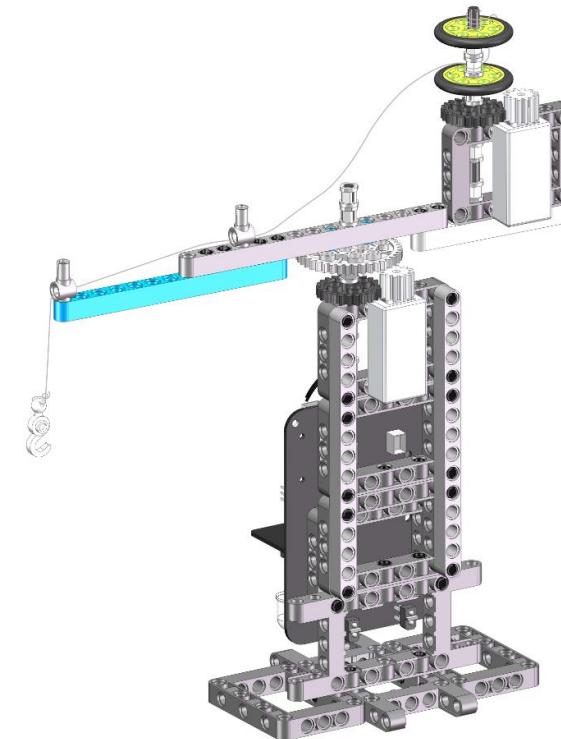
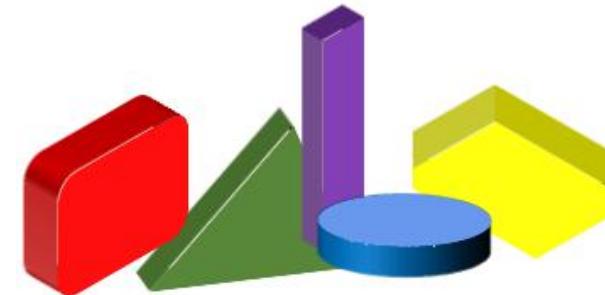
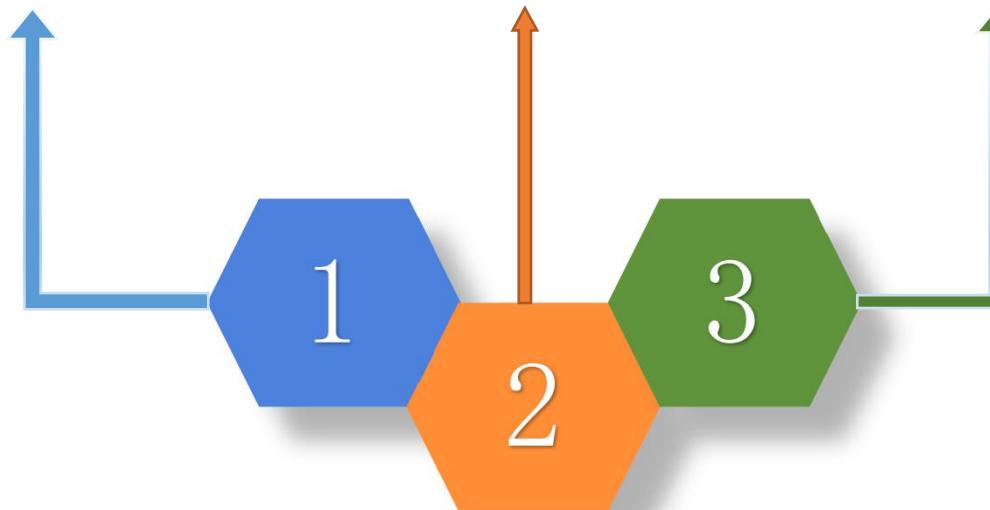


Yahboom Building:bit blocks

No.7 Tower Crane



DIY Thinking Creativity

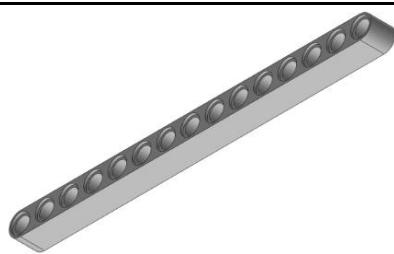
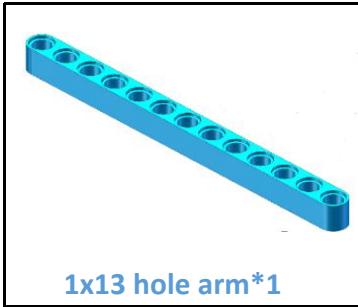


DIY: This section is mainly to teach you to assemble the tower crane with building blocks.

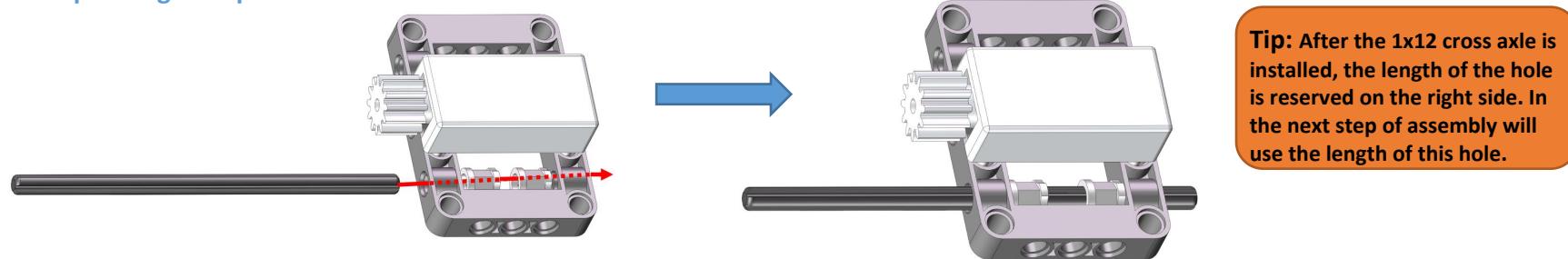
Prepare the following blocks and we will assemble a building block tower crane.



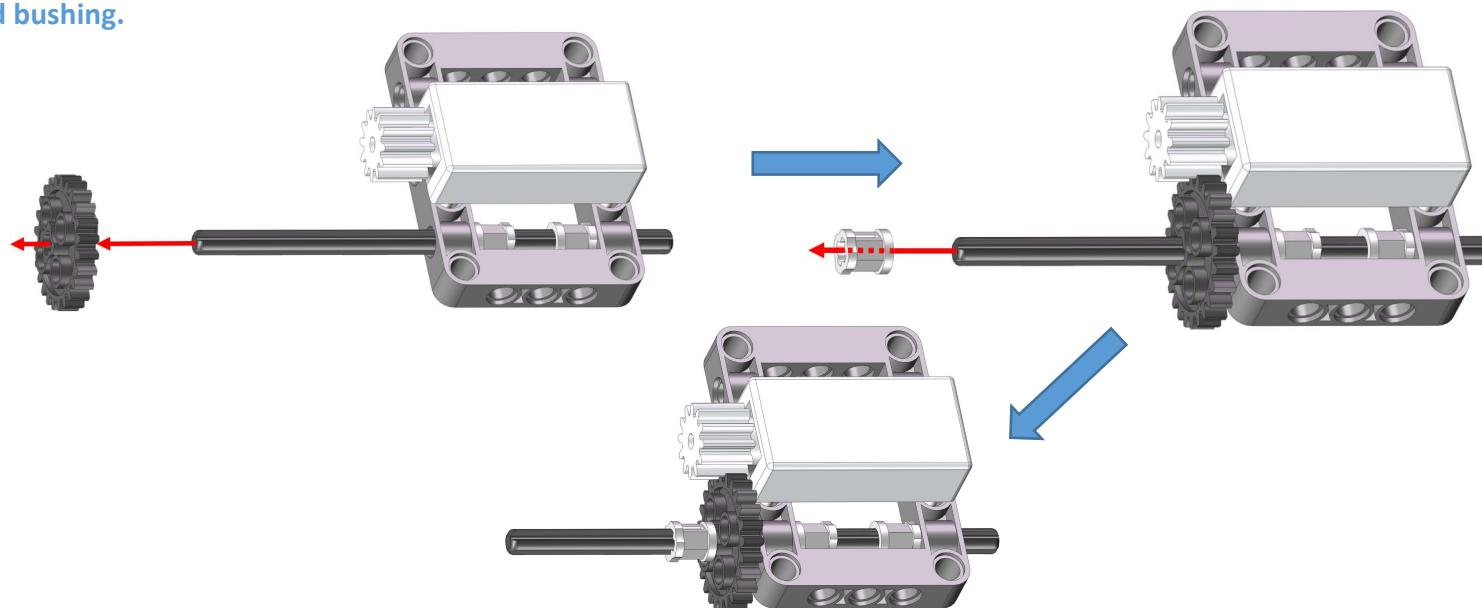
Micro:bit*1	Micro:bit expansion board*1	Motor module*2	5x7 beam frame*4	40 toothed wheel*1
24 toothed wheel*2	Battery*1	5x11 beam frame*2	1x2 Frictional pin *36	Rubber ring+24 pulley*2
Bushing*10	1x2 Shaft and bolt connector*2	1x9 hole arm*1	1x3 Bolt connector *2	Lifting hook*1



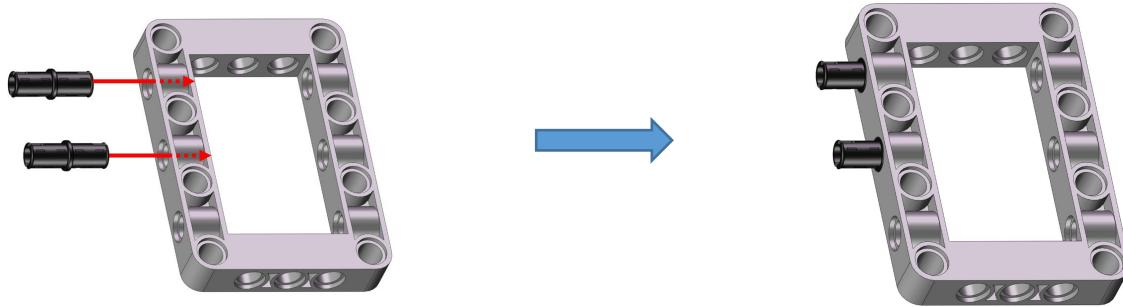
Step 1: Find a motor module, two bushings and a 1x12 cross axle. Pass the 1x12 cross axle through both bushings and the corresponding hole position of the motor module.



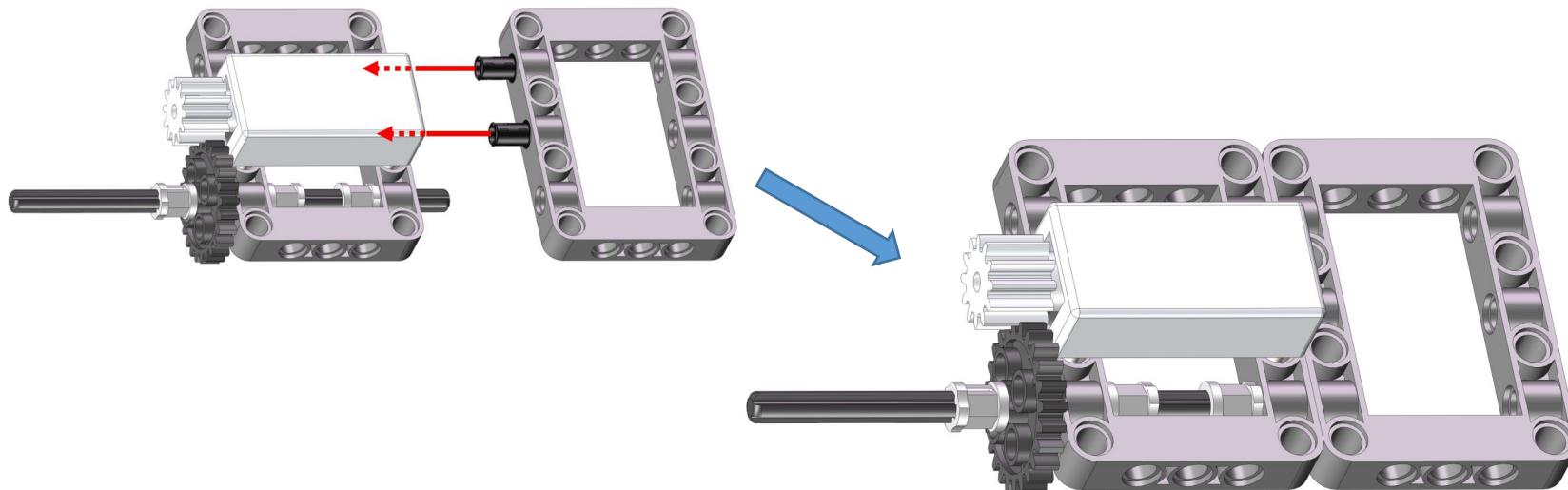
Step 2: Locate a 24-toothed wheel and a bushing that passes the assembled 1x12 cross axle through the 24-toothed wheel and bushing.



Step 3: Locate the two 1x2 friction pins and pass them through the corresponding holes in the 5x7 beam frame.



Step 4: Combine the two parts of the assembled blocks in the step 2 and step 3.

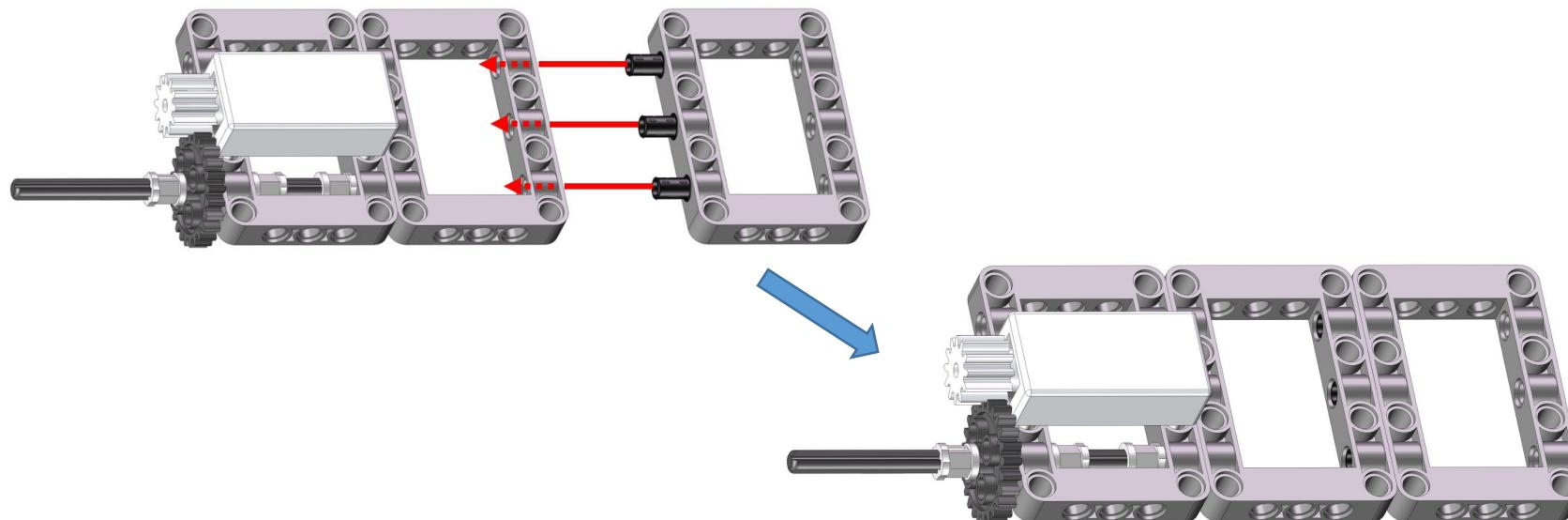




Step 5: Locate the three 1x3 bolts and a 5x7 beam frame and insert the 1x3 bolts from the side into the corresponding holes in the 5x7 beam frame.

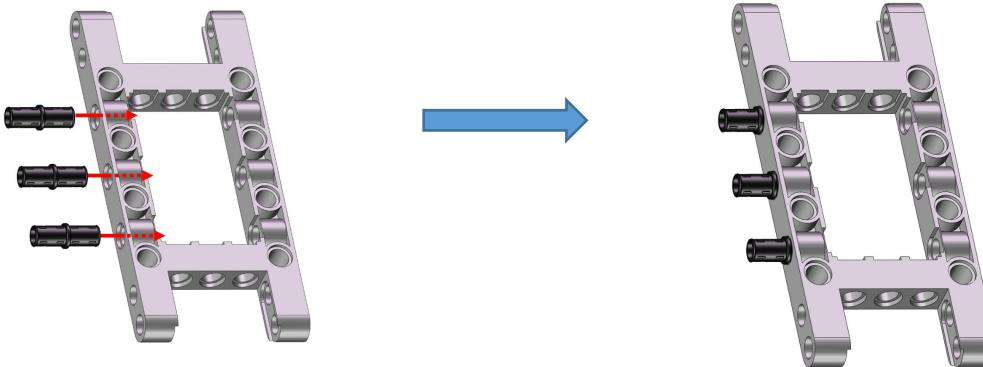


Step 6: Combine the assembled blocks of the step 4 and step 5.

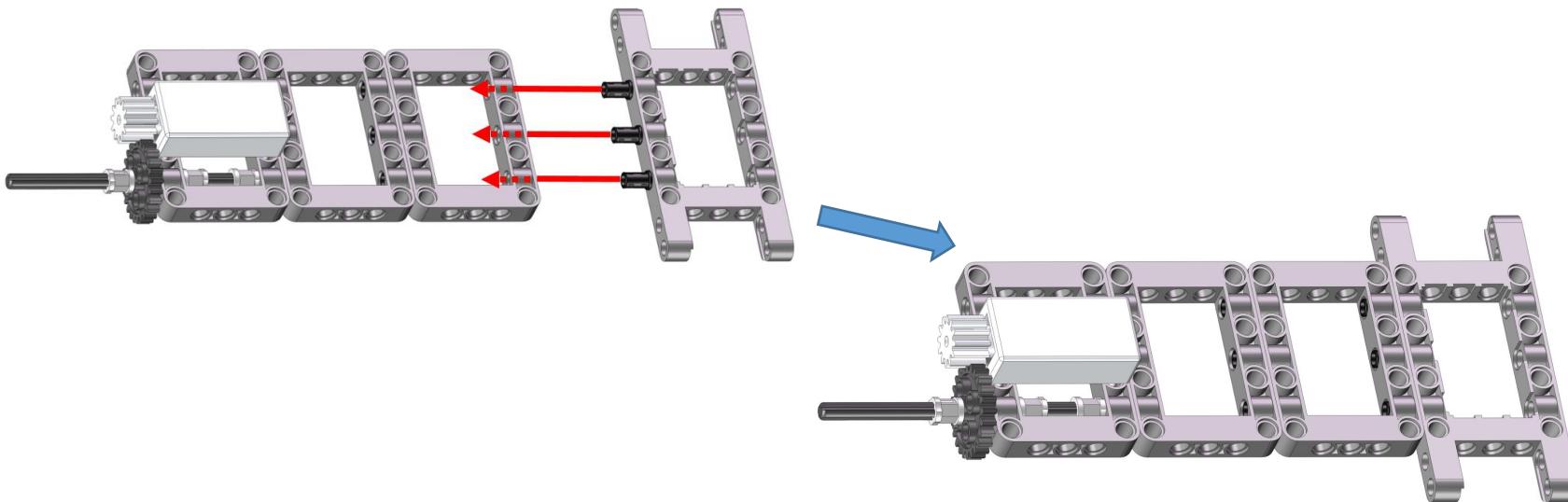




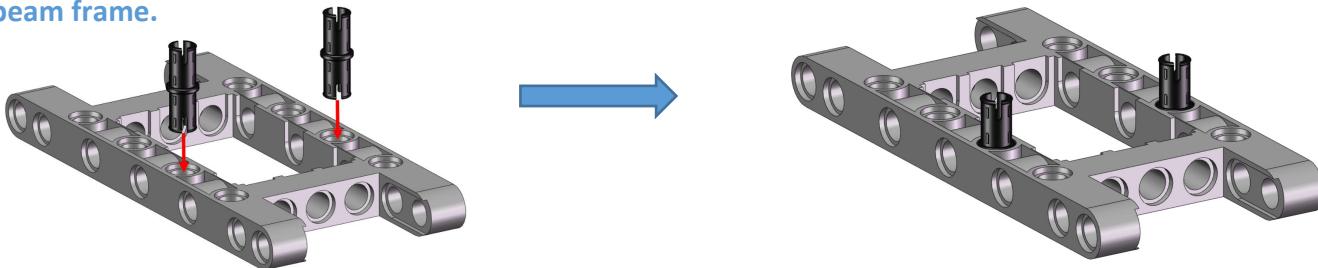
Step 7: Locate the three 1x2 friction pins and a 5x11 beam frame and insert the friction pins into the holes on the side of the 5x11 beam frame.



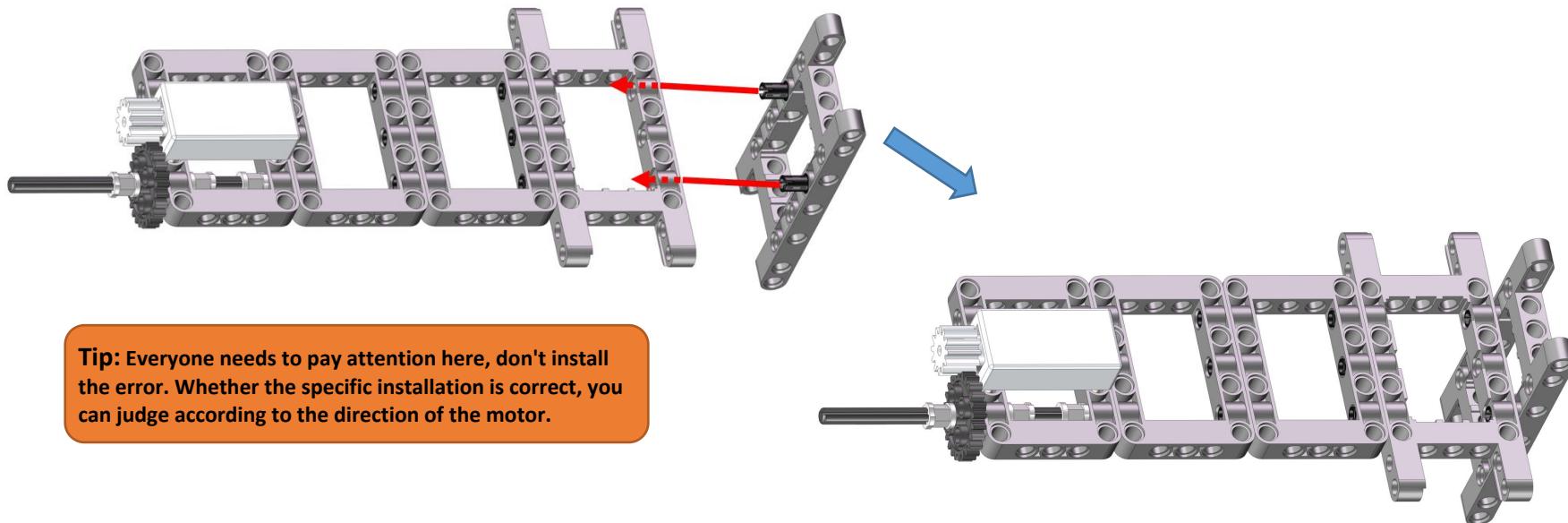
Step 8: Combine the assembled blocks of the step 6 and step 7.



Step 9: Locate the two 1x2 friction pins and a 5x11 beam frame and insert the friction pins into the corresponding holes in the 5x11 beam frame.



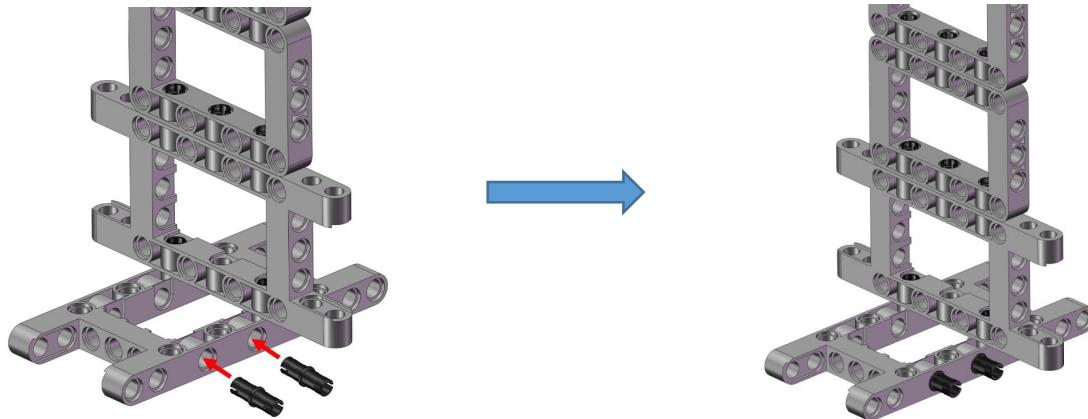
Step 10: Combine the two parts of the assembled blocks in the step 8 and step 9.



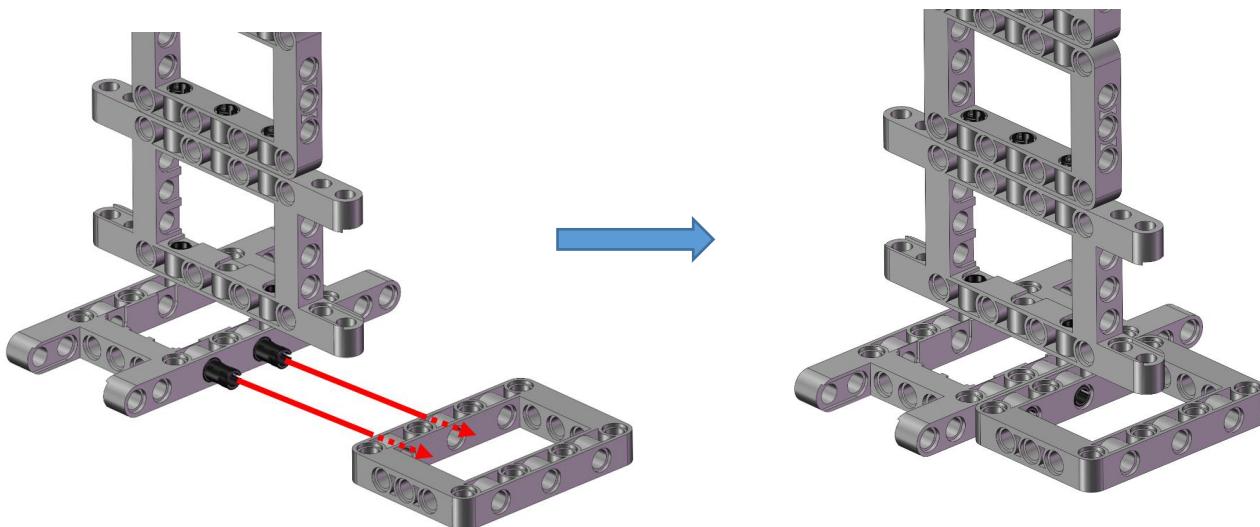
Tip: Everyone needs to pay attention here, don't install the error. Whether the specific installation is correct, you can judge according to the direction of the motor.



Step 11: Look for two 1x2 friction pins and insert them into the corresponding holes on the side of the bottom 5x11 beam frame.

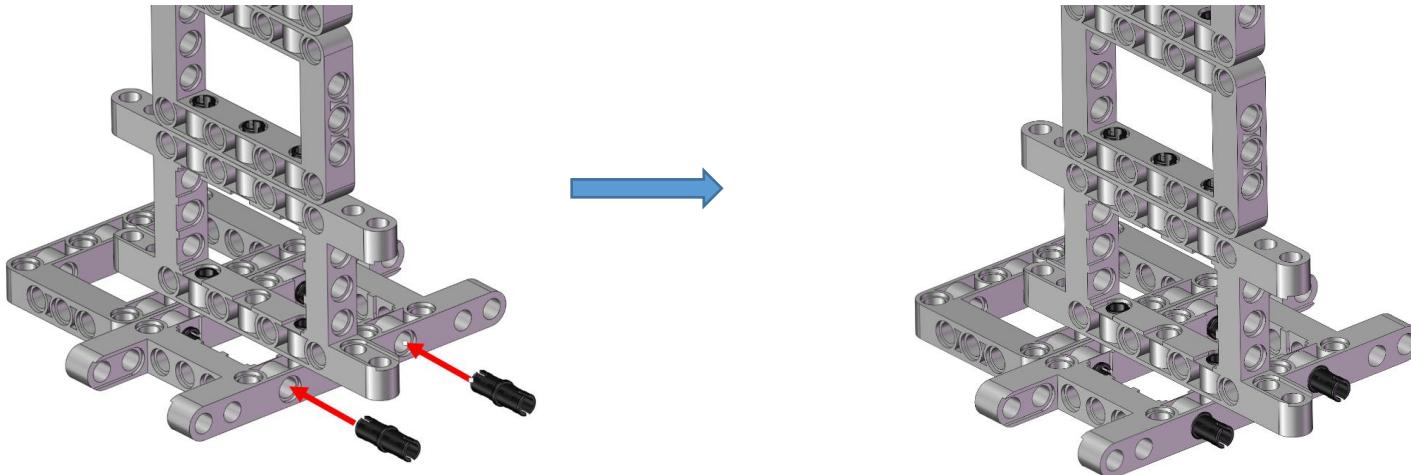


Step 12: Look for a 5x7 beam frame and insert it into the 1x2 friction pin on the side.

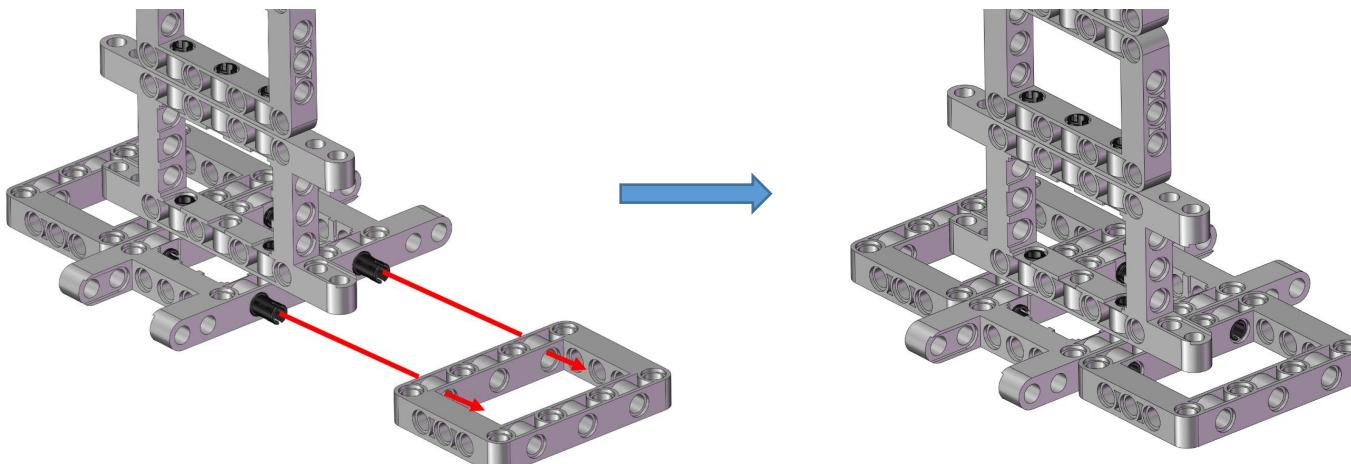




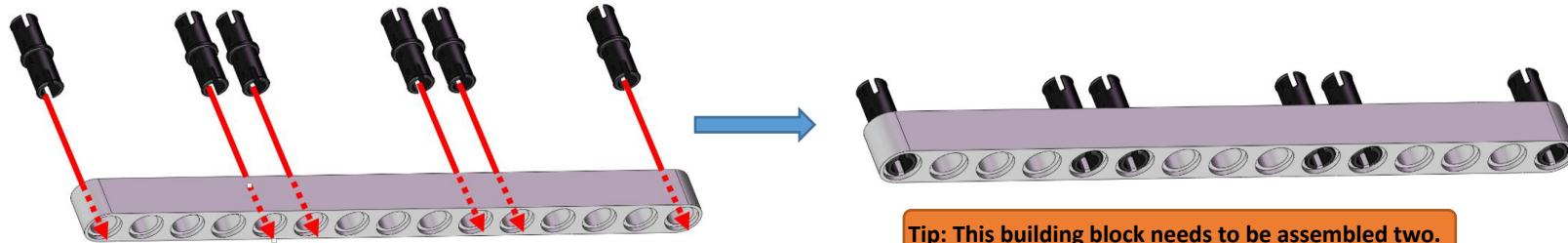
Step 13: Look for two 1x2 friction pins and insert them into the corresponding holes on the other side of the bottom 5x11 beam frame.



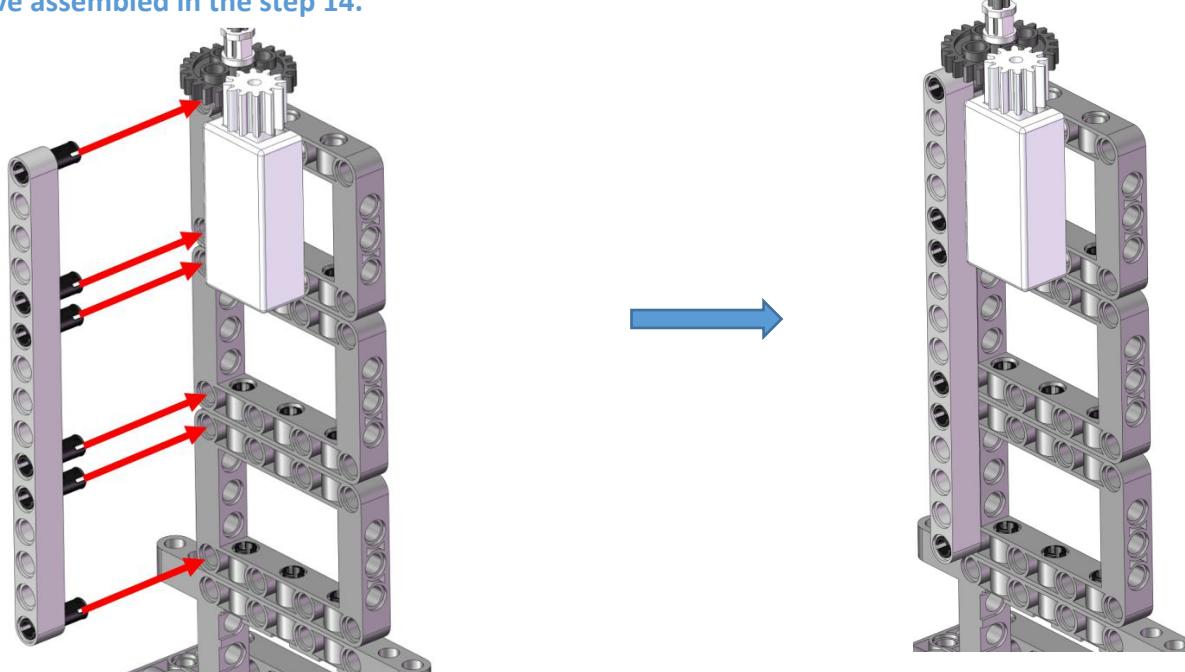
Step 14: Look for a 5x7 beam frame and insert it into the friction pin that has been installed in the previous step.



Step 15: Look for six 1x2 friction pins and 1x15 hole arms, and insert the friction pins into the holes 1st, 5th, 6th, 8th, 10th, 11th, and 15th of the hole arm.

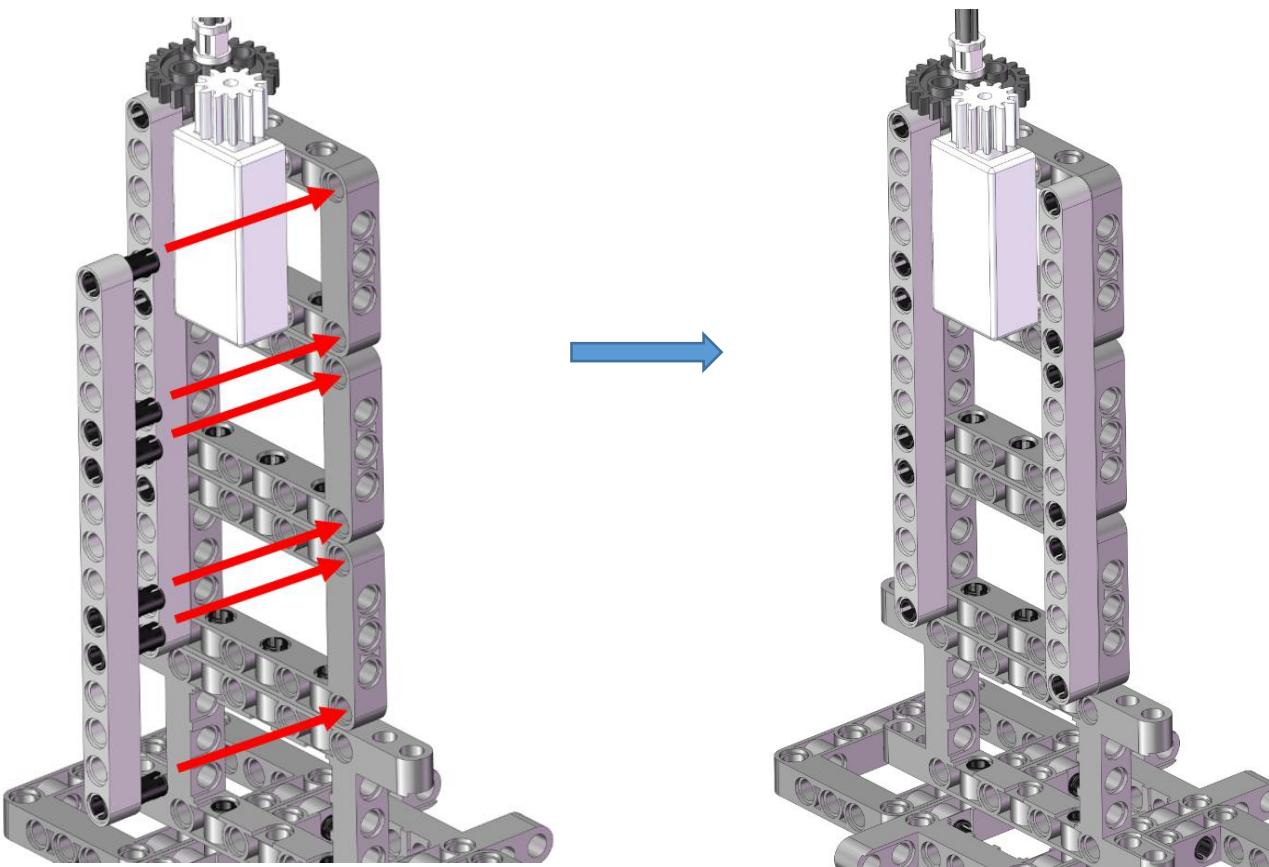


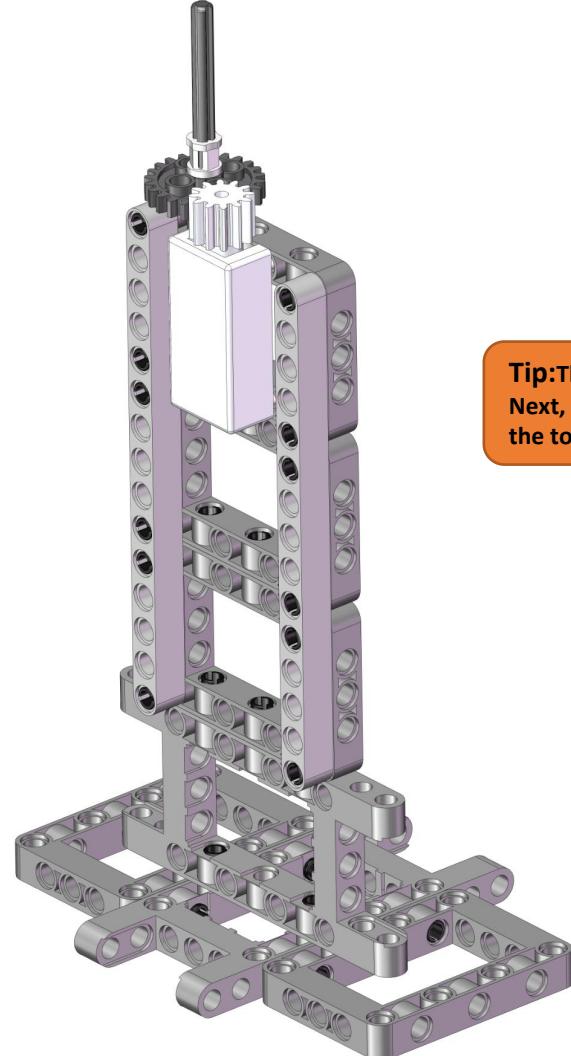
Step 16: Insert the assembled building block in the step 15 into the corresponding position on the left side of the building block that we have assembled in the step 14.





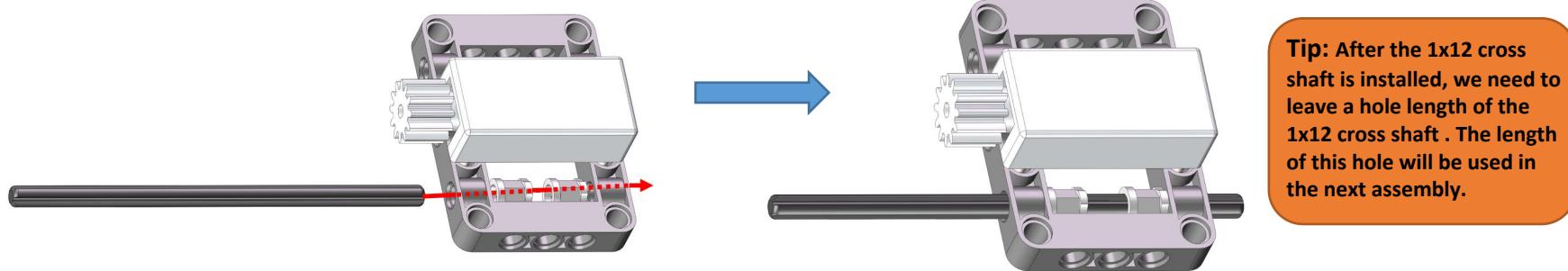
Step 17: Insert the assembled building block in the step 15 into the corresponding position on the right side of the building block that we have assembled in the step 14.



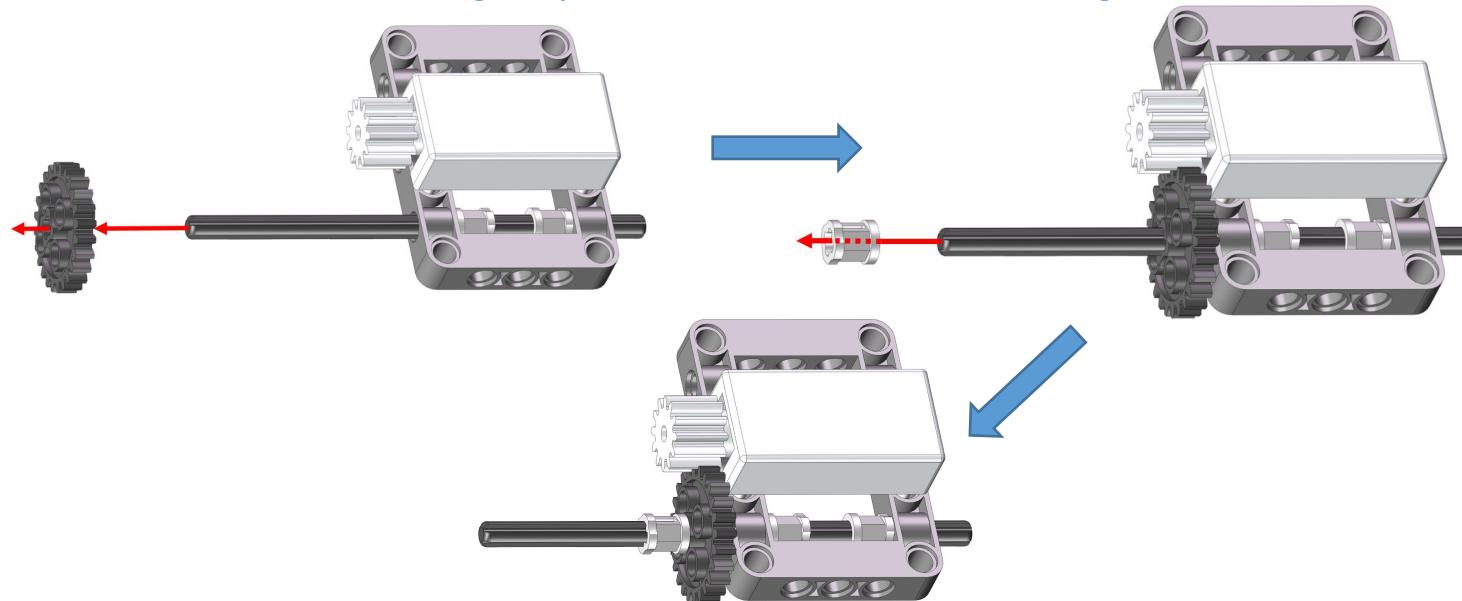


Tip:This is the chassis part of our assembled tower.
Next, we will continue to assemble the upper body part of
the tower.

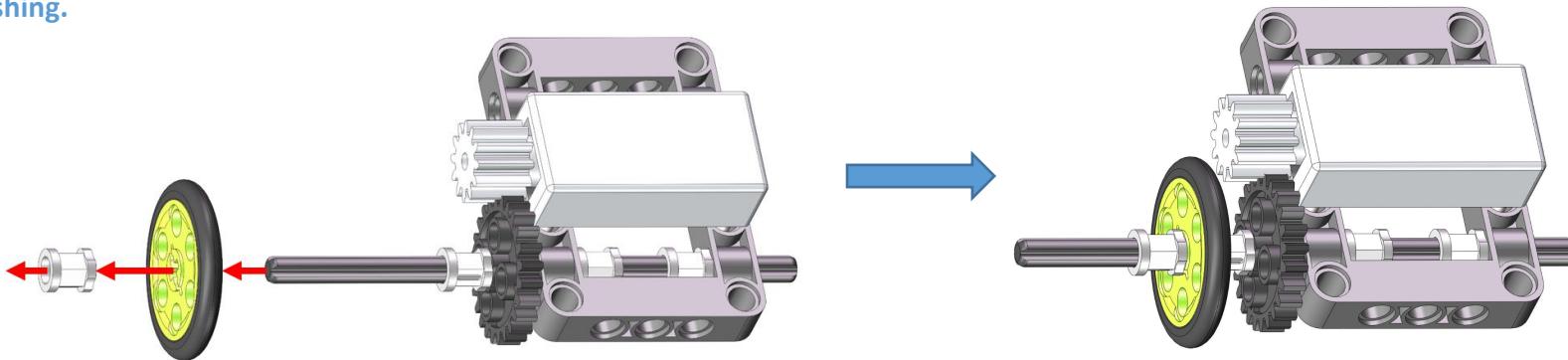
Step 18: Find another motor module, two bushings and a 1x12 cross axle. Pass the 1x12 cross axle through both bushings and the corresponding hole position of the motor module.



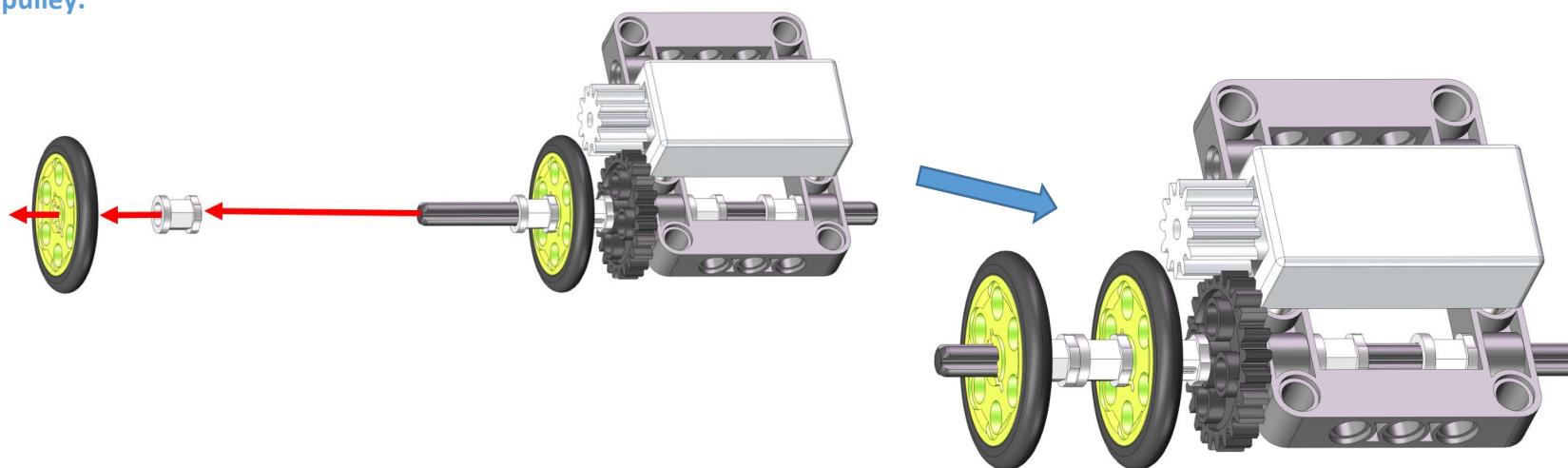
Step 19: Find a 24-toothed wheel and a bushing, and pass the assembled 1x12 cross axle through the 24-toothed wheel bushing.



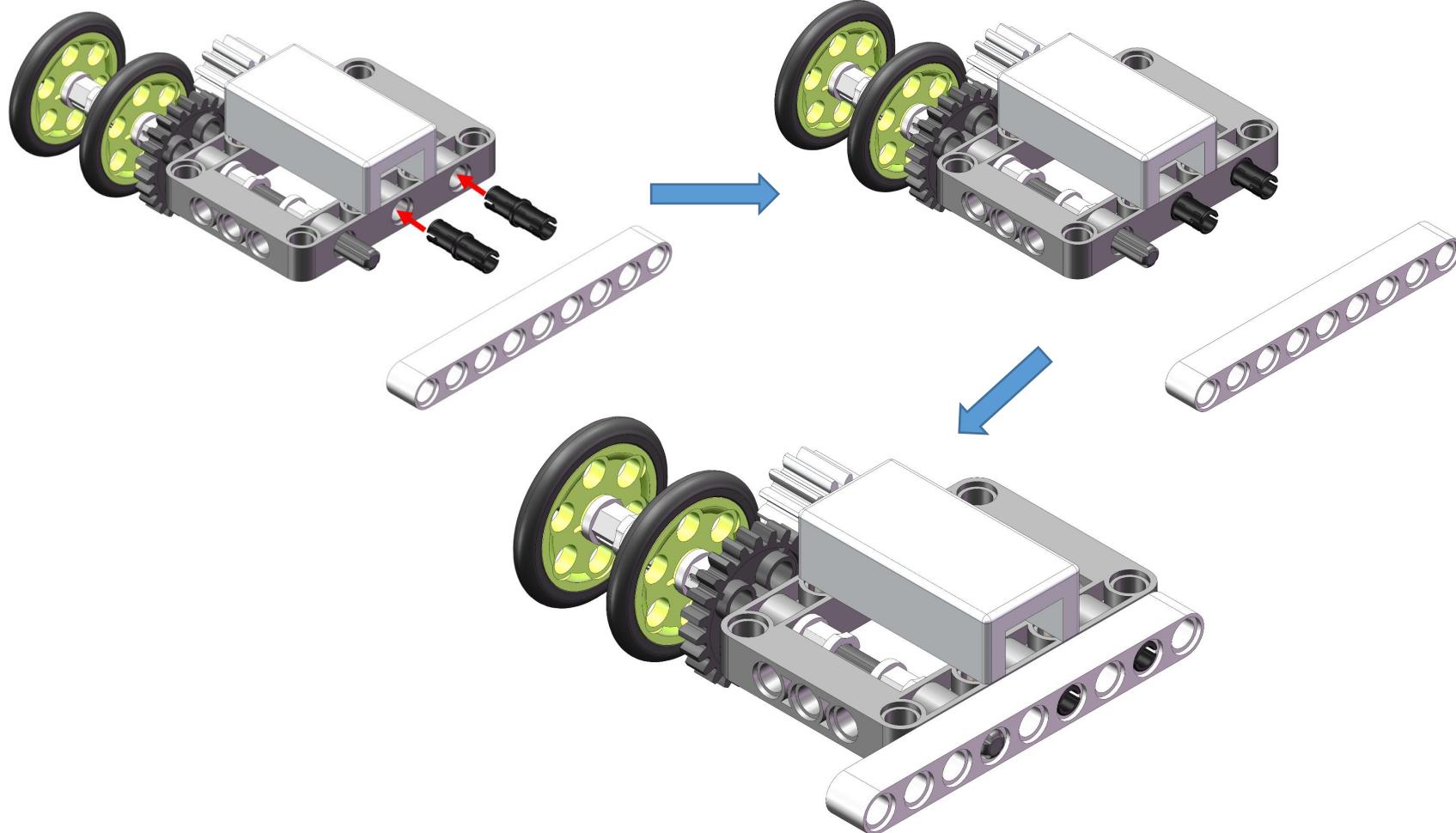
Step 20: Find a rubber ring +24 pulley and a bushing, and pass the assembled 1x12 cross axle through the rubber ring +24 pulley and bushing.



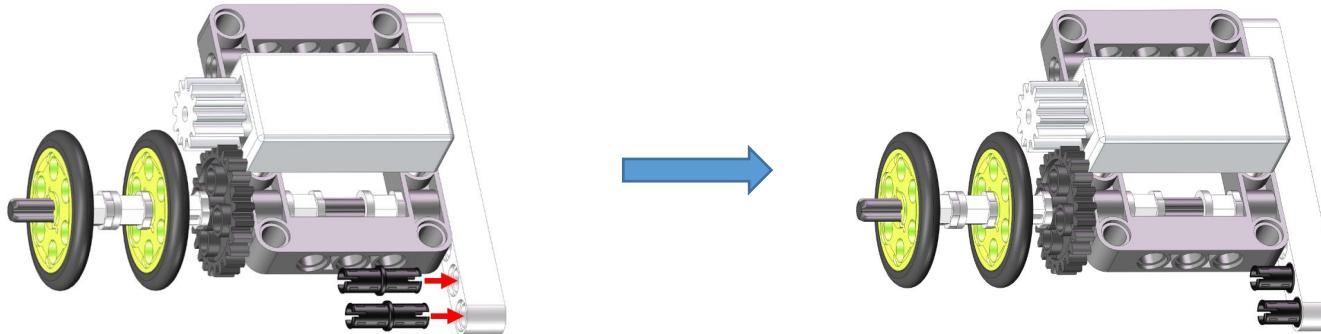
Step 21: Find a rubber ring +24 pulley and a bushing, and pass the assembled 1x12 cross axle through the bushing and rubber ring +24 pulley.



Step 22: Locate two 1x2 friction pins and one 1x9 hole arm. First insert the friction pin into the corresponding hole on the side of the motor module, then insert the friction pin and the reserved cross shaft into the 2nd, 4th, and 6th holes from the right side of the 1x9 hole arm.

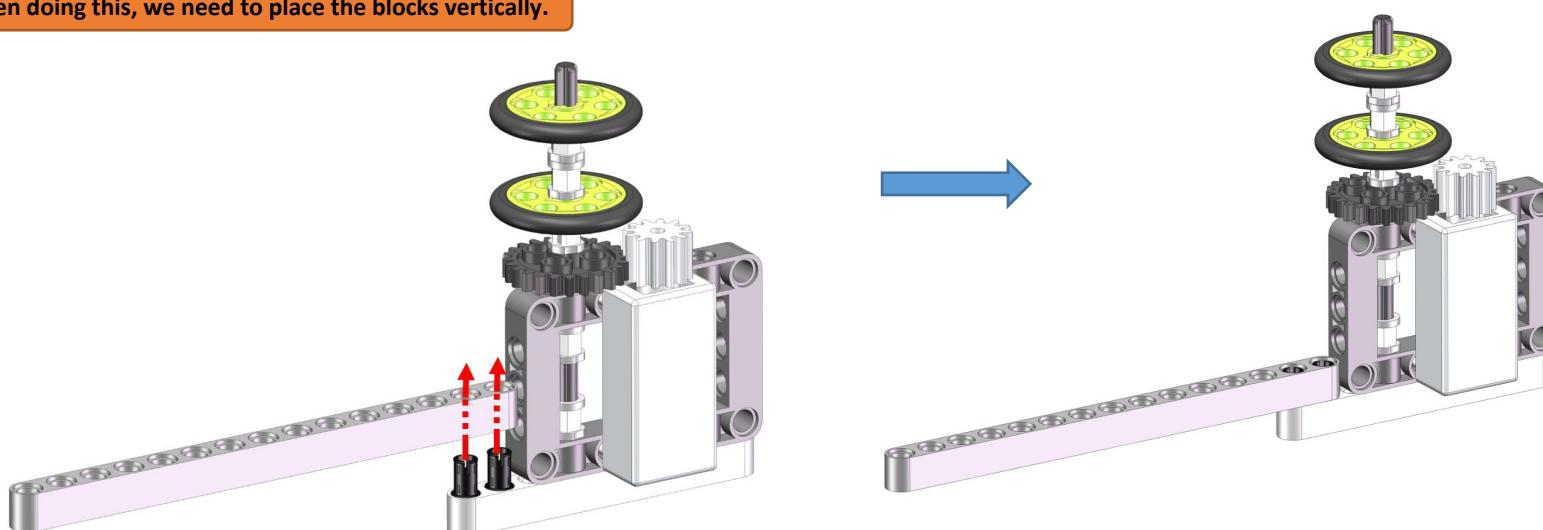


Step 23: Locate the two 1x2 friction pins and insert them into the corresponding holes in the 1x9 hole arm.

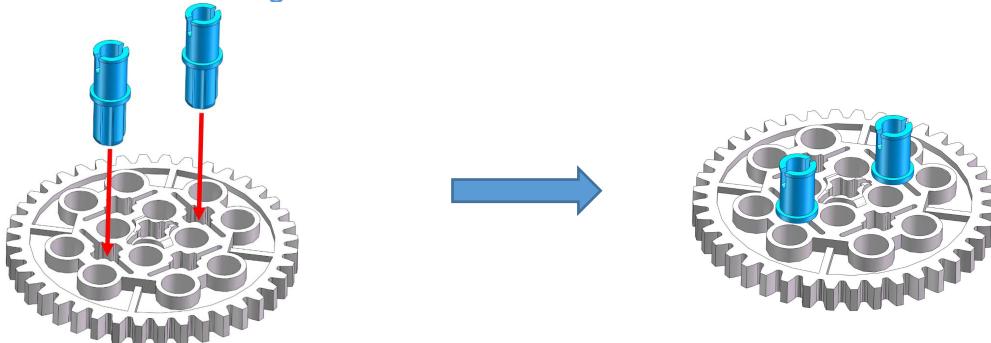


Step 24: Locate a 1x15 hole arm and insert the 1x2 friction pin installed in the previous step into the two holes at the far right end of the hole arm.

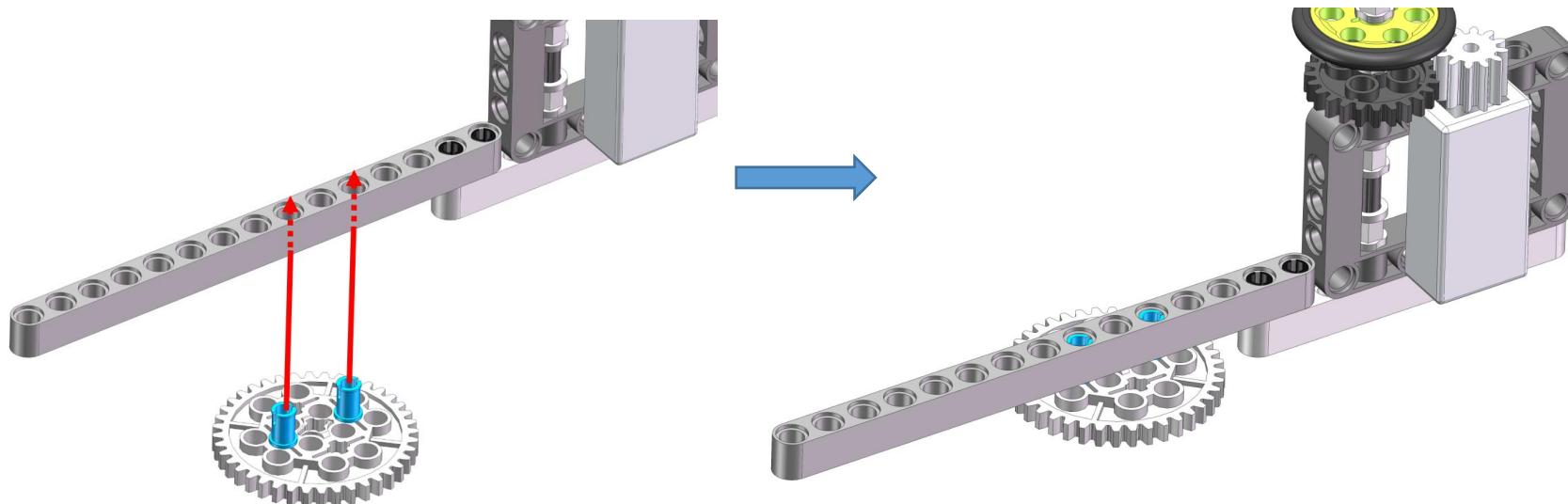
Tip: When doing this, we need to place the blocks vertically.



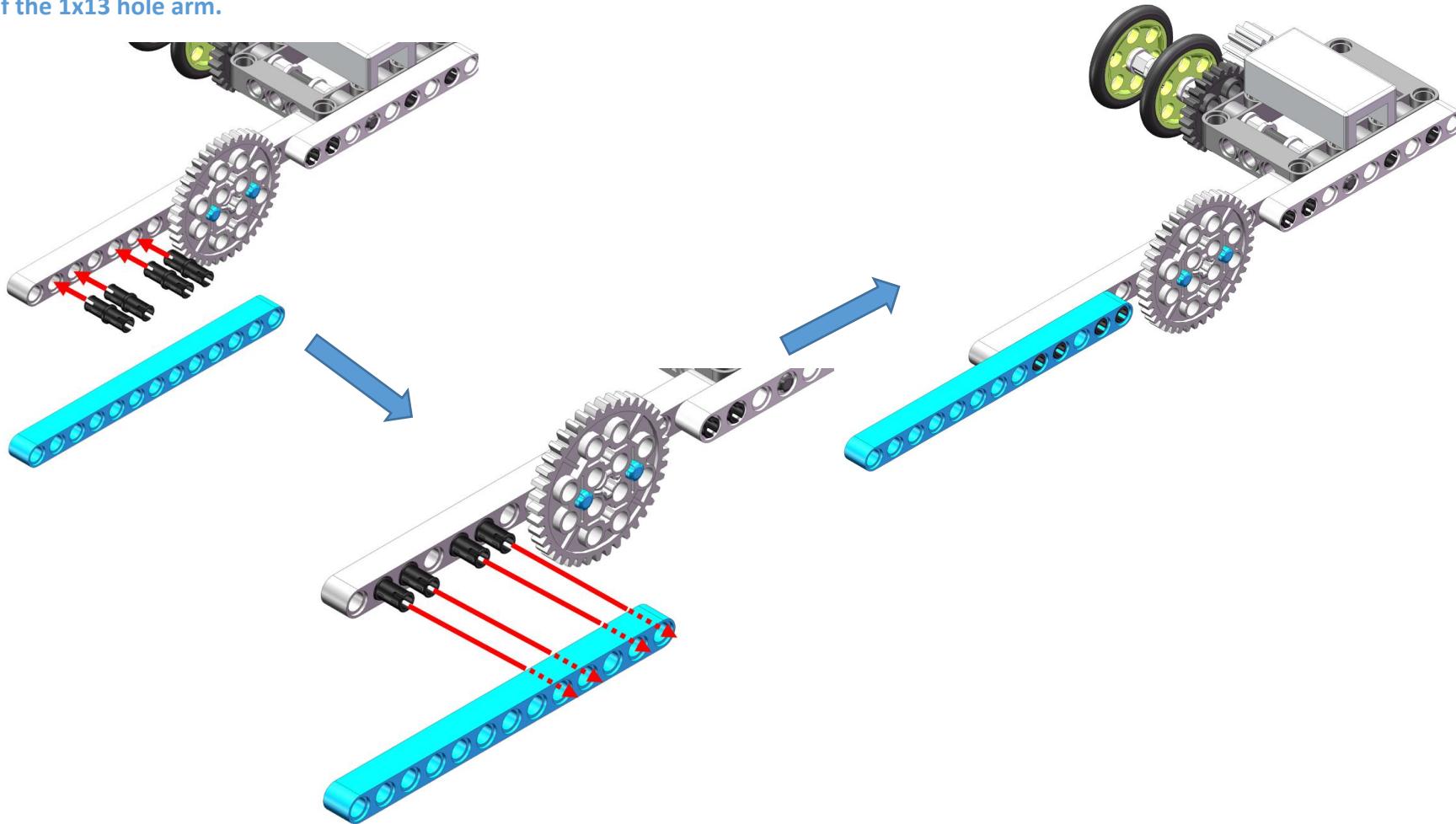
Step 25: Locate a 40-toothed wheel and two 1x2 shaft and bolt connector. Insert the two 1x2 shaft and bolt connector into the corresponding holes as shown in the figure below.



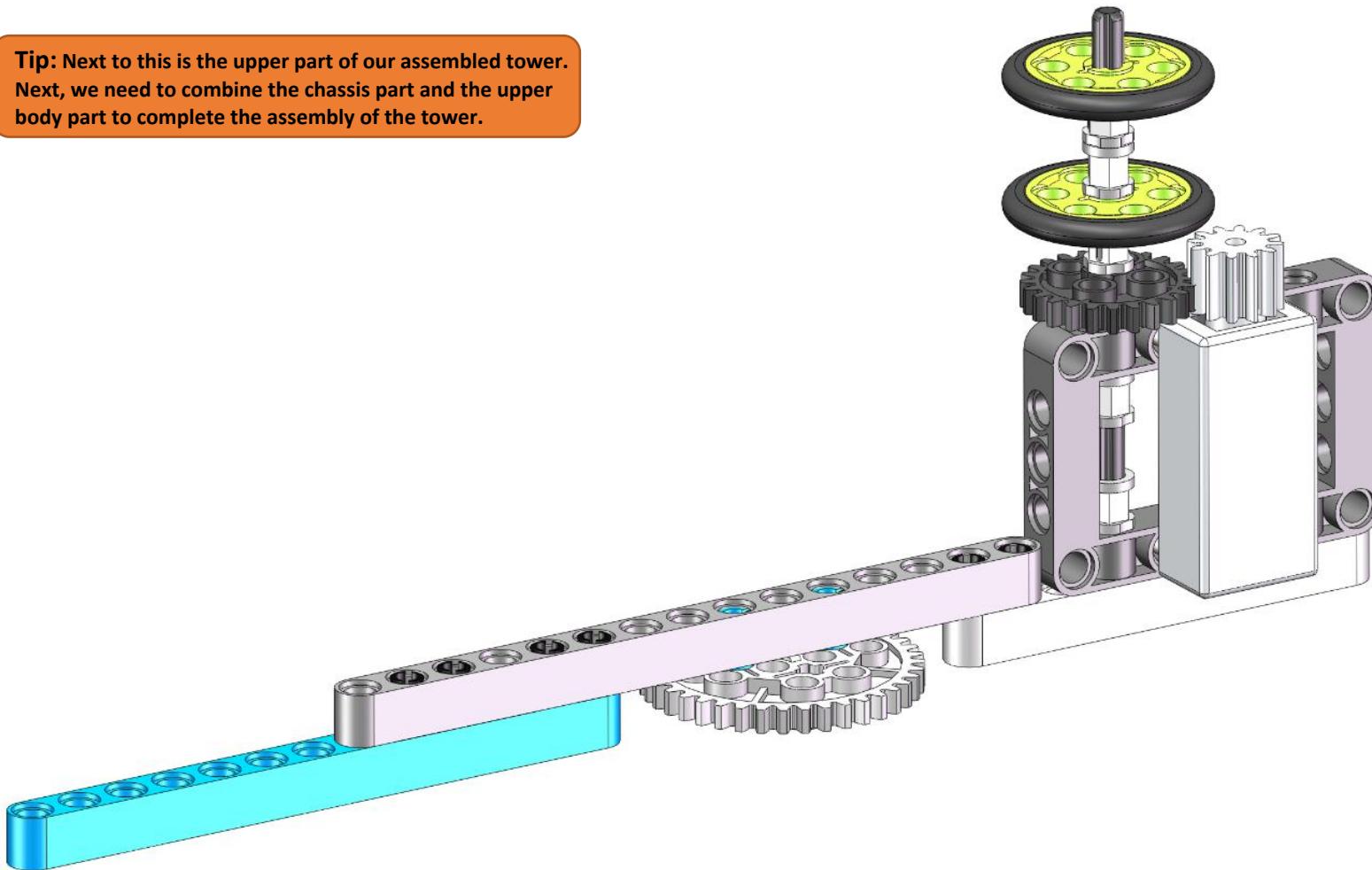
Step 26: Combine the building blocks assembled in the previous step with the building blocks that we have assembled in the step 24.



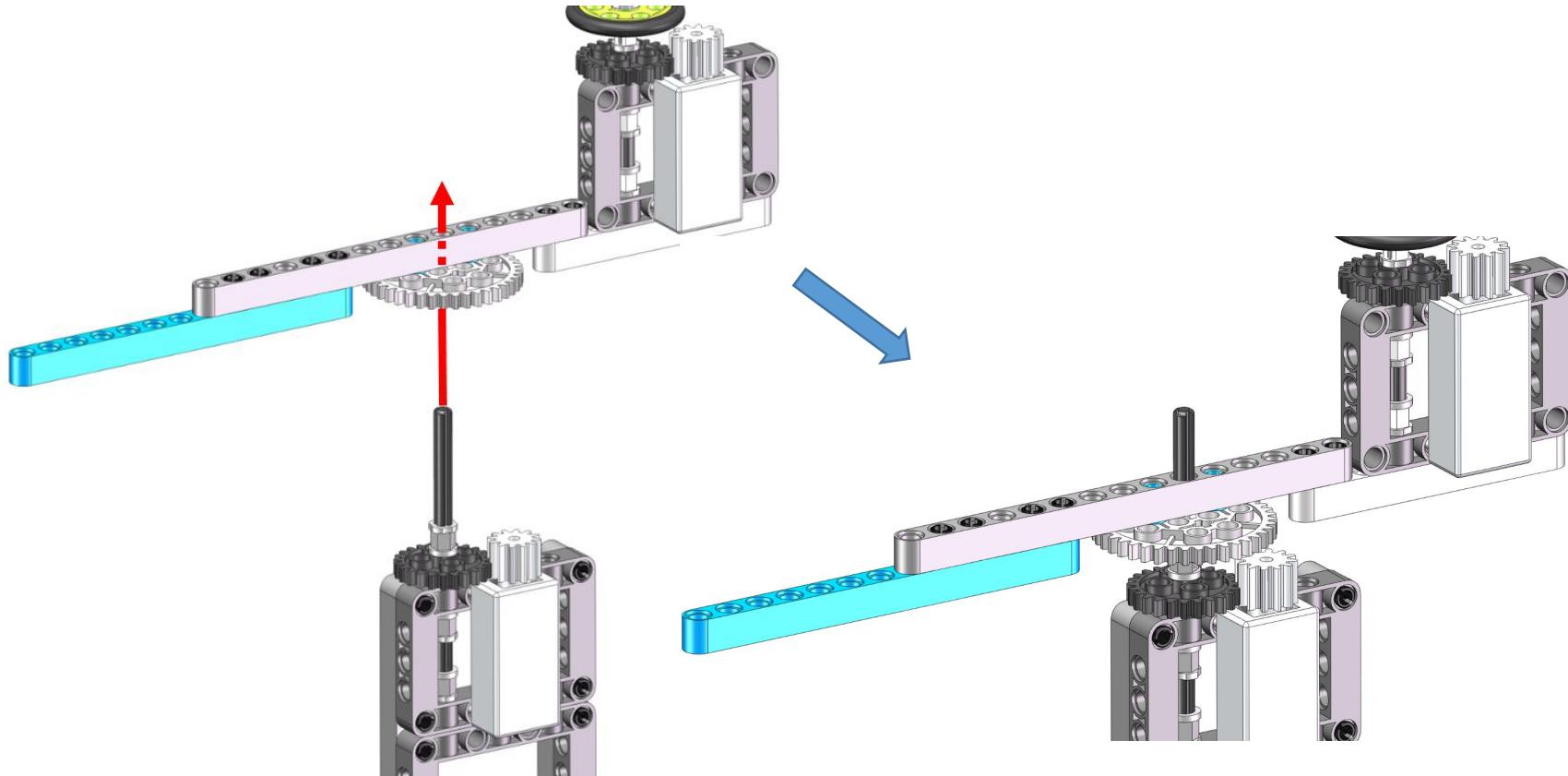
Step 27: Look for four 1x2 friction pins and a 1x13 hole arm. First insert the four 1x2 friction pins into the 2nd, 3rd, 5th, and 6th holes from the left of our assembled 1x15 hole arm. Then insert the four 1x2 friction pins into the 1st, 2nd, 4th, and 5th holes from the right side of the 1x13 hole arm.



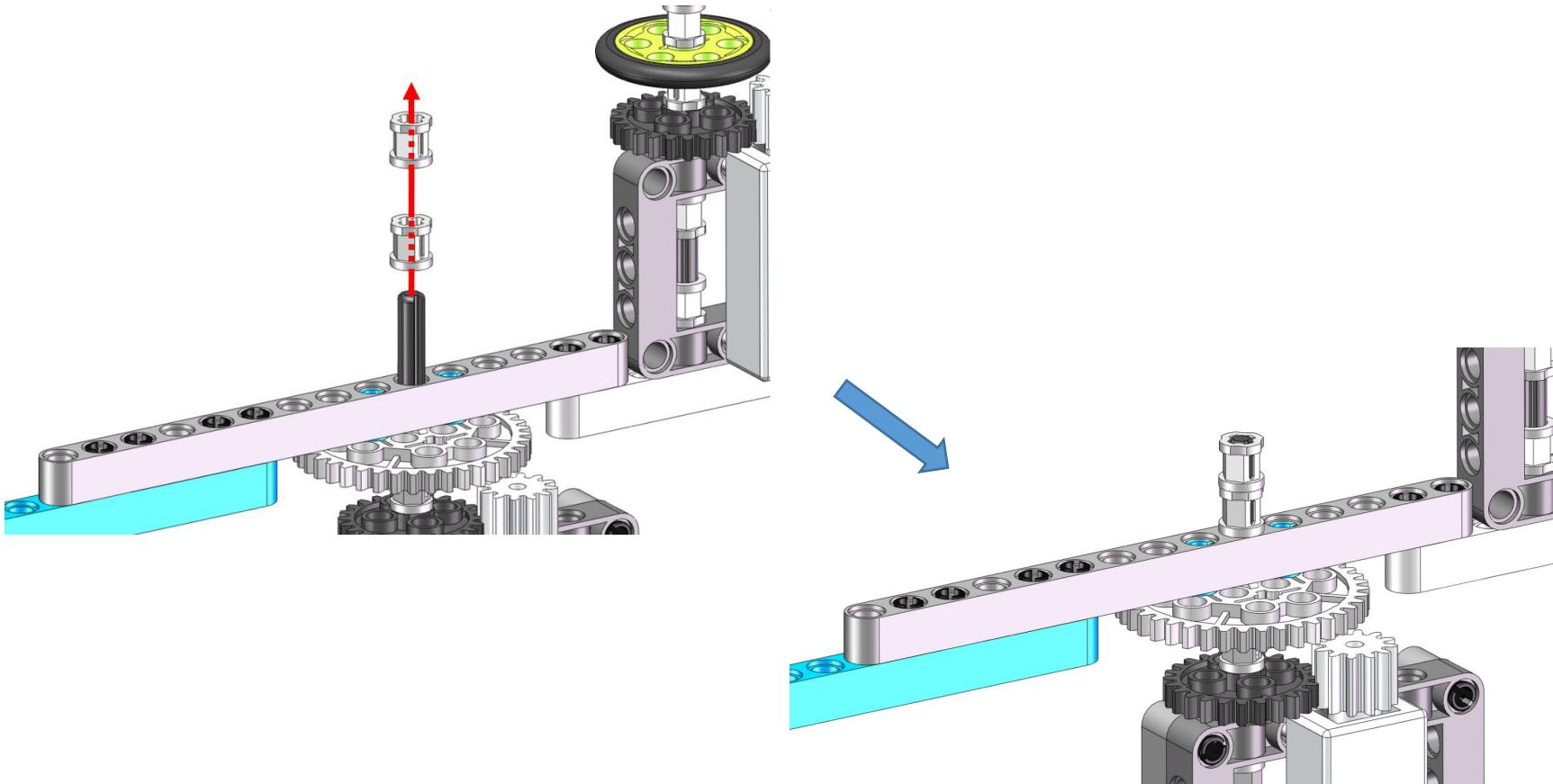
Tip: Next to this is the upper part of our assembled tower. Next, we need to combine the chassis part and the upper body part to complete the assembly of the tower.



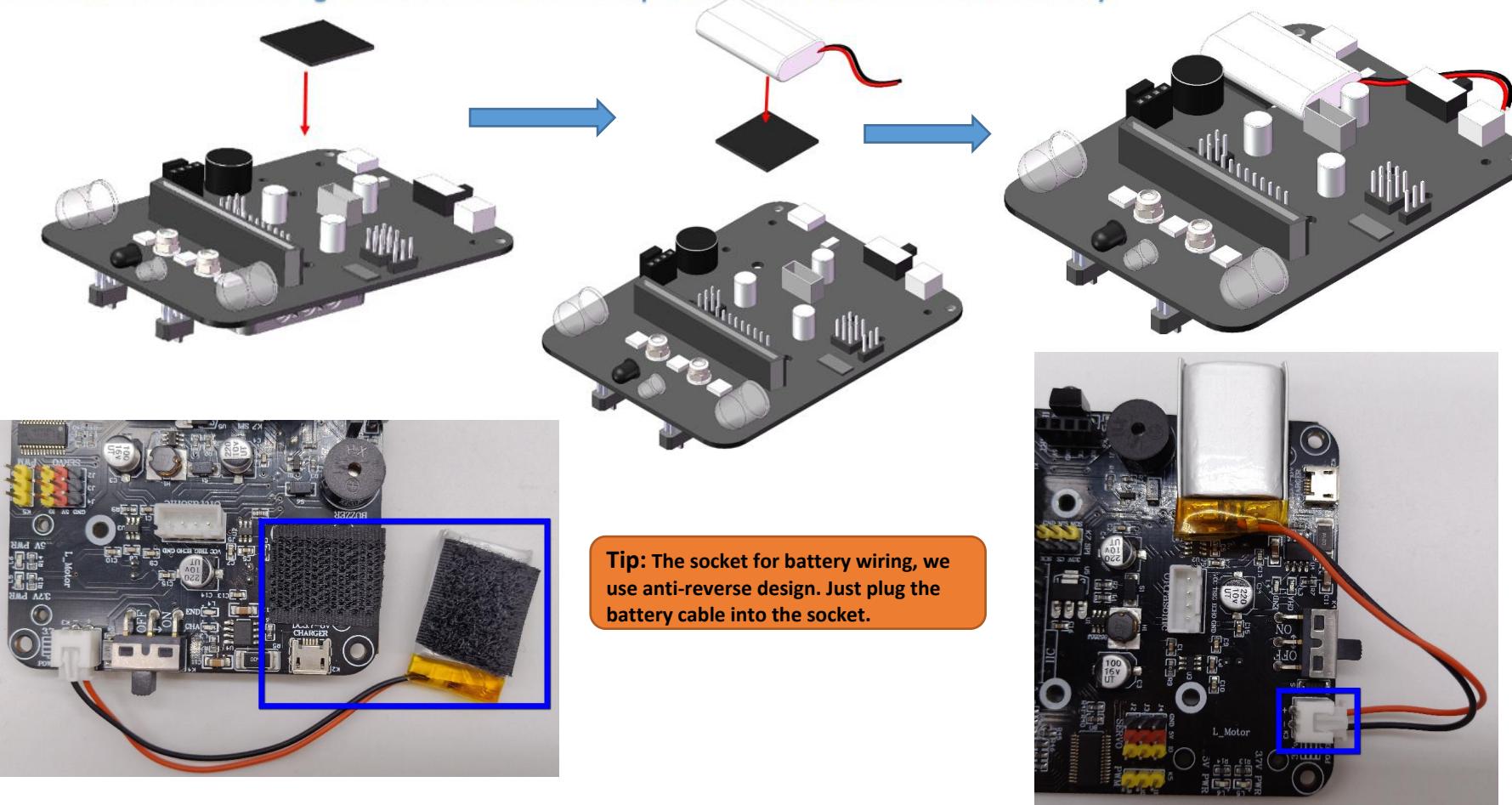
Step 28: Combine the chassis part and the upper body part of the assembled tower that we have assembled in steps 17 and 27. The 1x12 cross axle at the top of the chassis section passes through the center hole of the 40-toothed wheel of the upper body section and then passes through the 1x15 hole arm to the 6th hole from the right.



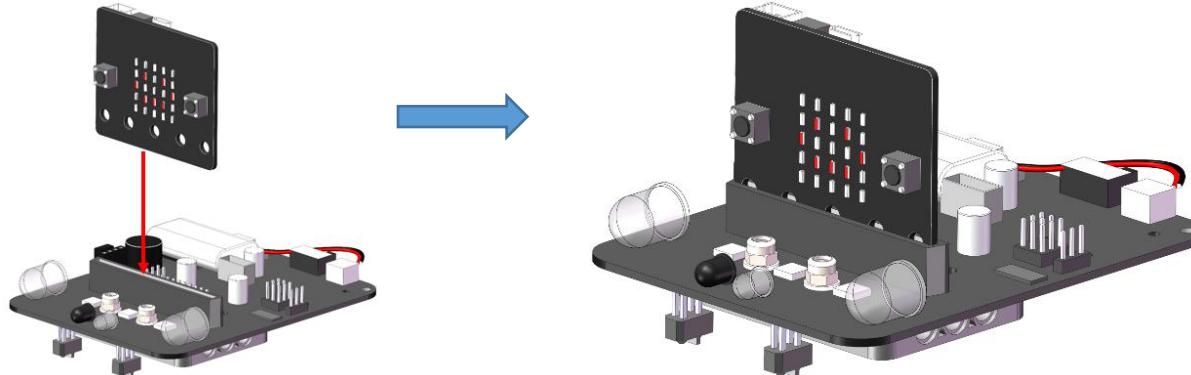
Step 29: Find the two bushings and mount them on the assembled 1x12 cross axle.



Step 30: Find the Velcro and micro:bit expansion board, remove the protective film on the back of the Velcro, and attach the two Velcro stickers to the lower right corner of the micro:bit expansion board and one side of the battery.

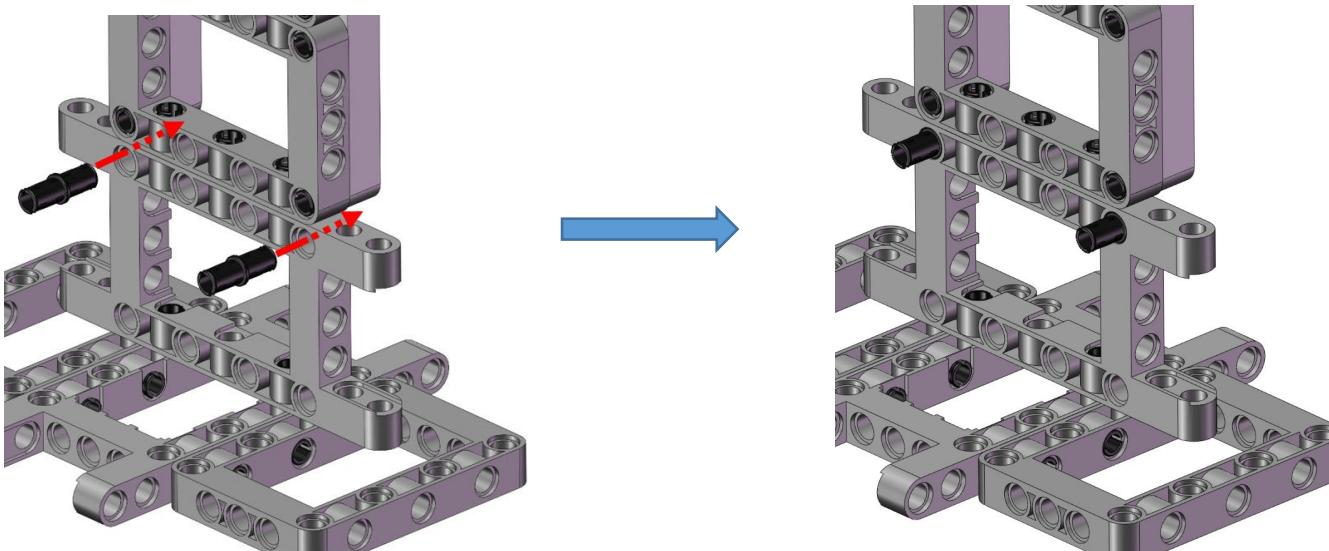


Step 31: Find the micro:bit motherboard and insert it correctly into the micro:bit expansion board.



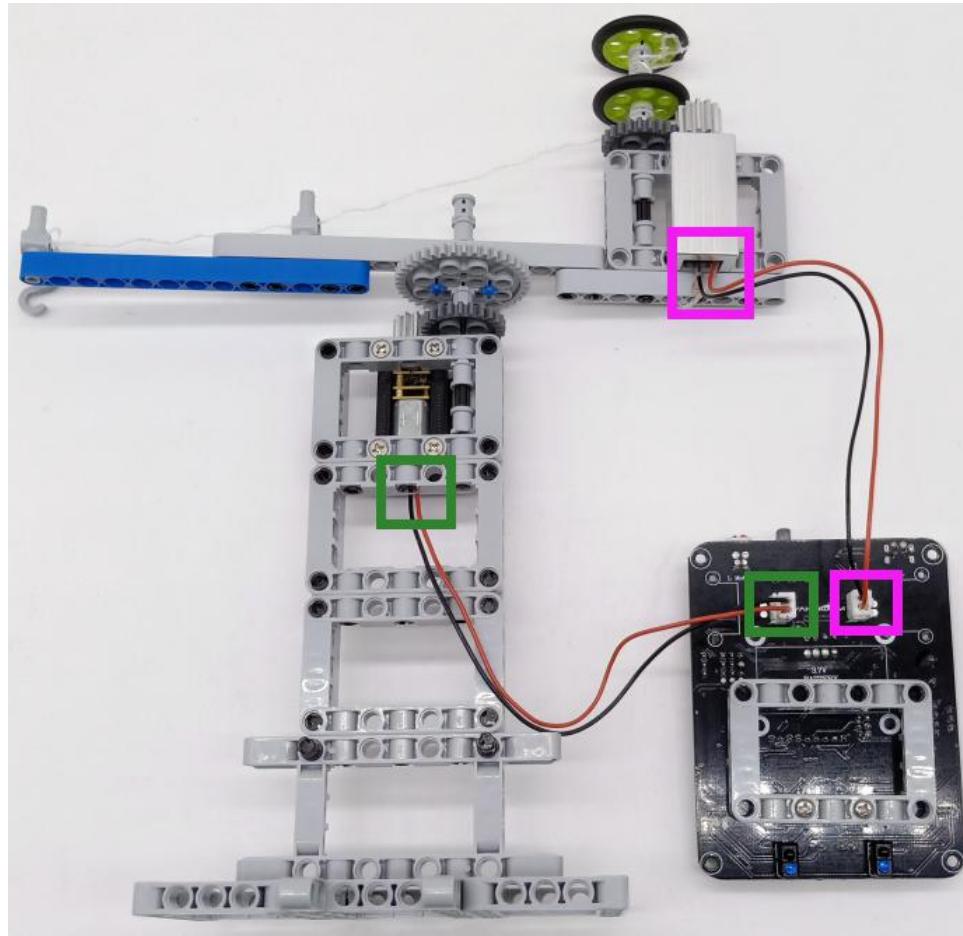
Tip: The micro:bit board is equivalent to the "brain" of the tower, so be sure to remember to install it properly.

Step 32: Locate the two 1x2 friction pins and insert them into the corresponding holes in the chassis section of the tower.

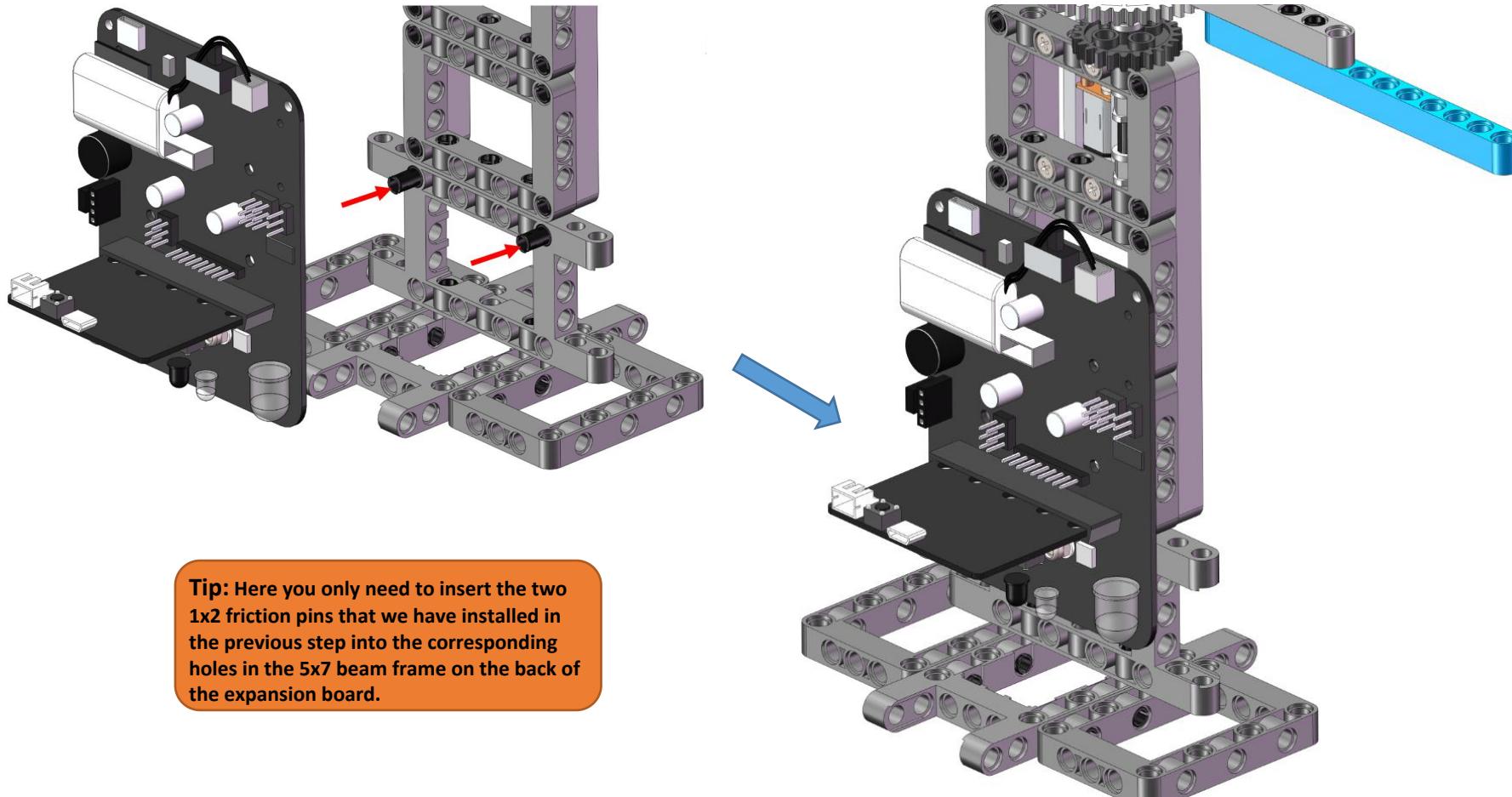




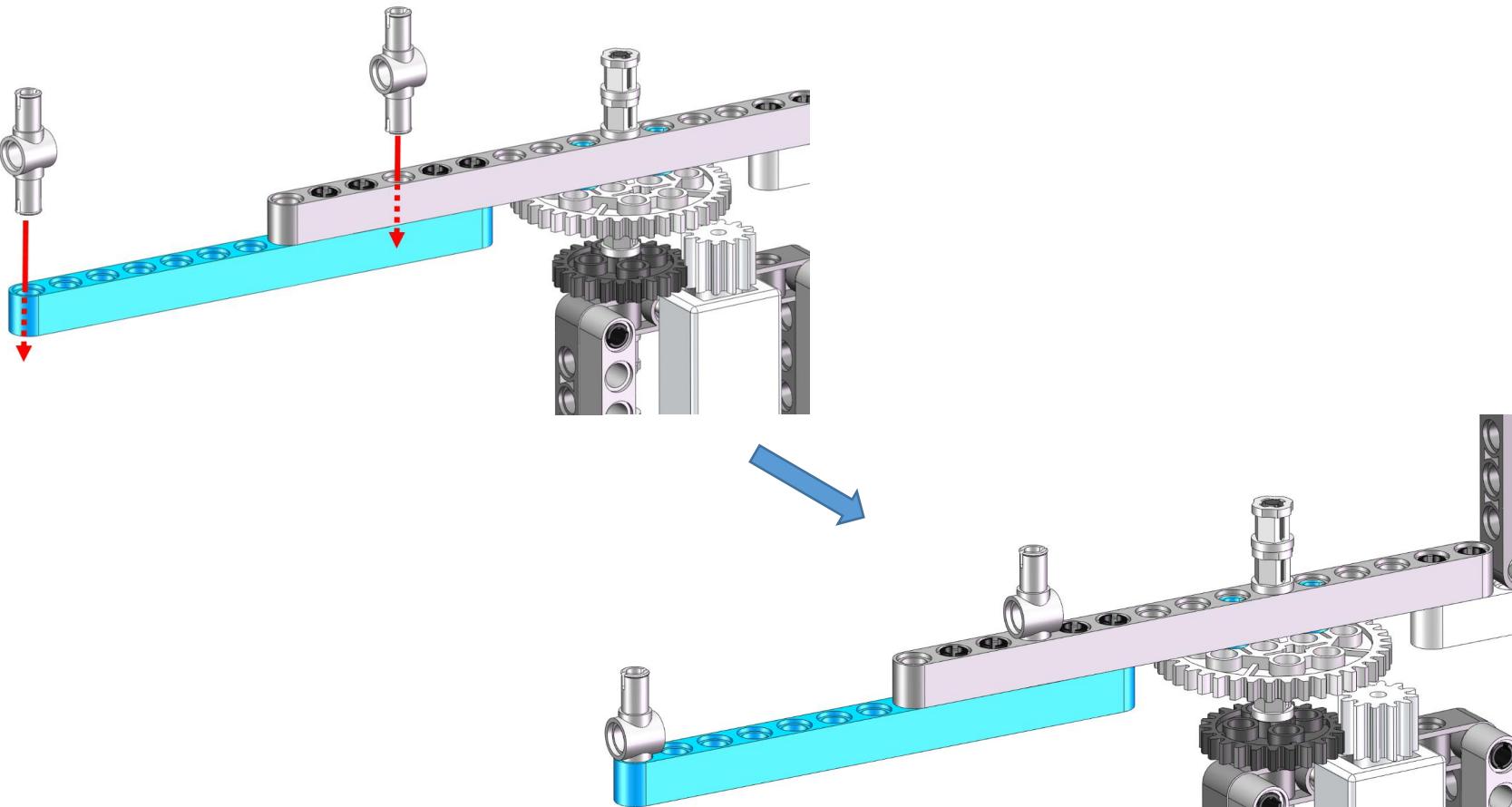
Step 33: Wire as shown in the figure below.



Step 34: Insert the micro:bit expansion board into the two 1x2 friction pins assembled in the previous step.

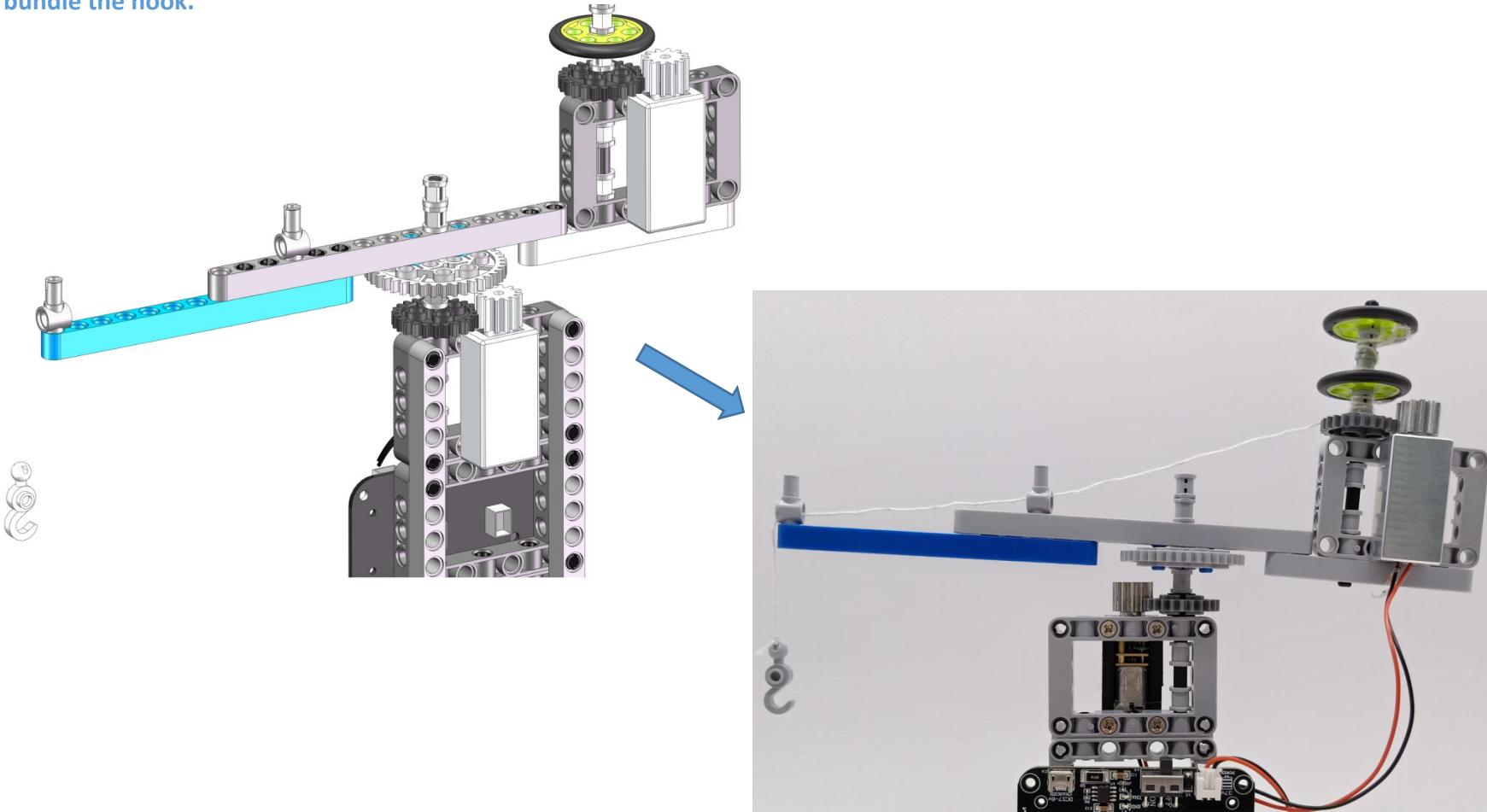


Step 35: Find two 1x3 bolt connectors, insert them into the first hole to the left of the assembled 1x13 hole arm, and the 4th hole to the left of the 1x15 hole arm.





Step 36: Pass the string around the intermediate shaft of the two rubber rings + 24 pulleys, then pass through the two 1x3 bolt connectors and bundle the hook.

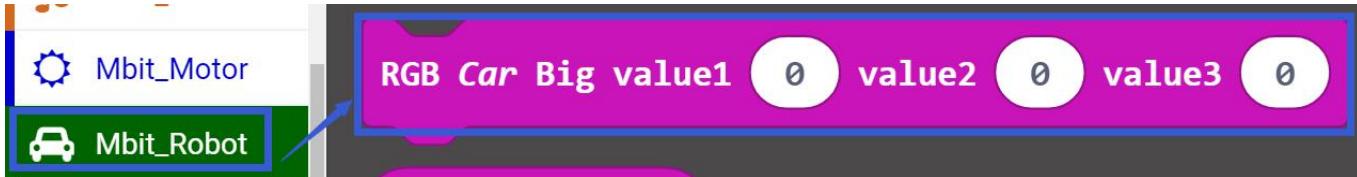
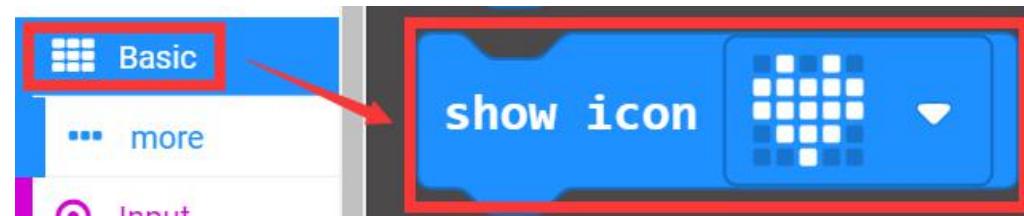


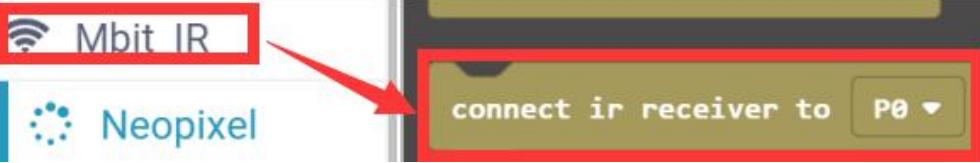
Thinking: This session is mainly to teach you how to use graphical programming to control the tower.

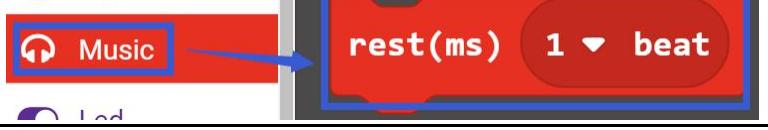
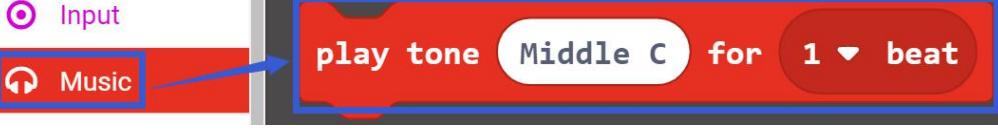
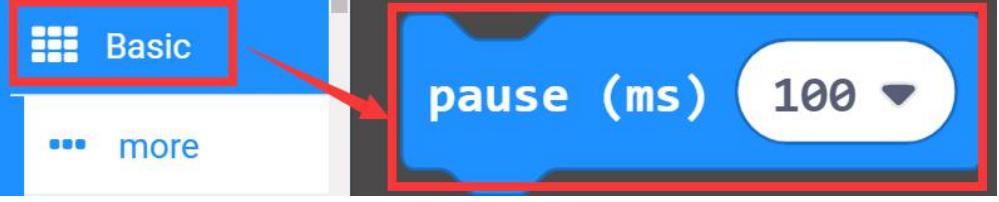
Preparation

- USB cable *1
- Tower crane*1
- IR remote control*1

Blocks

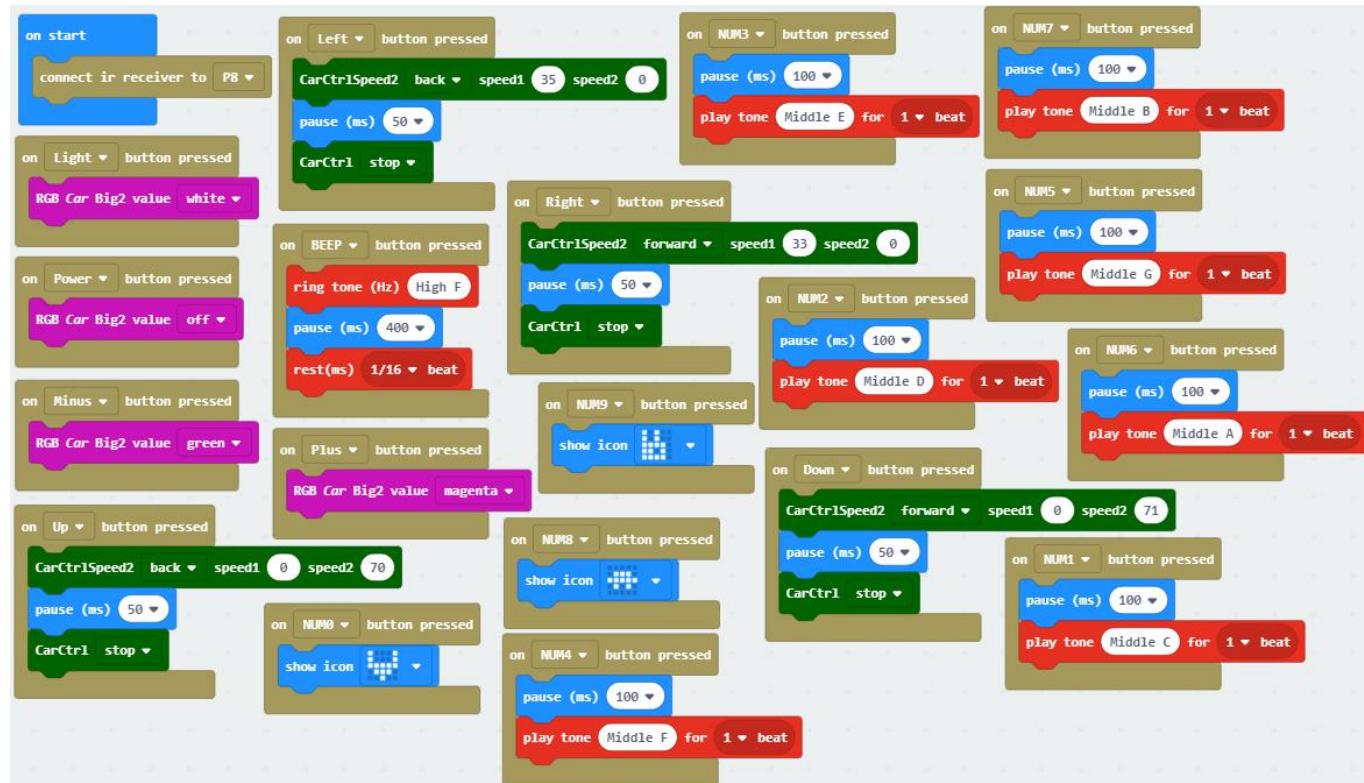
Block	Instruction
	Select the color that the lights are lit.
	Display the image on the micro:bit dot matrix screen.

Block	Instruction
 <p>The image shows a Scratch script starting with a 'on start' hat block.</p>	<p>Executed at the moment of boot, the code is only executed once.</p>
 <p>The image shows a Scratch script with an 'Mbit_IR' block and a 'Neopixel' block. A red arrow points from the 'Mbit_IR' block to a 'connect ir receiver to P0' control block.</p>	<p>Set the infrared remote control receiving pin. In this experiment, the receiving pin is P8, so you must select P8, otherwise you will not receive the signal.</p>
 <p>The image shows a Scratch script with an 'Mbit_Robot' block. A red arrow points from the 'Mbit_Robot' block to an 'on Power button pressed' control block.</p>	<p>When the power on the remote control is pressed, the code inside will be executed, and the button can be customized.</p>
 <p>The image shows a Scratch script with two 'CarCtrlSpeed' blocks. A red arrow points from the first 'CarCtrlSpeed' block to a 'CarCtrlSpeed2' block.</p>	<p>The Carctrl forward represents the forward rotation of the motor, and the Carctrl back represents the reverse rotation of the motor and control the speed of two motors.</p>

Block	Instruction
	Control the pitch of the music.
	Control the beat of the sound played, which is the time the sound continues.
	Control the tone and the sound continuos.
	The program pauses for 100 milliseconds and the time can be modified by itself.
	The Carctrl forward represents the forward rotation of the motor, and the Carctrl back represents the reverse rotation of the motor.

Programming

The program of this course is shown in the figure below. After downloading the program, open the power switch of the tower and press the button of the infrared remote control. The tower will have corresponding action. The ismall light, the plus and minus buttons of the infrared remote control are used to control the color of the colorful lights, the red power button is the light button, and the 1~7 represents the do, re, mi, fa, sol, la, si in the music. The front, back, left and right buttons control the rise and fall of the tower and the left and right rotation. 0 and 8, 9 are used to control the image of the dot matrix screen.



This experimental program file has been provided, you can download and use it directly according to the steps in “Instruction” .

Program path:Building bit starter kit\2. Experimental course\G.Tower crane\2.Tower crane Infrared remote control\Tower-crane-Infrared-remote-control.hex

We have packaged the blocks as shown in the two figures below for this tower.



If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely.
Drag these blocks and play with our building block tower crane!!!



On our official website, we also provides other tutorial: [Tower crane bit handle remote control](#).
Official website learning website: www.yahboom.net/study/Building_bit