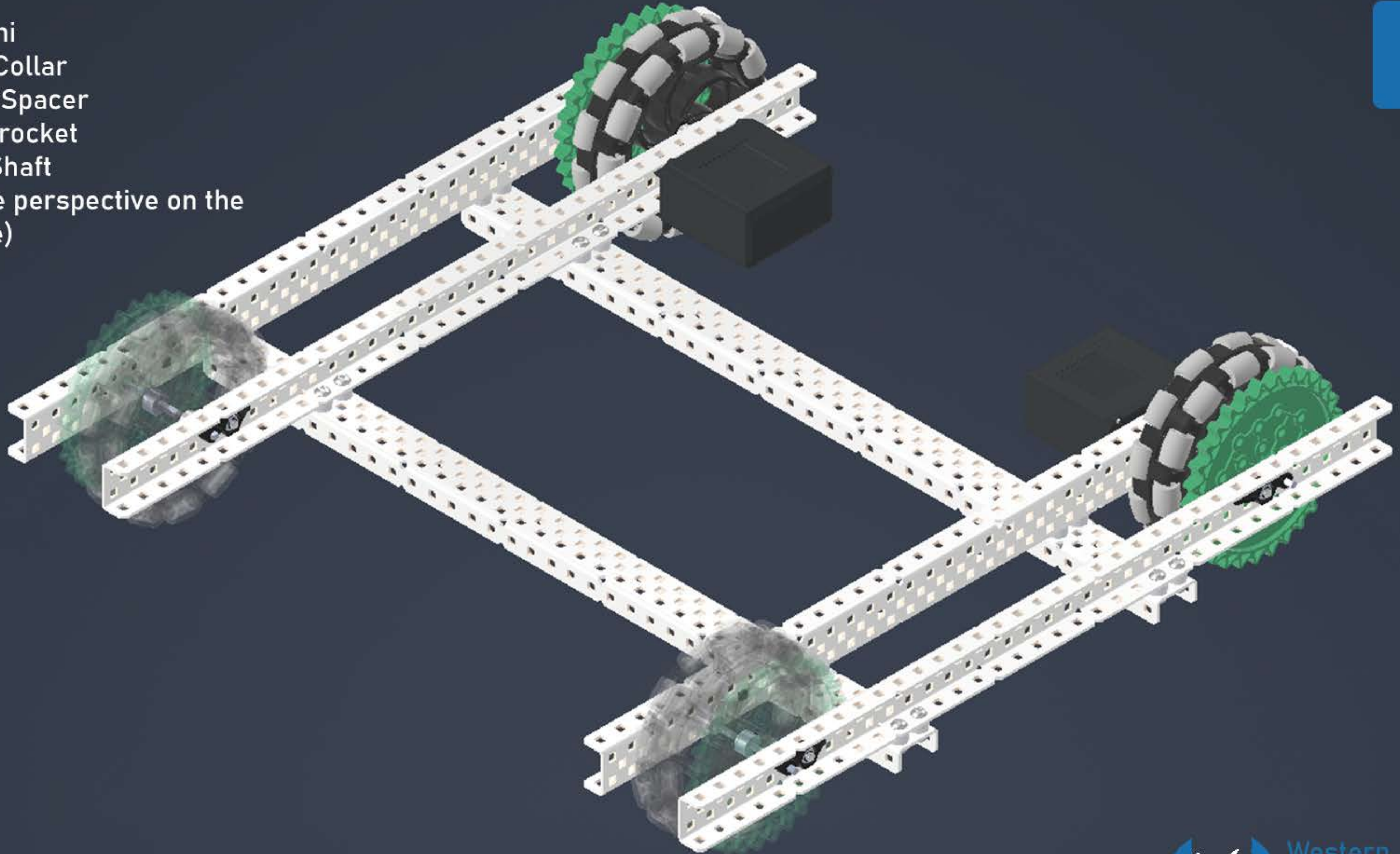
(alternate perspective)

Front view of the robot

6.5



2x 4" Omni
2x Shaft Collar
2x 0.375" Spacer
2x 30t Sprocket
2x 3.25" Shaft
(alternate perspective on the
next page)



(alternate perspective)

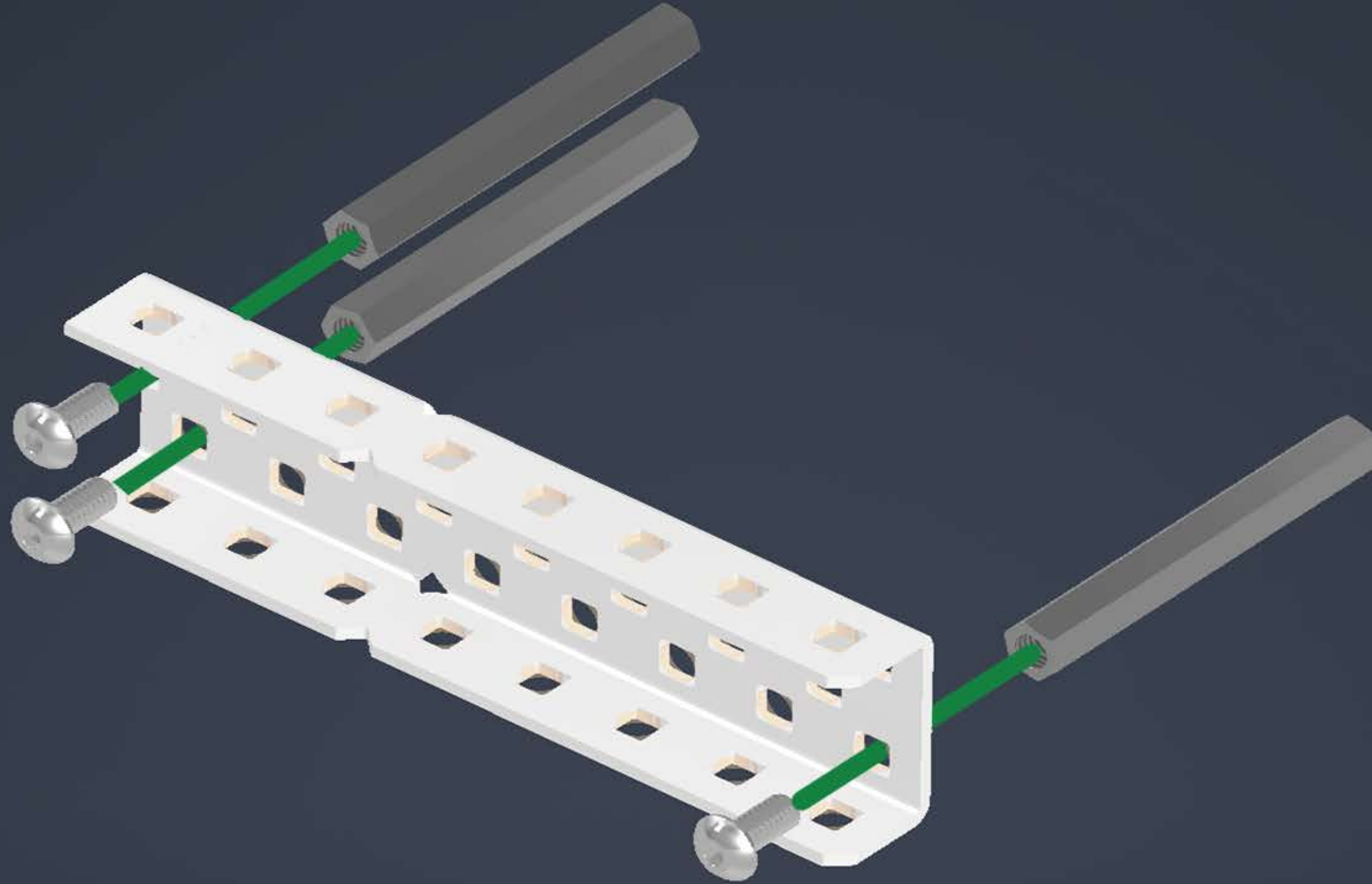
Back view of the robot

7.5

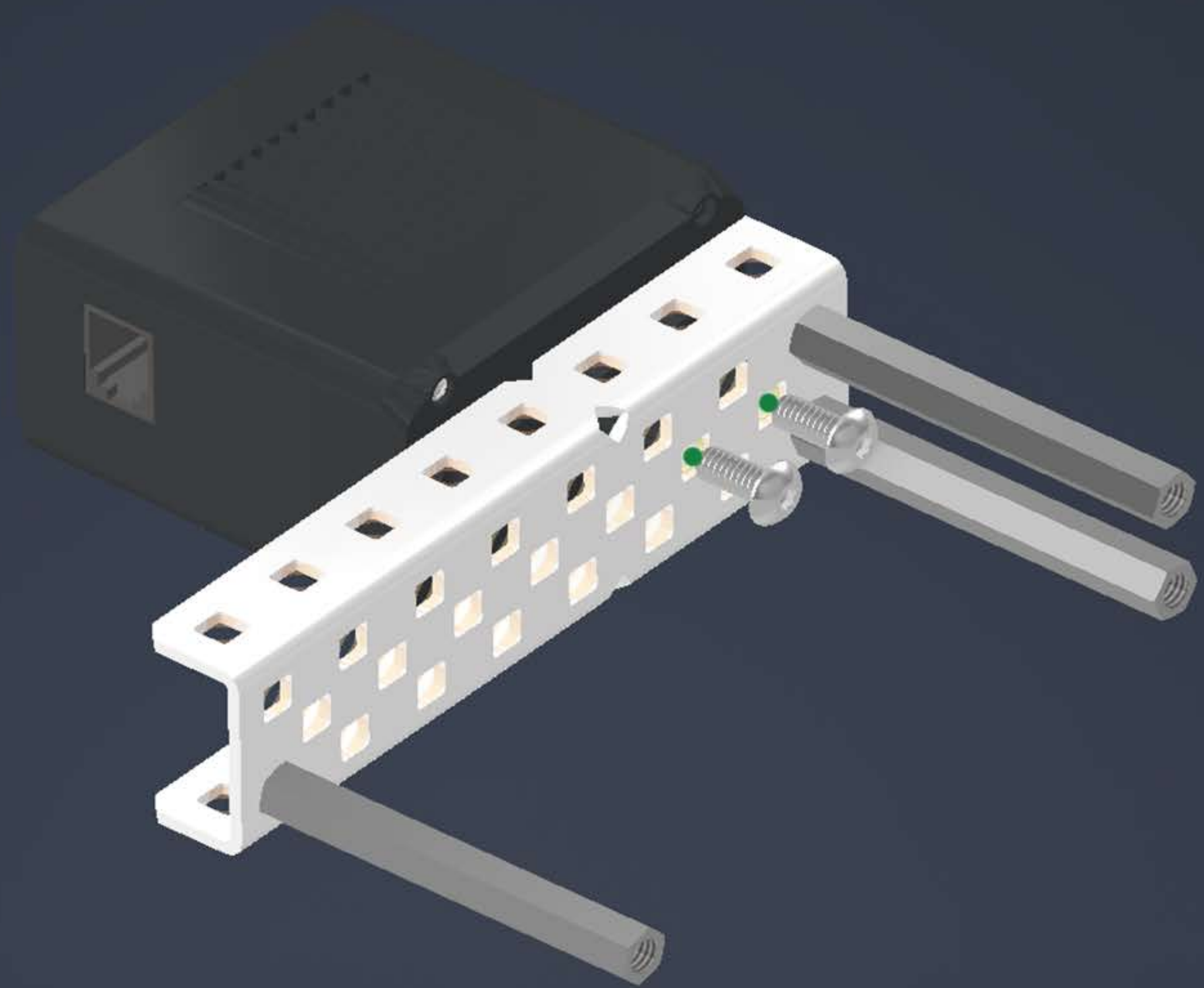


1x 1x2x1x8 C-Channel
3x 2" Standoff
3x 0.375" Screw

8

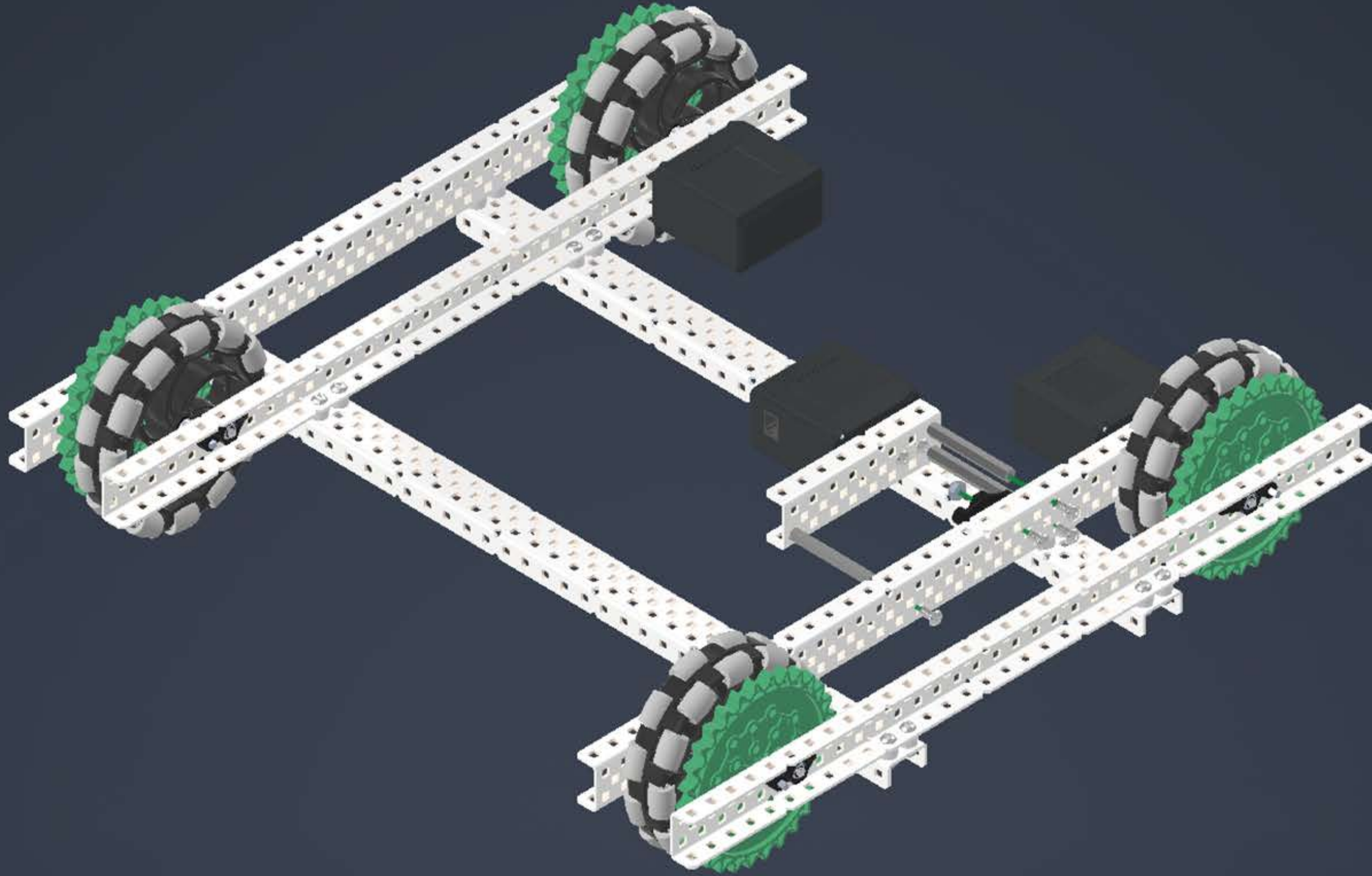


1x Motor
2x 0.375" Screw

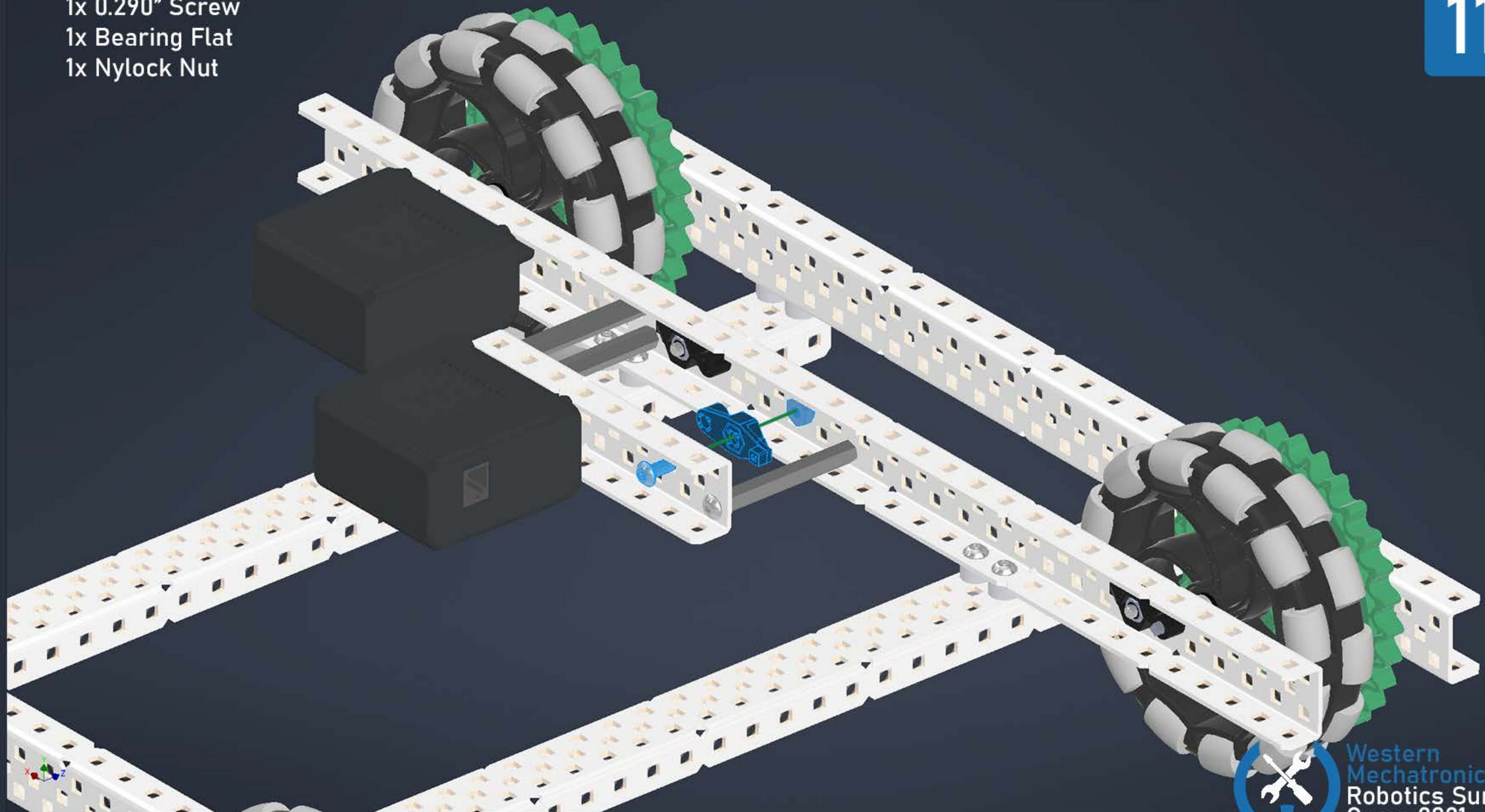


Part from step 9
4x 0.375" Screw
1x Nylock Nut
1x Bearing Flat

10

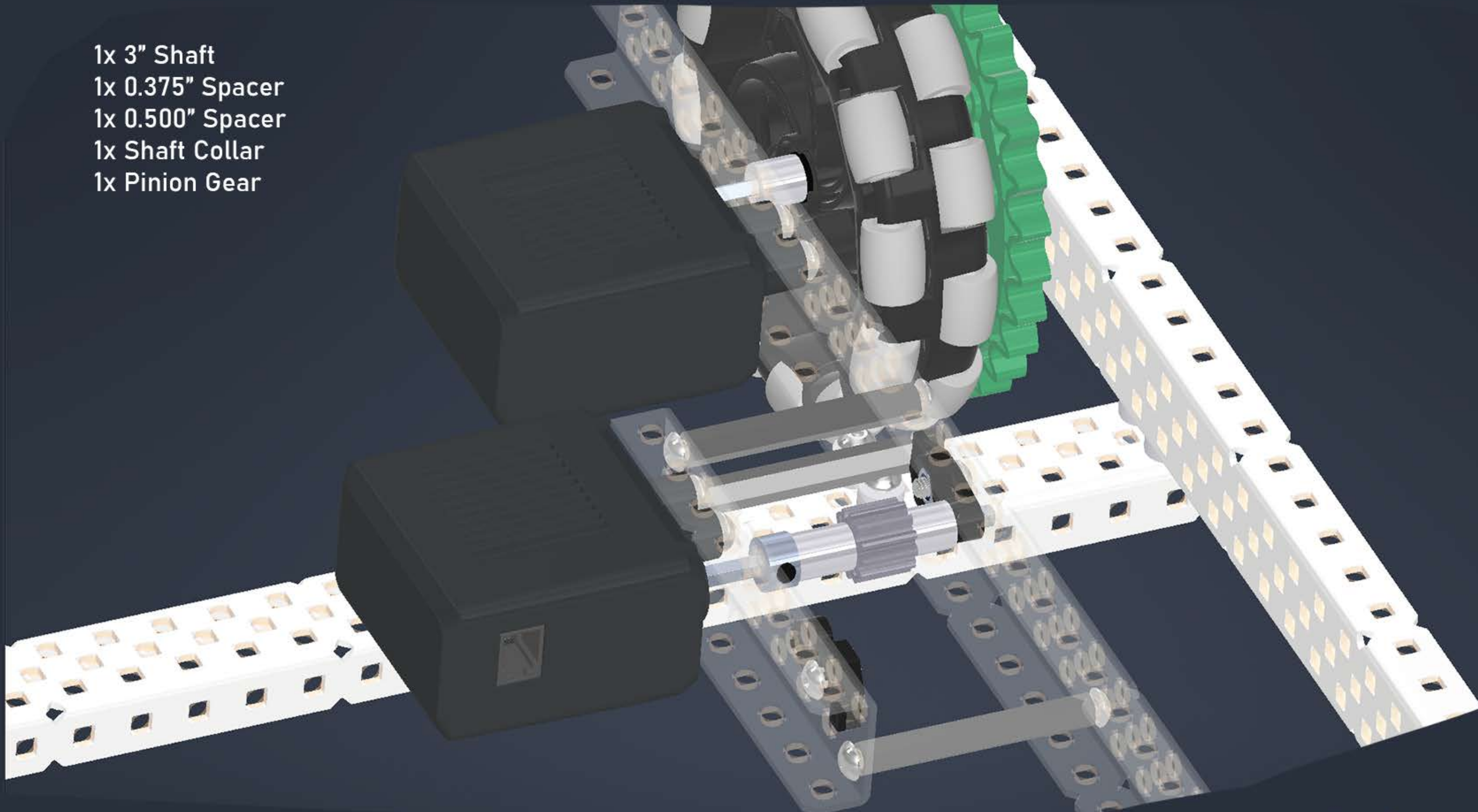


1x 0.290" Screw
1x Bearing Flat
1x Nylock Nut



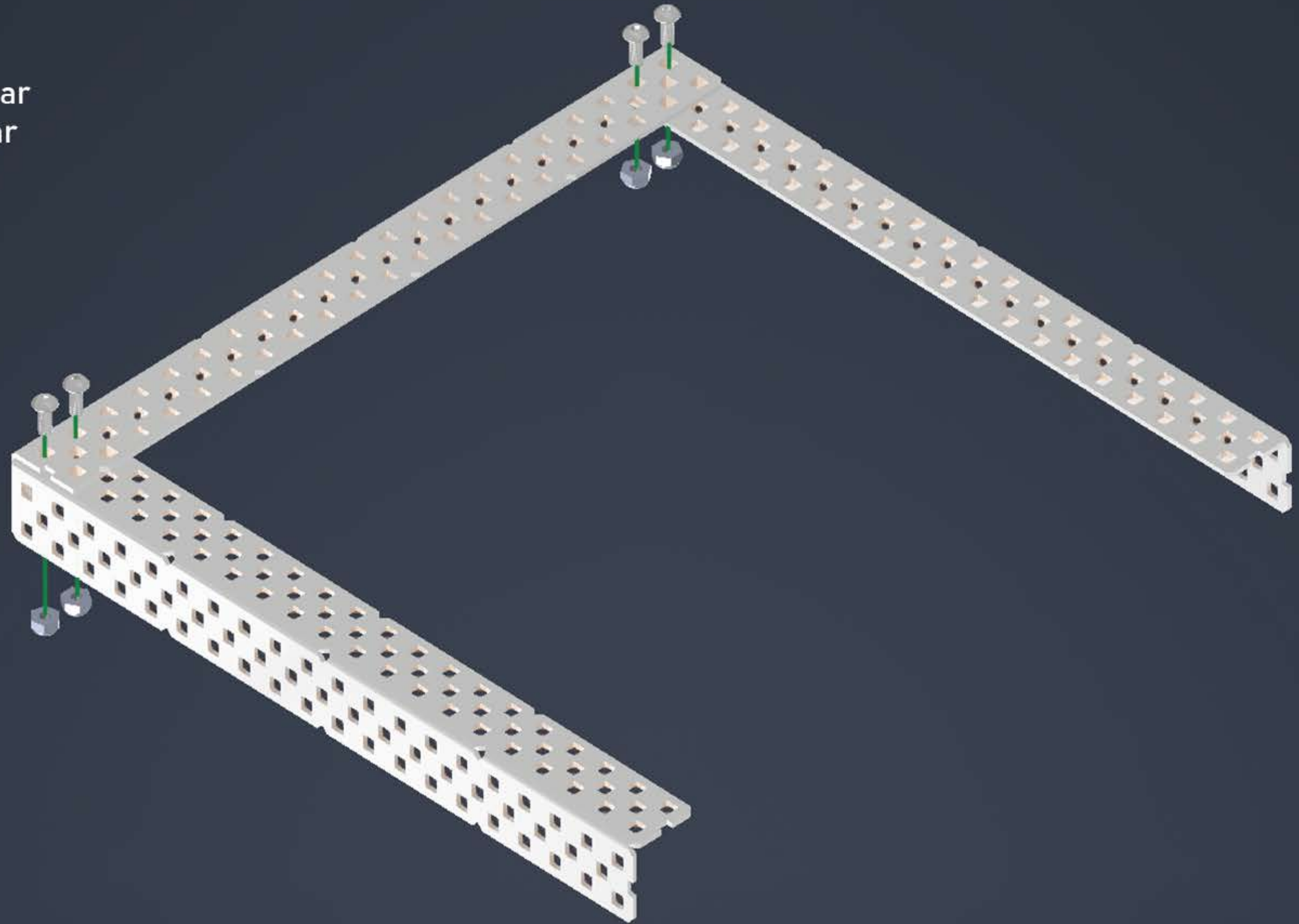
1x 3" Shaft
1x 0.375" Spacer
1x 0.500" Spacer
1x Shaft Collar
1x Pinion Gear

12



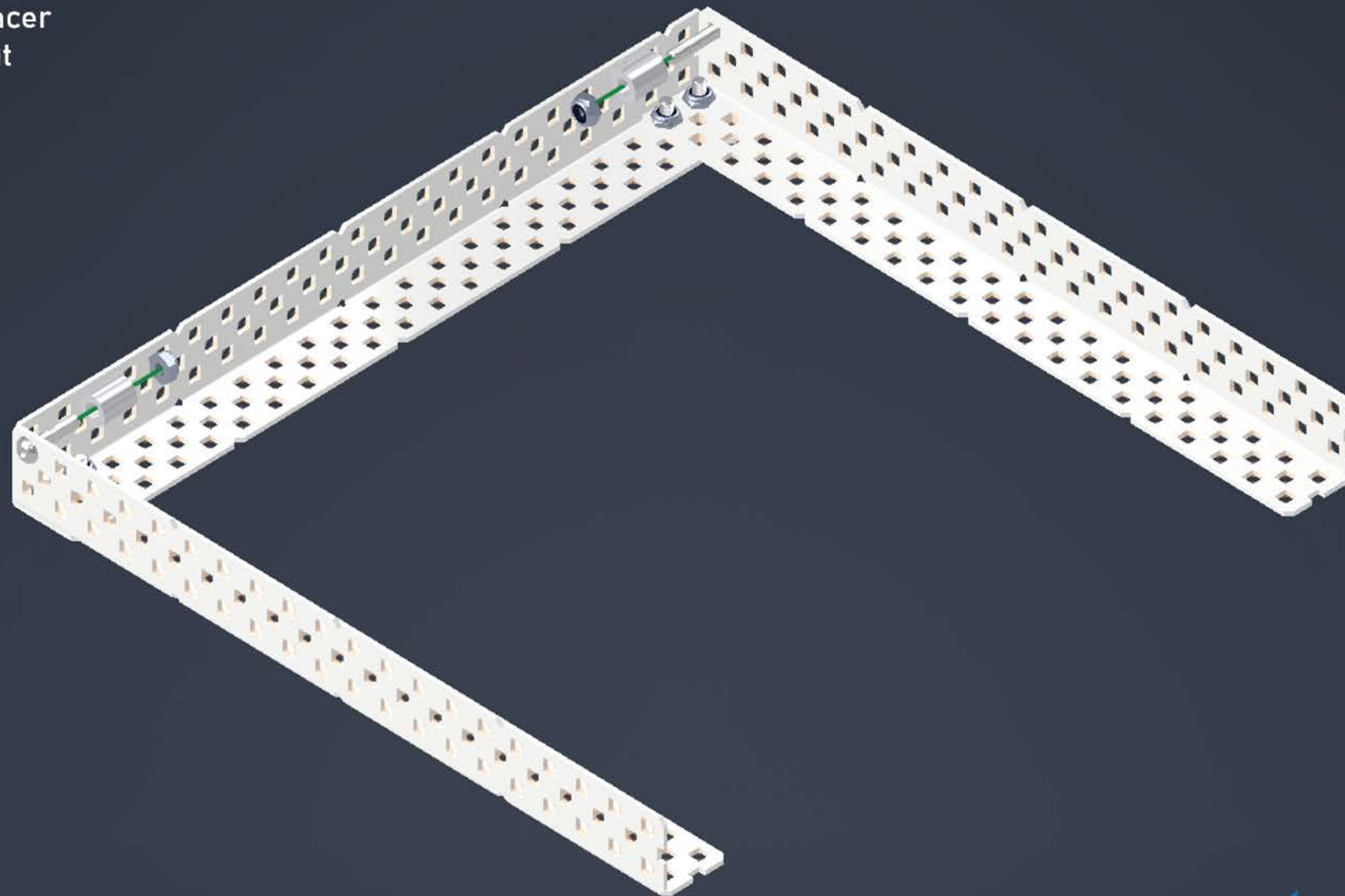
4x 0.375" Screw
4x Nylock Nut
2x 2x2x20 angle bar
1x 2x2x21 angle bar

13



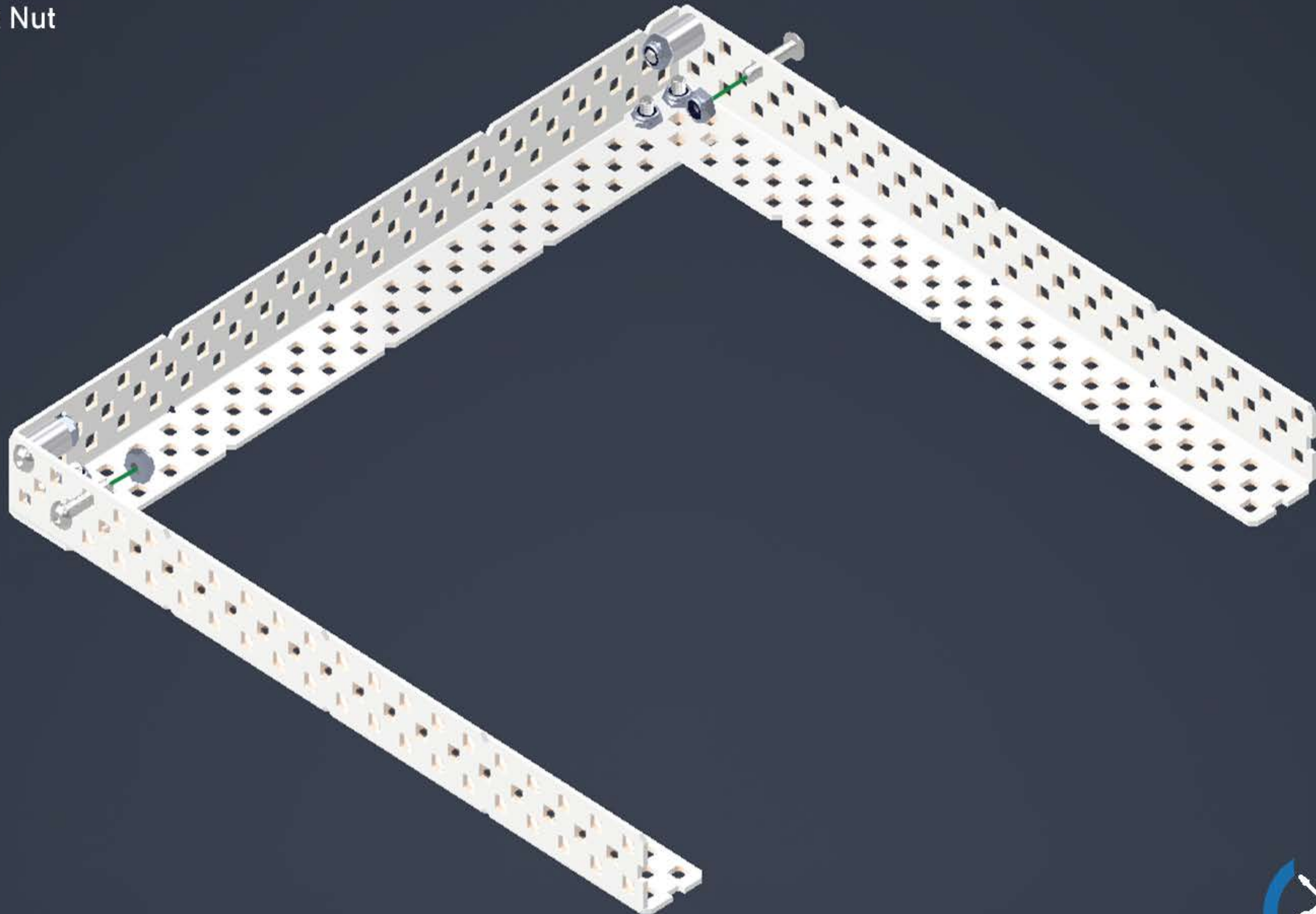
2x 0.750" Screw
2x 0.500" Spacer
2x Nylock Nut

14



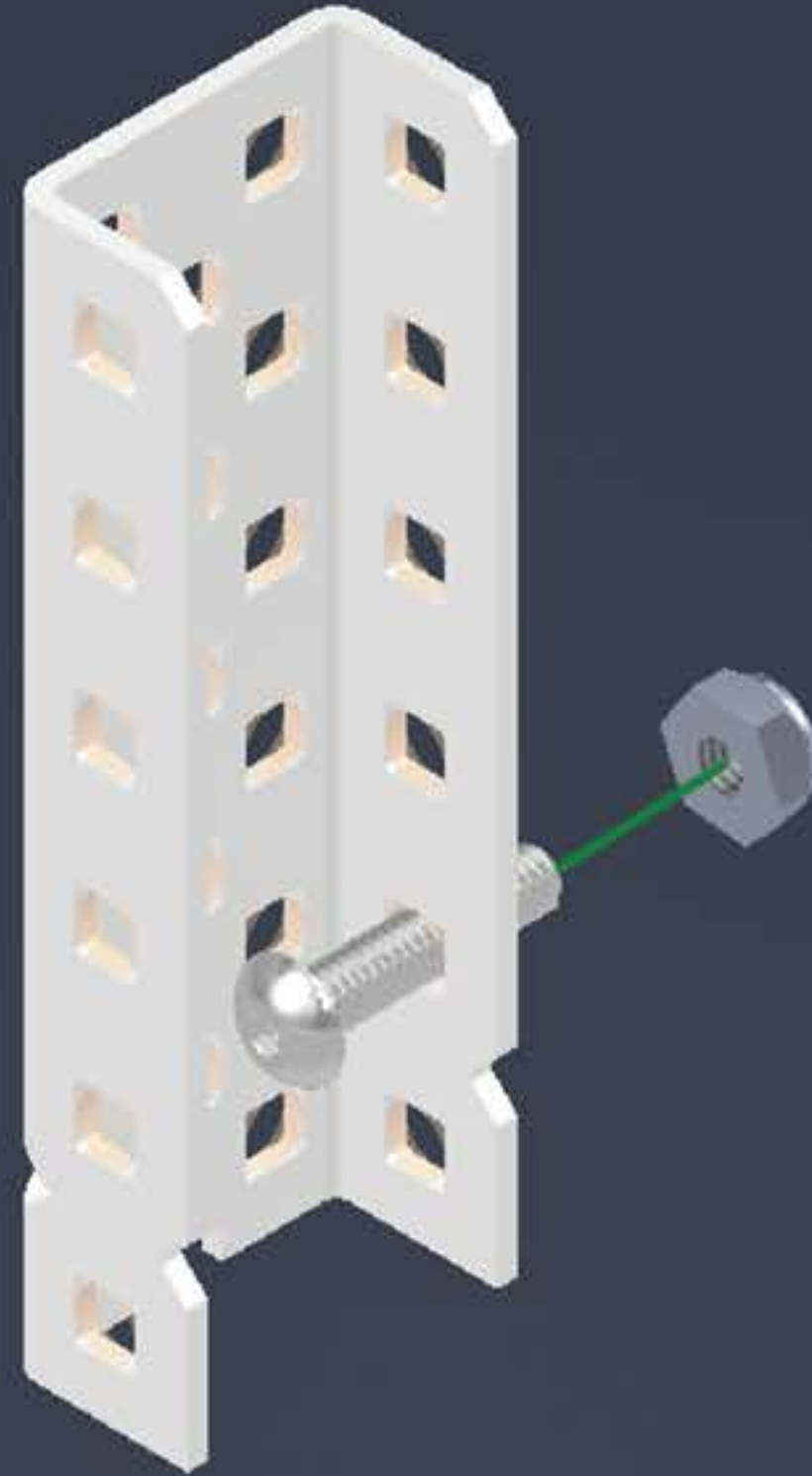
2x 0.750" Screw
2x Nylock Nut

15



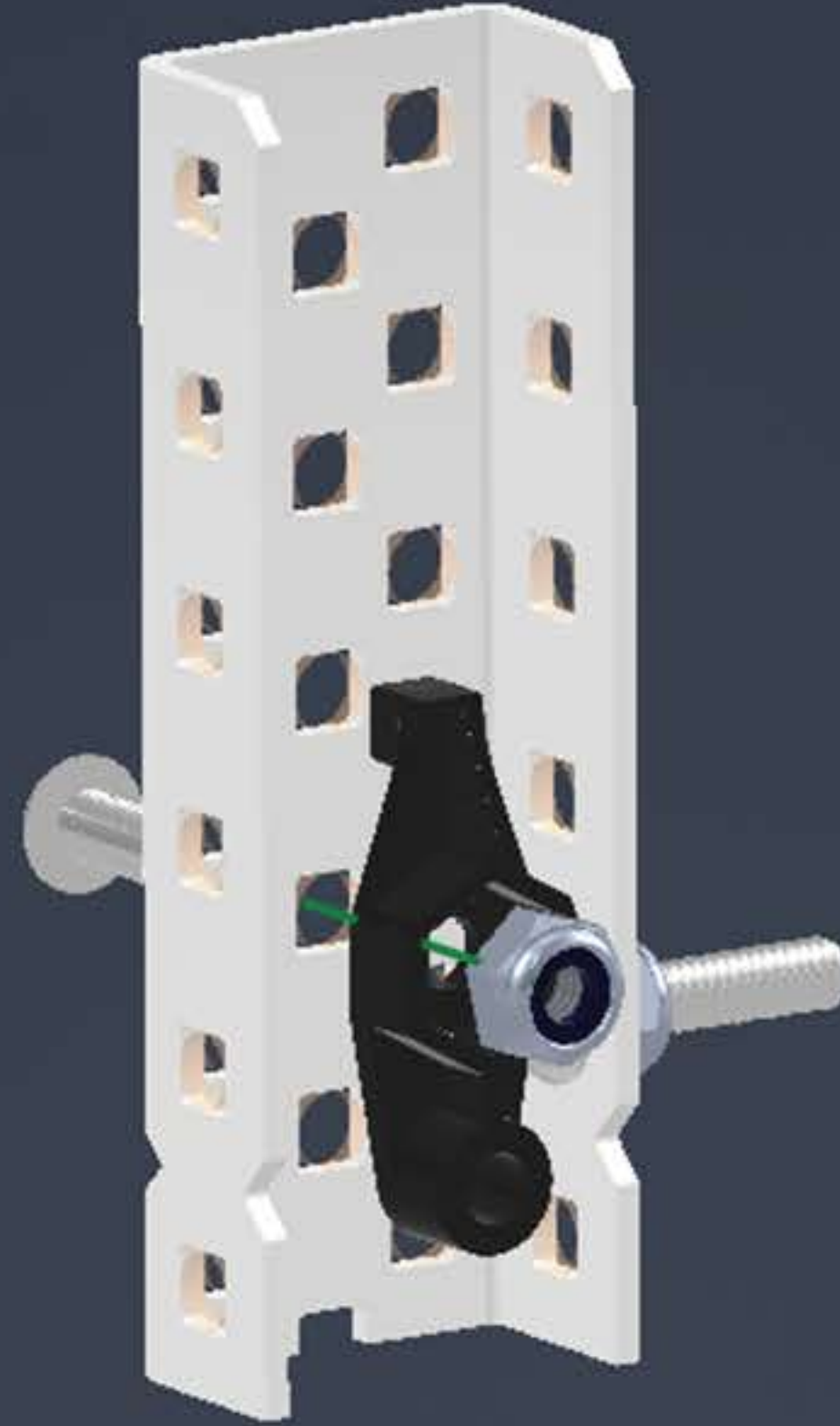
1x 1x2x1x6 C-Channel
1x 0.750" Screw
1x Nylock Nut

16

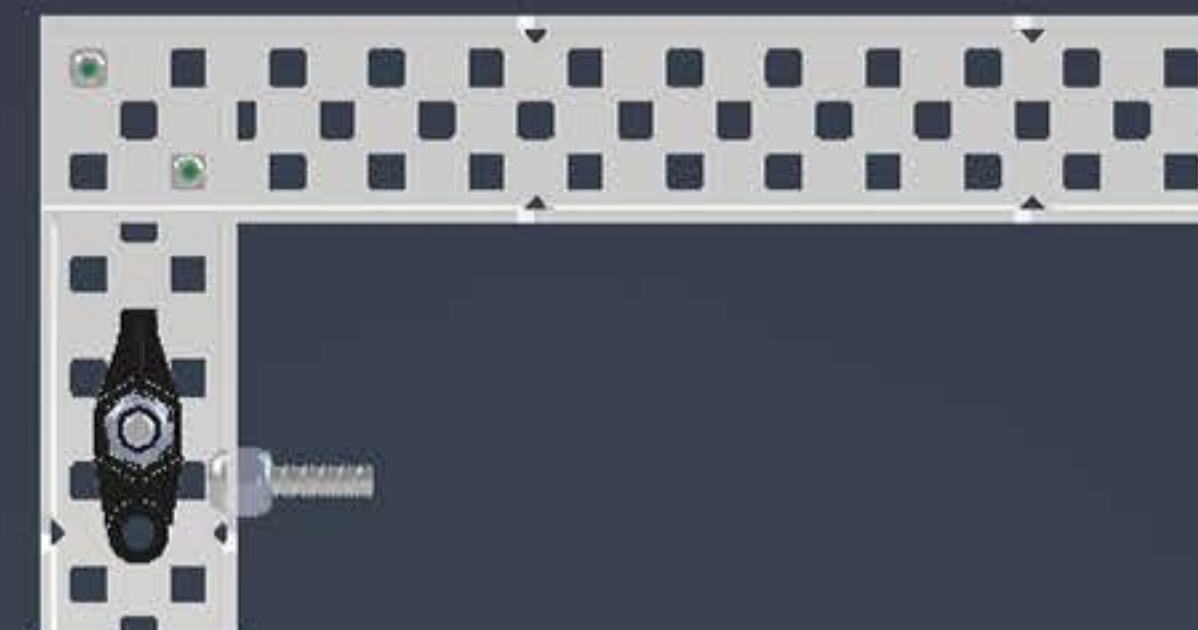
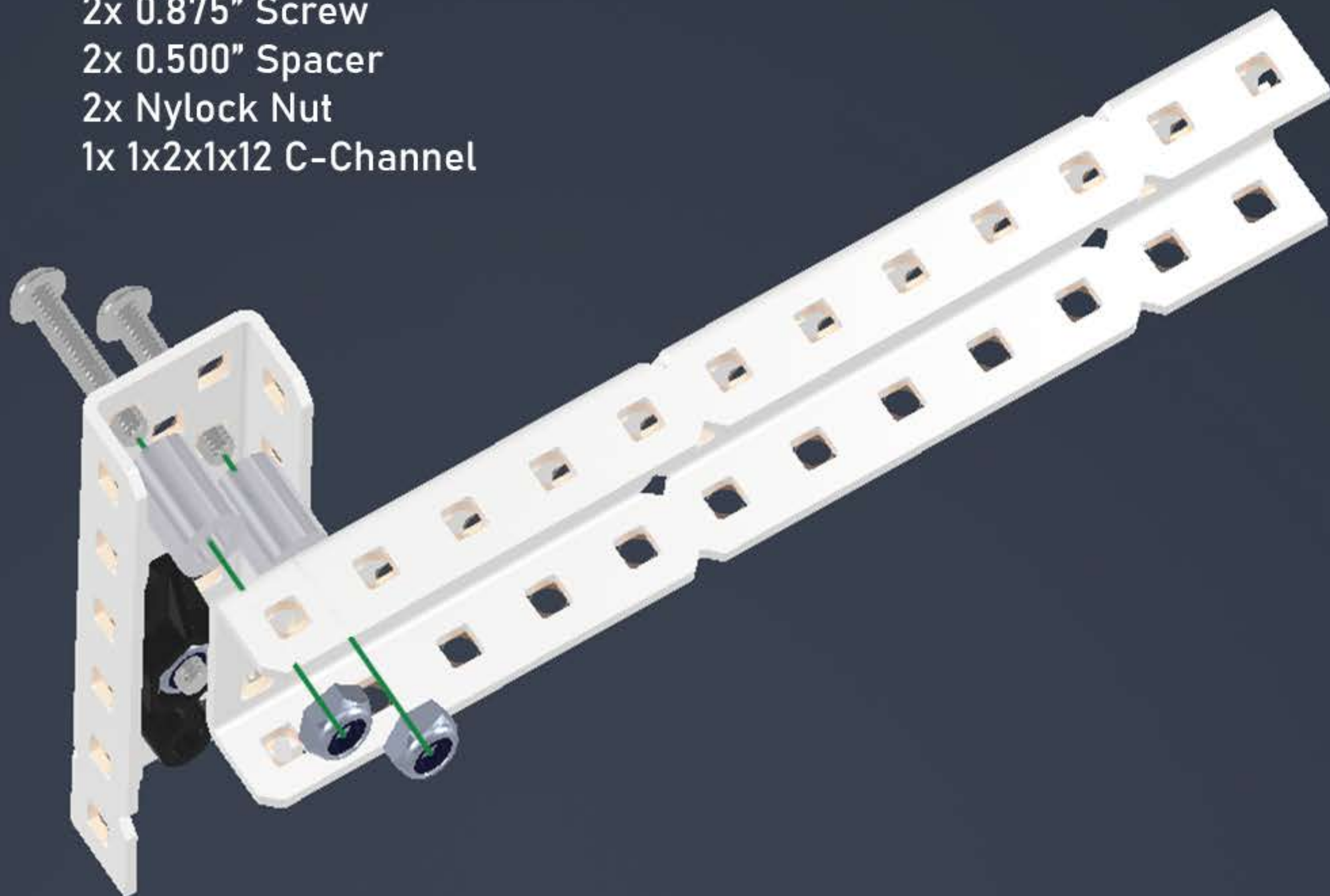


1x Bearing Flat
1x 0.375" Screw
1x Nylock Nut

17

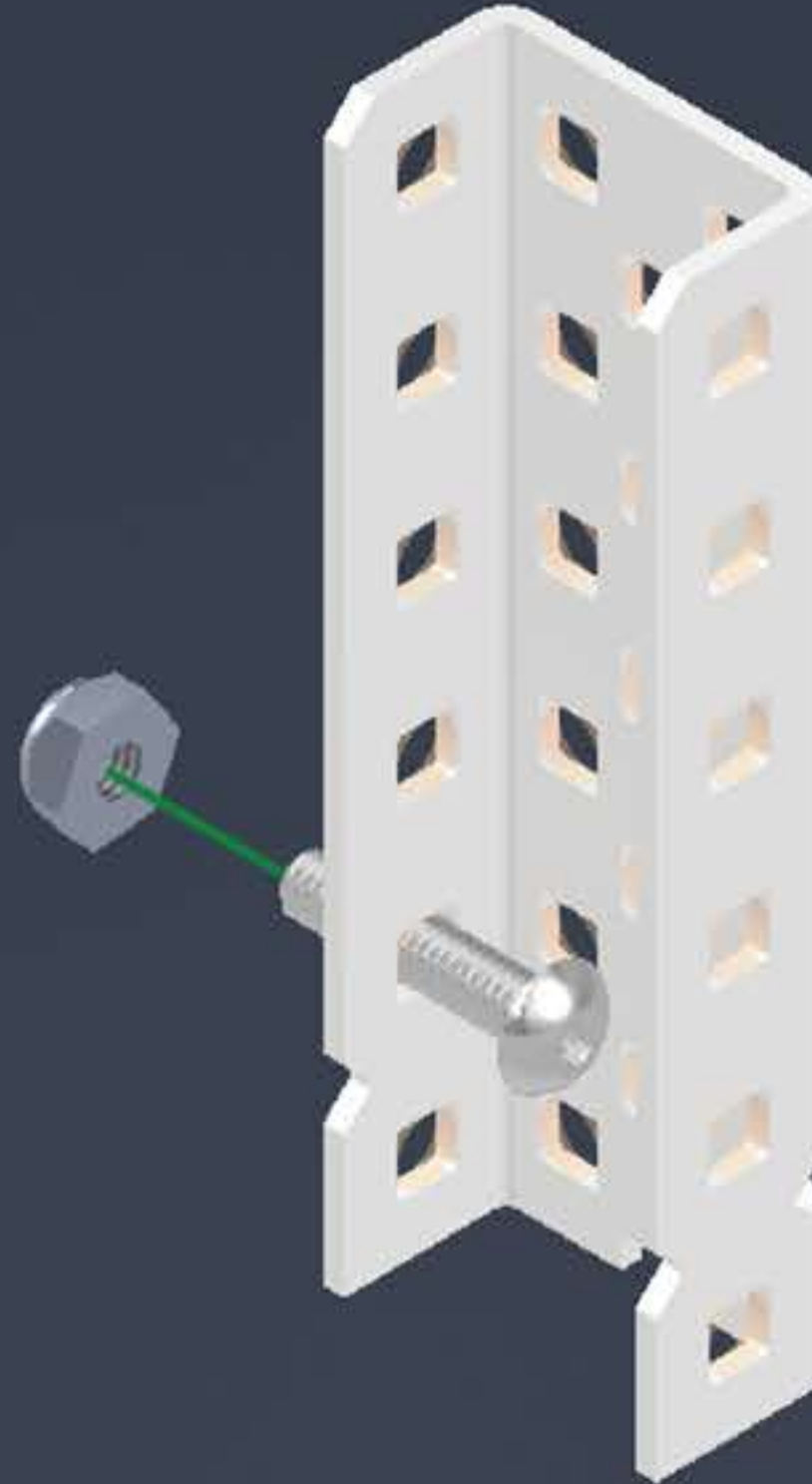


2x 0.875" Screw
2x 0.500" Spacer
2x Nylock Nut
1x 1x2x1x12 C-Channel



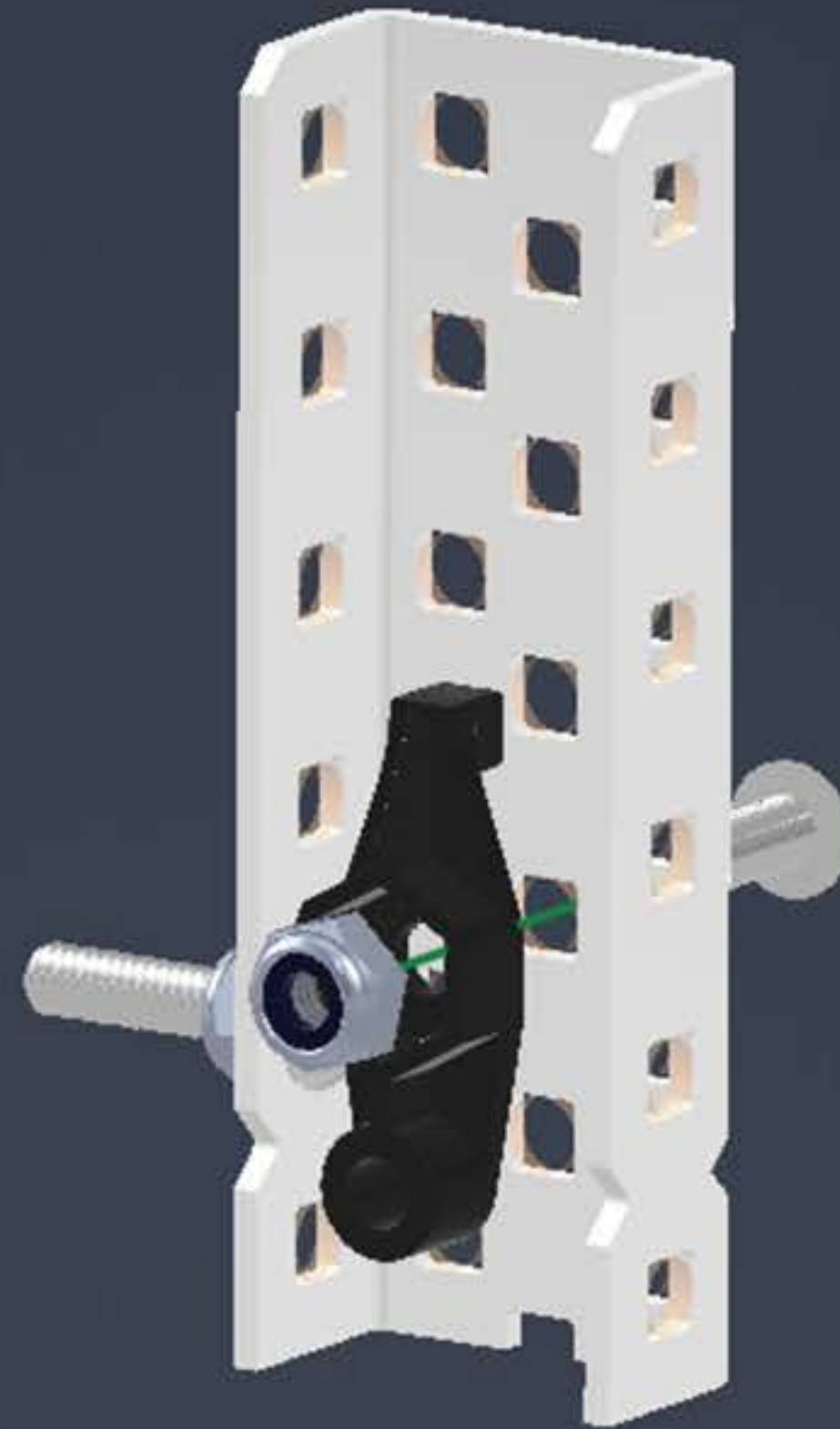
1x 1x2x1x6 C-Channel
1x 0.750" Screw
1x Nylock Nut

19

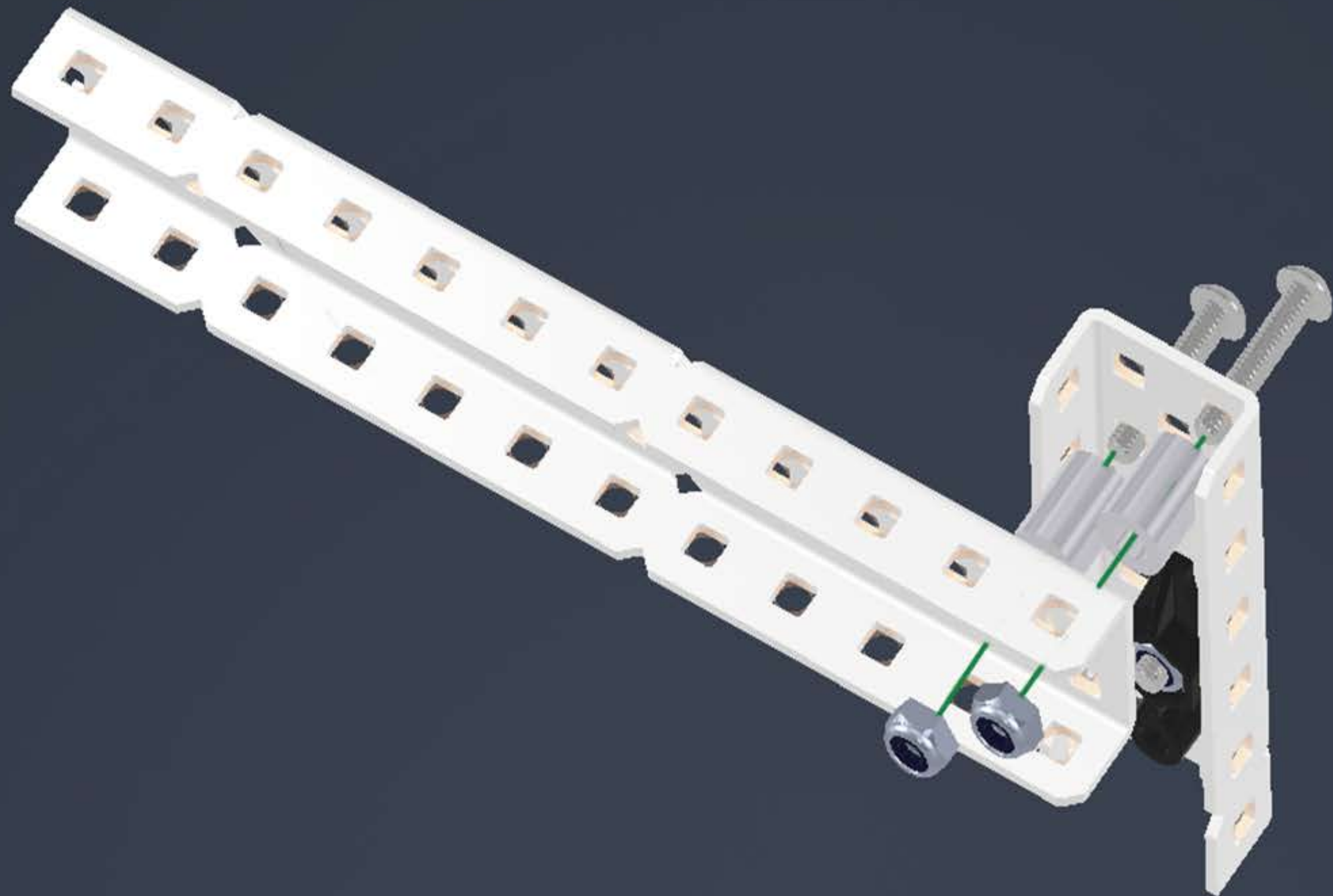


1x Bearing Flat
1x 0.375" Screw
1x Nylock Nut

20



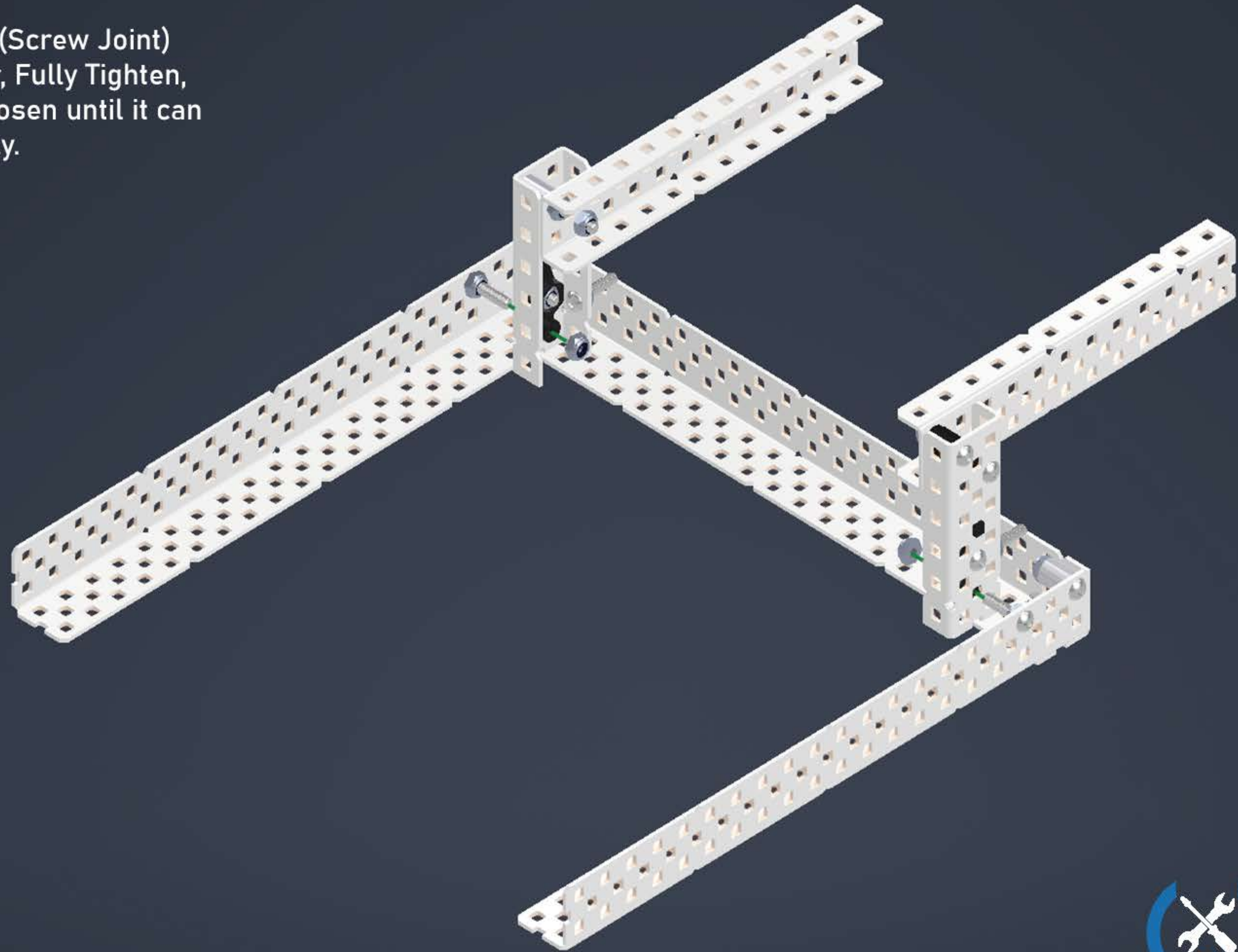
- 2x 0.875" Screw
- 2x 0.500" Spacer
- 2x Nylock Nut
- 1x 1x2x12 C-Channel



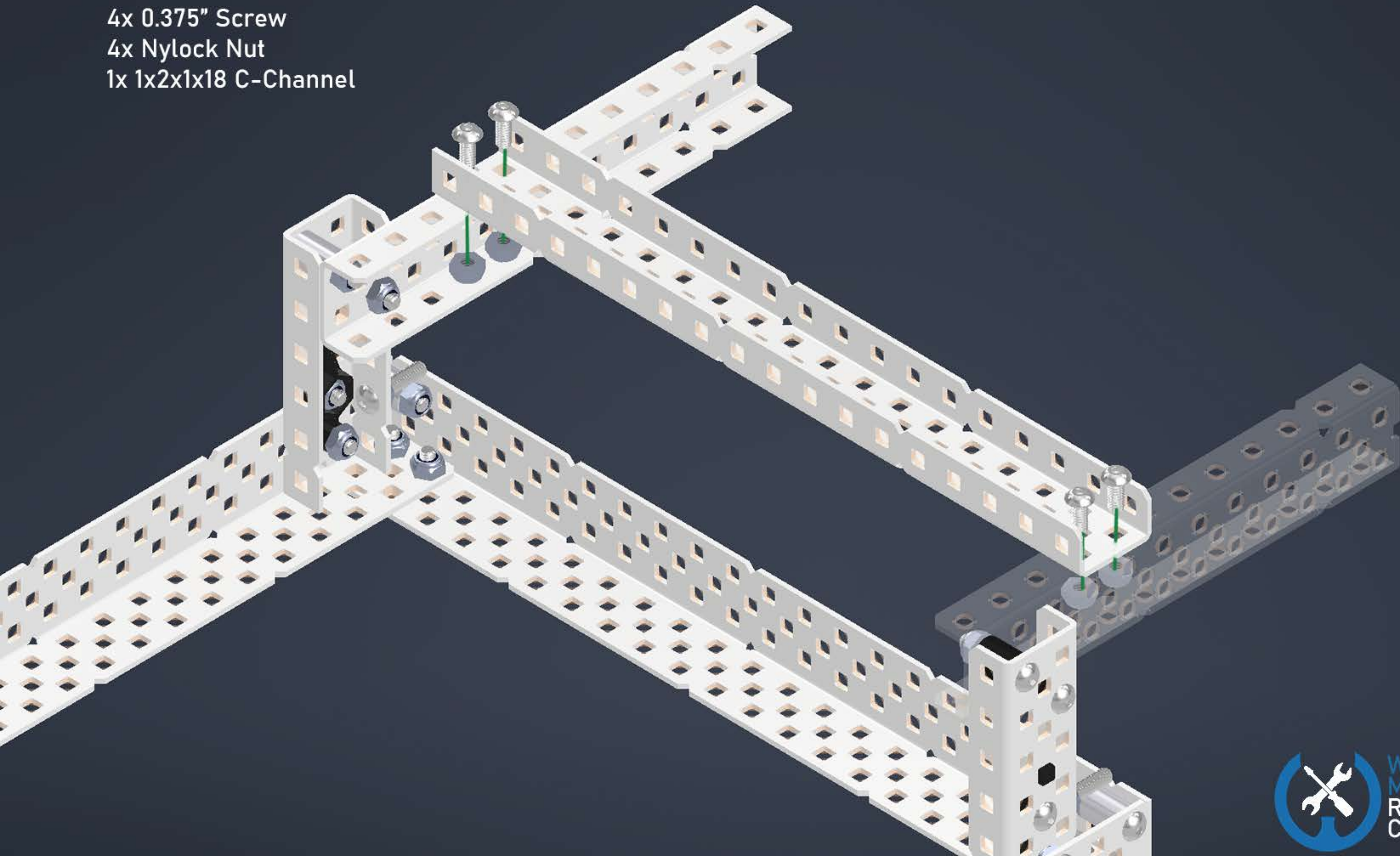
(alternate perspective)



2x Nylock Nut (Screw Joint)
Use Nut Driver, Fully Tighten,
Then slowly loosen until it can
rotate smoothly.



4x 0.375" Screw
4x Nylock Nut
1x 1x2x1x18 C-Channel



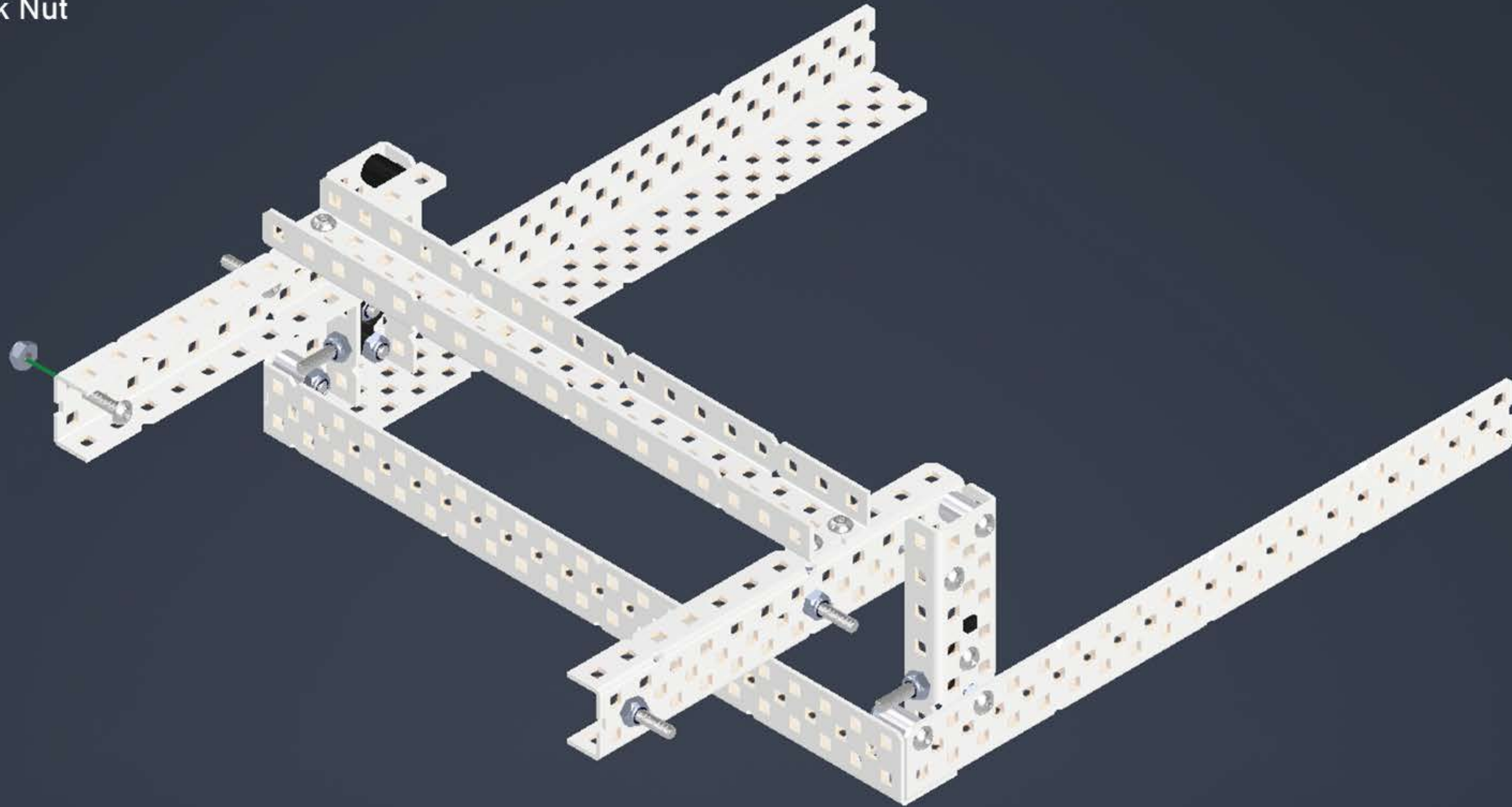
3x 0.750" Screw
3x Nylock Nut

24



1x 1.000" screw
1x Nylock Nut

25



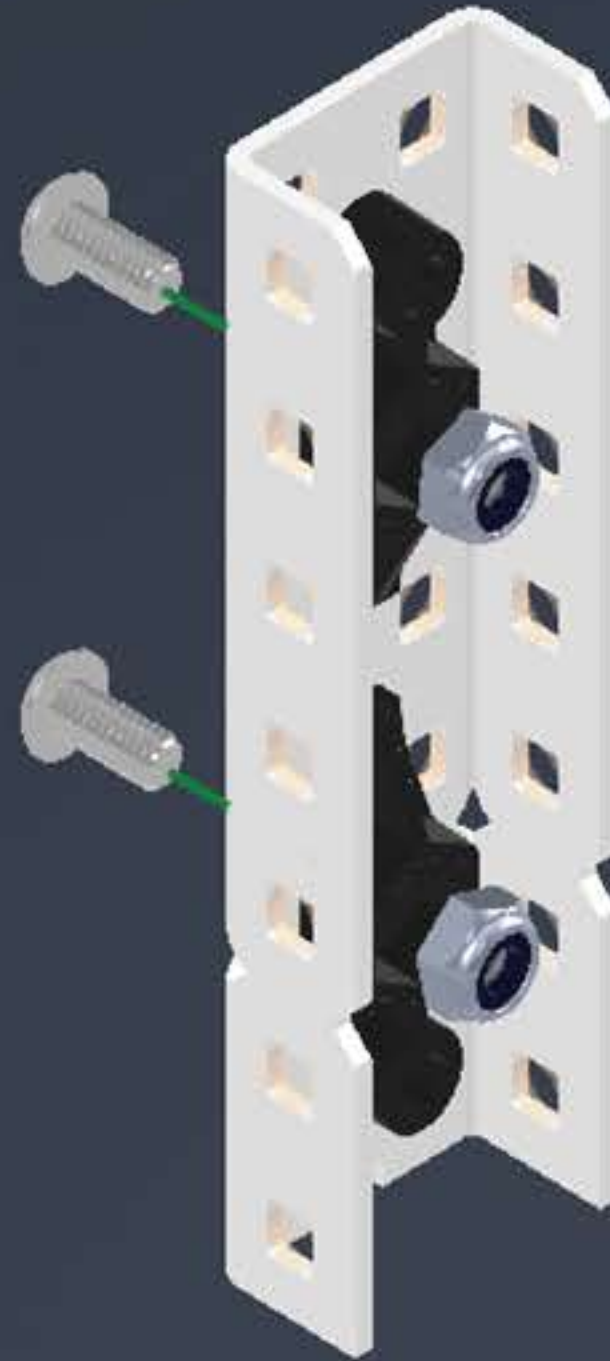
3x

2x 0.375" Screw

2x Bearing Flat

2x Nylock Nut

1x 1x2x1x7 C-Channel



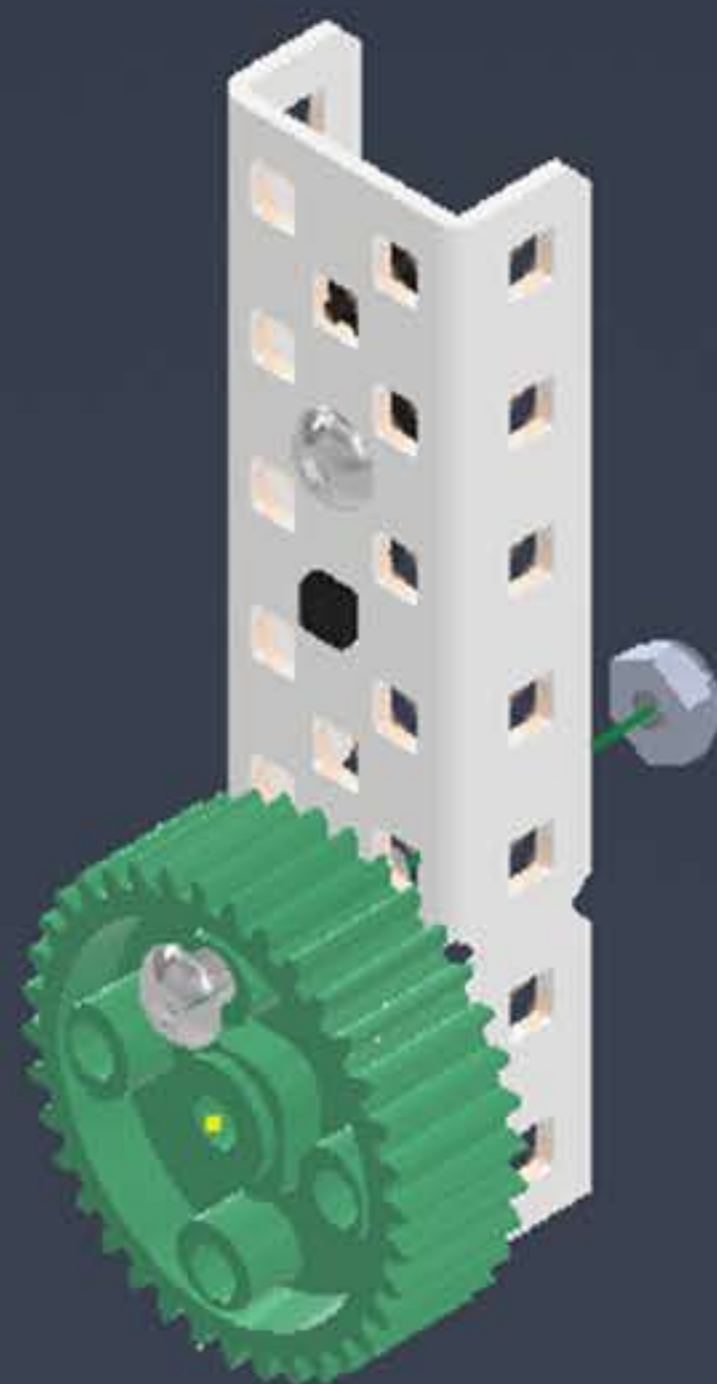
1x 0.375" Screw
1x Bearing Flat
1x Nylock Nut

27



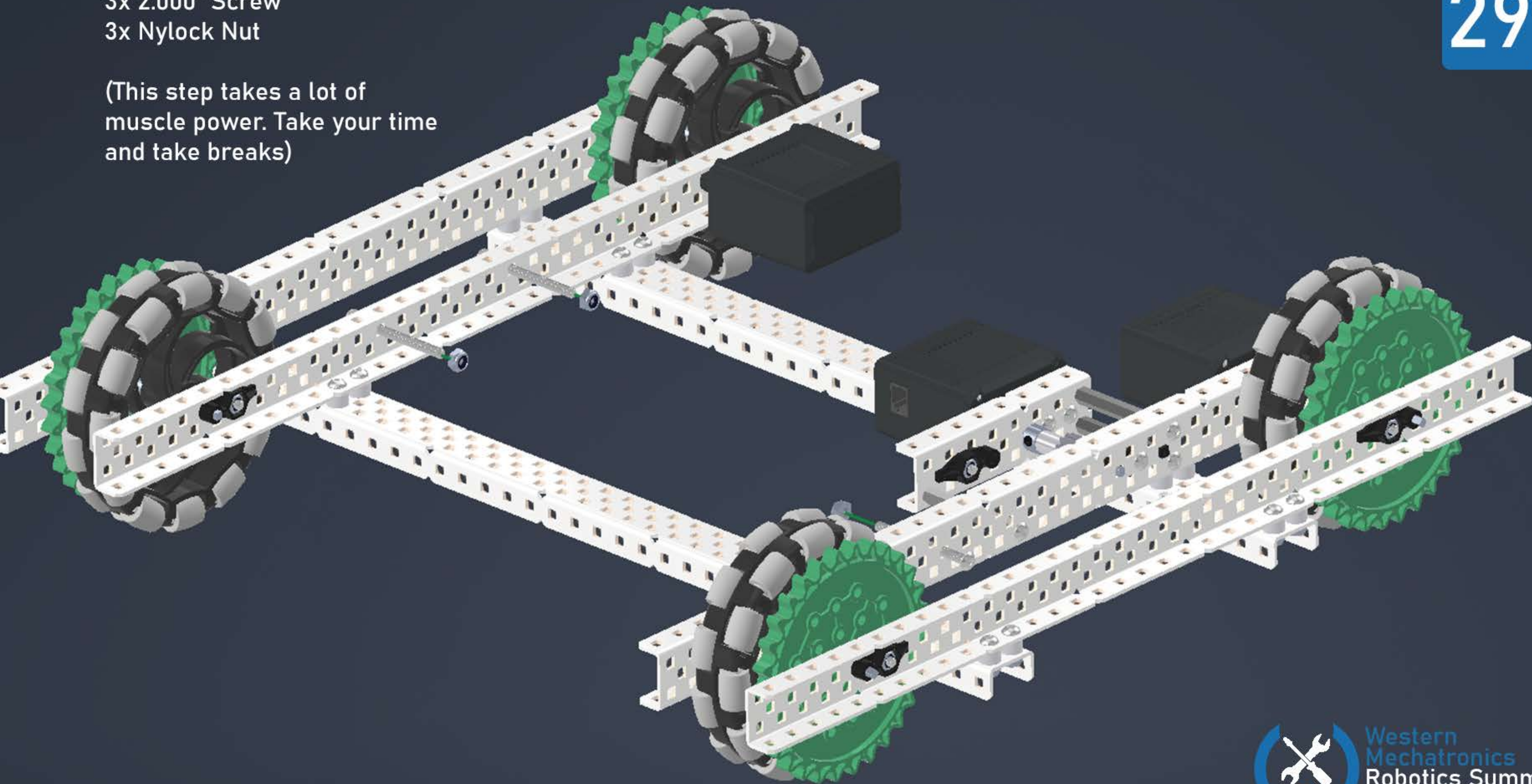
1x From Step 27
1x 0.875" Screw
1x 36t Gear
1x Nylock Nut

28



3x 2.000" Screw
3x Nylock Nut

(This step takes a lot of
muscle power. Take your time
and take breaks)

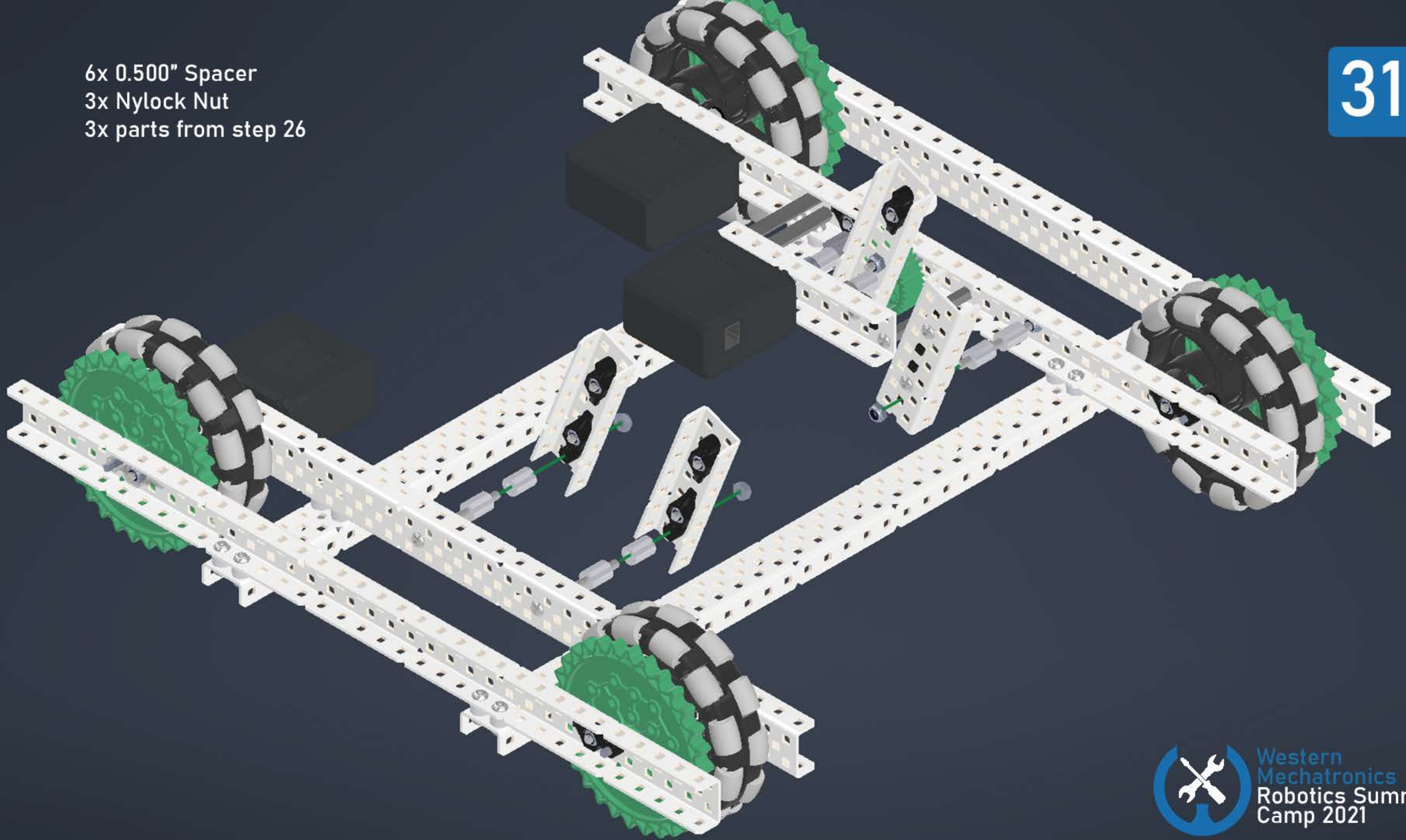


- 1x 2.000" Screw
- 1x 0.500" Spacer
- 1x 0.375" Spacer
- 3x Steel Washer

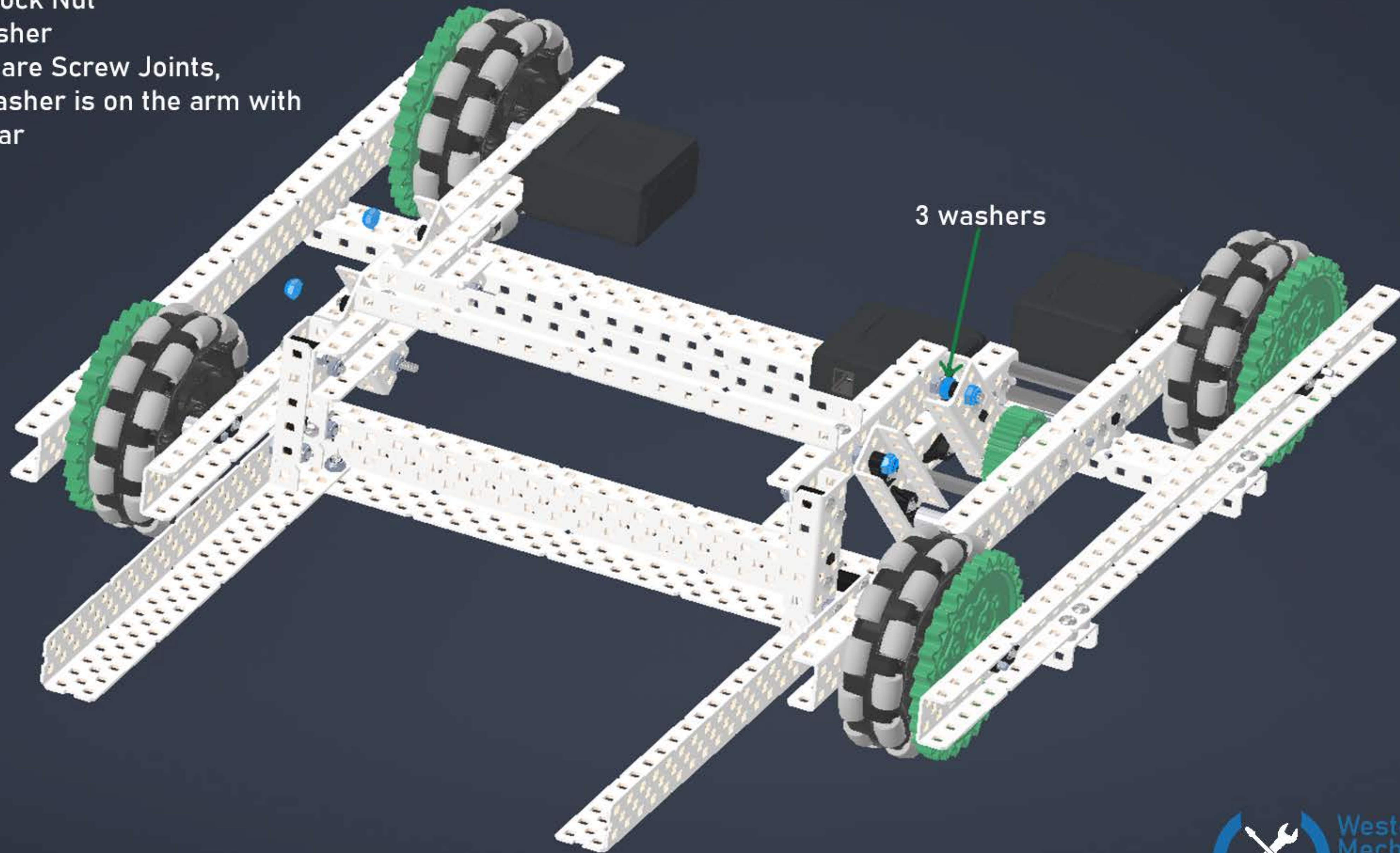
As you tighten the 2-Inch screw, you need to add the spacers. This is very challenging and will take time

6x 0.500" Spacer
3x Nylock Nut
3x parts from step 26

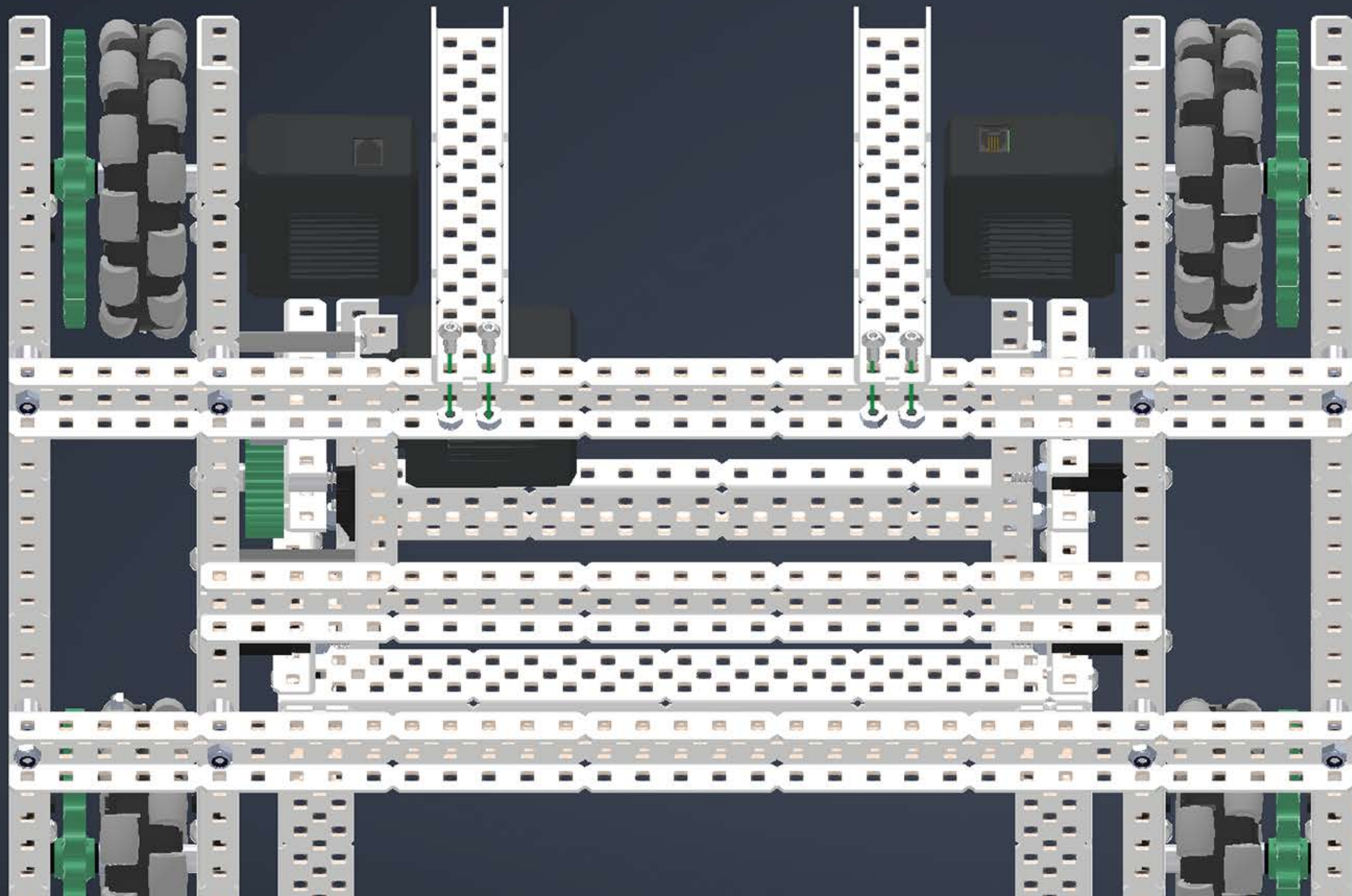
31



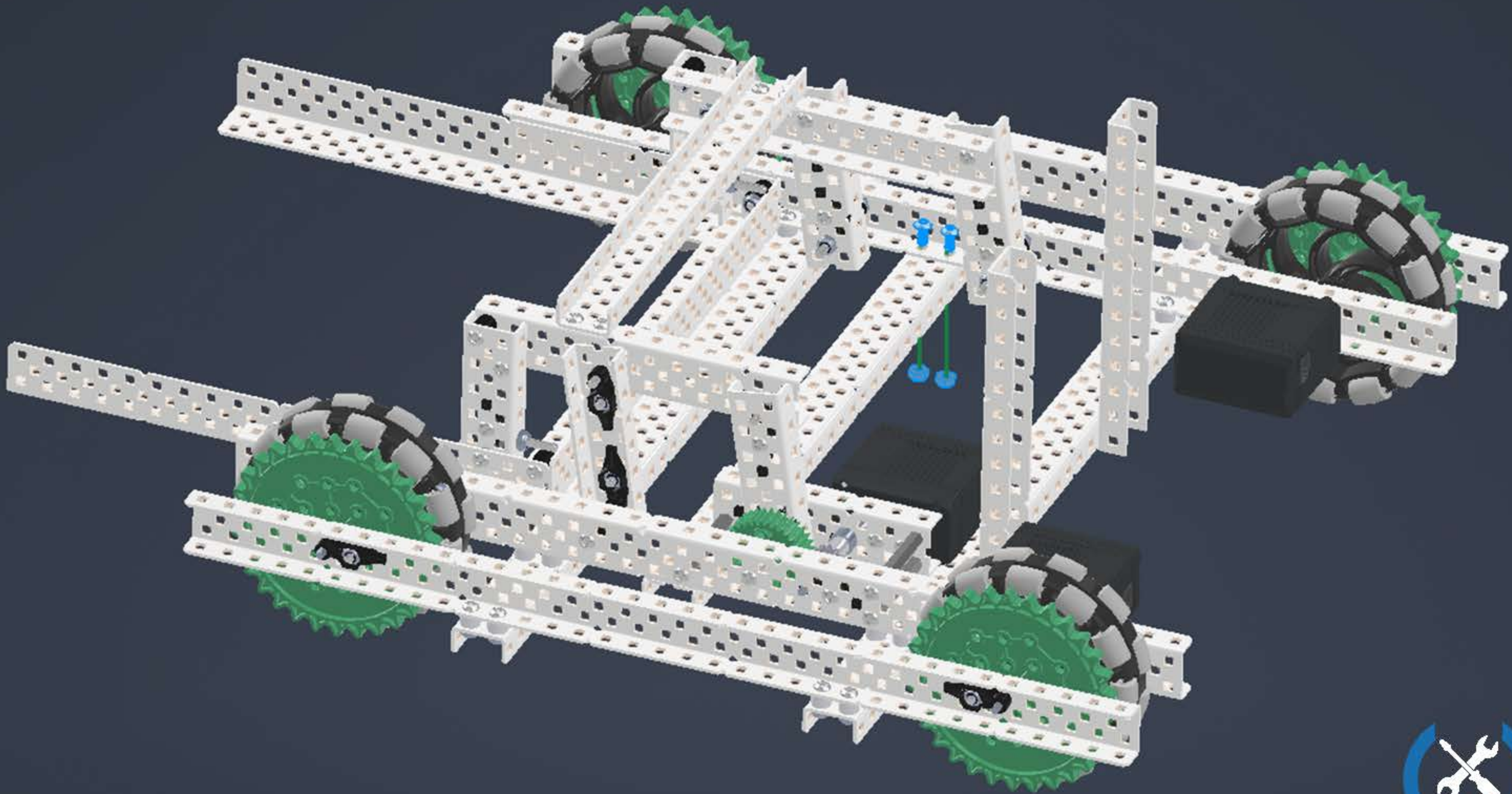
4x Nylock Nut
3x Washer
These are Screw Joints,
The washer is on the arm with
the gear



(Flip over the Robot)
2x 1x2x13 C-Channel
4x 0.375" Screw
4x Nylock Nut

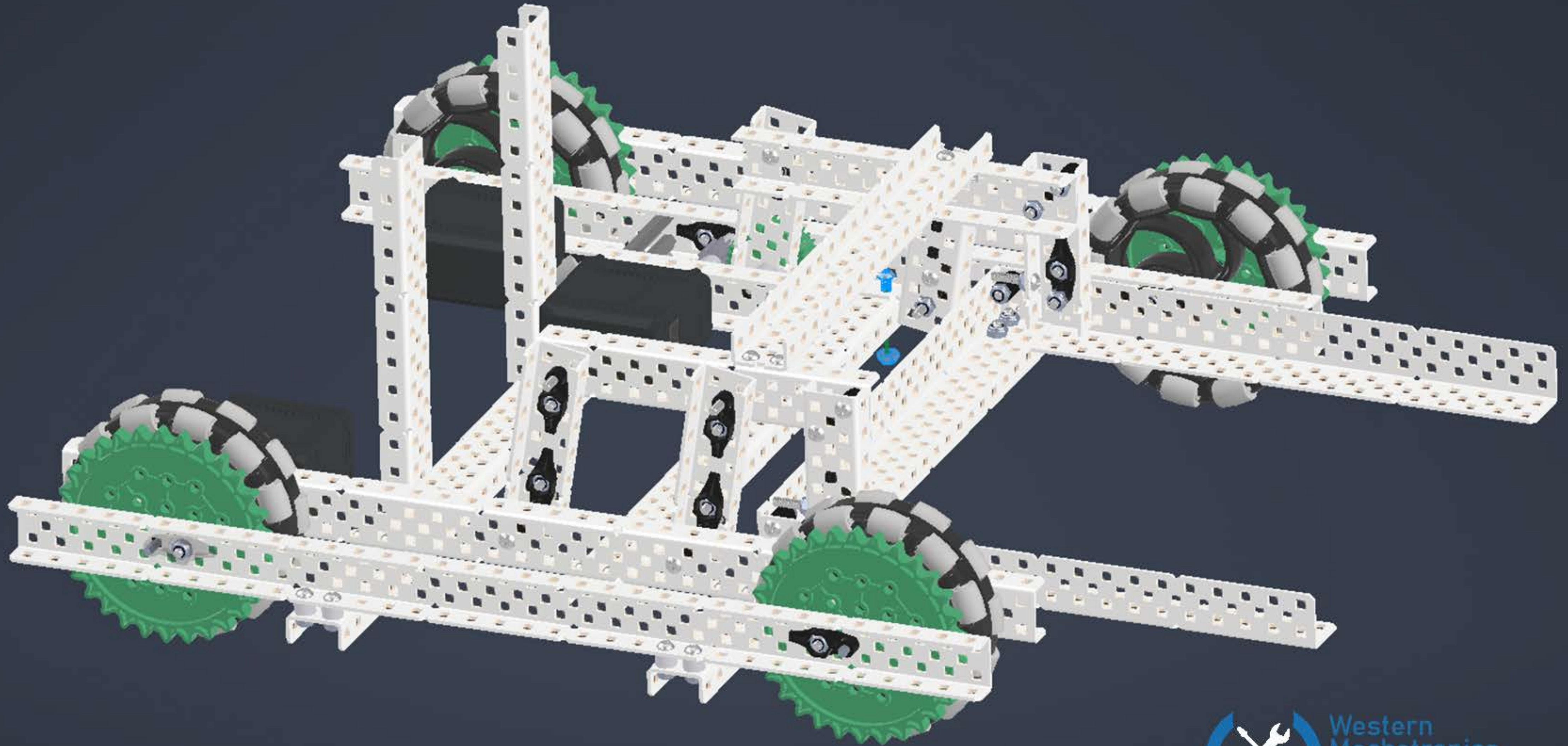


1x 1x2x1x25 C-Channel
2x 0.375" Screw
2x Nylock Nut

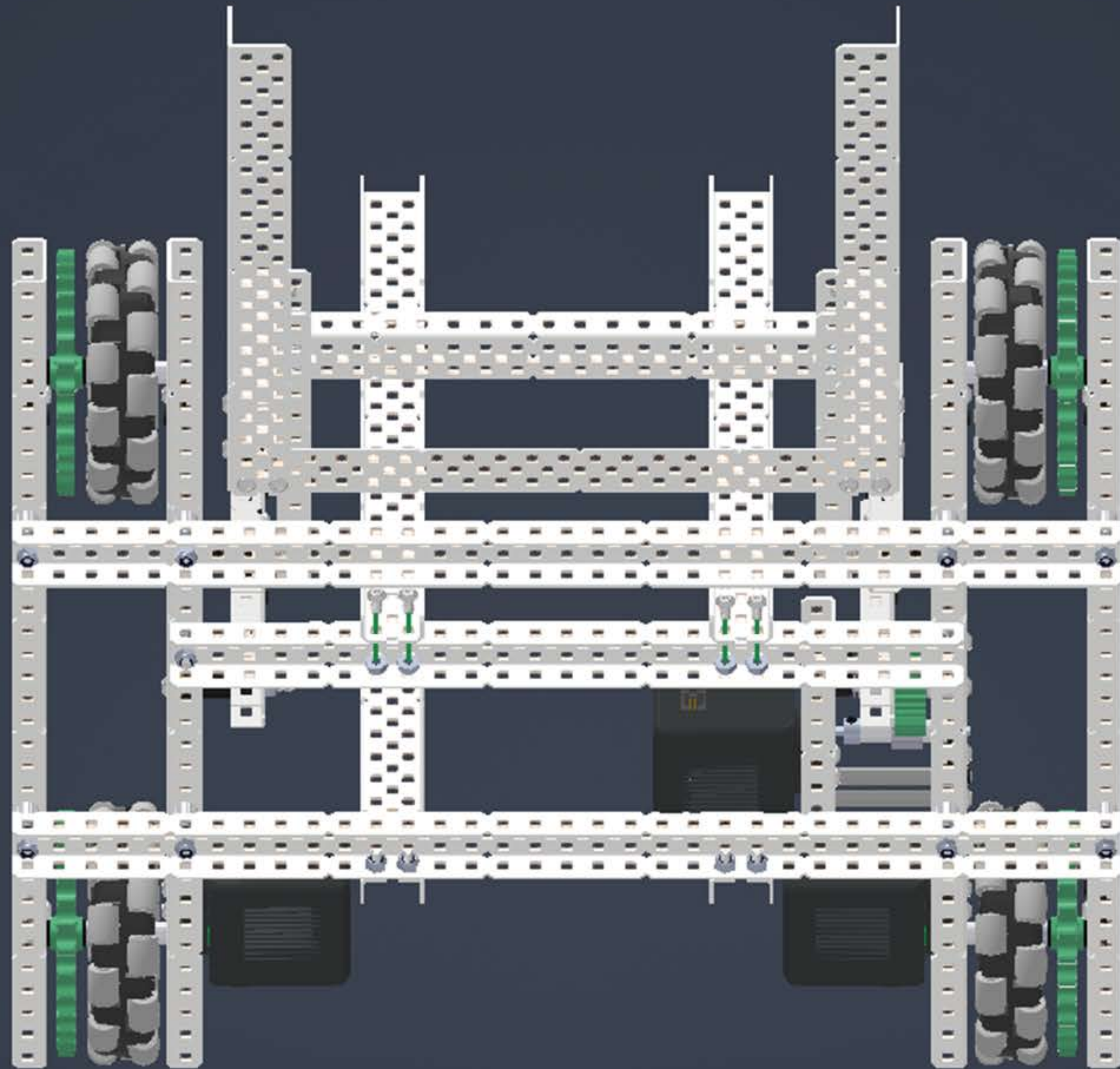


1x 0.375" Screw
1x Nylock Nut

35

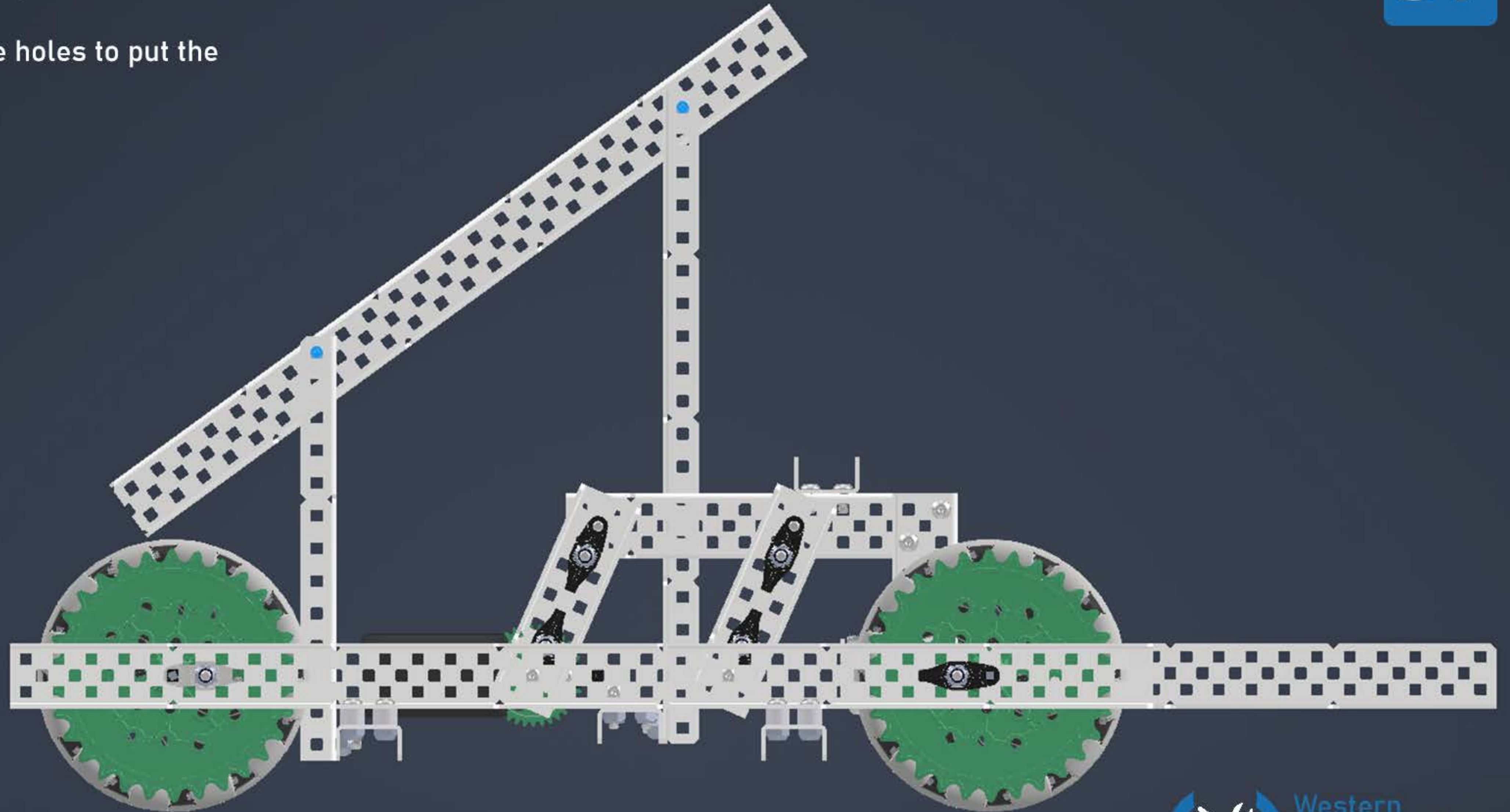


(flip over the robot)
2x 1x2x1x20 C-Channel
4x 0.375" Screw
4x Nylock Nut

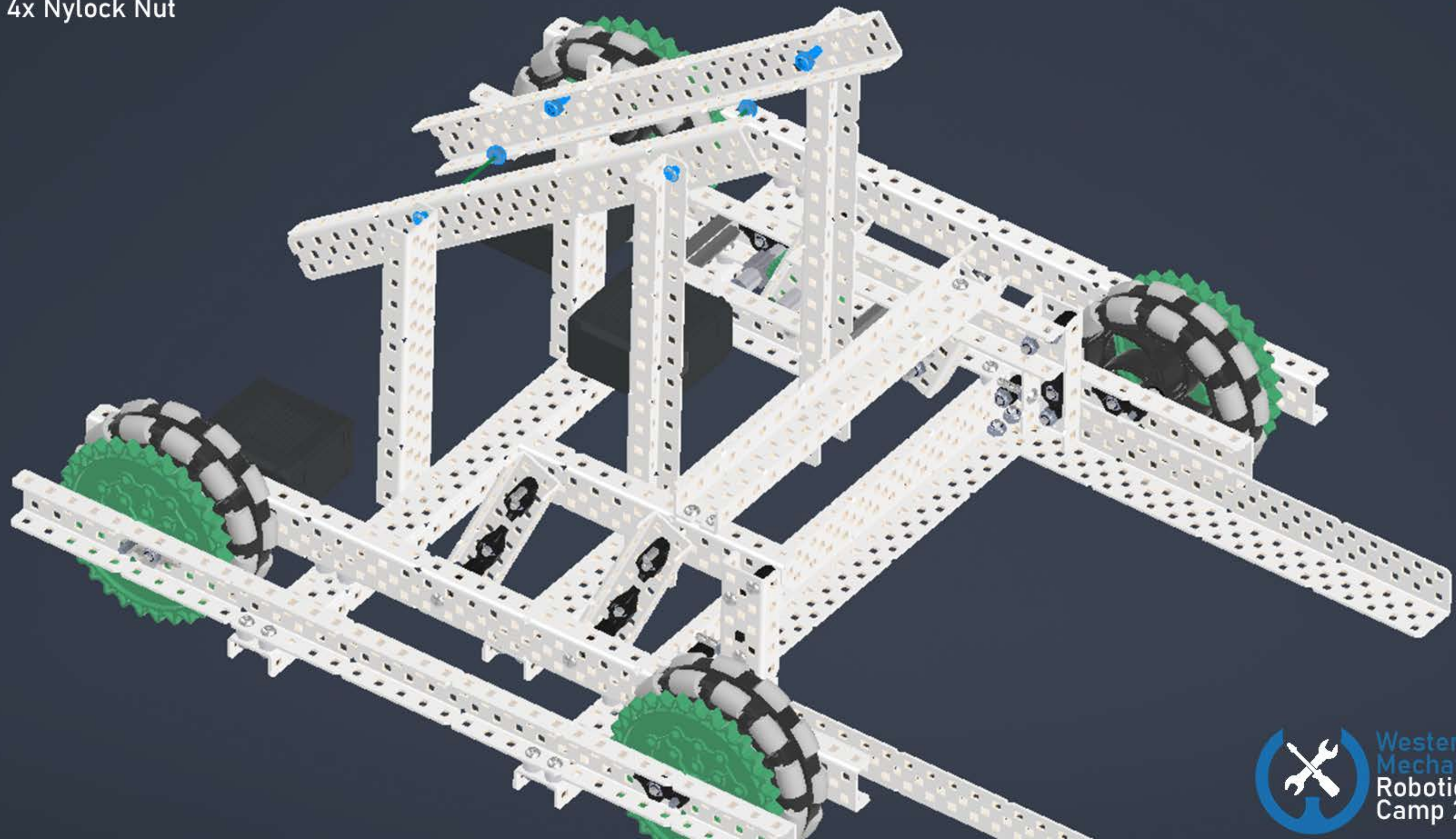


Use this picture for reference for the next step.

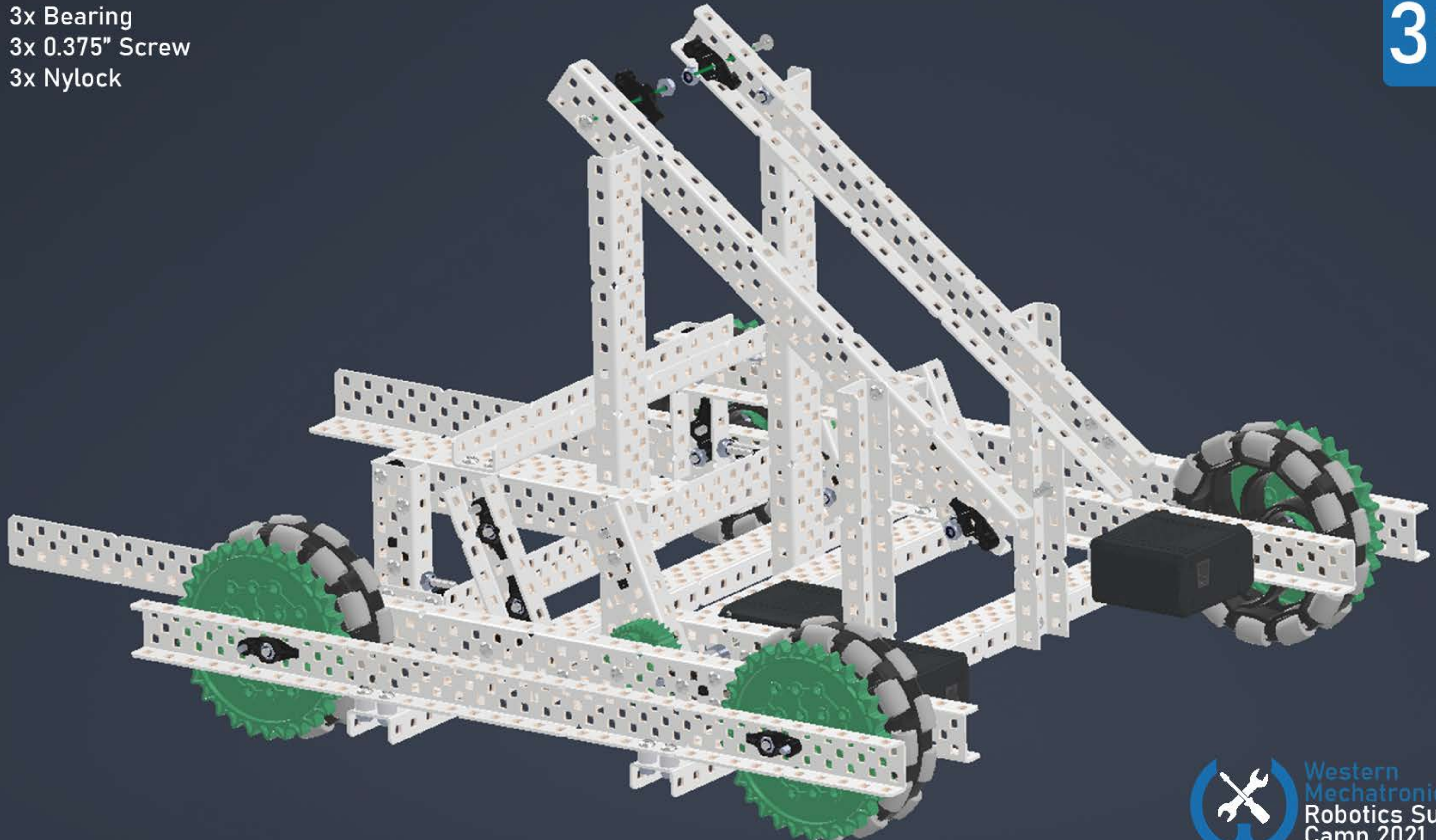
(These are the holes to put the screws in)



2x 1x2x1x25 C-Channel
4x 0.375" Screw
4x Nylock Nut

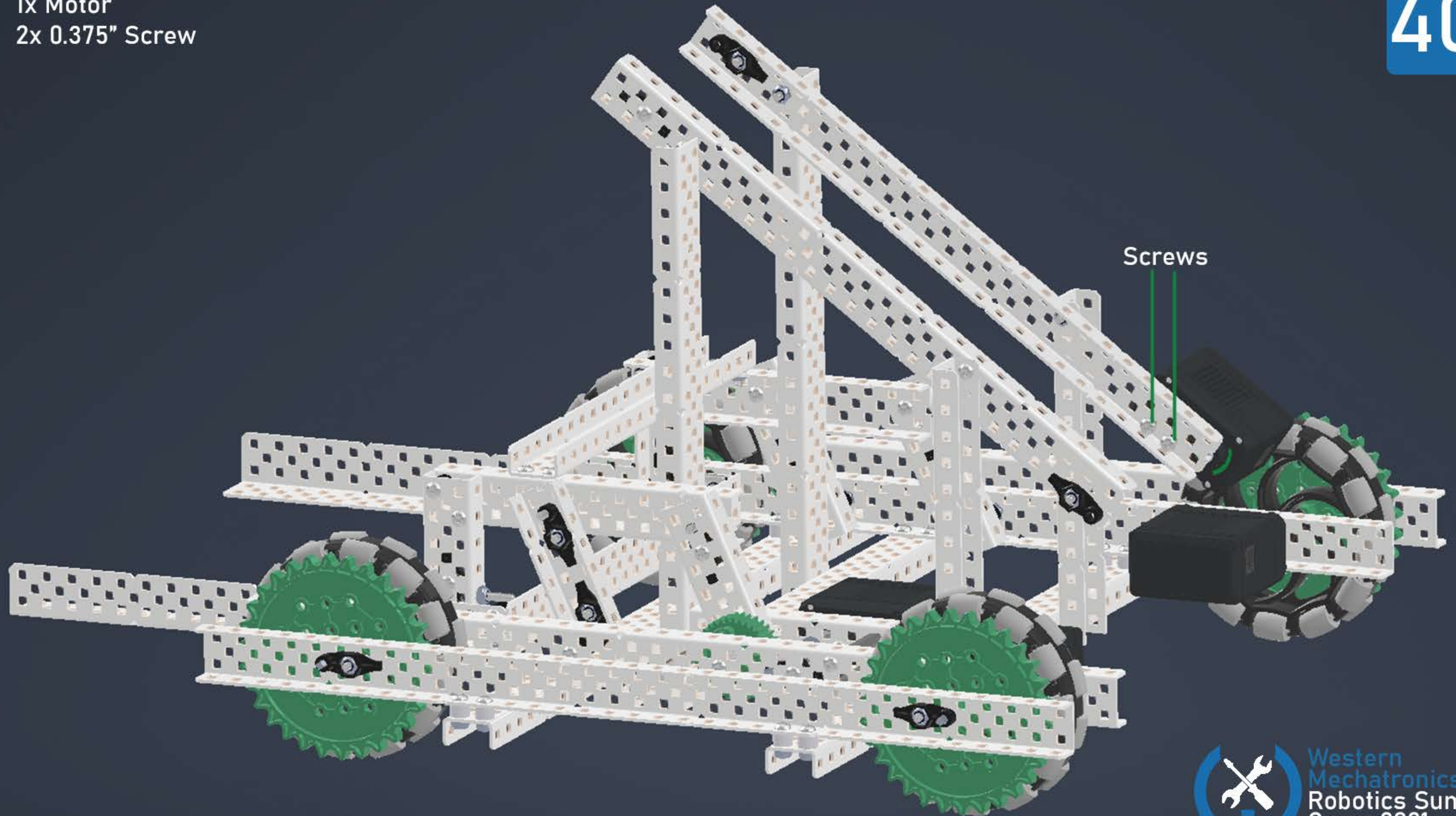


3x Bearing
3x 0.375" Screw
3x Nylock

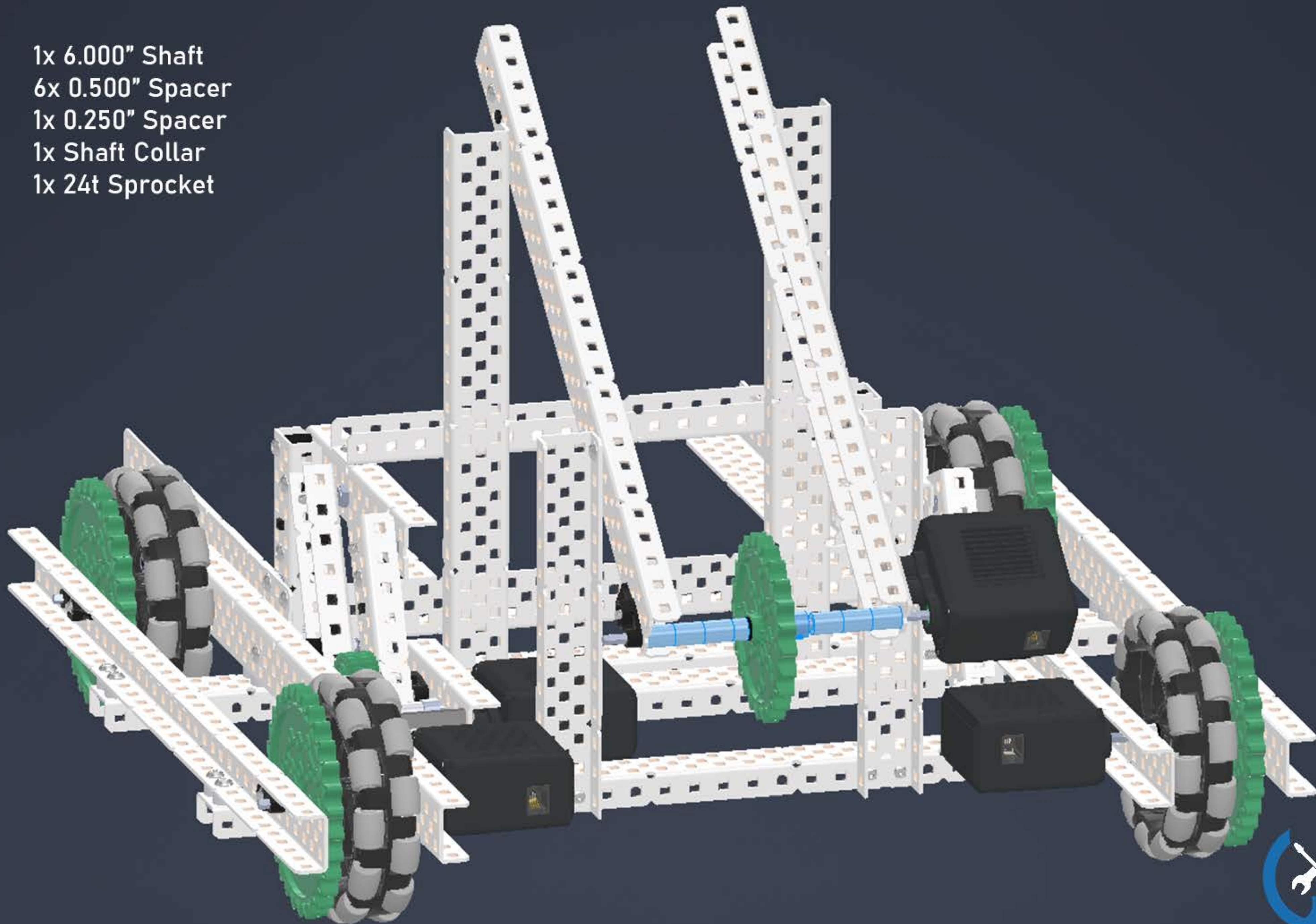


1x Motor
2x 0.375" Screw

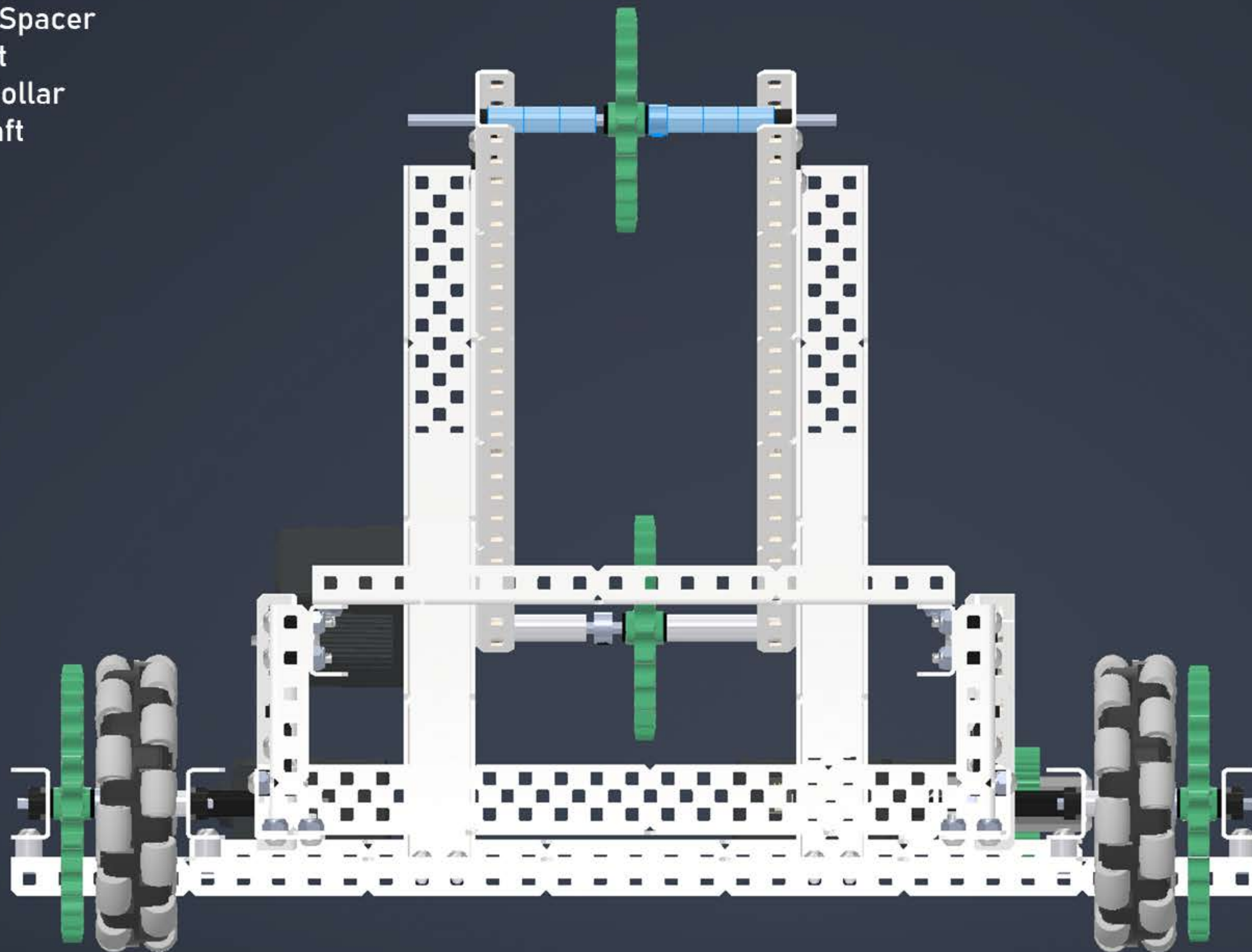
40



1x 6.000" Shaft
6x 0.500" Spacer
1x 0.250" Spacer
1x Shaft Collar
1x 24t Sprocket

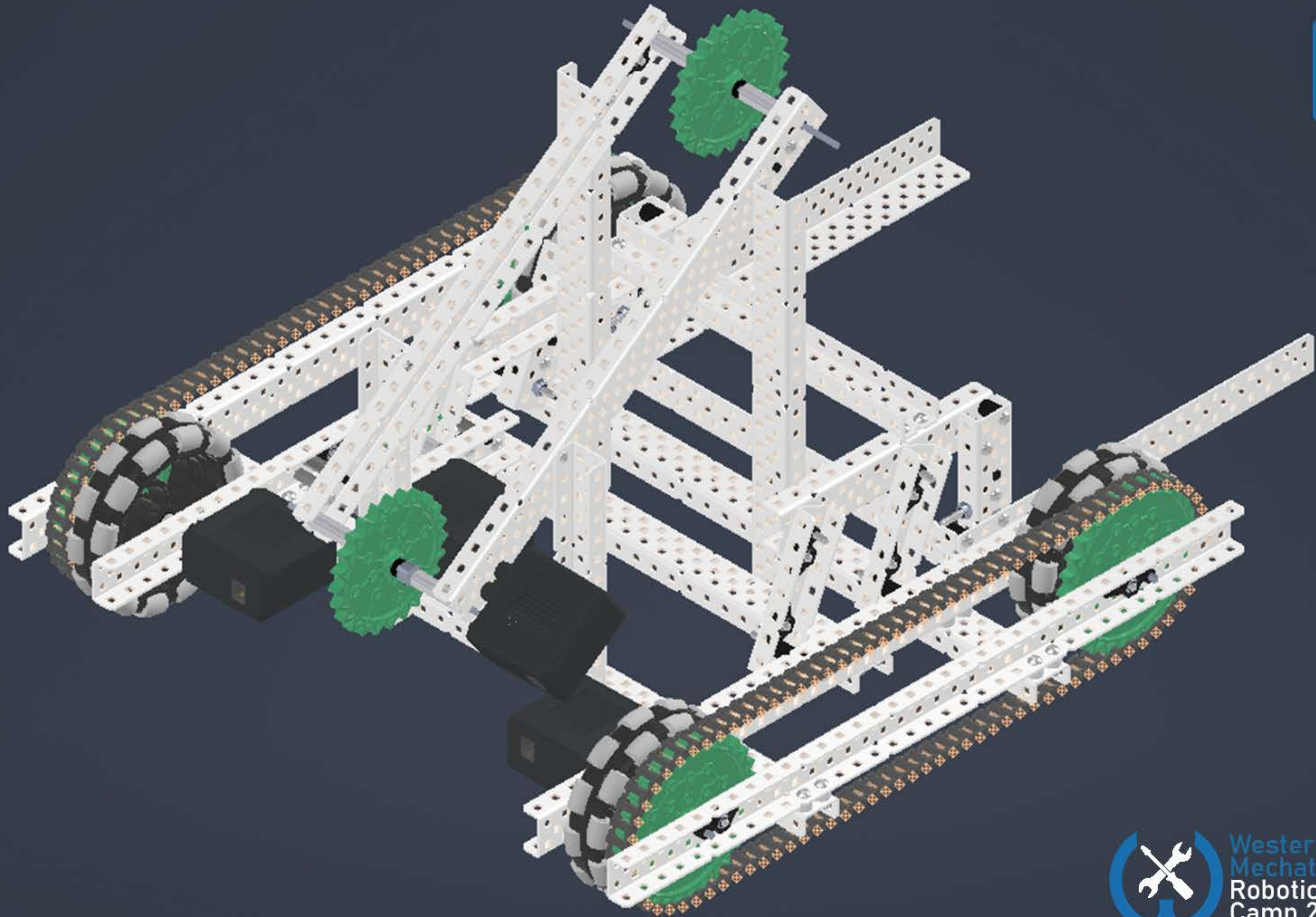


(Back View of Robot)
6x 0.500" Spacer
1x 6" Shaft
1x Shaft Collar
1x 24t Shaft

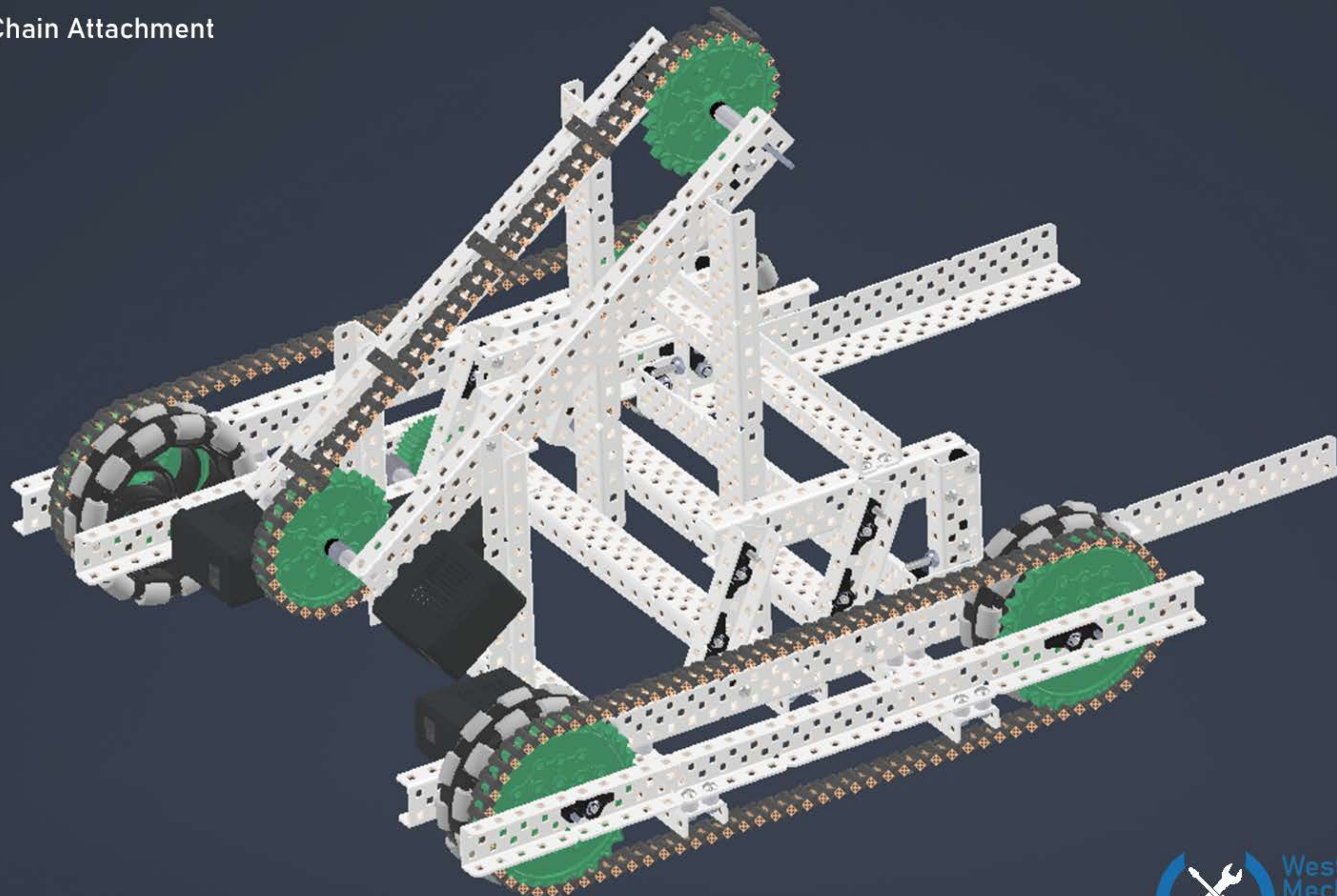


2x Chain

43



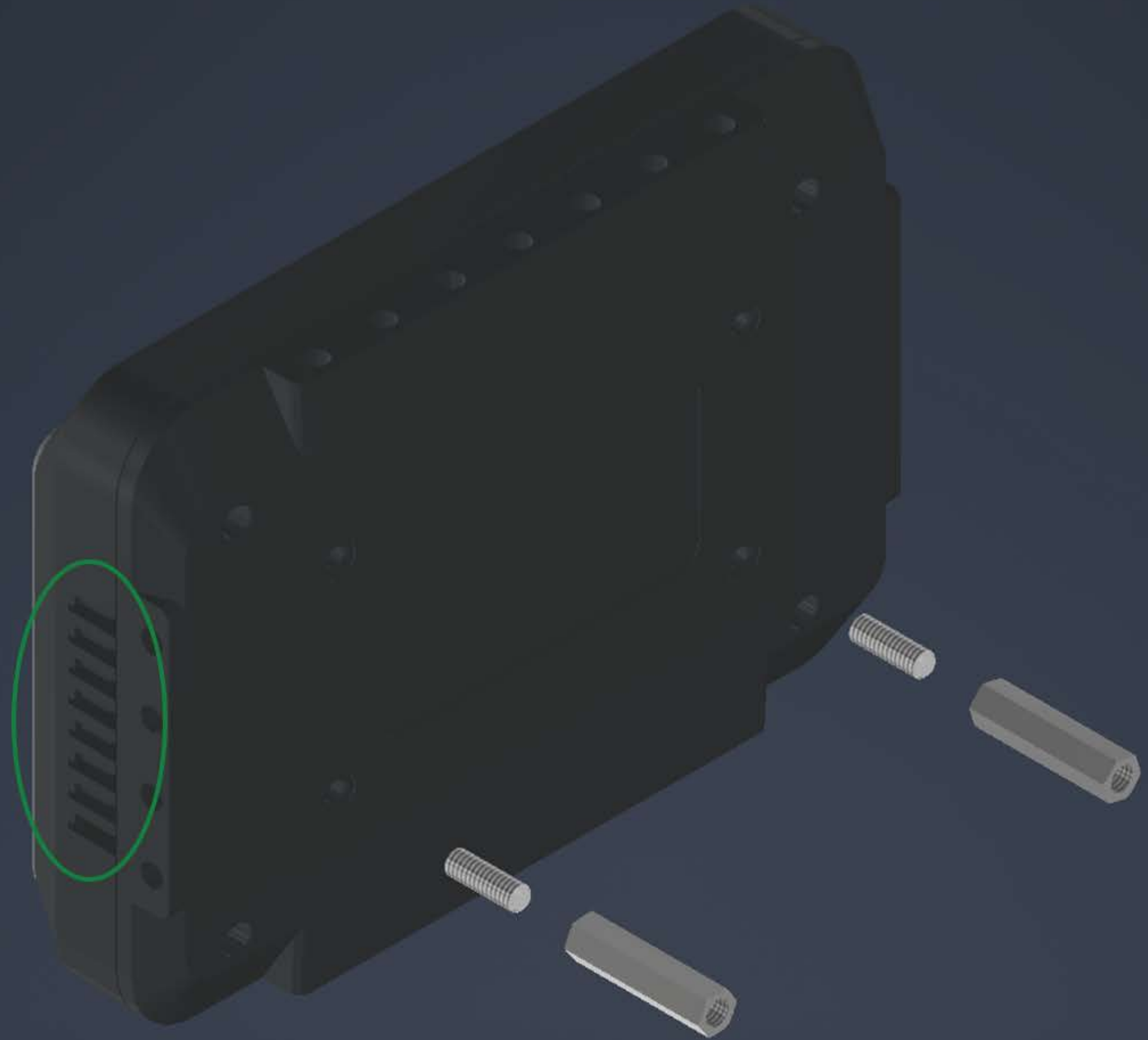
Chain with Chain Attachment
Link



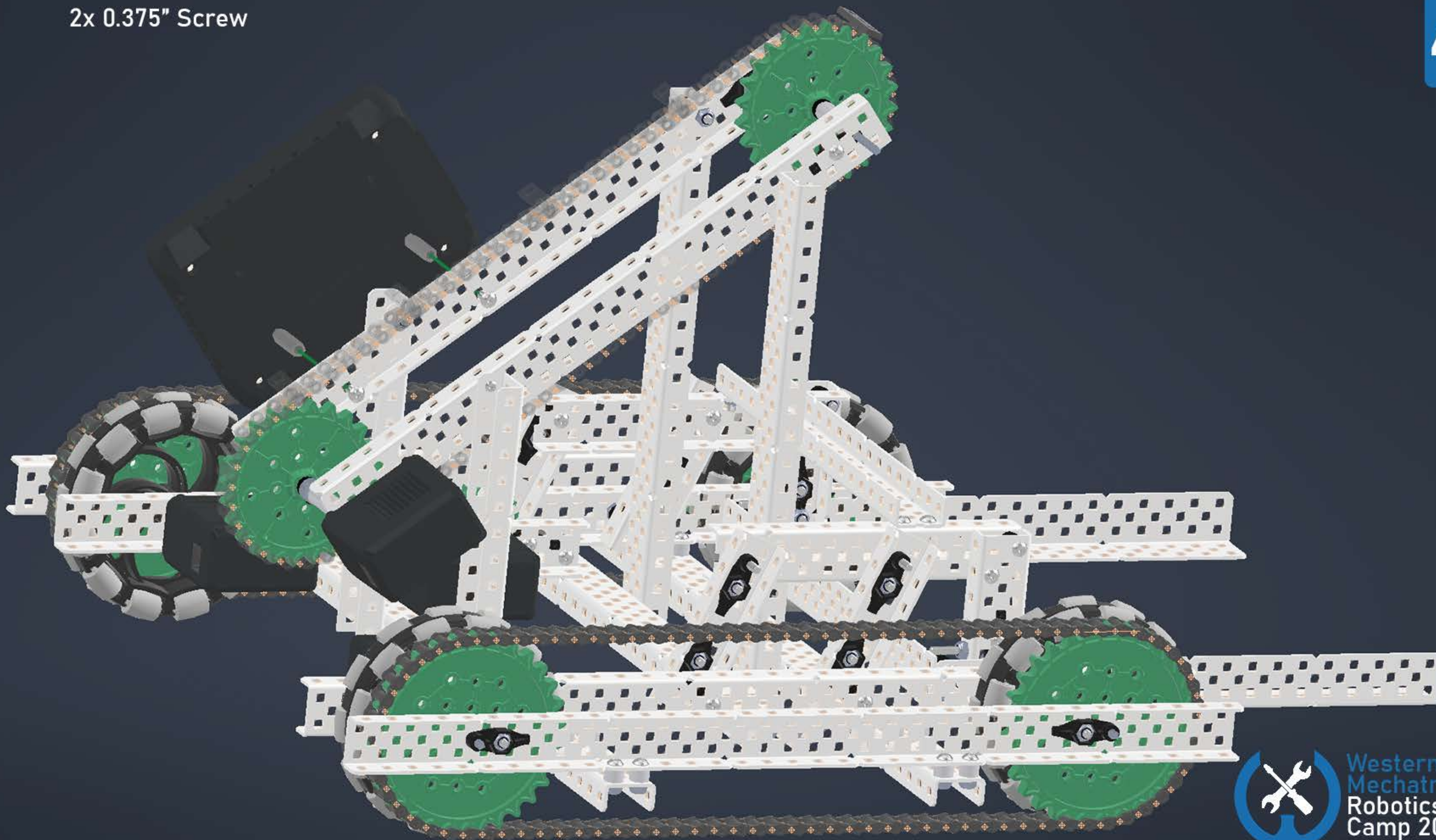
1x V5 Brain
2x 0.500" Coupler
2x 1" standoff

Make sure the V5 Brain is oriented so that the ports are visible as shown here

(The other side has the battery port.)

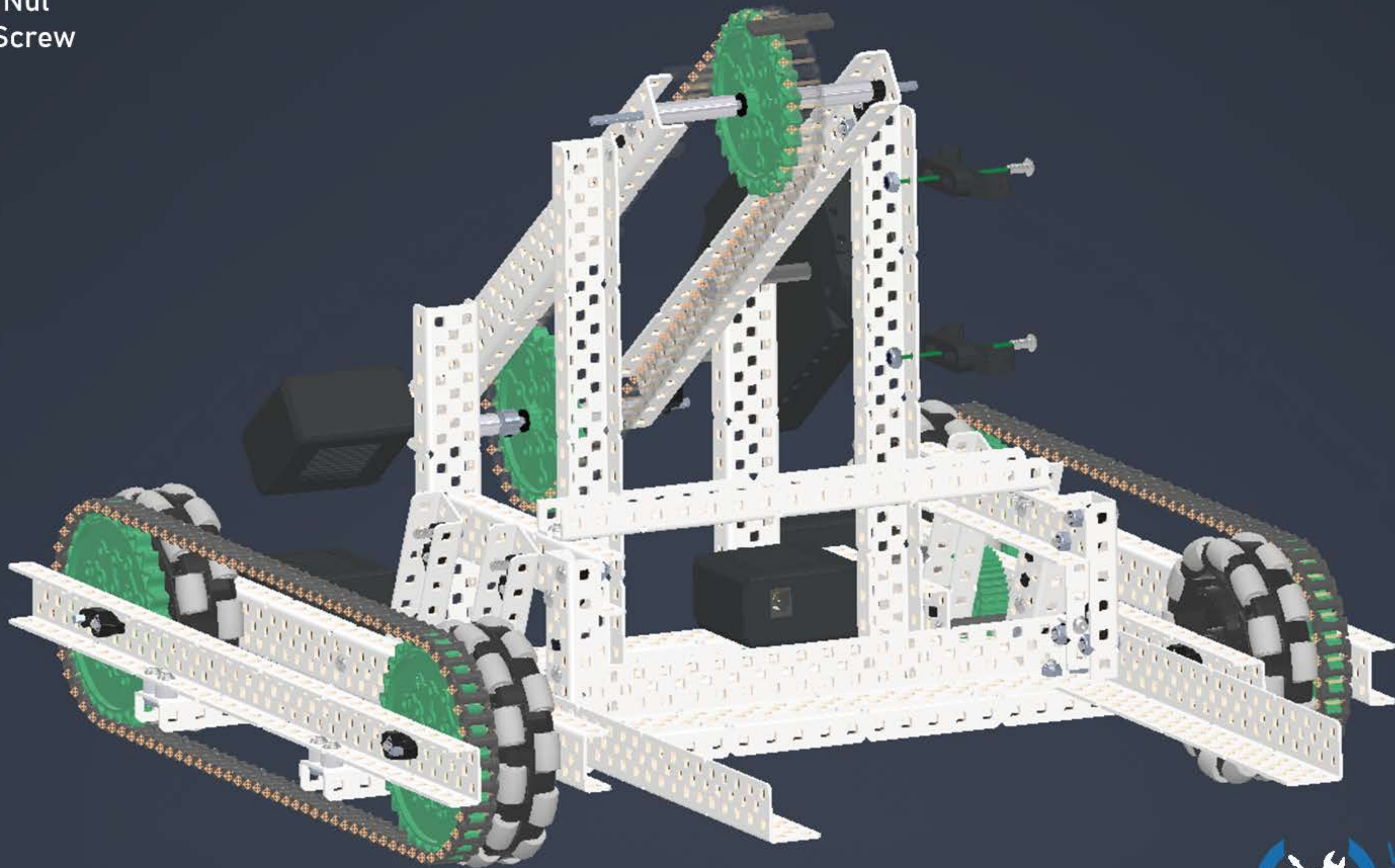


2x 0.375" Screw



2x Battery Clips
2x Nylock Nut
2x 0.375" Screw

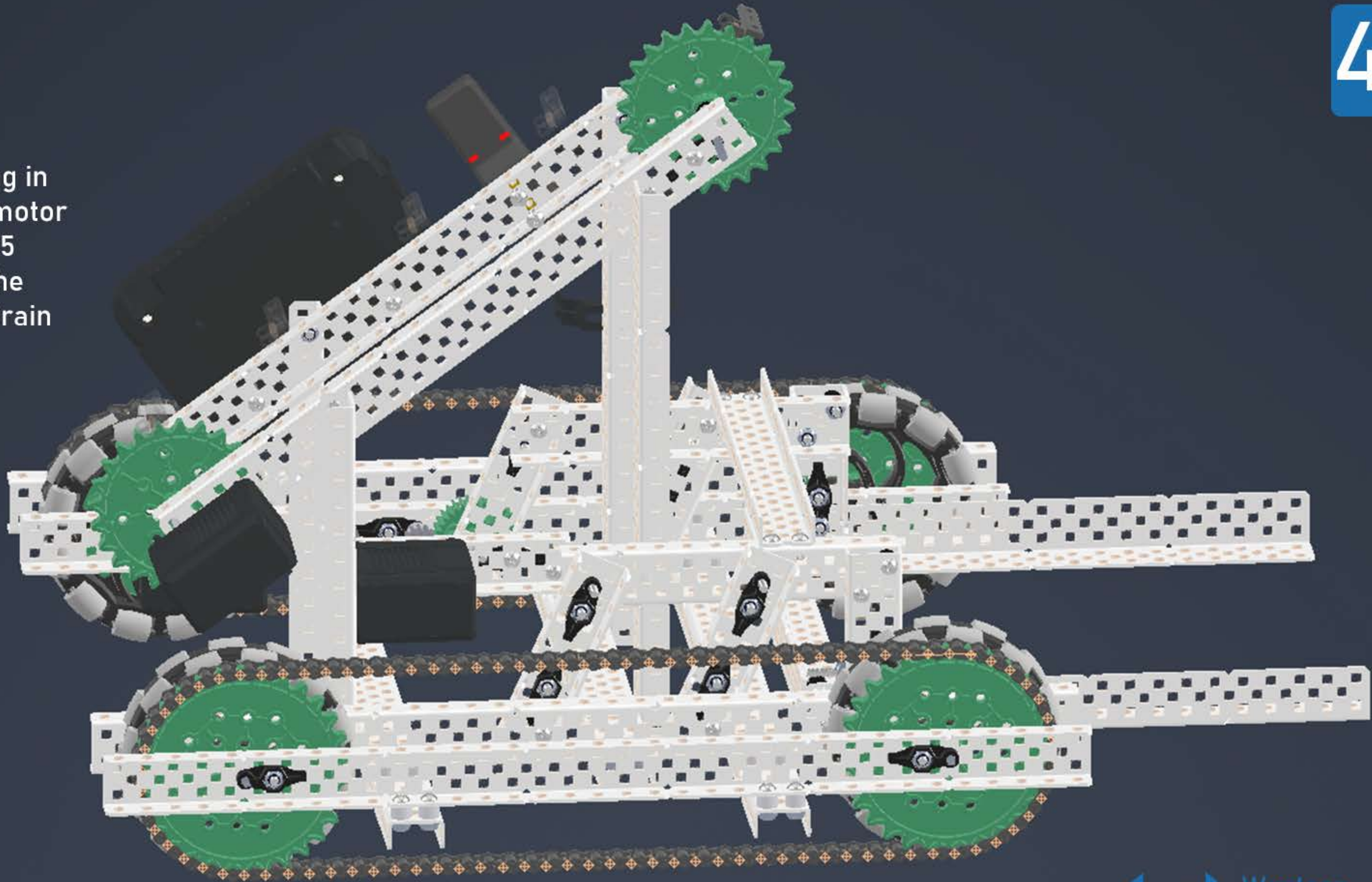
47



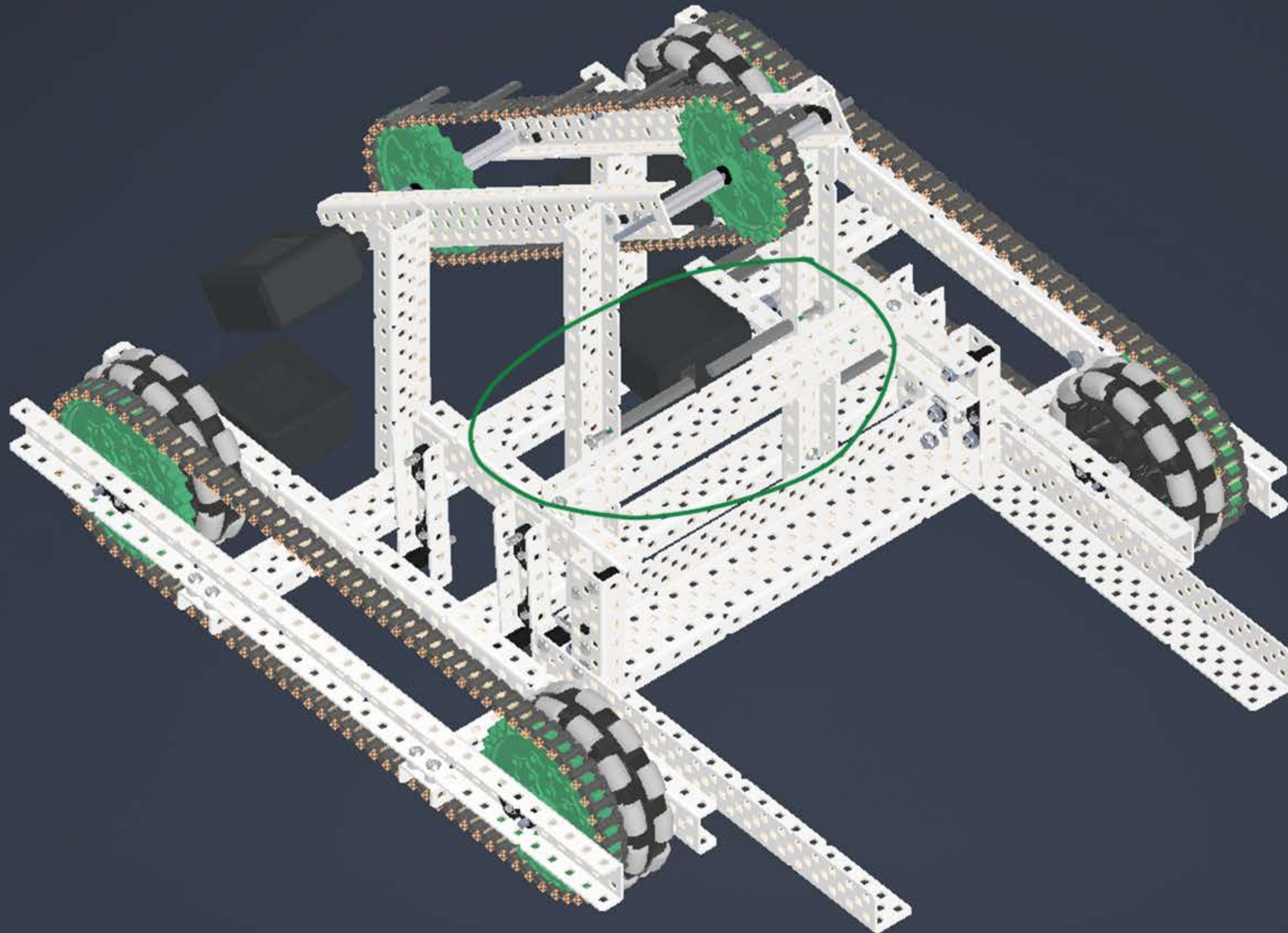
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Camp 2021

1x Radio
2x 0.375" Screw

All done!
Make sure to plug in
wire from each motor
to a port in the V5
Brain. Connect the
radio to the V5 Brain
using a wire.



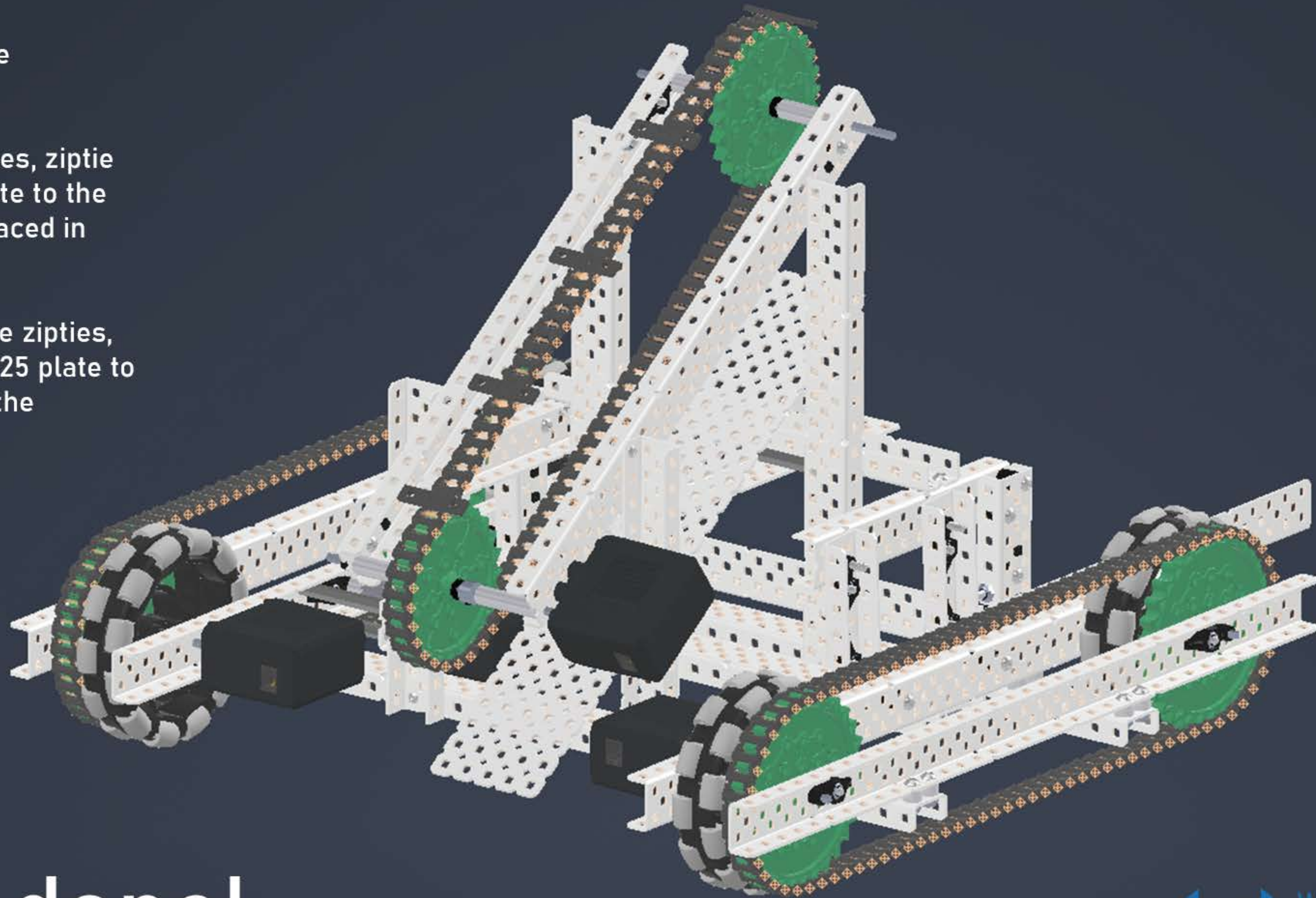
2x 2" Standoff
2x 0.375" Screw



1x 5x25 Plate
4x Ziptie

Using 2 zipties, ziptie the 5x25 plate to the standoffs placed in step 49.

Using 2 more zipties, ziptie the 5x25 plate to the base of the drivetrain.



All done!

Use the wires to connect each motor to a port on the V5 Brain. Take note of which port each motor is in as we need those ports for the programming class!