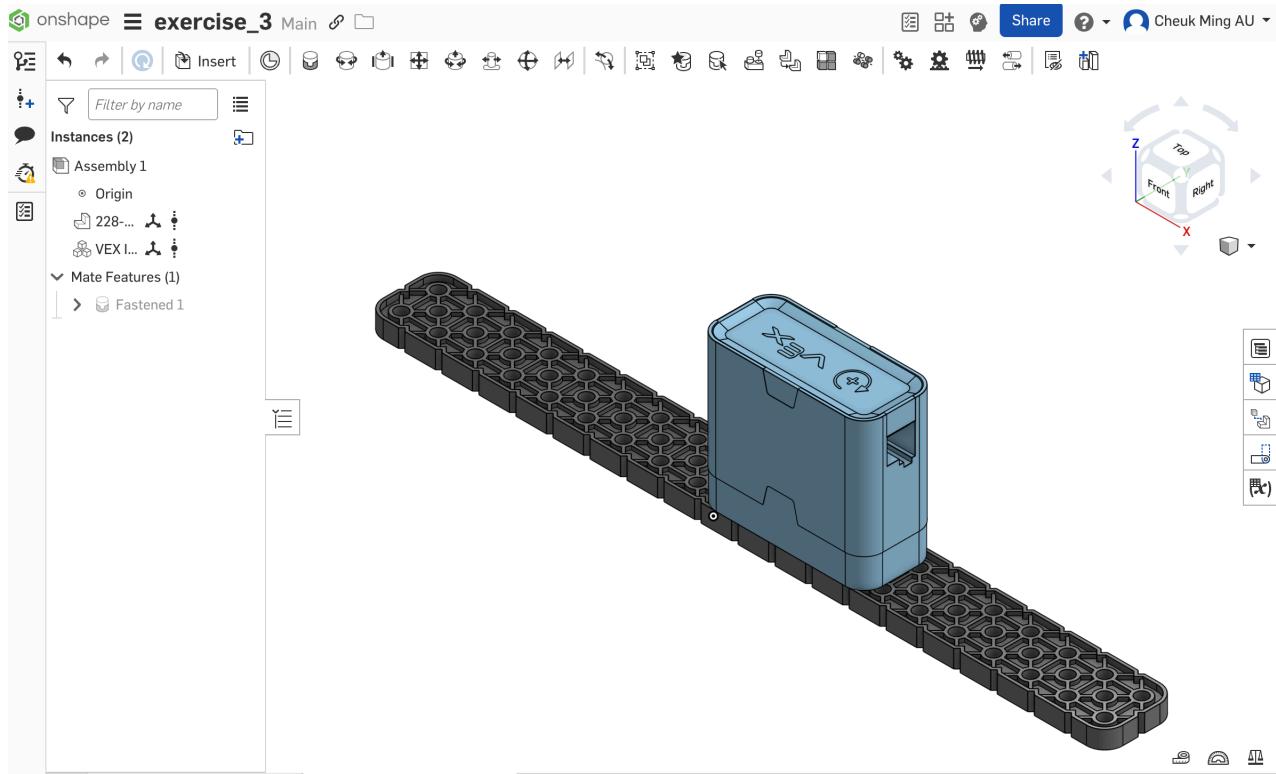


# Exercise 3: Fasten a VEX IQ Motor to a Structural Beam



The final result of Exercise 3

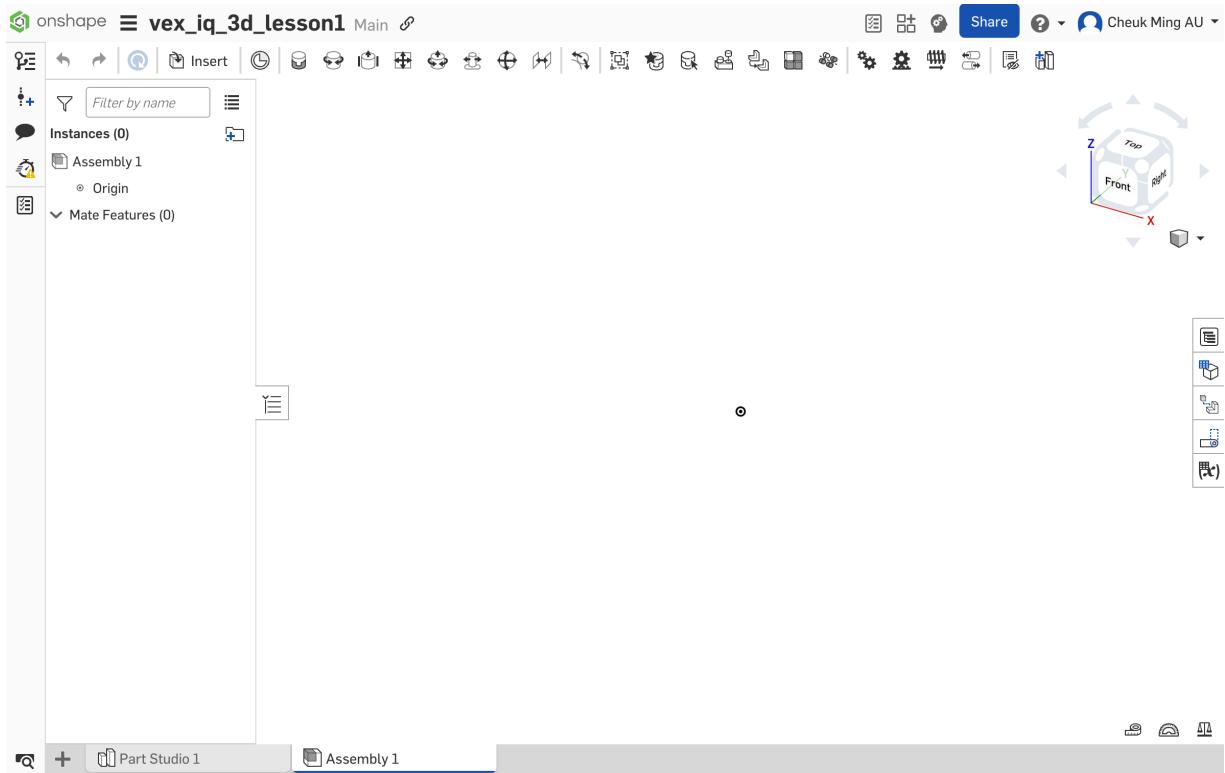
## Objective:

To assemble a VEX IQ motor and a structural beam using the **Fasten Mate** function in Onshape, ensuring the motor is securely attached to the beam as it would be in a real-world robotics build.

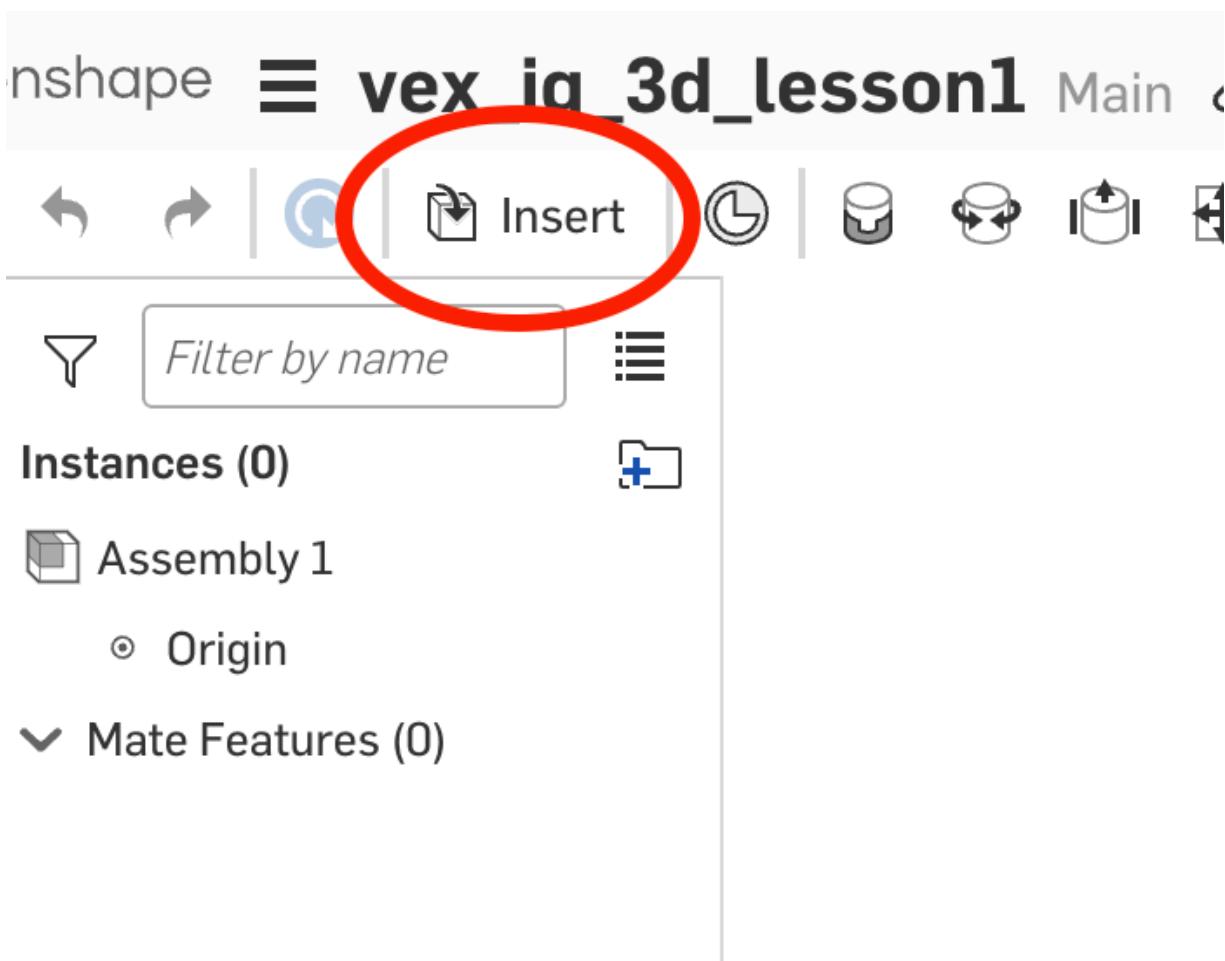
## Step 1: Insert the Motor and Beam into an Assembly

- **Create an Assembly:**

Go to the **Assembly tab** in Onshape.



Click the **Insert** tool.



Click "Other documents".



Insert parts and assemblies ✓ ✕

**Current document** Other documents Standard content

vex\_iq\_3d\_lesson1 + ↴

Main

**Part Studios** Assemblies

*Search Part Studios*

No Part Studios available.

Go to the folder "VEX IQ/Part List".

## Insert parts and assemblies



Current  
document

Other  
documents

Standard  
content



Search in "Shared with me"



< Part\_list

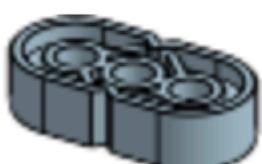
Generating  
preview

Untitled document

Start



200mm Omni Wheel 2-pack.step  
V1



1x2 Beam (228-2500-001).step  
V1



1x3 Beam (228-2500-002).step  
V1



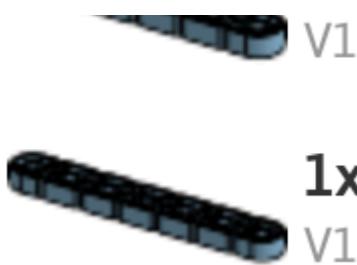
1x4 Beam (228-2500-003).step  
V1



1x5 Beam (228-2500-004).step  
V1



1x6 Beam (228-2500-005).step  
V1



## 1x7 Beam (228-2500-006).step

V1

- Use the **Insert** tool to bring both the "VEX IQ Smart motor (228-2560)" and "2x20 Beam (228-2500-030)" into the assembly from the Part Studio.



## VEX IQ Smart Motor...

V1



### Part Studios

### Assemblies

Search Part Studios



VEX IQ Smart Motor (228-2560)



VEX IQ Smart Motor (228-2560)



2x20 Beam (228-25...

V1



## Part Studios

## Assemblies

Search Part Studios

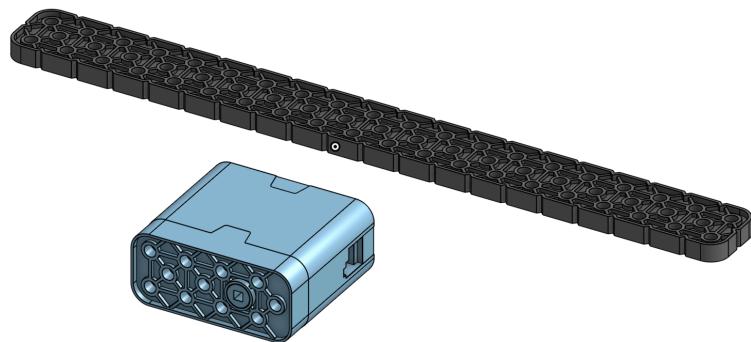
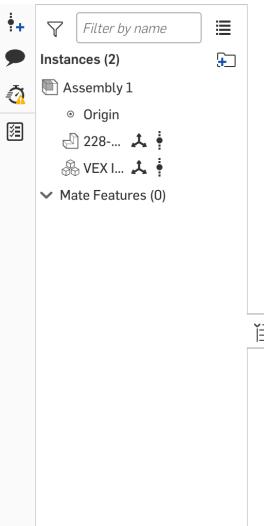


2x20 Beam (228-2500-030)



228-2500-030

- Place both components in the assembly workspace.

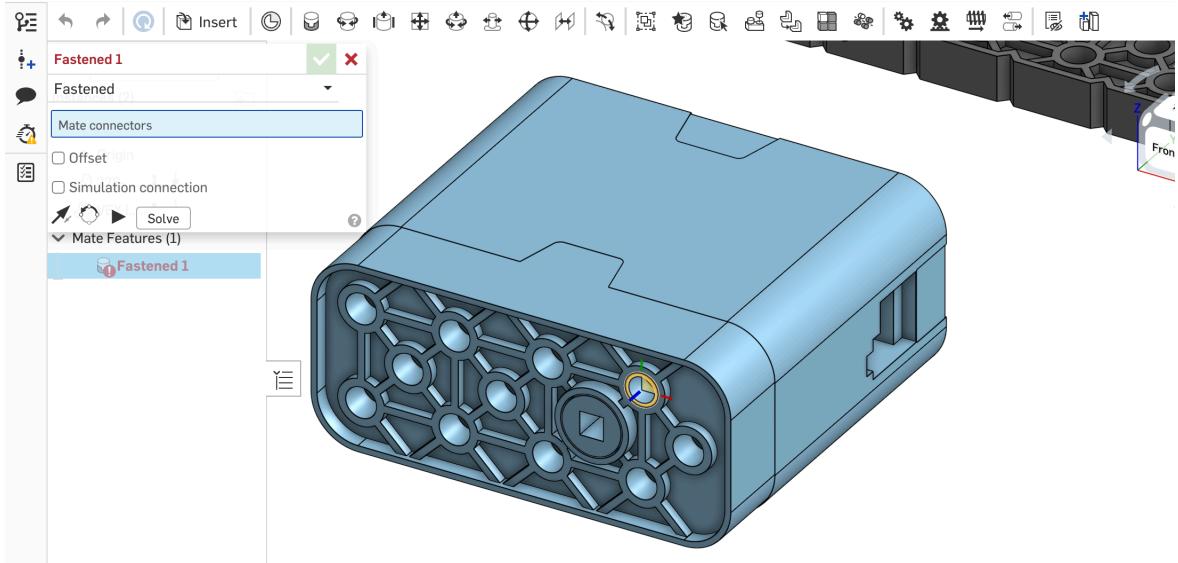


### Step 2: Apply the Fasten Mate

- Choose the First Mate Connector (Motor):

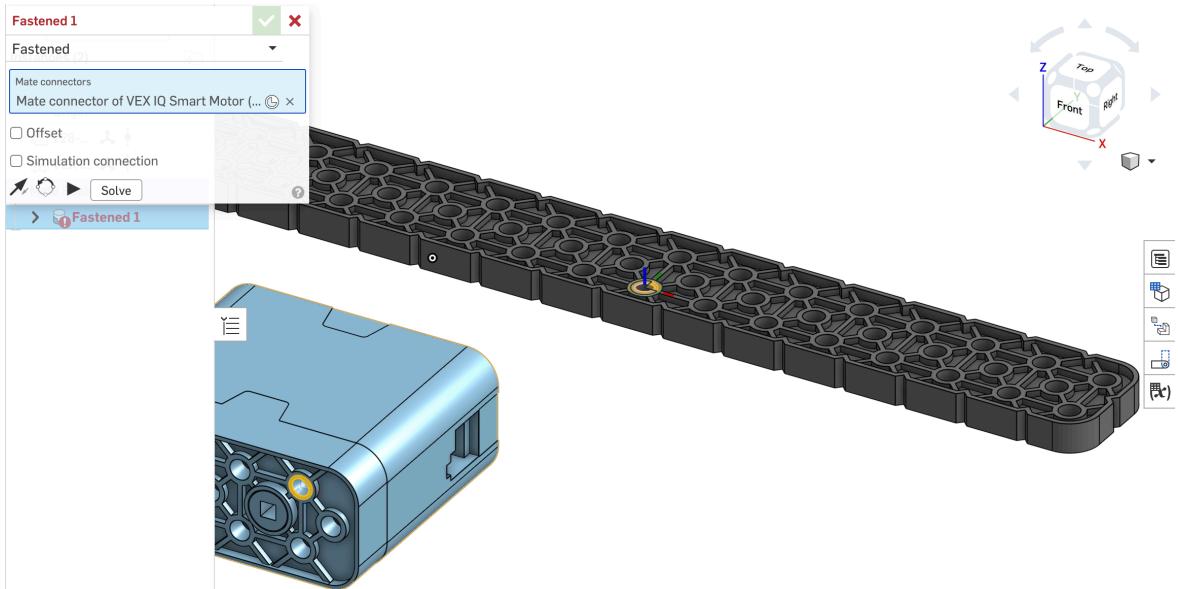
Hover over the **motor** until you see mate connectors appear at the mounting holes or the base of the motor.

Select a mate connector on the motor that aligns with where it would attach to the beam (e.g., a mounting hole on the bottom).

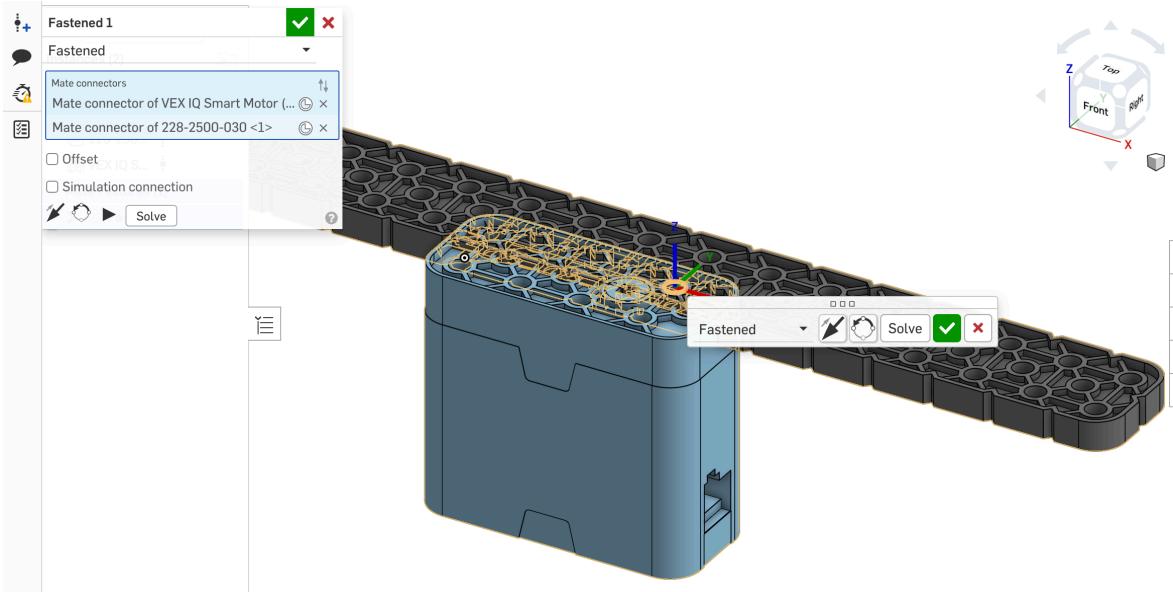


- **Choose the Second Mate Connector (Beam):**

Now, select the mate connector on the **beam** that corresponds to the motor's mounting position (e.g., the eighth hole on the top face of the beam).



Onshape will align and position the motor on the beam according to the selected mate connectors.



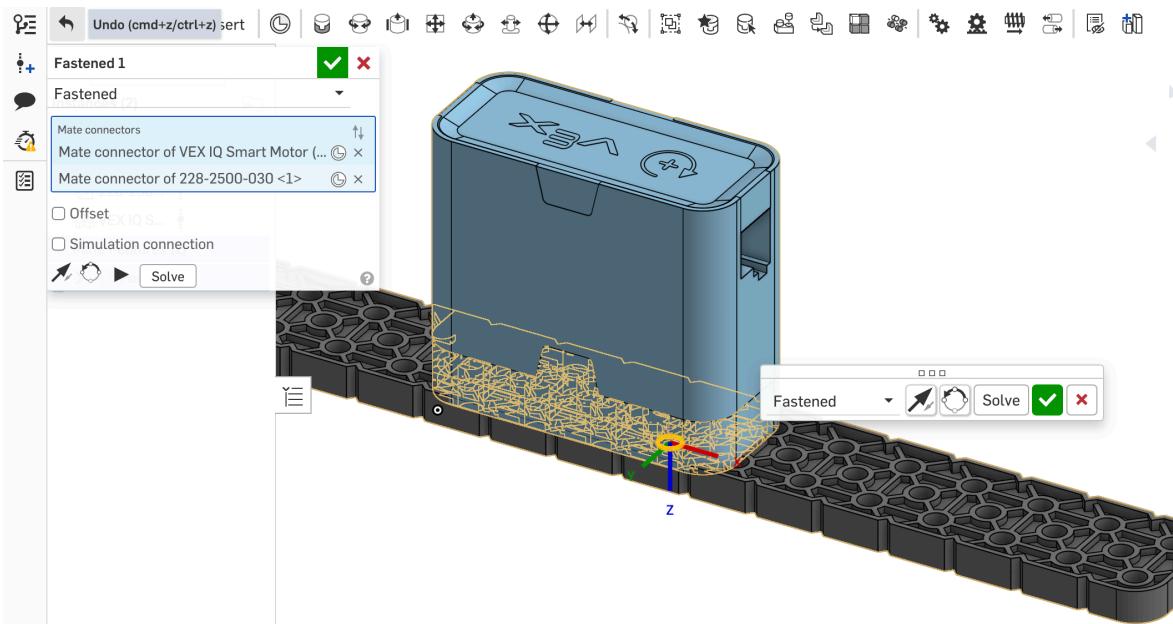
### Step 3: Adjust the Alignment (If Necessary)

- Check the Alignment:**

Verify that the motor is properly aligned and sitting flush with the beam, ensuring it is correctly positioned at the mounting points.

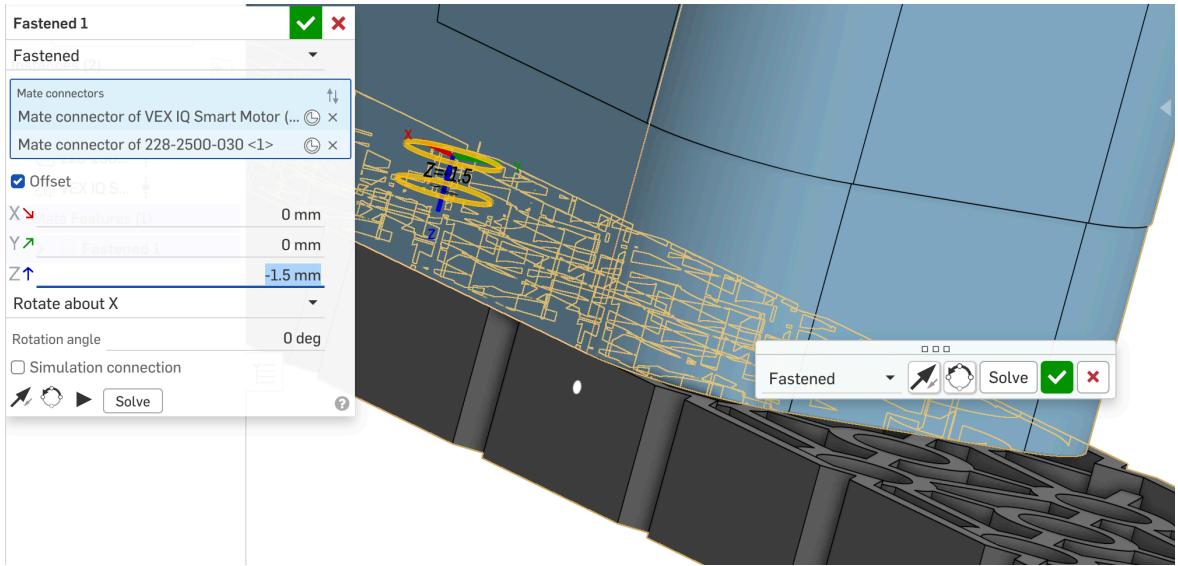
- Flip or Offset (Optional):**

If the motor is not aligned as expected, use the **Flip** option to change its orientation.



Since the motor is at the downside, click the flip button to flip the motor back on top.

**Apply X, Y, or Z offsets** if needed to adjust the motor's position on the beam for precise alignment.



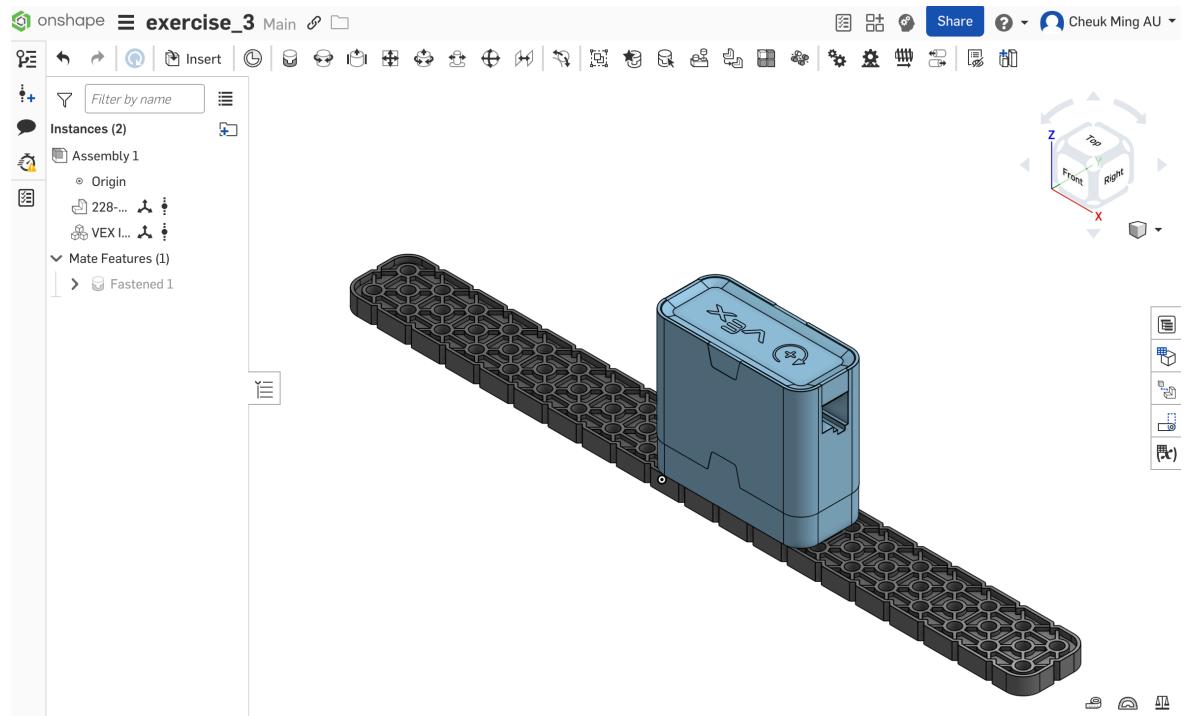
The motor and the beam is overlapping, change the Z-offset to -1.5mm.

## Step 4: Finalize the Assembly

- Confirm the Mate:**

Once satisfied with the alignment, click the green checkmark to confirm the **Fasten Mate**.

The motor is now securely attached to the beam, simulating a real-world mount.



## Conclusion:

By following these steps, you have successfully modeled and assembled a VEX IQ motor and a structural beam using the **Fasten Mate** function in Onshape. The motor is now securely attached to the beam, mimicking how it would be mounted in a real robotics build.