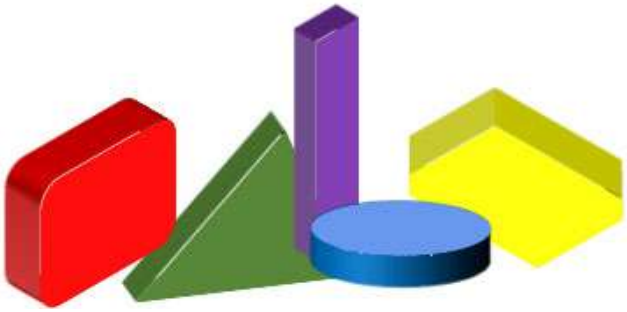
Yahboom Building:bit blocks

Introduction

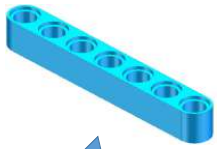


Note: The description is only for display, please refer to the actual color of the building blocks you received

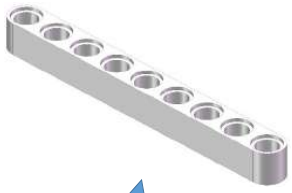
Introduction 1:Hole building blocks



1x3 hole building block *4



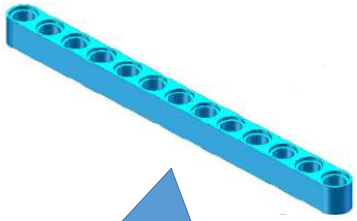
1x7 hole building block *4



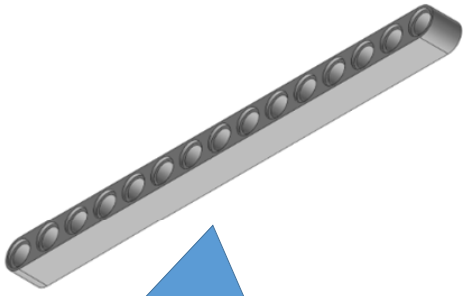
1x9 hole building block *5



1x11 hole building block *5

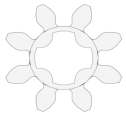


1x13 hole building block *4

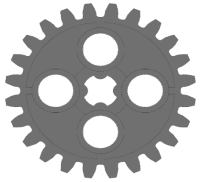


1x15 hole building block *6

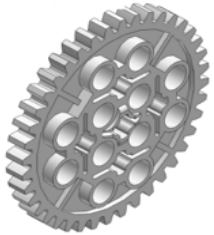
Introduction 2:Wheel building blocks



8 toothed-wheel building block *5



24 toothed-wheel building block *3



40 toothed-wheel building block *7



Spiral wheel *2



Crawler wheel *6



Rubber ring+24 pulley *4



37*22mm car wheel *4

Introduction 3: Cross Axle building blocks



1x8 Cross Axle building block *3



1x12 Cross Axle building block *7

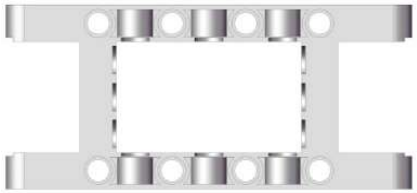


1x4 Cross Axle building block *3

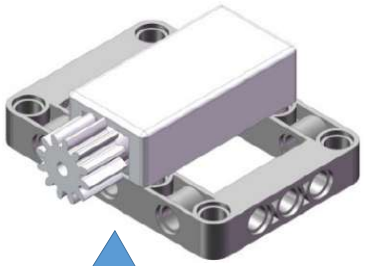
Introduction 4: Liftarm frame building block



5x7 beam frame building block *5



5x11 beam frame building block *2

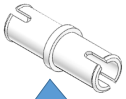


Motor+ 5x7 beam frame building block *2

Introduction 5: Pin building blocks



1x2 Frictional pin building block *68



1x2 Smooth pin building block *7

Introduction 6: Bushing building blocks

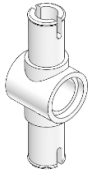


1x1 Bushing building block *16

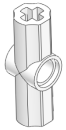


1/2 Bushing building block *5

Introduction7: Shaft/Bolt connector building blocks



1x3 Bolt connector building block *11



2# Bolt connector building block *7



3x3 Bolt connector building block *7

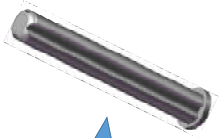


1x2 Shaft and bolt connector building block *9



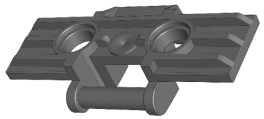
1x3 Shaft building block *12

1x2 Shaft connector building block *3



1x4 Shaft cutoff building block *9

Introduction 8: Other accessaries



Plastic crawler piece *68

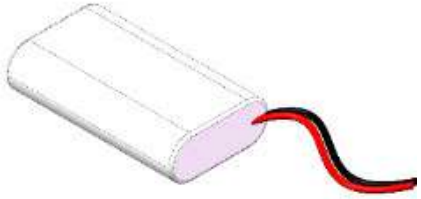


Lifting hook *1

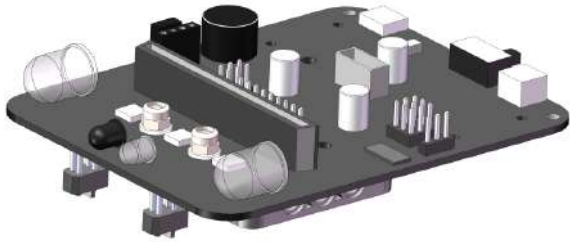


Building block remover *1





Battery*1



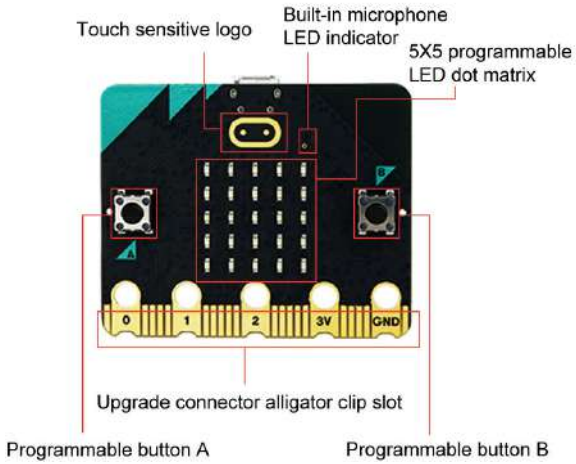
Micro:bit expansion board*1

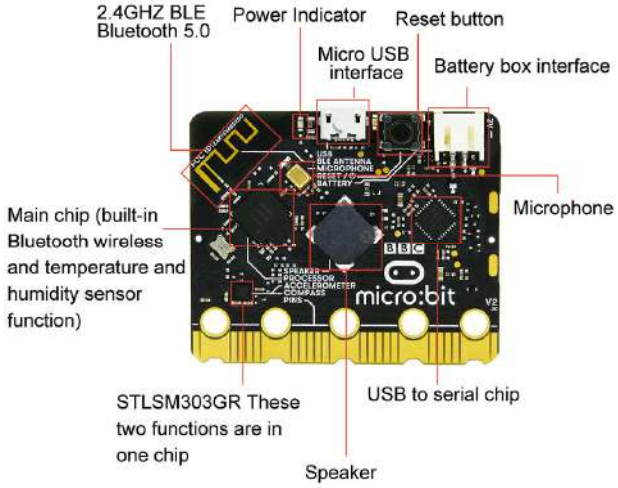


Micro:bit *1 (option)

What's micro:bit?

The BBC micro:bit is a handheld, programmable micro-computer that can be used for all sorts of cool creations, from robots to musical instruments – the possibilities are endless.





How to use micro:bit online programming?

1.First connect the micro:bit to the computer with the data cable. At this time, the computer will have a micro:bit U disk. Open the USB flash drive and click on the micro:bit URL as shown in Figure 1 below to enter the micro:bit official website.



Figure 1

2.After successfully entering the URL, we can click on the [English] at the top right of the interface as shown in Figure 2 below to switch the language of the entire interface.

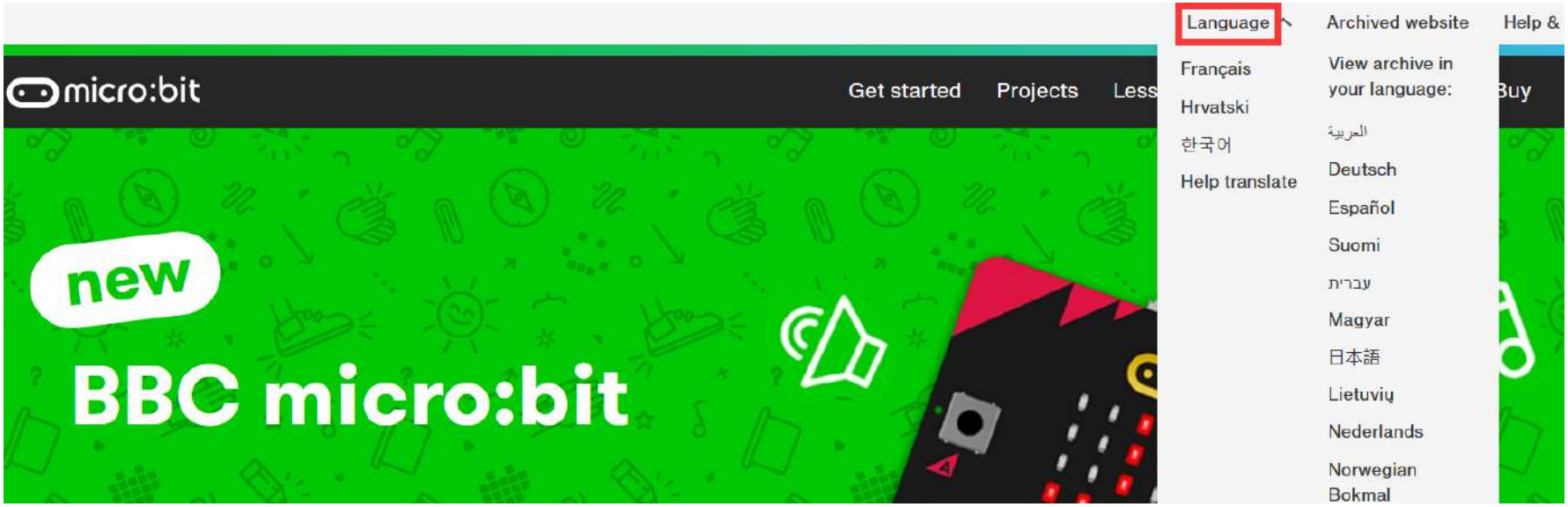


Figure 2

3.If you don't need to switch languages, continue to click [Let's code] at the top of the interface shown in Figure 3. At this point we will enter a new interface.

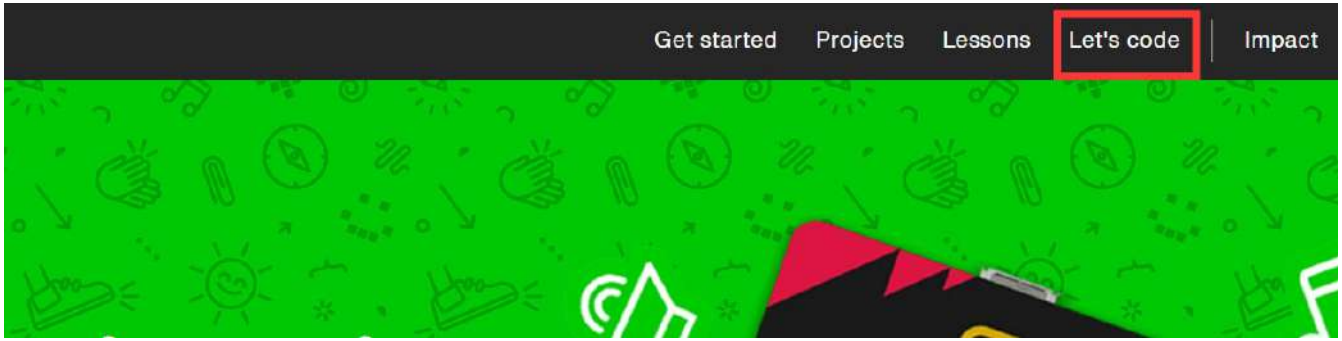


Figure 3

4. After entering a new page, click [Let's code] at the bottom of the interface shown in Figure 4 below, and you will be able to enter the MakeCode editor.

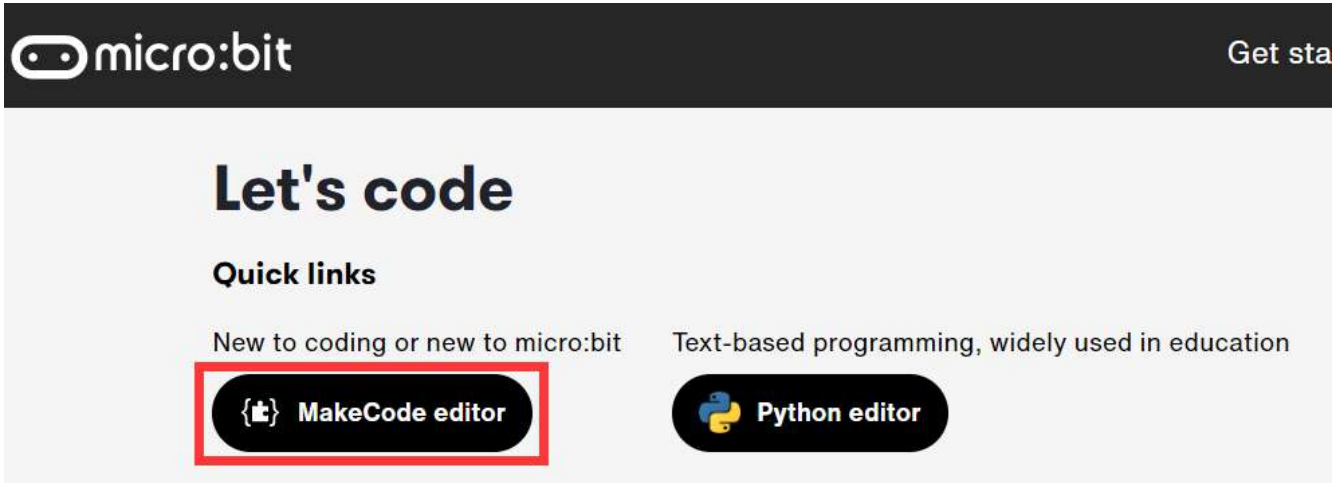


Figure 4

5.After clicking, we will enter the interface shown in Figure 5 below. We need to click [New Project] in the lower left corner to enter the MakeCode editor.

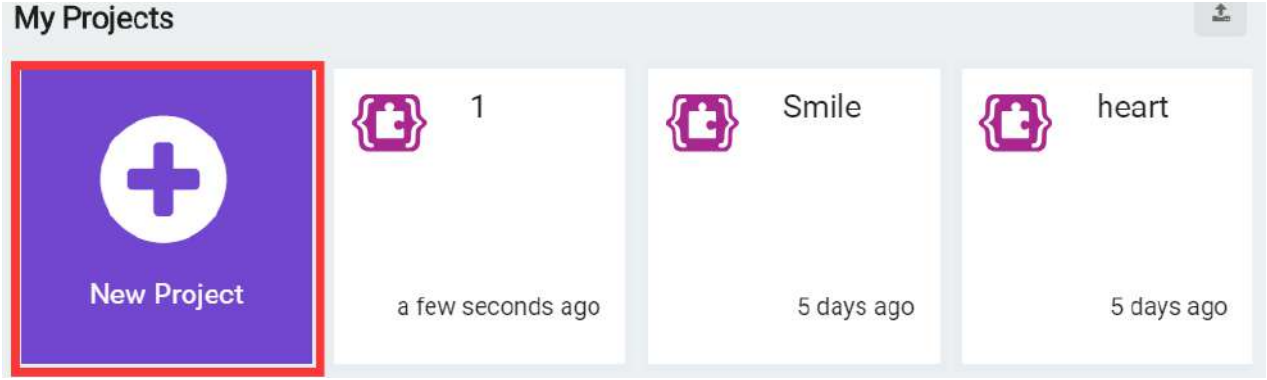


Figure 5

6. The interface shown in Figure 6 below is the micro:bit online programming interface we need to use.

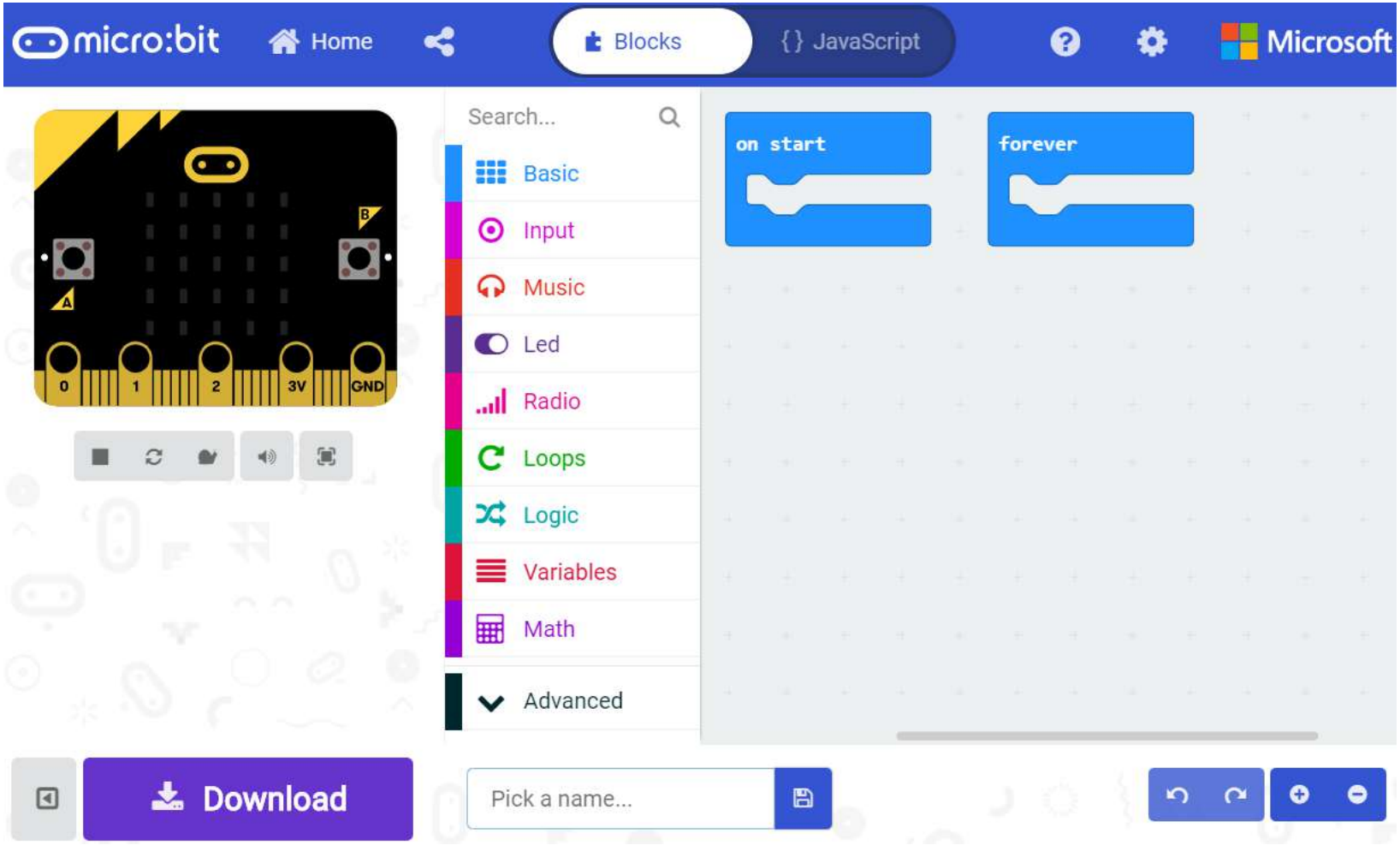


Figure 6

7. We first need to add the Yahboom package. In the interface shown in Figure 7 below, click [Advanced], then click [Extensions], an interface will pop up.

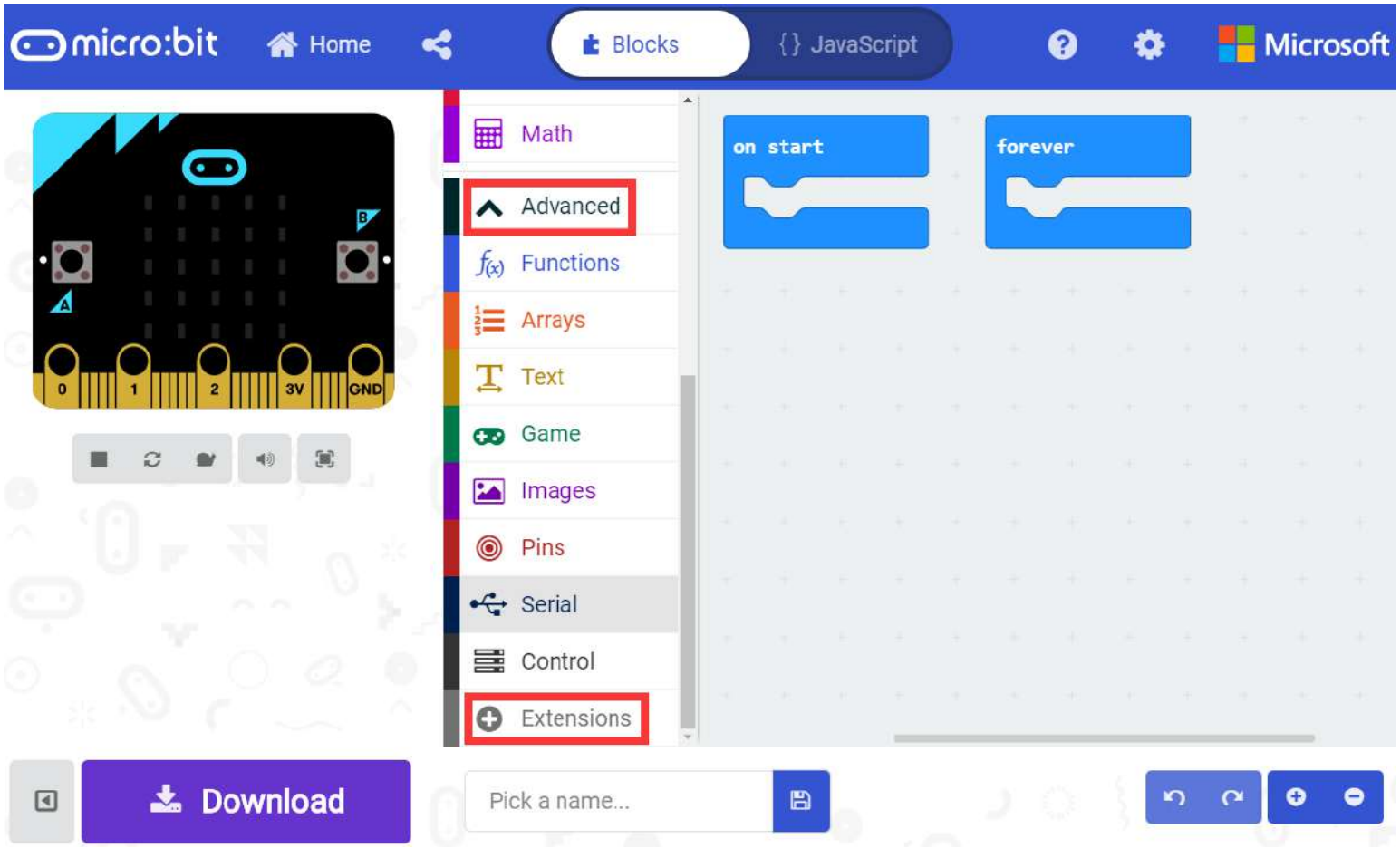


Figure 7

8.Enter the URL in the input field: https://github.com/lzty634158/yahboom_mbit_en. Then click “search” or press the "Enter" key on the keyboard, as shown in Figure 8. You can search for the Yahboom software package, and then click mbit, as shown in Figure 9, you can successfully add the software package.

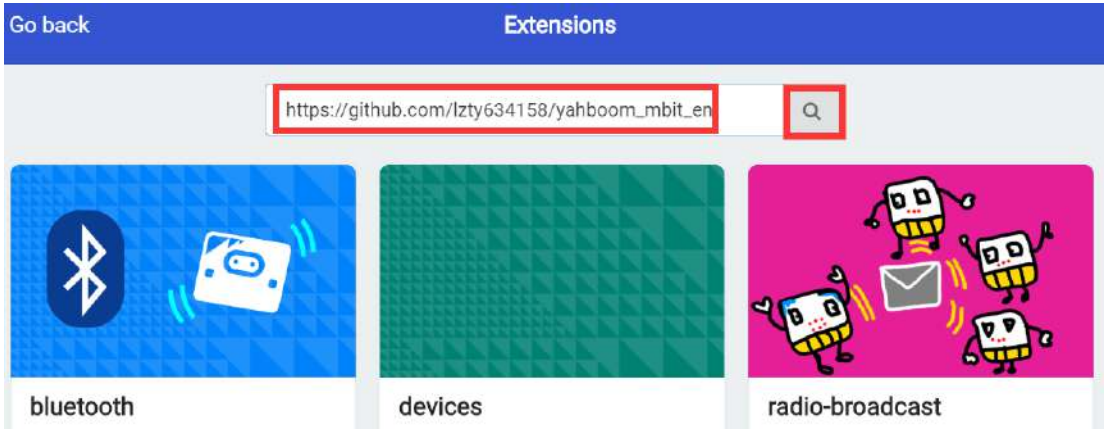


Figure 8

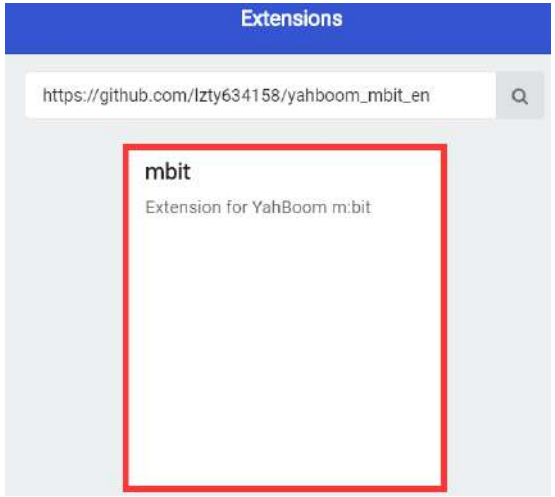


Figure 9

9.After loading the package, we can see that the program bar has loaded the building blocks made by Yahboom, as shown in Figure 10.

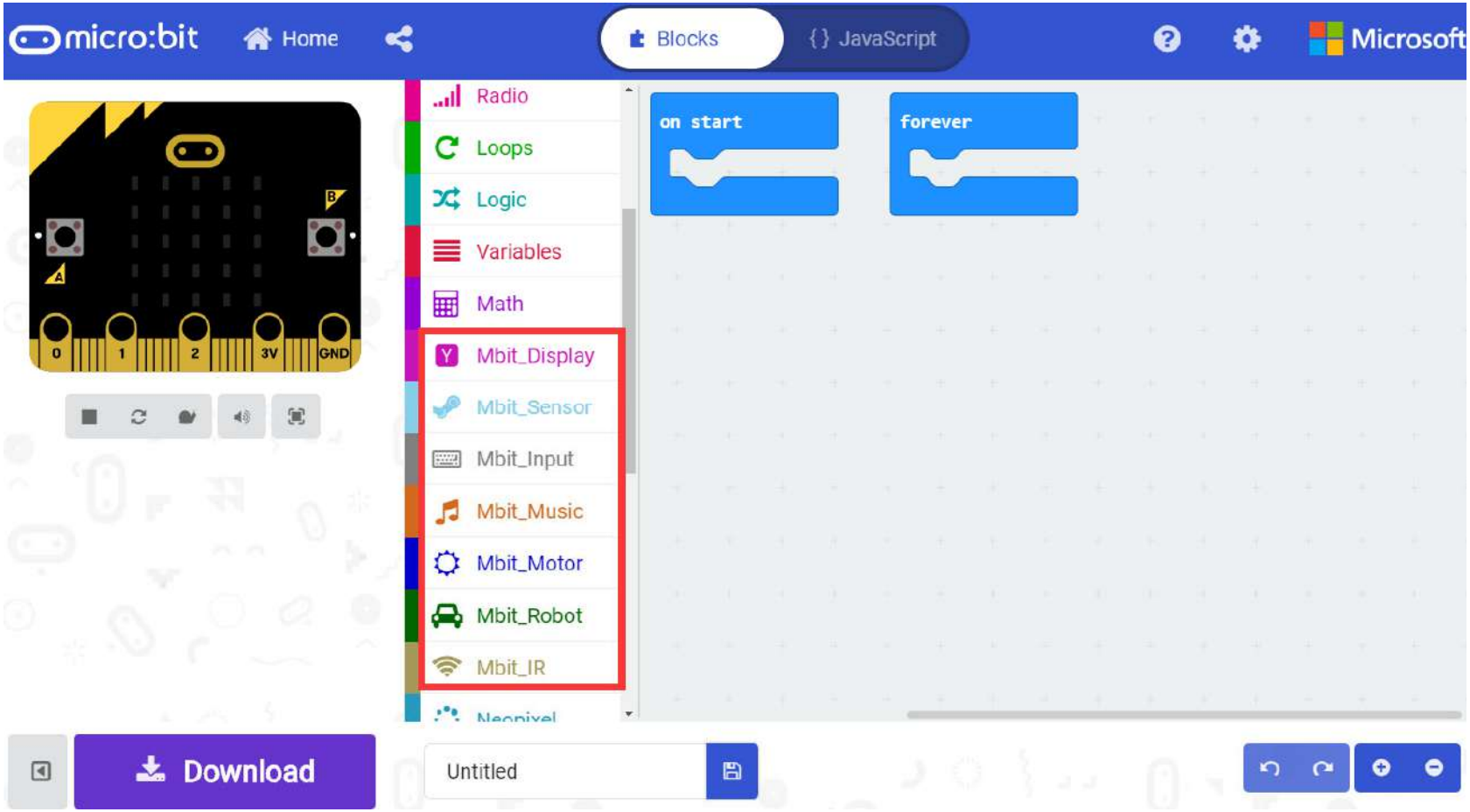


Figure 10

10.You can build your own blocks for programming. After setting up the program blocks, we can name the program ourselves, and then click [Download] to download the program, as shown in Figure 11. We can set the download path to micro:bit U disk, or directly to the computer, and then copy it to the micro:bit U disk, as shown in Figure 12.

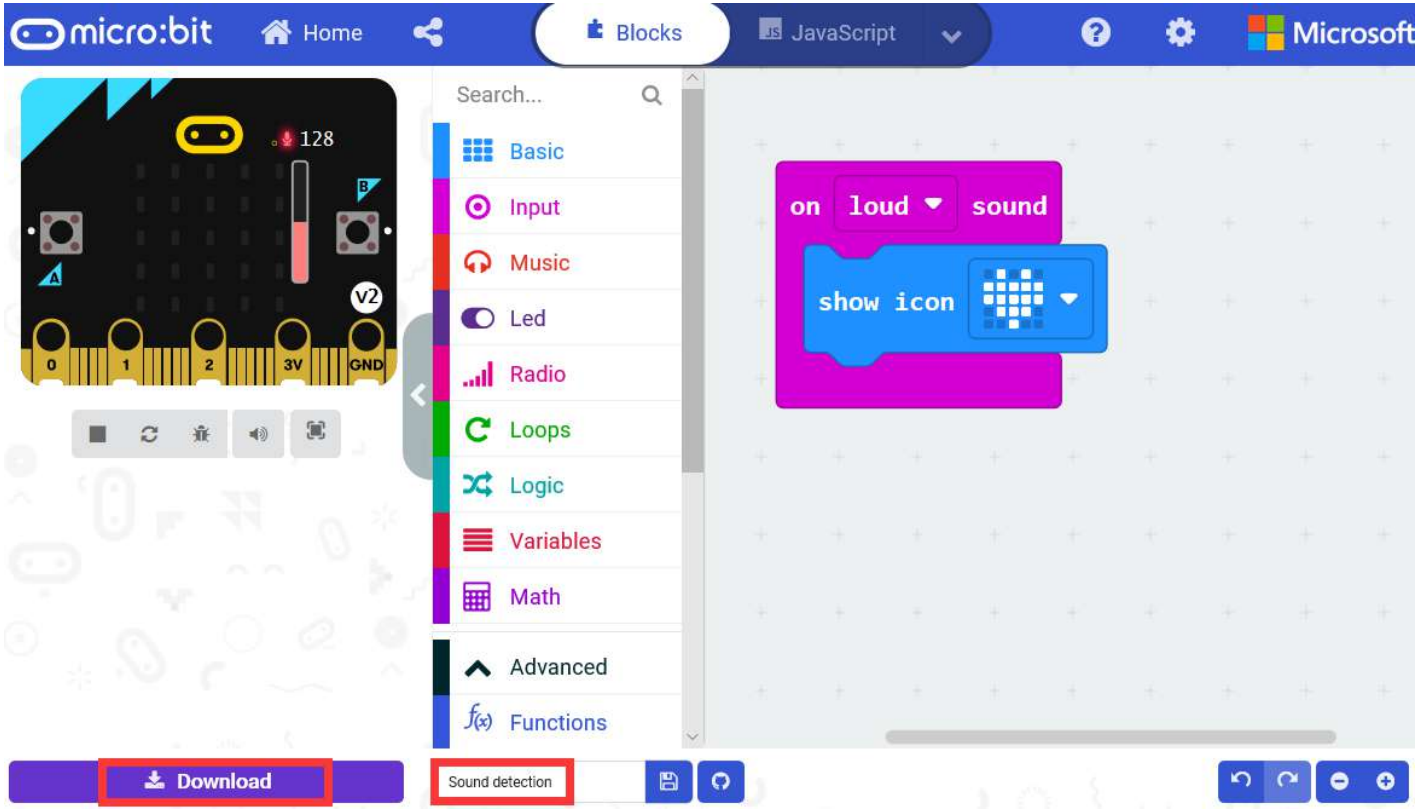


Figure 11

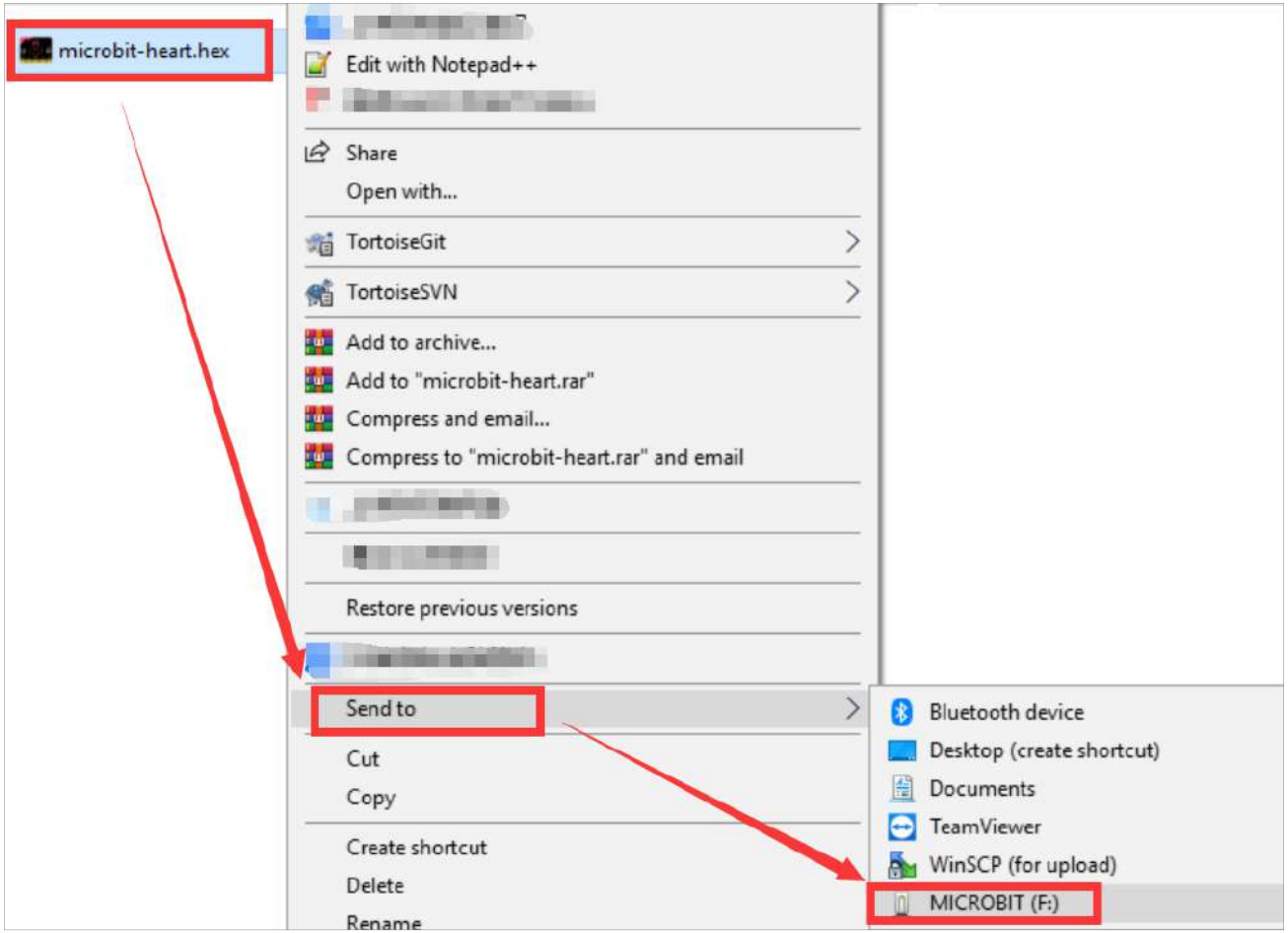


Figure 12

11.The indicator light on the back of the micro:bit motherboard will flash during the download. After the download is complete, the indicator light stops flashing and we can see the corresponding experimental phenomena and effects.

How to use micro:bit offline programming?

Notice： **For the installation package and install method of offline programming software, please refer to the tutorial materials provided by us.**
Download ZIP : www.yahboom.net/study/Building_bit
Route： **Building bit starter kit\1. Preparation before class\Introduction of programming method\Makecode.zip**

1.Open a shortcut on your desktop, shown in Figure 13.



You can enter the offline programming interface, as

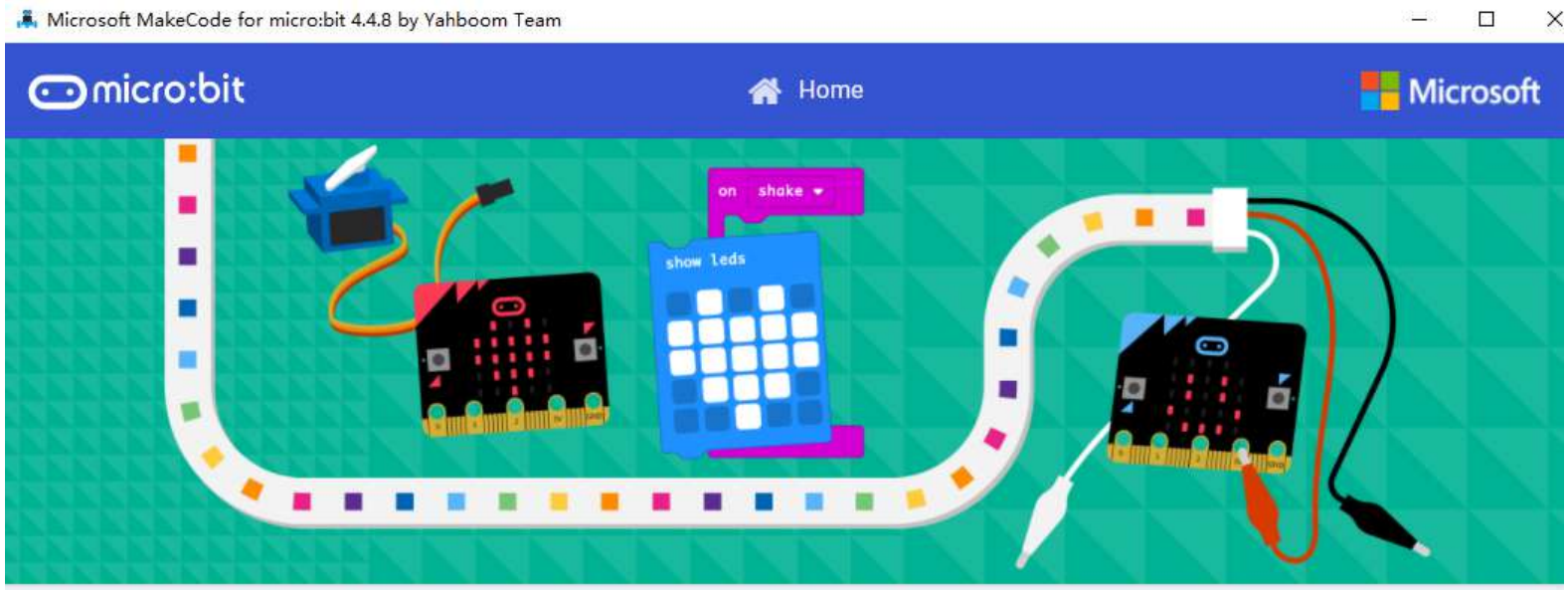


Figure 13

2.Click the [New Project] option in the interface to enter the programming page, as shown in Figure 14.

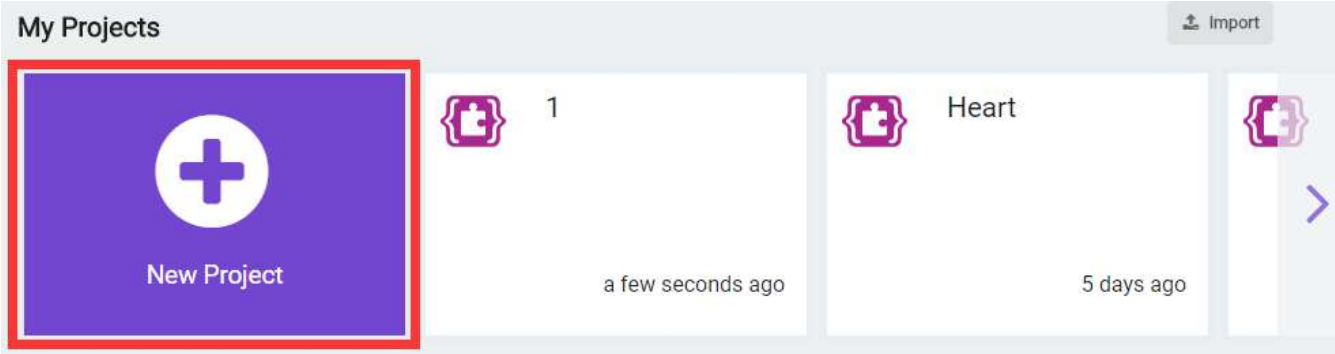


Figure 14

3.The interface shown in Figure 15 below is the micro:bit offline programming interface we need to use.

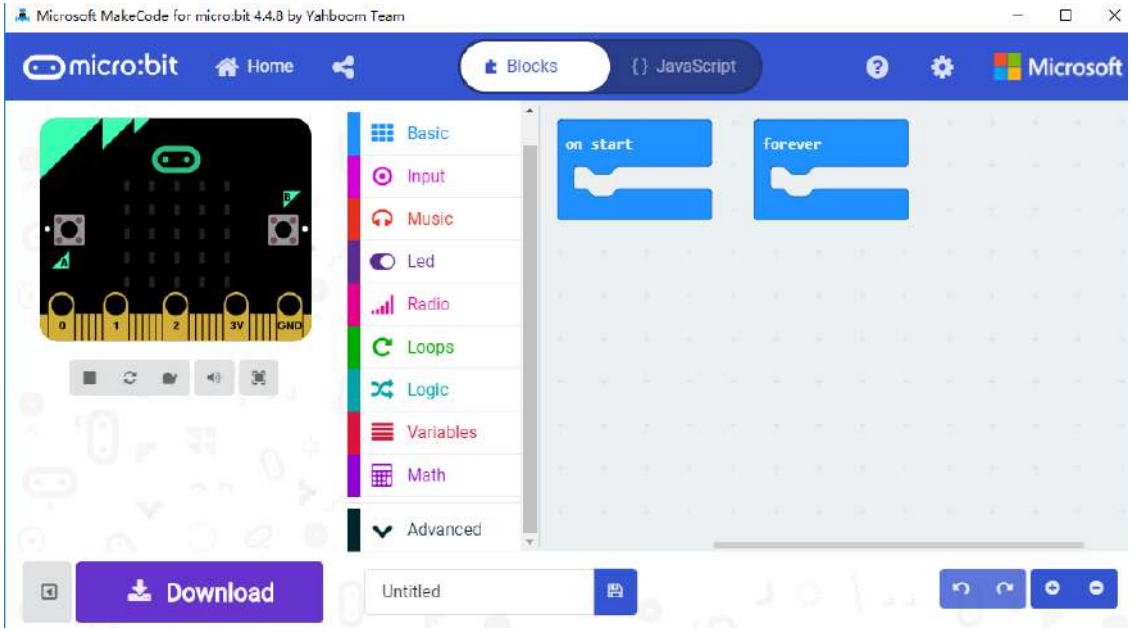


Figure 15

4.Click the icon in the upper right corner to switch languages, as shown in Figure 16.

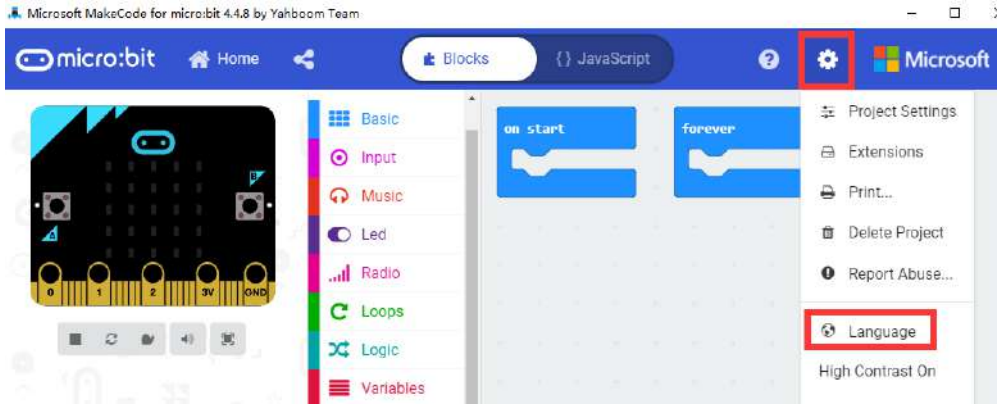


Figure 16

5.We first need to add the Yahboom package. In the interface shown in Figure 17 below, click [Advanced], then click [Extensions], an interface will pop up.

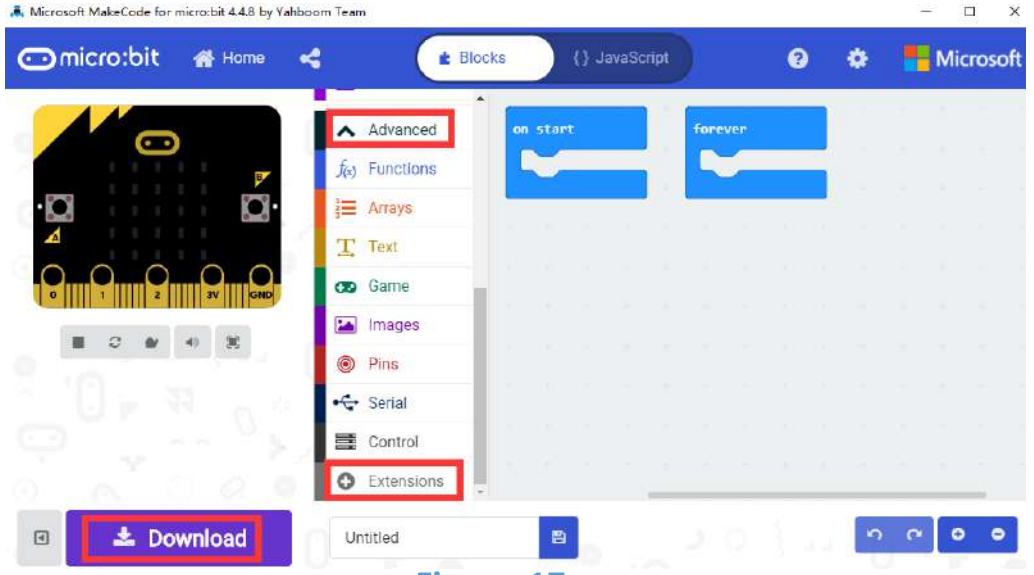


Figure 17

6.Enter the URL in the input field: https://github.com/lzty634158/yahboom_mbit_en. Then click "Search" or press the "Enter" key on the keyboard, as shown in Figure 18. You can search for the Yahboom software package, and then click mbit, as shown in Figure 19, you can successfully add the software package.

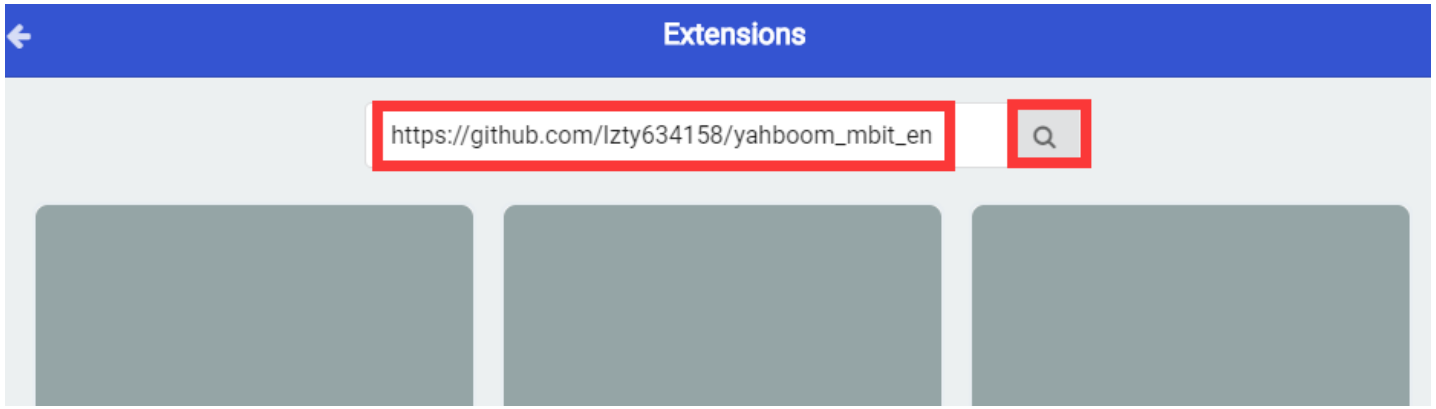


Figure 18



Figure 19

7.After loading the package, we can see that the program bar has loaded the building blocks made by Yahboom, as shown in Figure 20.

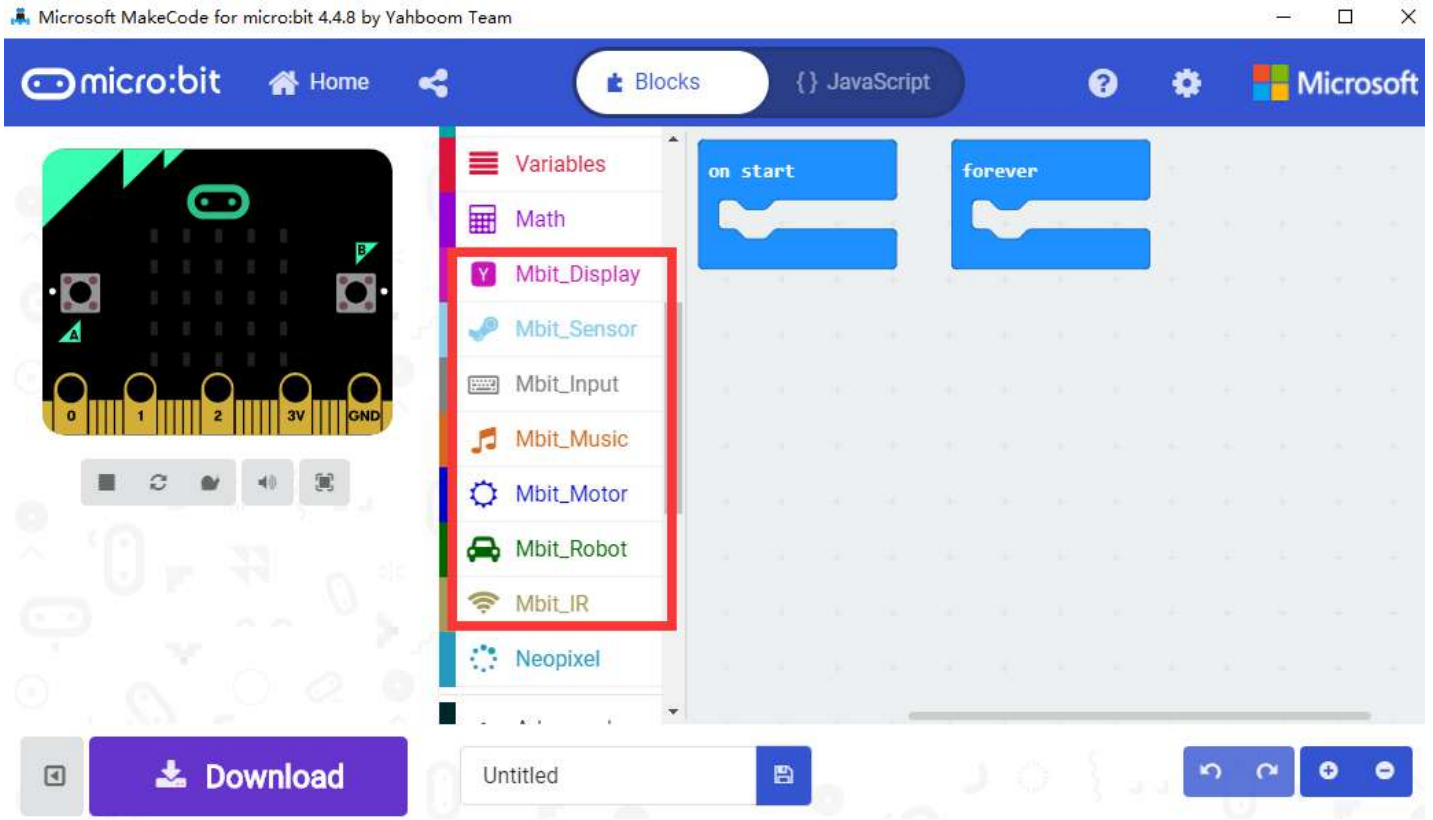


Figure 20

8.You can build your own building blocks for programming. After setting up the program blocks, we can name the program ourselves, and then click [Download] to download the program, as shown in Figure 21. We can set the download path to micro:bit U disk, or directly to the computer, and then copy it to the micro:bit U disk, as shown in Figure 22.

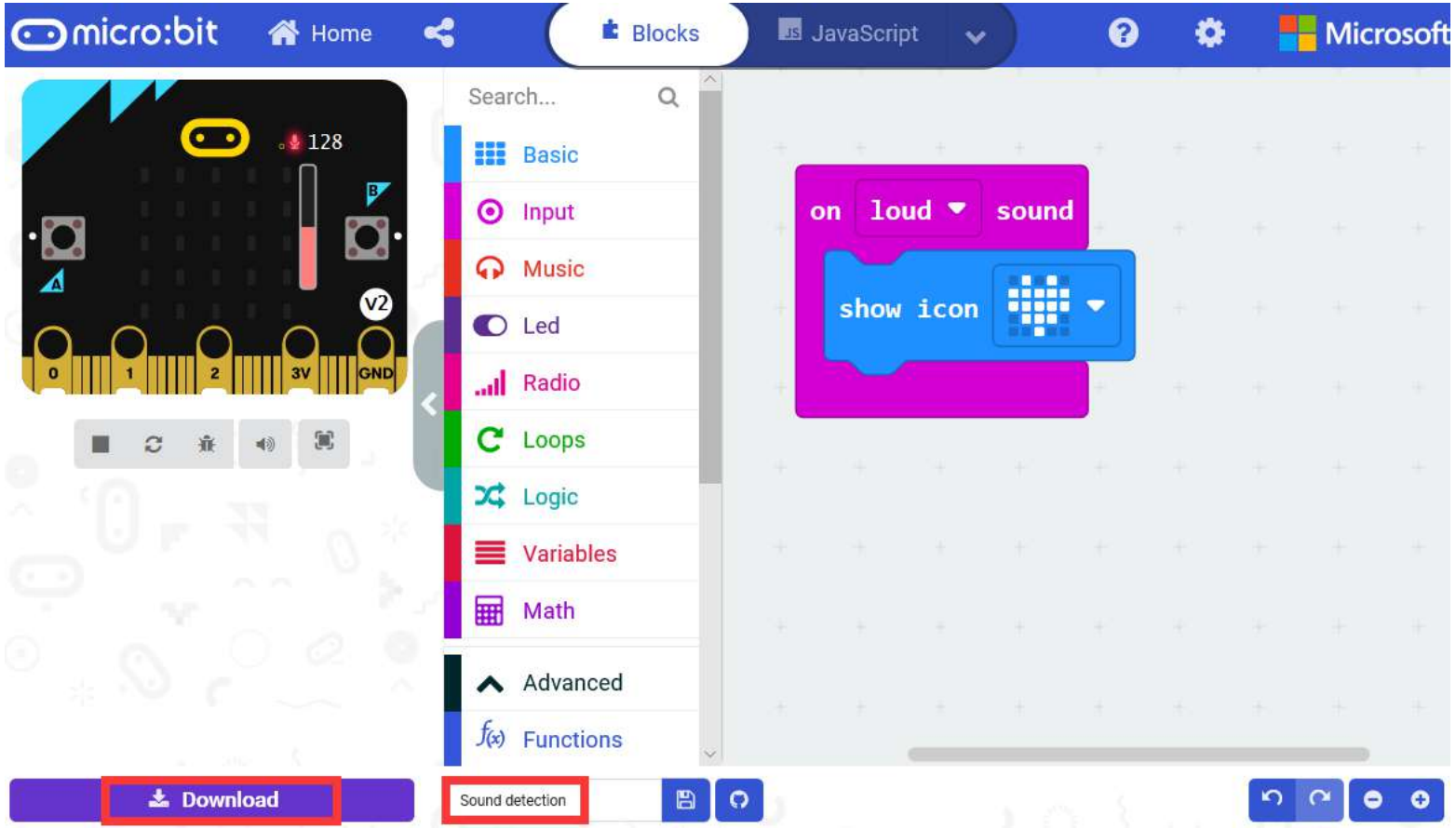


Figure 21

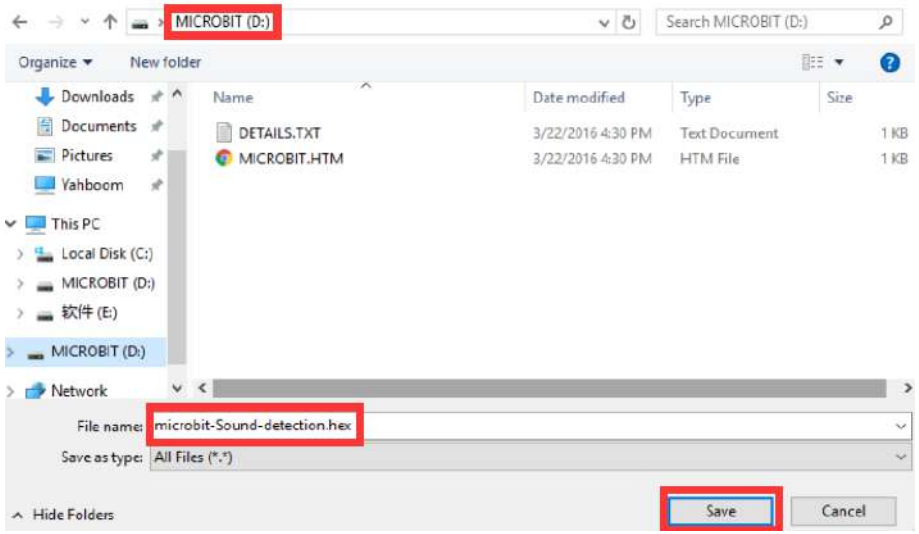


Figure 22

9.During the download, the indicator light on the back of the micro:bit motherboard will flash, as shown in Figure 23. After the download is complete, the indicator light stops flashing, and we can see the corresponding experimental phenomena and effects, as shown in Figure 24.

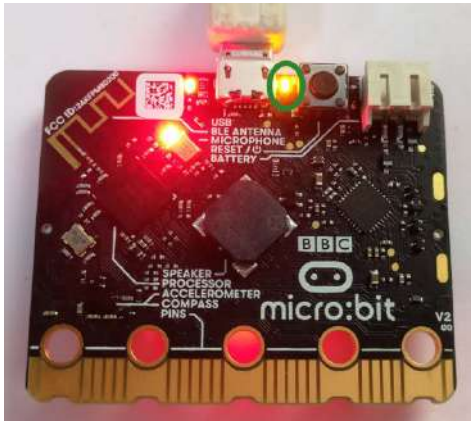


Figure 23

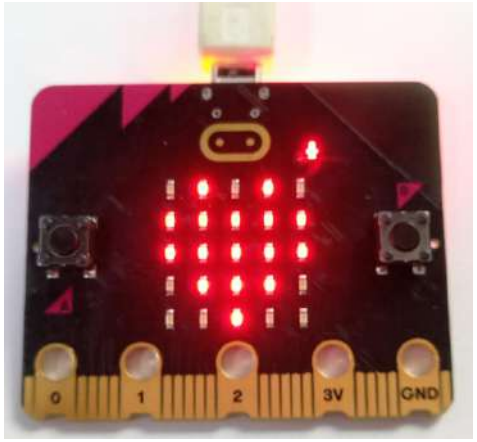
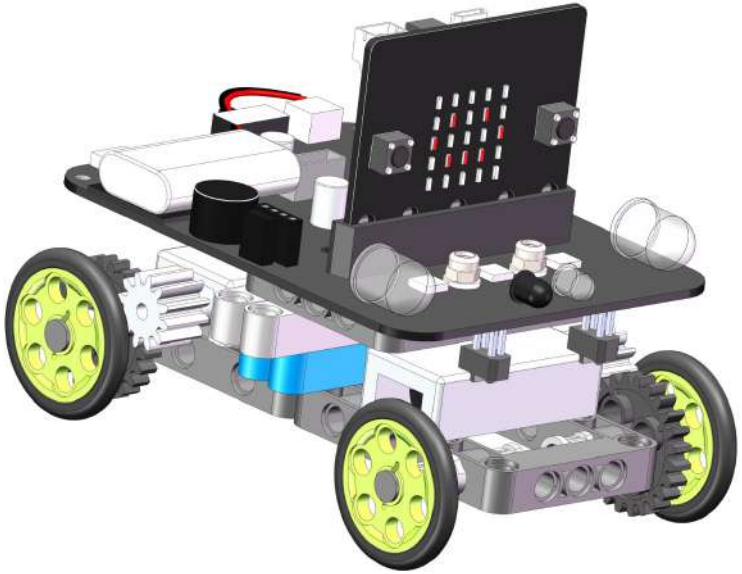
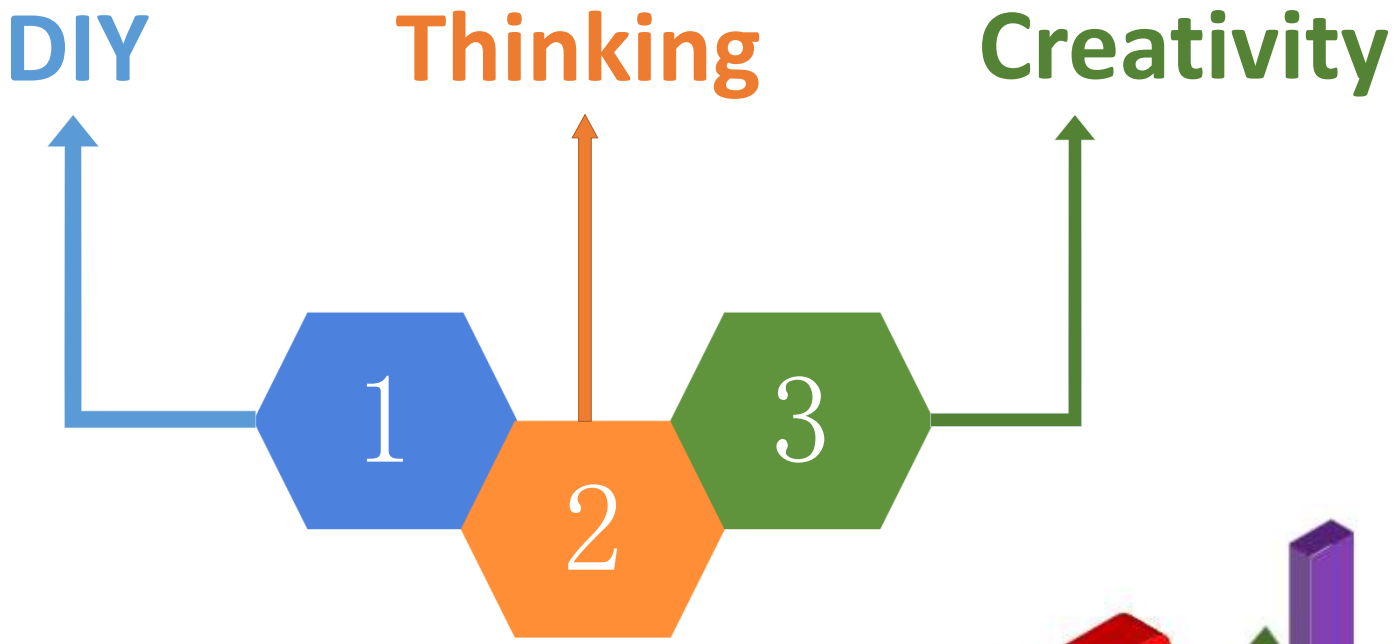


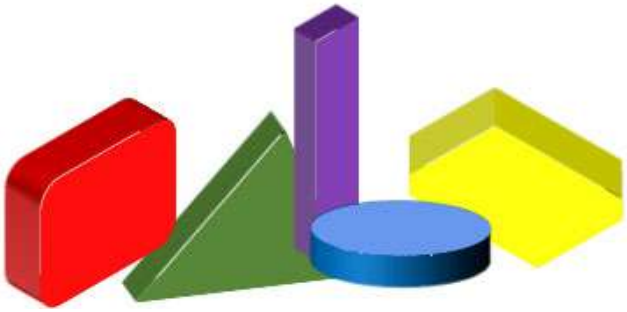
Figure 24

Yahboom Building:bit blocks

No.1 Mini car

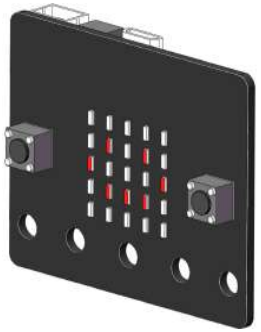
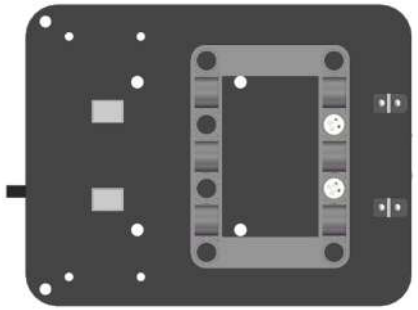
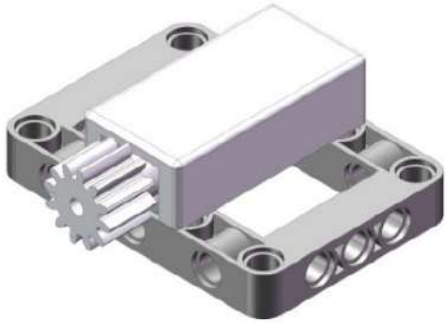
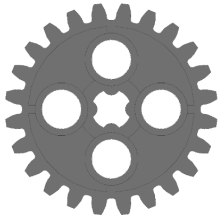
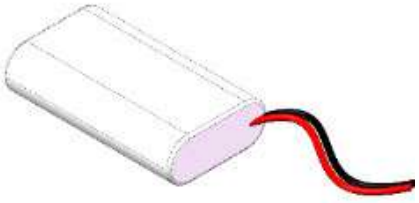
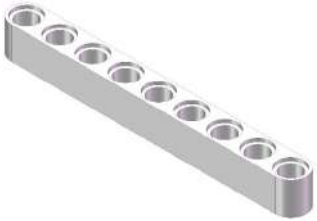
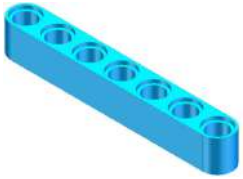



DIY
Thinking
Creativity
1
2
3

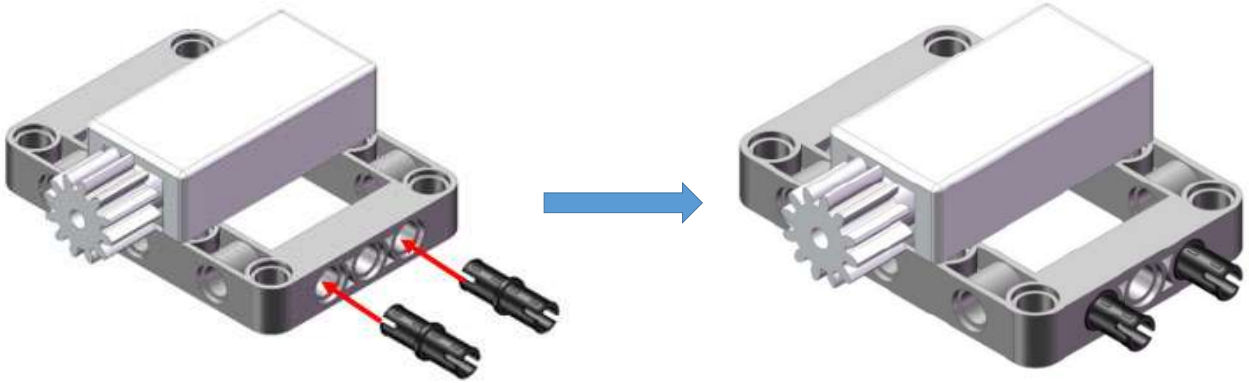


DIY: This section is mainly to teach you to assemble mini car with building blocks.

Prepare the following blocks and we will assemble a cute building block mini car.

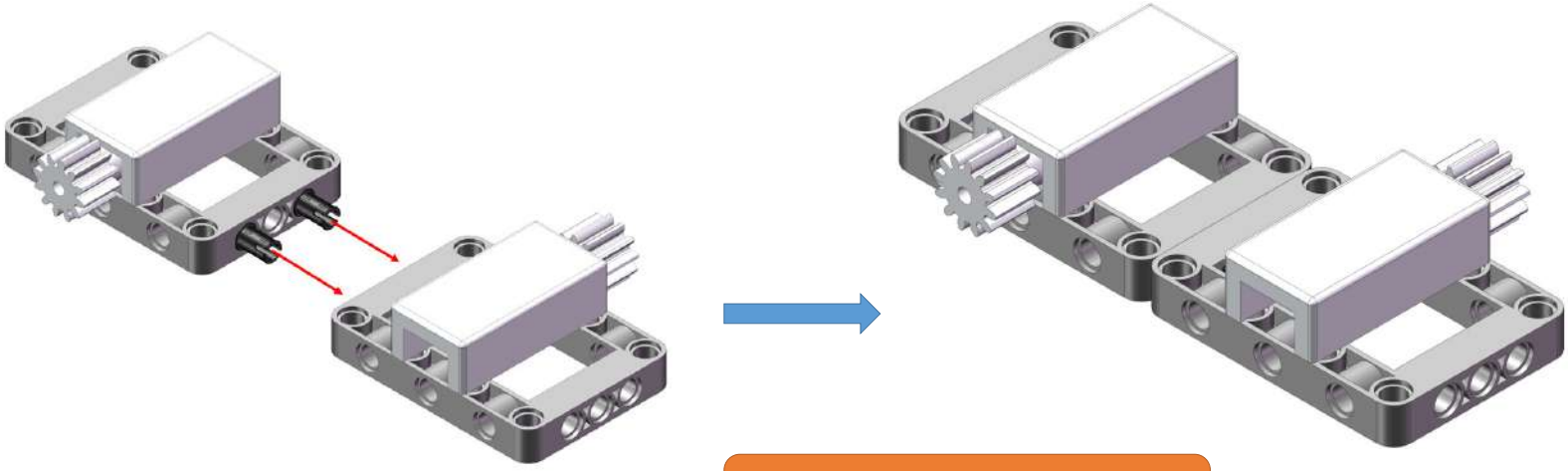
 Micro:bit*1	 Micro:bit expansion board*1	 Motor module*2	 24 toothed wheel*2	 Rubber ring+24 pulley*4
 1x4 Shaft cutoff *4	 Battery*1	 1x9 hole arm*2	 1x7 hole arm*2	 1x3 bolt building block*4
 1x1 Bushing building block*6	 1/2 Bushing building block*4	 1x2 Frictional pin building block*8		

Step 1: Find a motor module and two 1x2 friction pin building blocks for assembly.



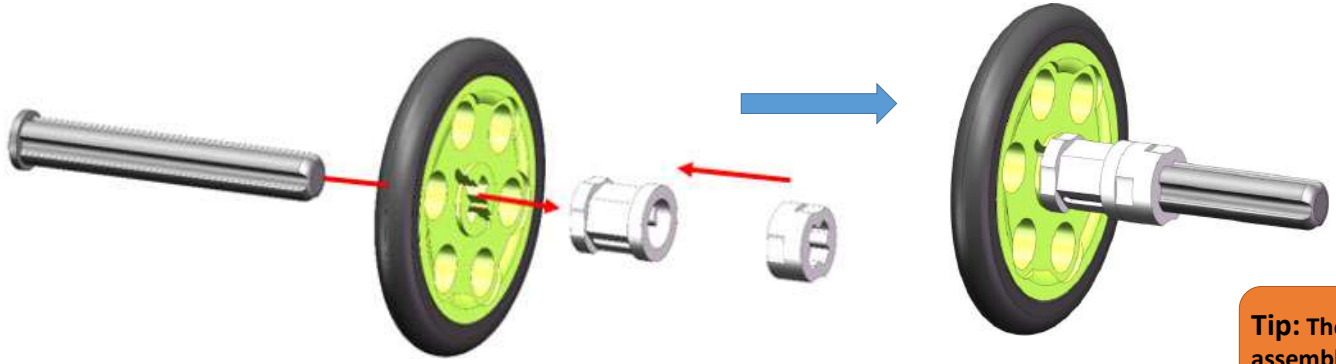
Tip: The function of the motor is to turn the wheel of the car. We need to use two motor modules .

Step 2: Combine the two motor modules that have been assembled.



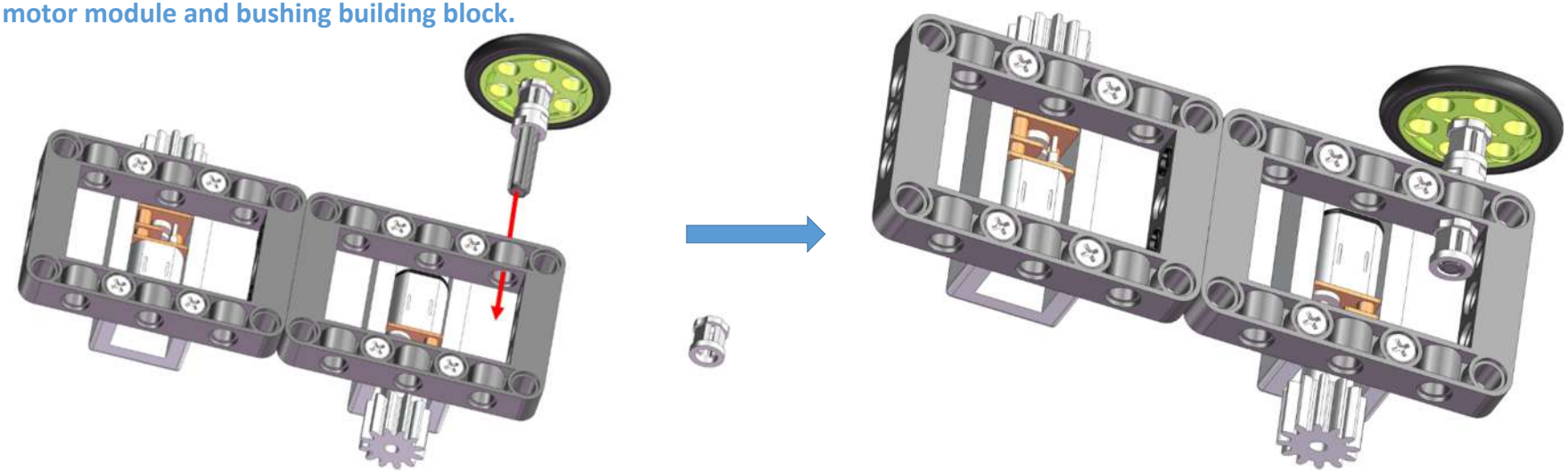
Tip: Please pay attention to the direction of the two motor modules.

Step 3: Find a 1x1 bushing, a 1/2 bushing, a 1x4 shaft cutoff, a rubber ring +24 pulleys, and assemble them.

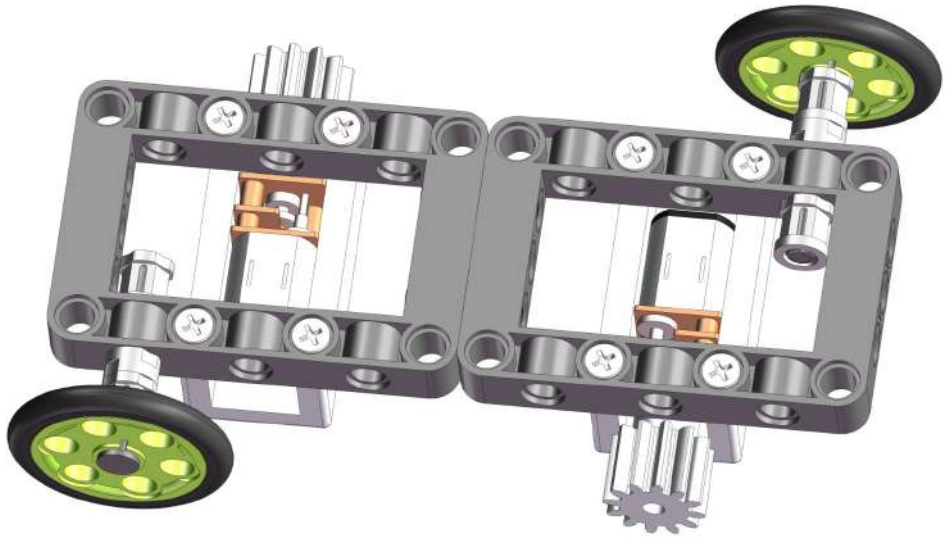


Tip: There are two wheels in this way of assembly, Please do not forget the other one.

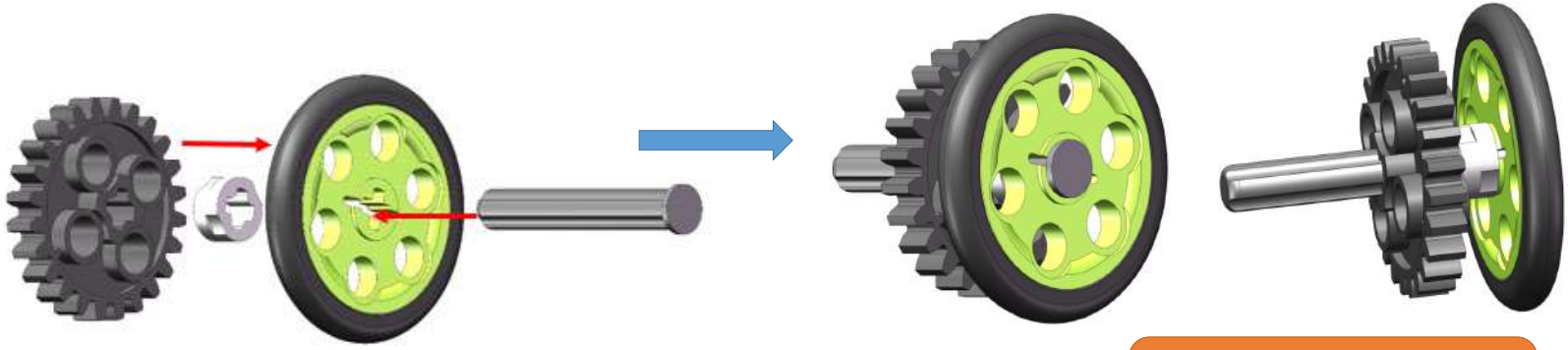
Step 4: Continue to find a 1x1 bushing, and then pass the 1x4 shaft of the wheel through the motor module and bushing building block.



Step 5: Assemble the diagonally facing wheels in the same way.

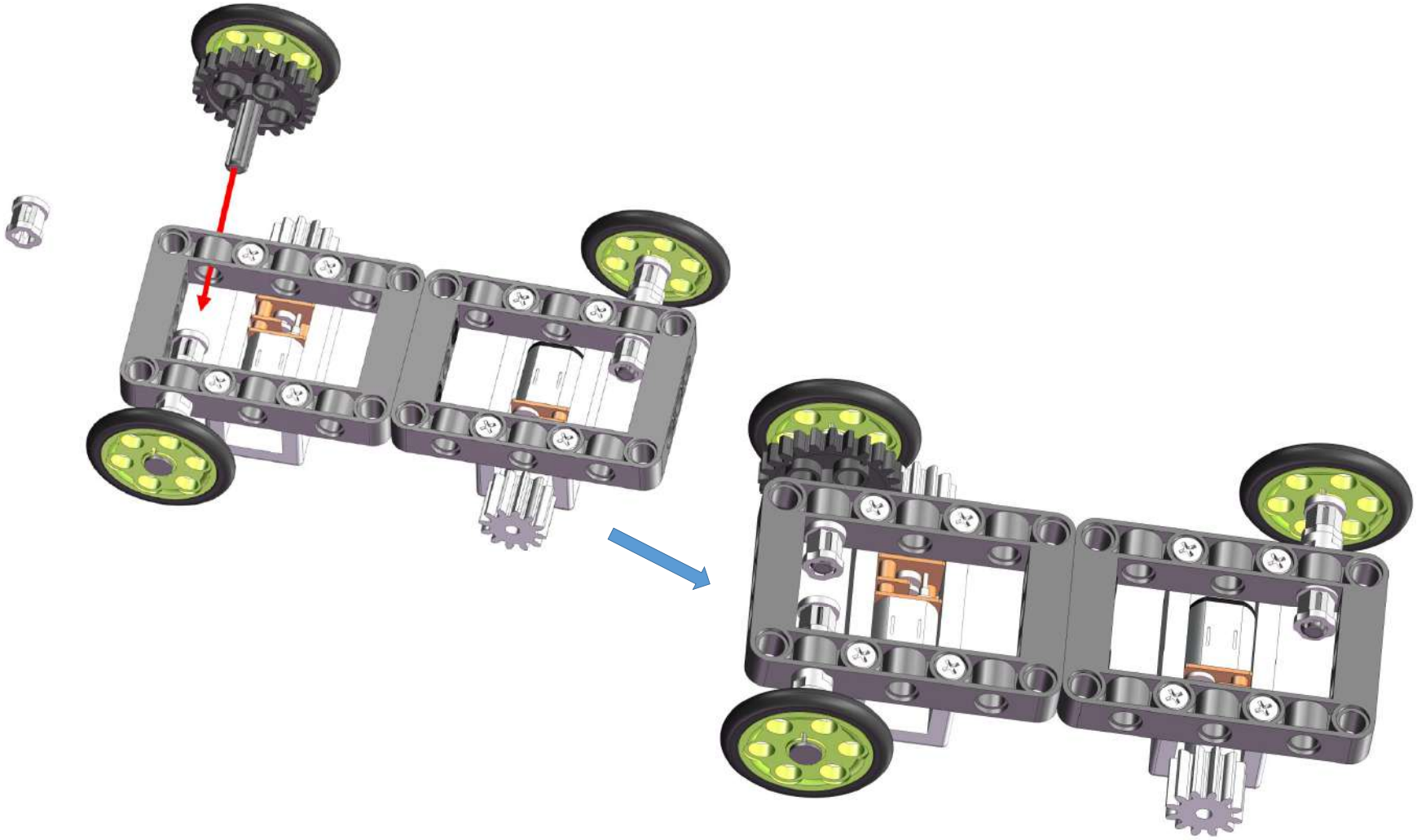


Step 6: Continue to find 1/2 bushings, rubber ring wheels, 1x4 shaft with cut-off, and 24-toothed wheel and assemble them.

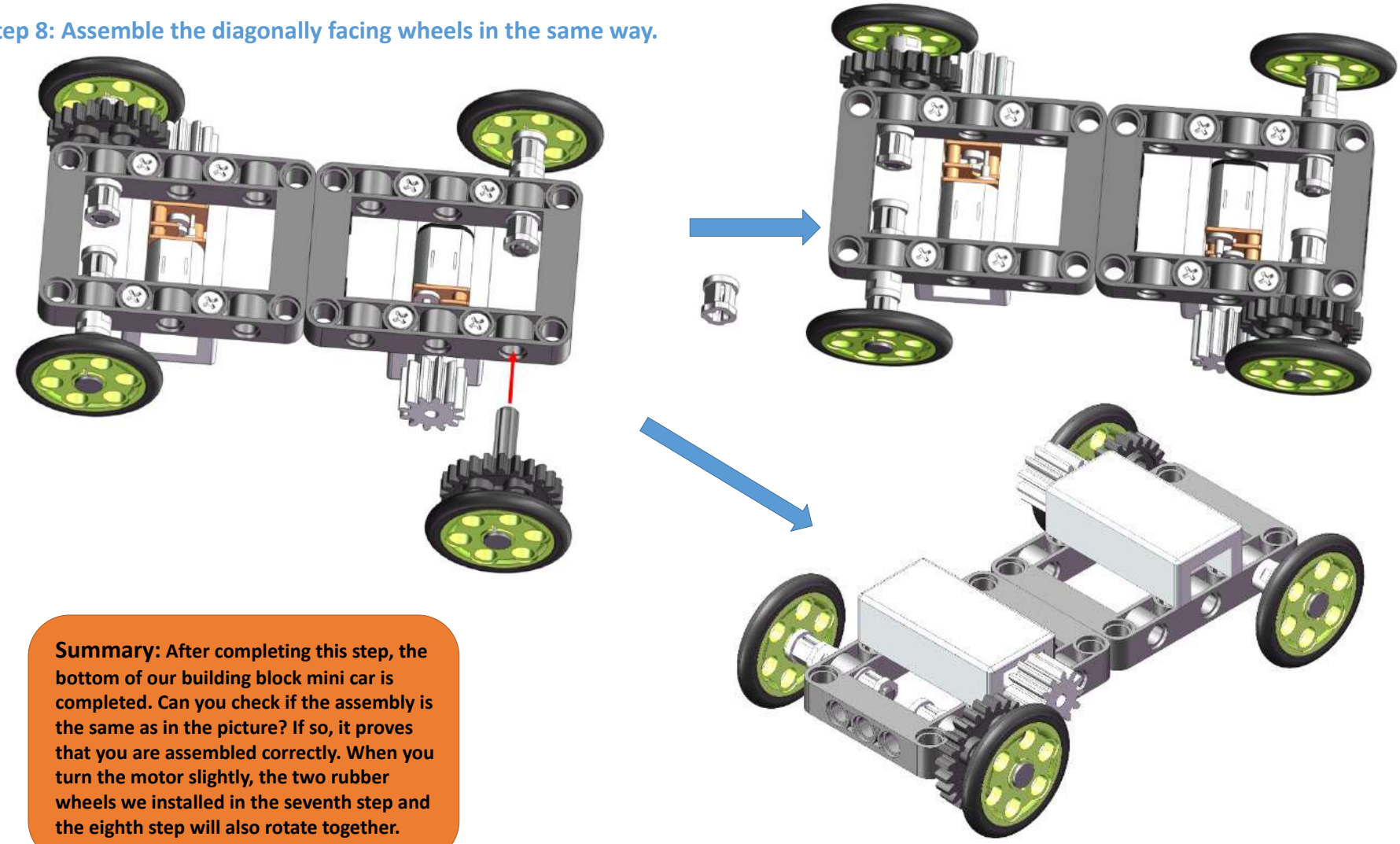


Tip: There are two wheels in this assembly method, please don't forget the other one.

Step 7: Continue to find a bushing and then pass the 1*4 shaft of the wheel through the motor module and bushing.



Step 8: Assemble the diagonally facing wheels in the same way.

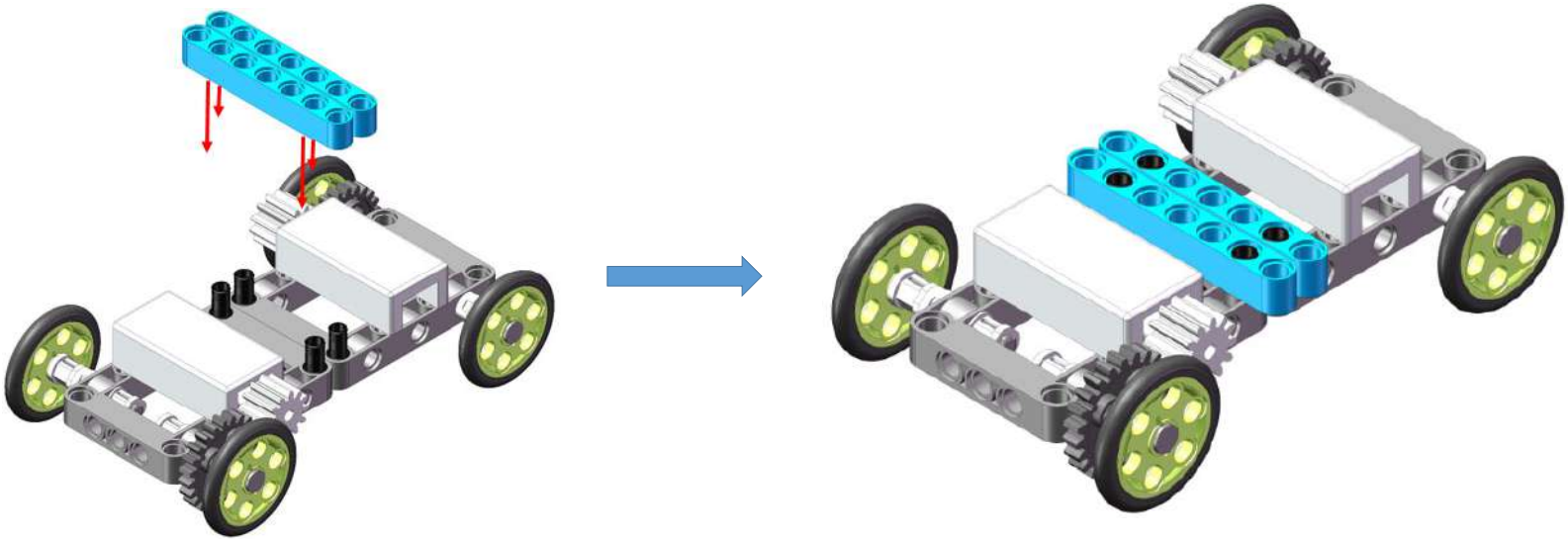


Summary: After completing this step, the bottom of our building block mini car is completed. Can you check if the assembly is the same as in the picture? If so, it proves that you are assembled correctly. When you turn the motor slightly, the two rubber wheels we installed in the seventh step and the eighth step will also rotate together.

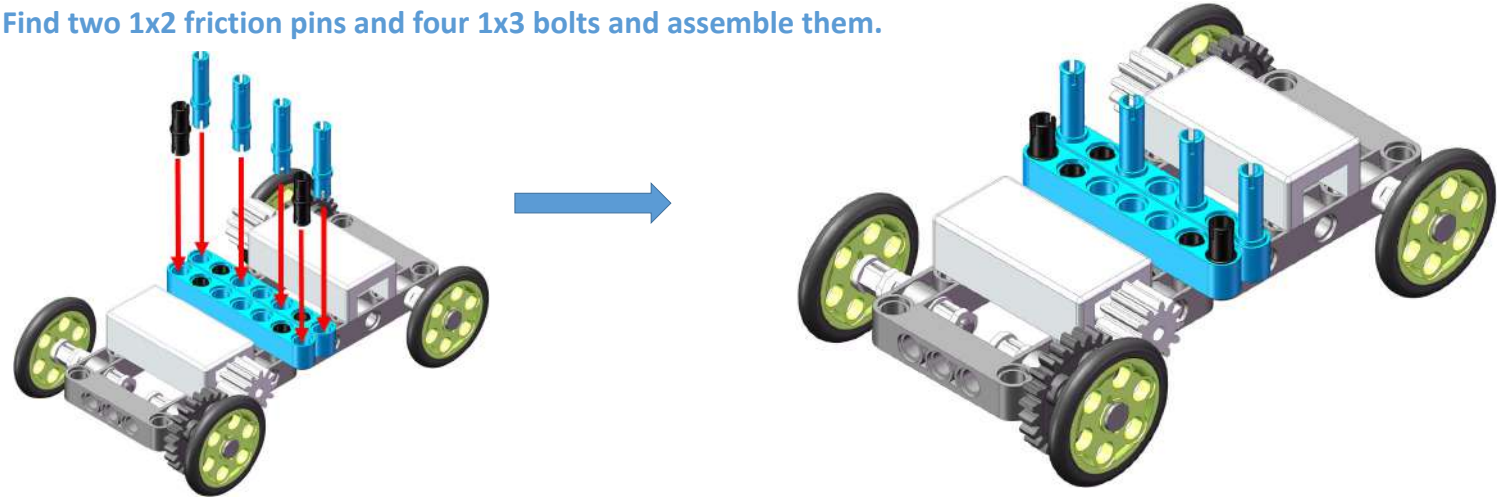
Step 9: Find four 1x2 friction pins and assemble them.



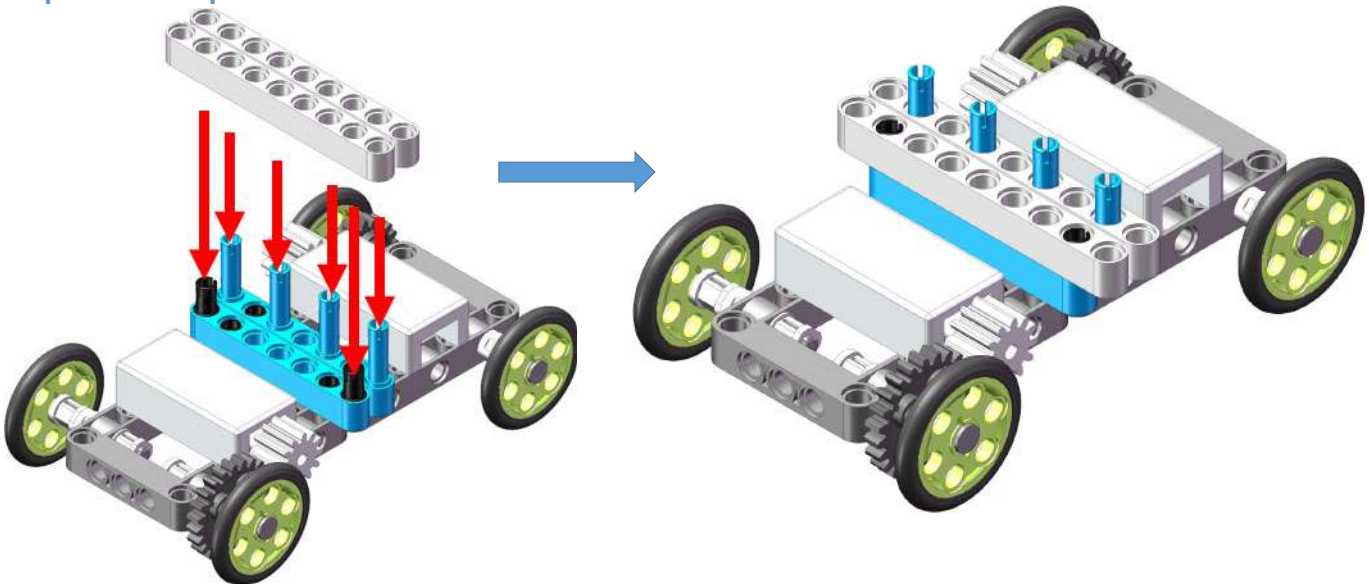
Step 10: Locate the two 1x7 hole arms and insert them into the four black 1x2 friction pins that have been assembled in the previous step.



Step 11: Find two 1x2 friction pins and four 1x3 bolts and assemble them.

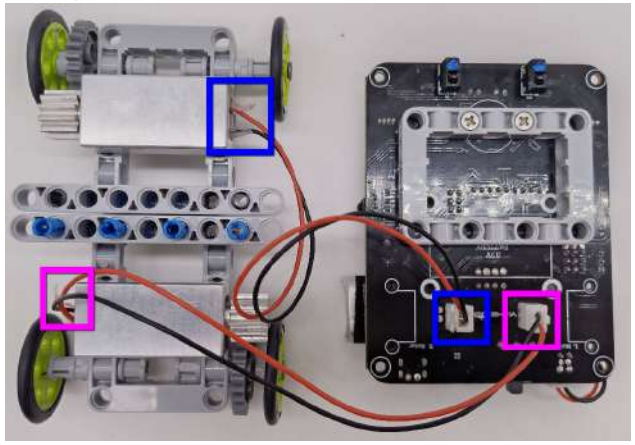


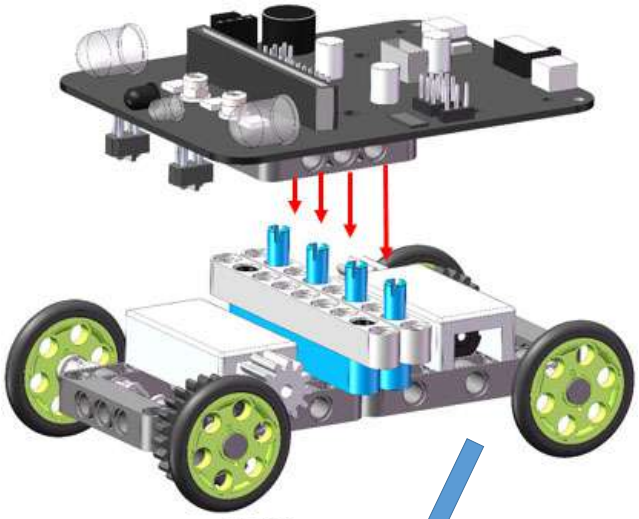
Step 12: Locate the two 1x9 hole arms and insert them into the 1x2 friction pins and the 1x3 bolts that have been assembled in the previous step.

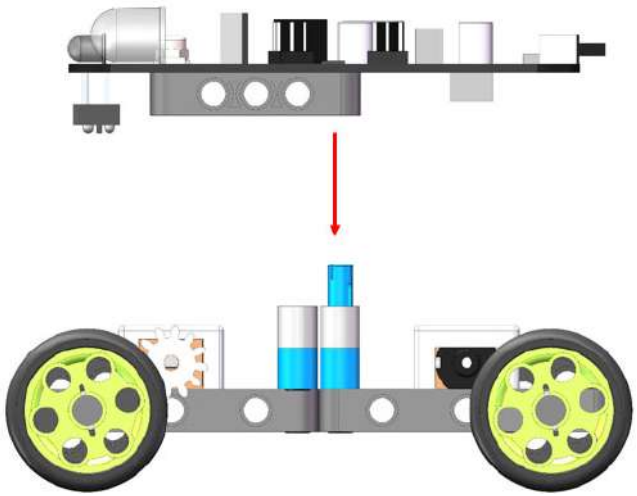


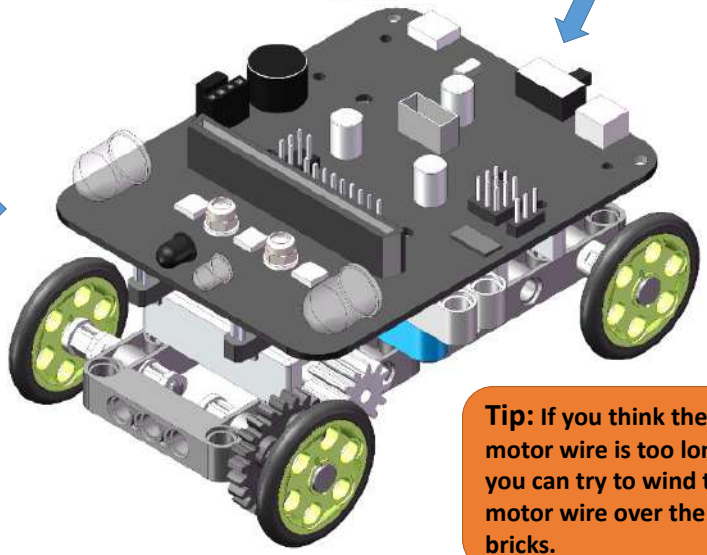
Tip: Look carefully at each picture in the installation step, and the shape of each brick. Then count the holes above the blocks. When assembling the blocks, make sure that each block is inserted into the correct hole. Otherwise, the shape will not be correct.

Step 13: Locate the micro:bit expansion board, connect the wiring of the two motors to the micro:bit expansion board, and assemble the expansion board.



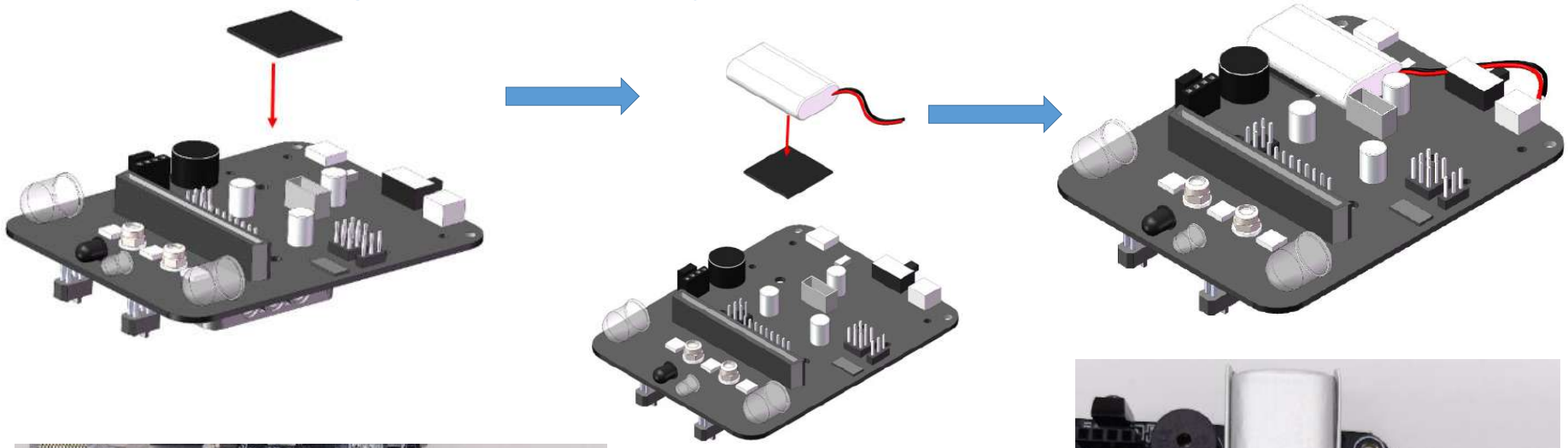


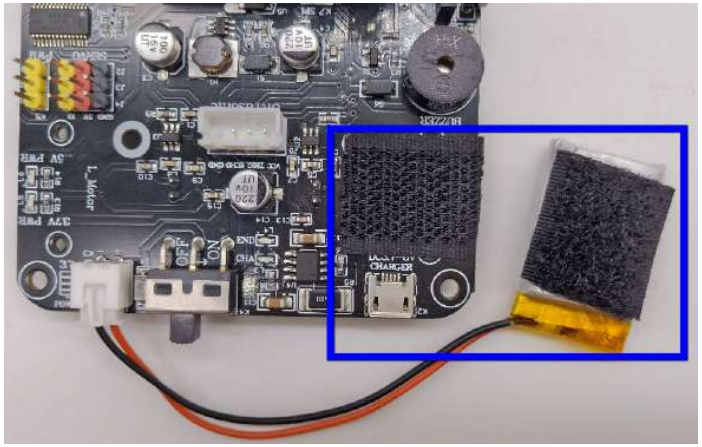




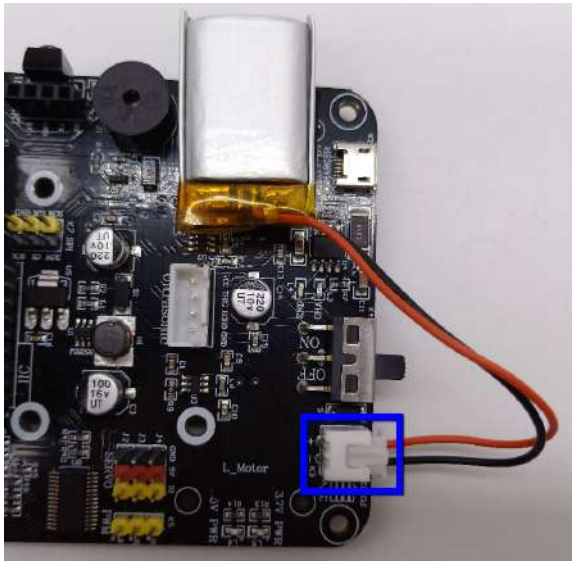
Tip: If you think the motor wire is too long, you can try to wind the motor wire over the bricks.

Step 14: 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.

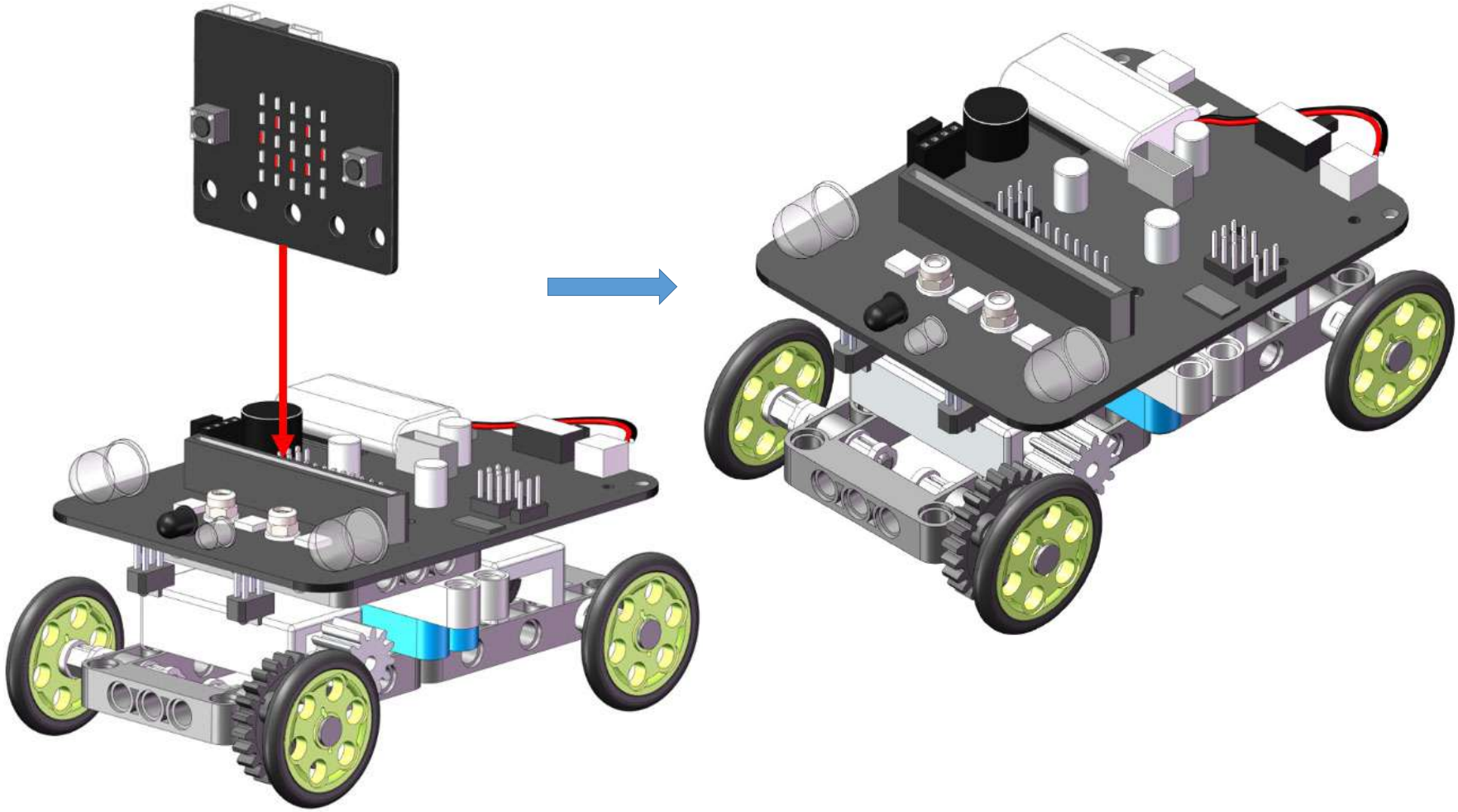




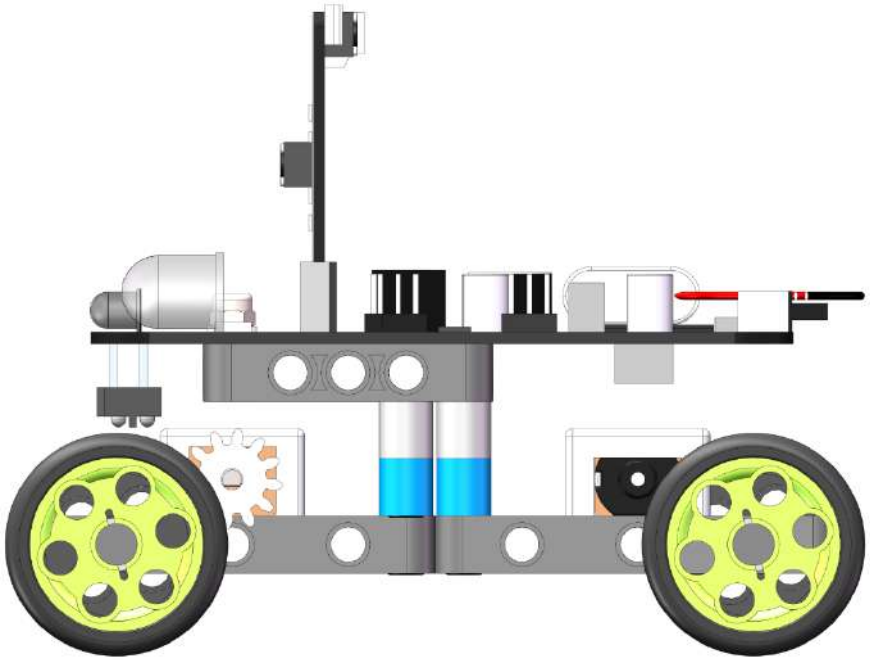
Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

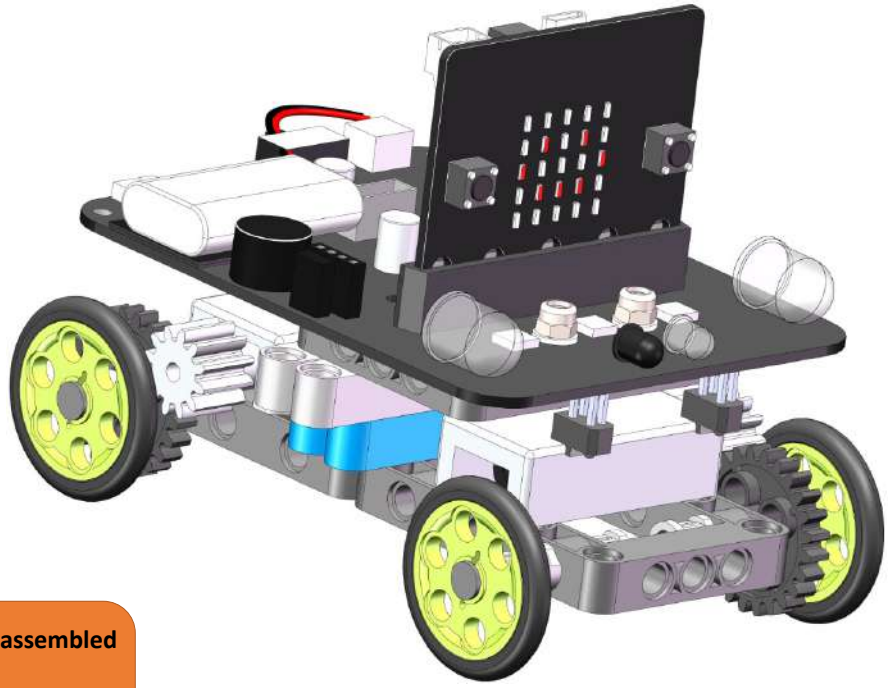


Step 15: Find the micro:bit and insert it correctly into the micro:bit expansion board.



Finished.





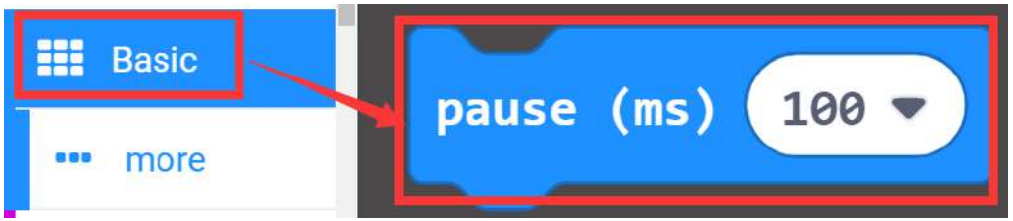
Summary: When the mini car is assembled here, we will show you the assembled building blocks from two different angles.
The process of assembling it yourself must be very interesting. I believe that everyone will be very happy to see the mini car they have assembled. Then you have to think about it, how can you make the car move?

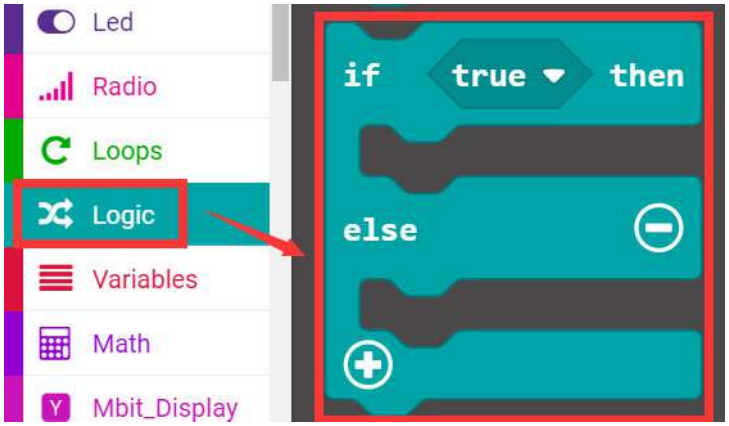
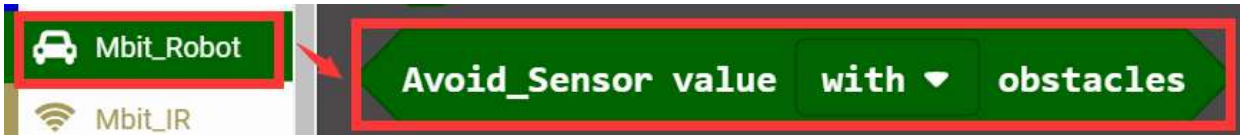
Thinking: This part is mainly to teach you how to use graphical programming to control the mini car.

Preparation

- USB cable *1
- Mini car *1

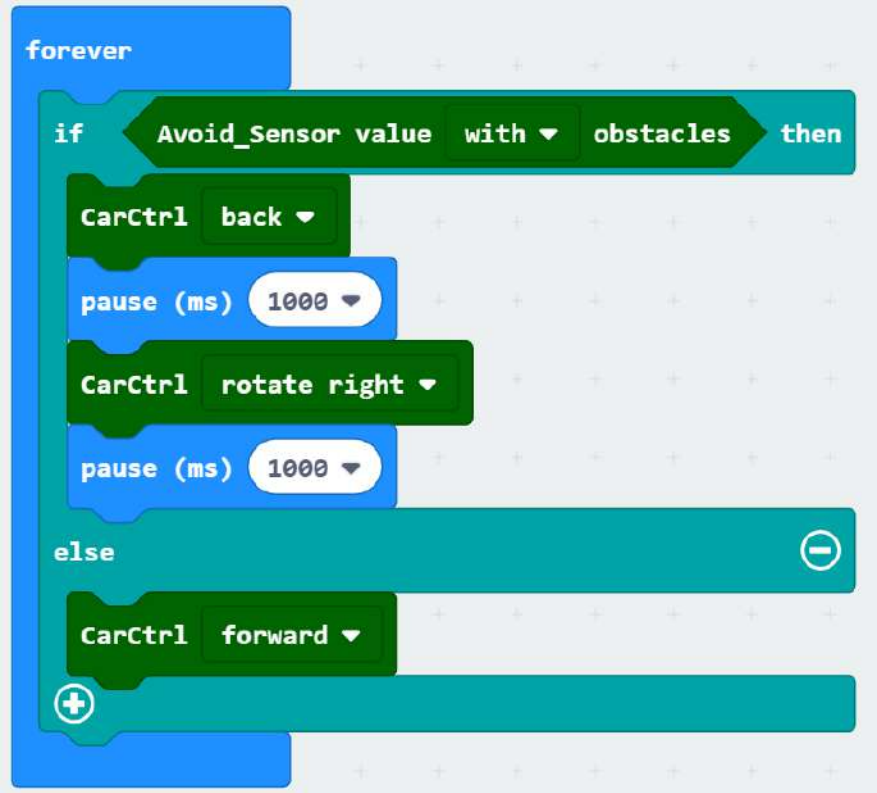
Studying Blocks

Block	Instruction
	The code inside is executed after booting.
	The program pauses for 100 milliseconds and the time can be modified by itself.

Block	Instruction
	If true then execute. If it is false, it will not be executed.
	The infrared sensor detects if there is an obstacle in front.
	The car's motion state selection: forward, back, turn left , turn right , rotate left, rotate right and stop.

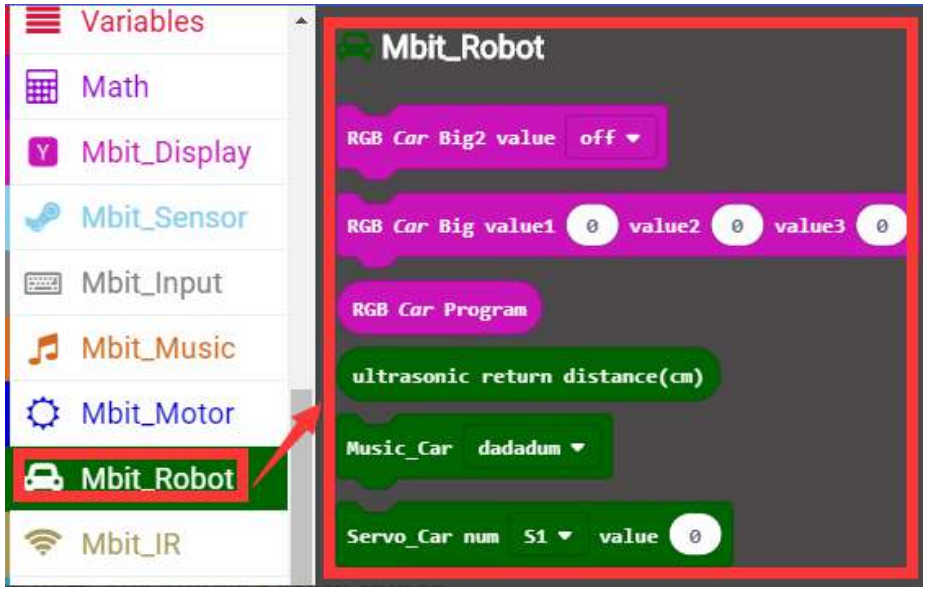
Programming

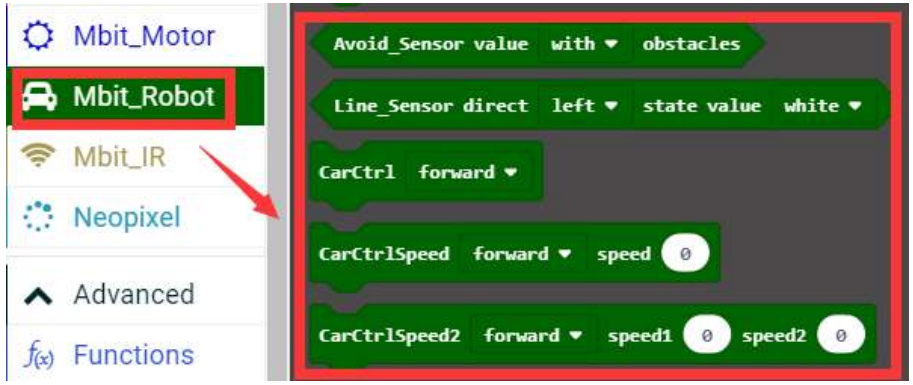
The program of this course is shown in the figure below. After downloading the program, turn on the power switch of the mini car, the mini car will run forward. If you encounter obstacles, it will back for 1 second, then rotate right for 1 second, and finally straight.



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\A.Mini car\2.Mini car Infrared obstacle avoidance\Mini-car-Infrared-obstacle-avoidance.hex.

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





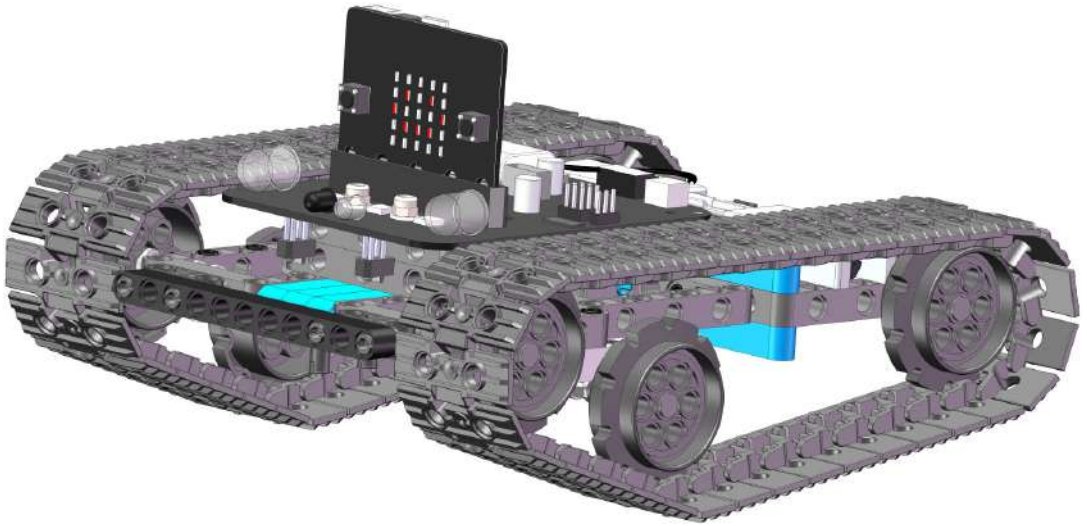
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely.
Drag these blocks and play with our building block mini car!!!

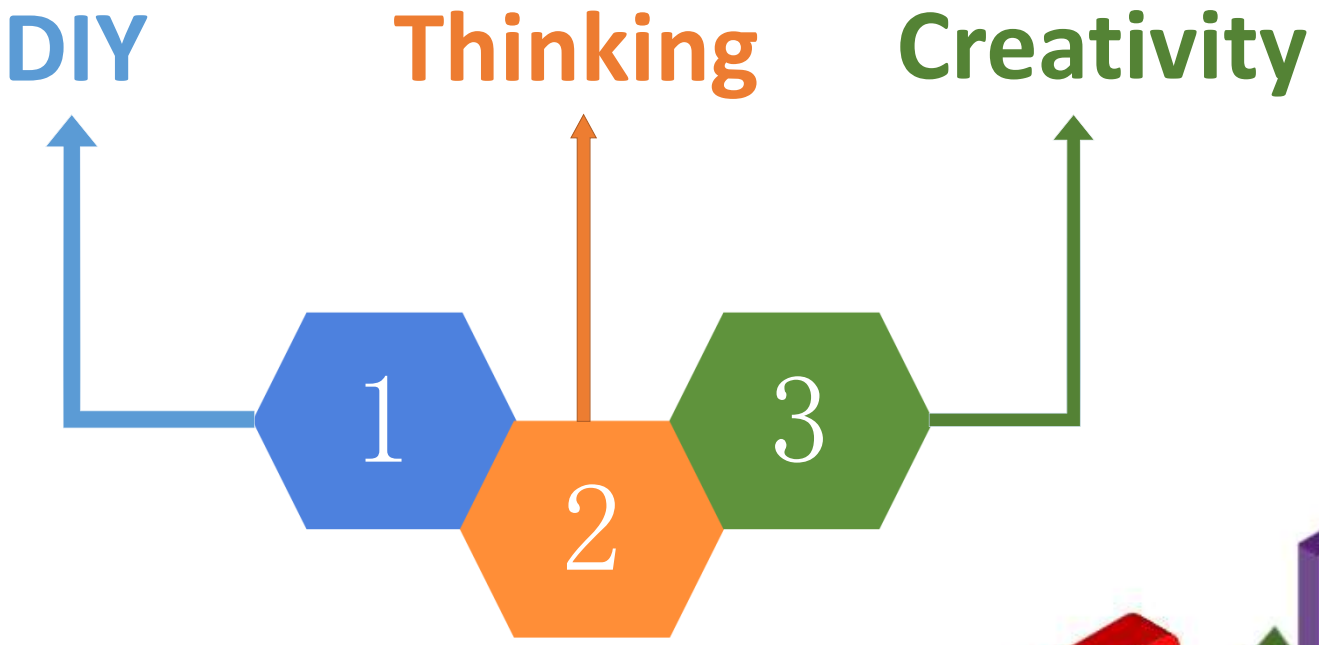


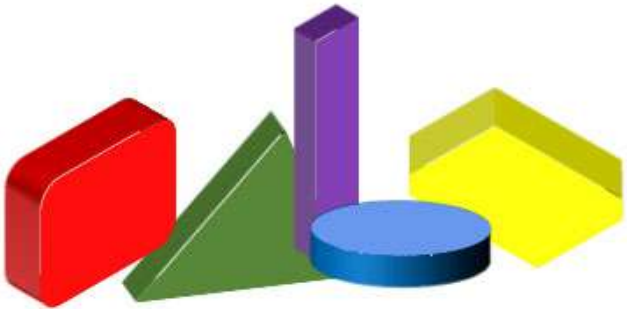
On our official website, we also provides other tutorial: Mini car Infrared remote control, Mini car bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.2 Tank car

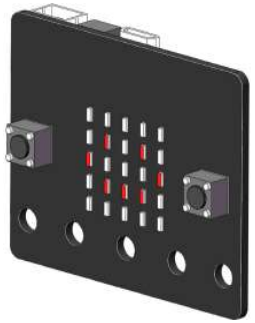
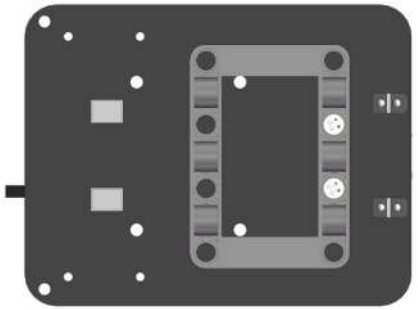
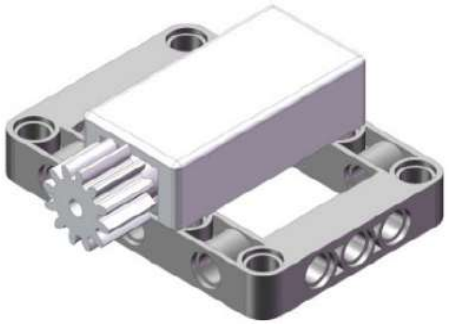
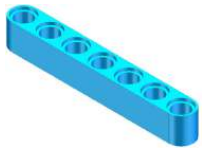
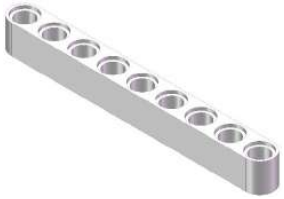
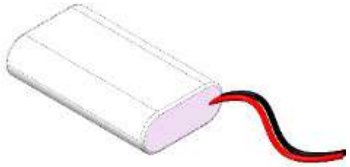
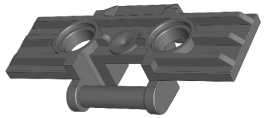
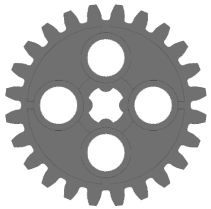
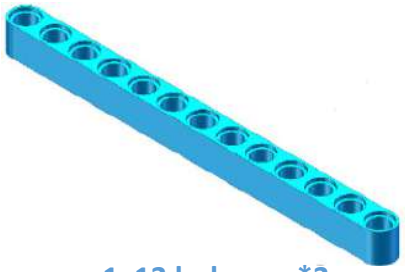



DIY
Thinking
Creativity
1
2
3



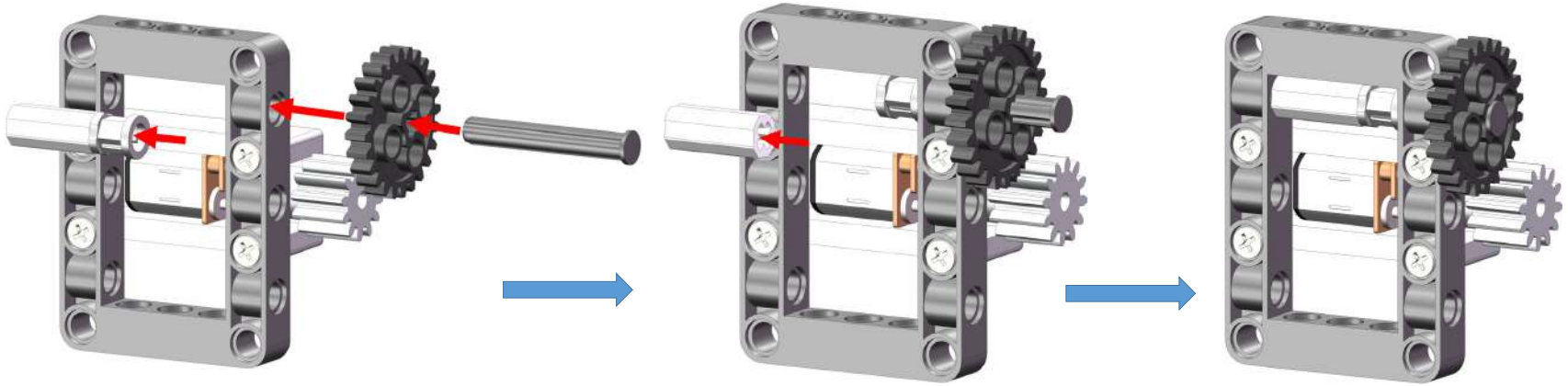
DIY: This section is mainly to teach you to assemble tank car with building blocks.

Prepare the following blocks and we will assemble a building block tank car.

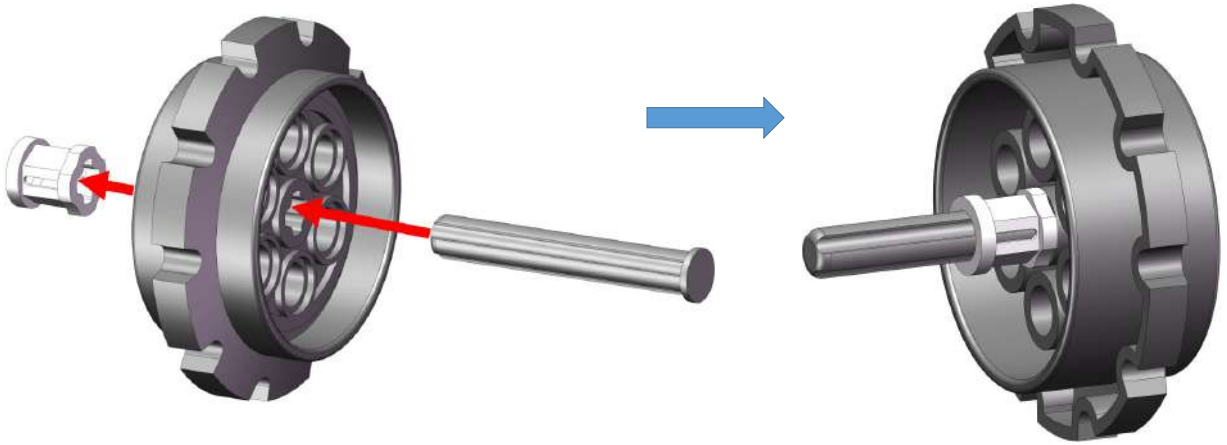
 Micro:bit *1	 Micro:bit expansion board*1	 Motor module*2	 1x7 hole arm*2	 3x3 Bolt connector *6
3x3 Bolt connector *2	 1x9 hole arm*2	 Battery*1	 Plastic crawler*68	 1x3 Shaft*8
 24 toothed wheel*2	 1x11 hole arm*2	 1x13 hole arm*3	 1x1 Bushing*16	 1x2 Frictional pin*26

 Crawler wheel*6	 5x7 beam frame*5	 1x4 Shaft cutoff *8		

Step 1: Find a motor module, a 1*4 shaft cutoff, a bushing, a 1*2 shaft connection and a 24-toothed wheel. Pass shaft cut-off through the 24-toothed wheel, the corresponding hole position of the motor module, the bushing and one end of the 1*2 shaft connection.

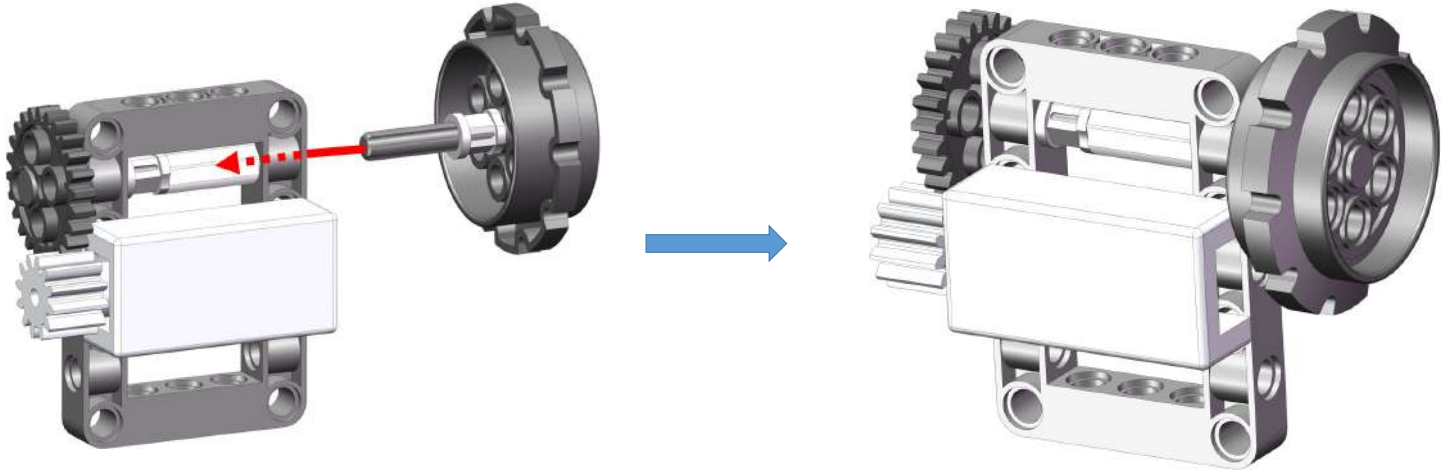


Step 2: Find a 1*4 shaft cutoff, a bushing and a crawler wheel. Pass the 1*4 shaft cutoff through the middle hole of the crawler wheel and bushing.

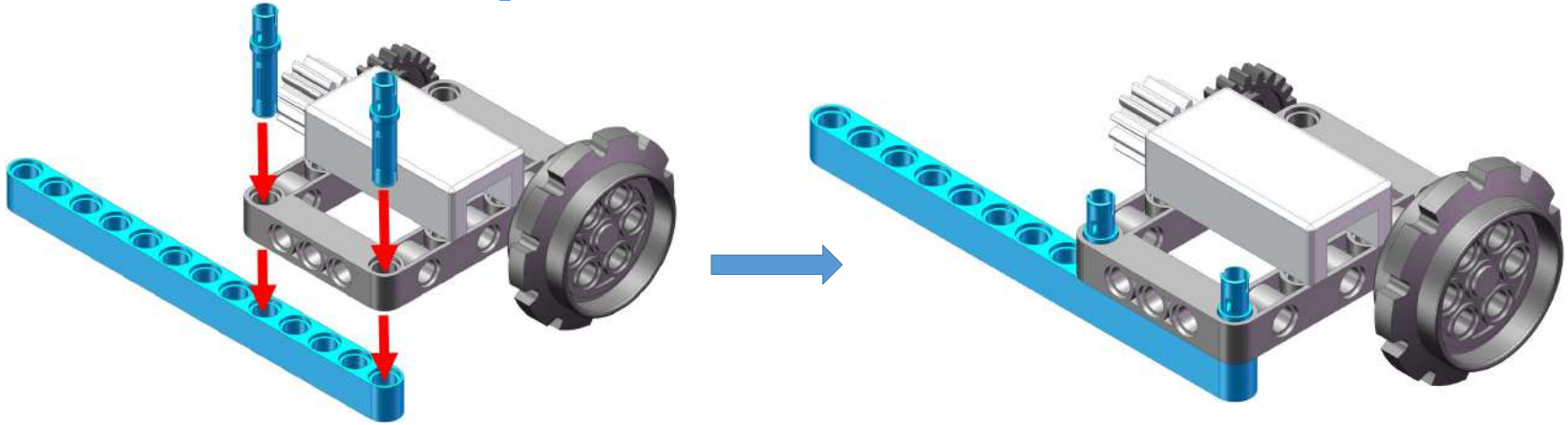


Tip: We need to use two such bricks in the later installation, so we need to repeat the first and second steps to assemble two such bricks again.

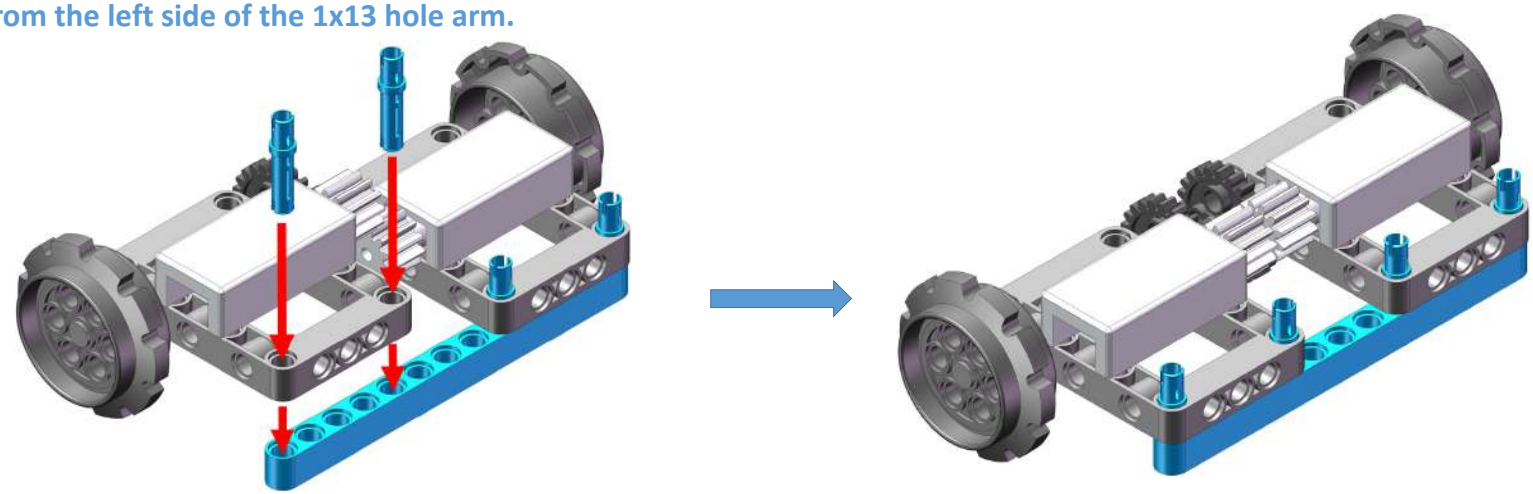
Step 3: Combine the two pieces of building blocks we have assembled in the first and second steps. Insert the 1x4 shaft cutoff with the crawler wheel into the corresponding hole of the motor module and the other end of the 1x2 shaft connection.



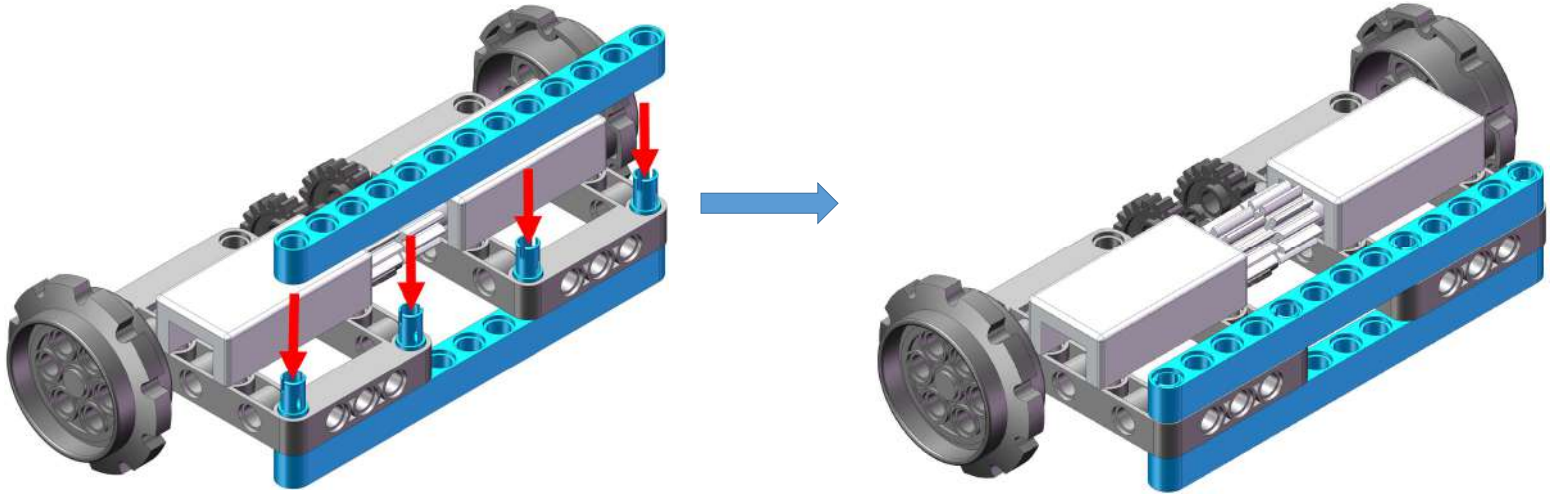
Step 4: Locate the two 1x3 bolts and the 1x13 hole arm. Insert the two 1x3 bolts into the corresponding hole positions of the motor module and the 1st and 5th holes from the right side of the 1x13 hole arm.



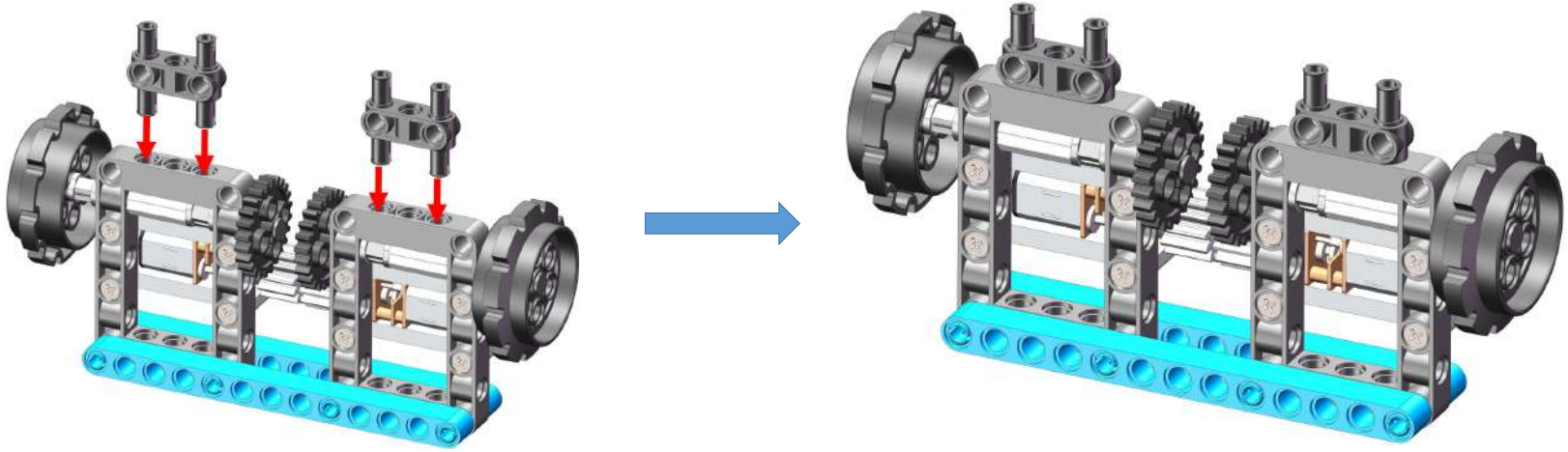
Step 5: Find two 1x3 bolts, insert the two 1x3 bolts into the corresponding hole positions of the motor module and the 1st and 5th holes from the left side of the 1x13 hole arm.



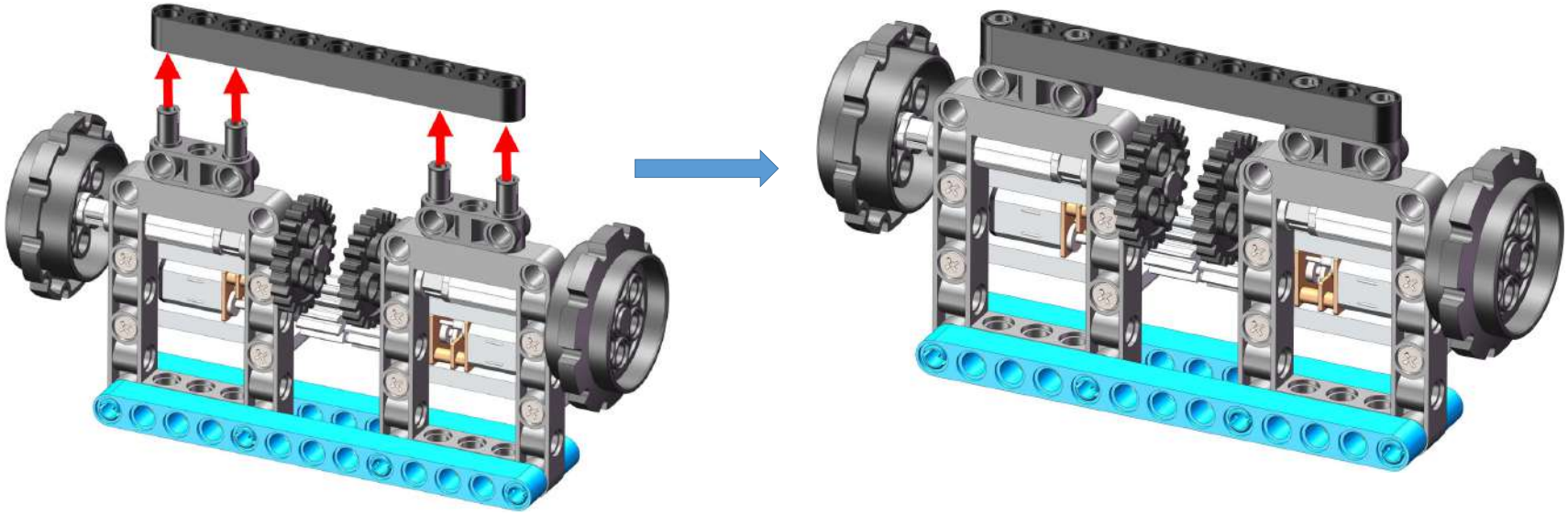
Step 6: Locate a 1x13 hole arm and insert the four 1x3 pins into the holes 1, 5, 9, and 13 of the hole arm.



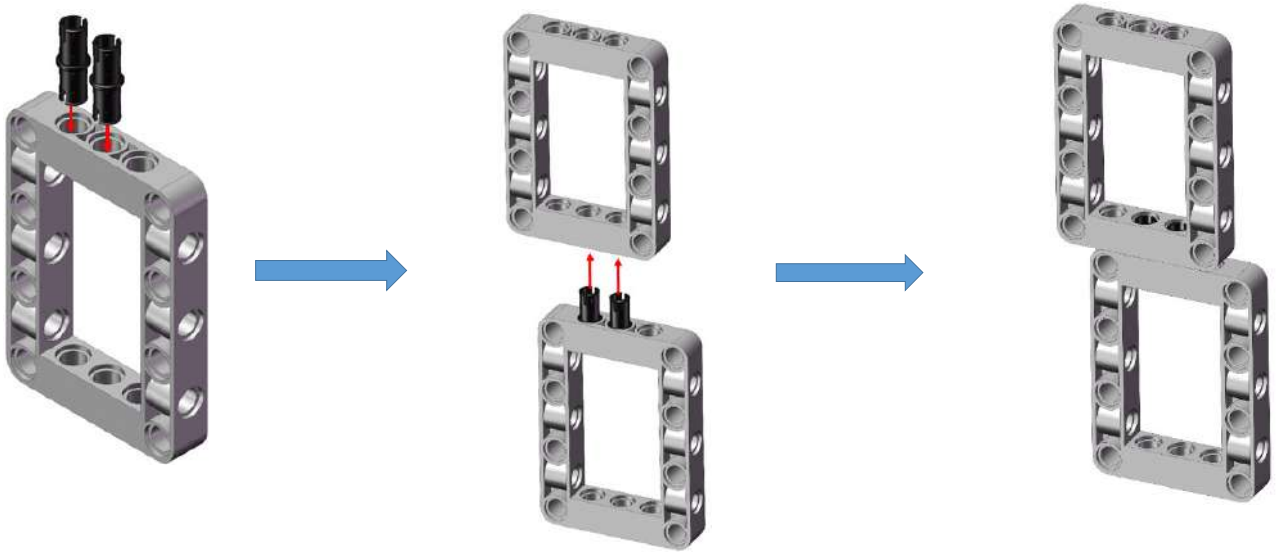
Step 7: Locate the two 3x3 pins and insert them into the corresponding holes on the side of the assembled motor module.



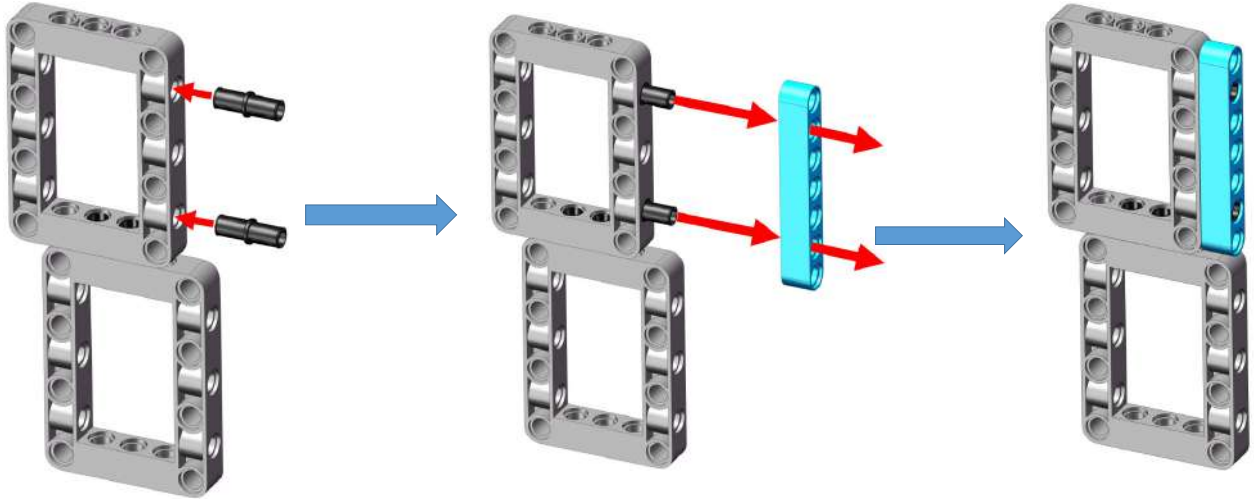
Step 8: Find a 1x11 hole arm and assemble it. When we got here, we completed the assembly of the gear part of the car.



Step 9: Find two 5x7 frame beams and two 1x2 friction pins and assemble them.

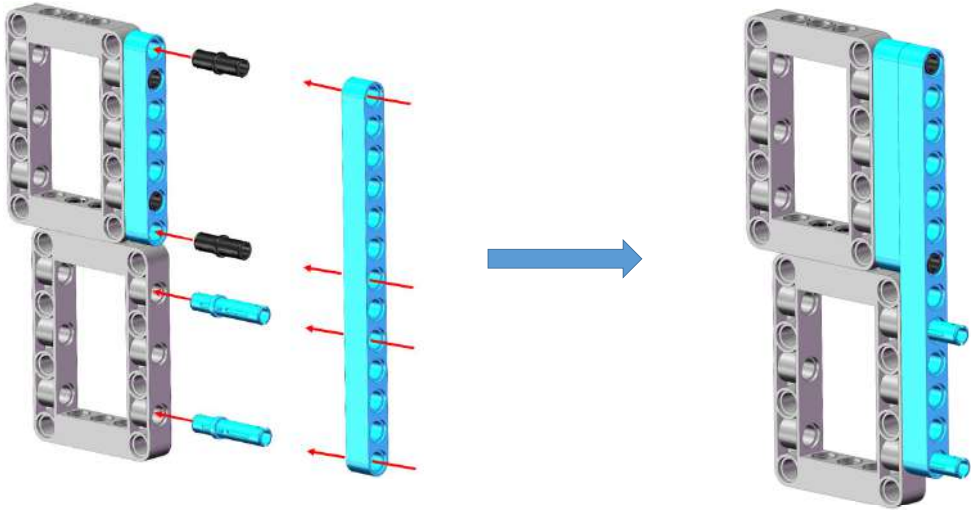


Step 10: Locate the two 1x2 friction pins and a 1x7 hole arm and assemble them.

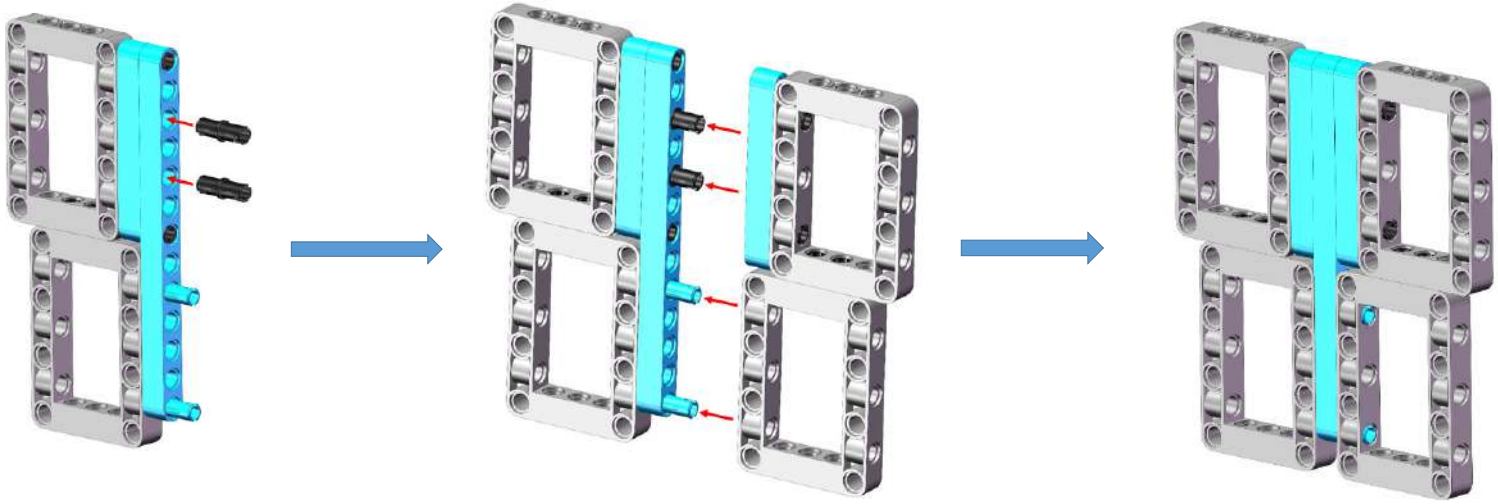


Tip: We need two such parts, so we need to repeat steps 6 and 7 to assemble the same part and proceed to the next step.

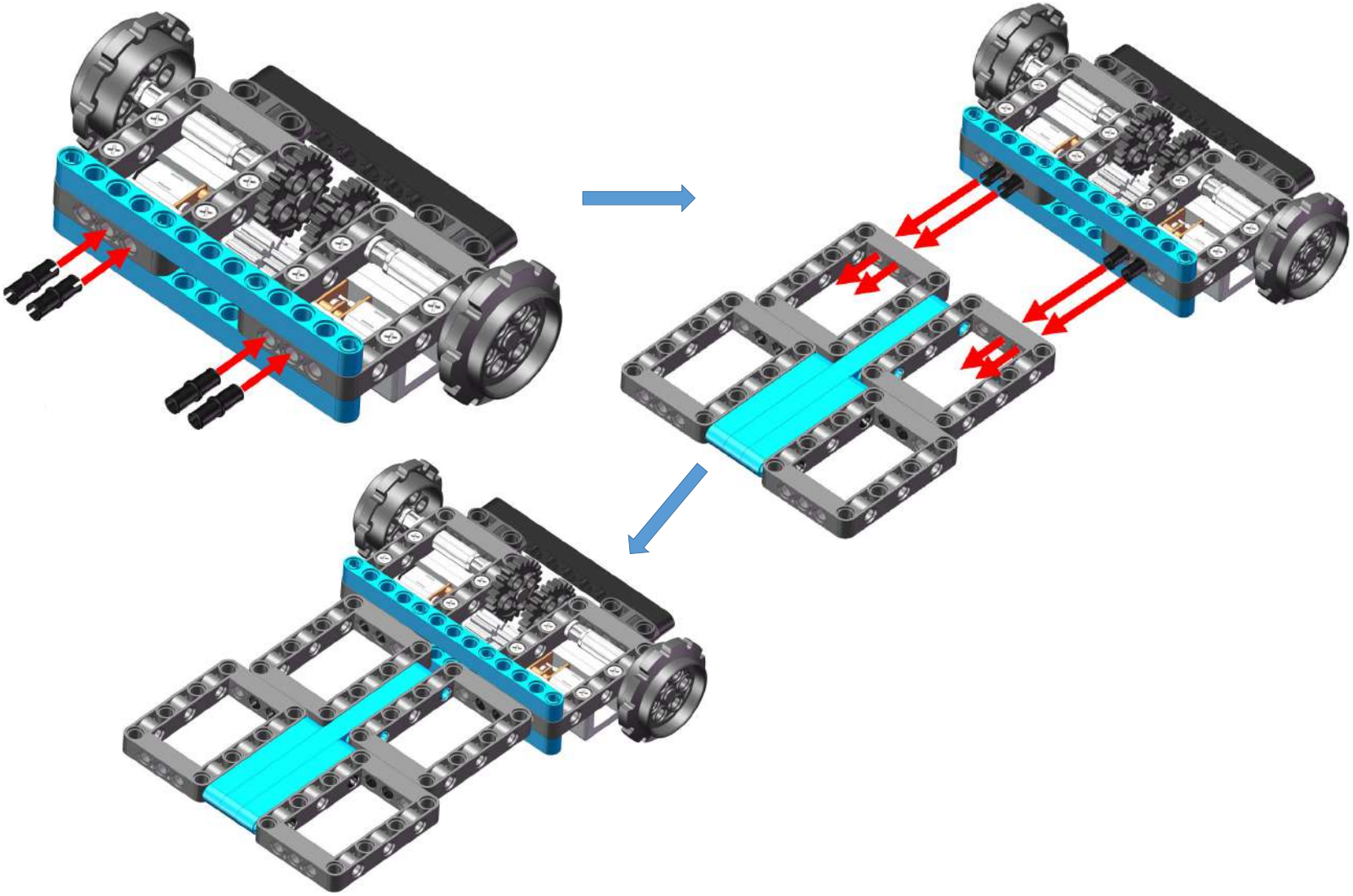
Step 11: Find two 1x2 friction pins, two 1x3 bolts and 1x13 hole arms and assemble them.



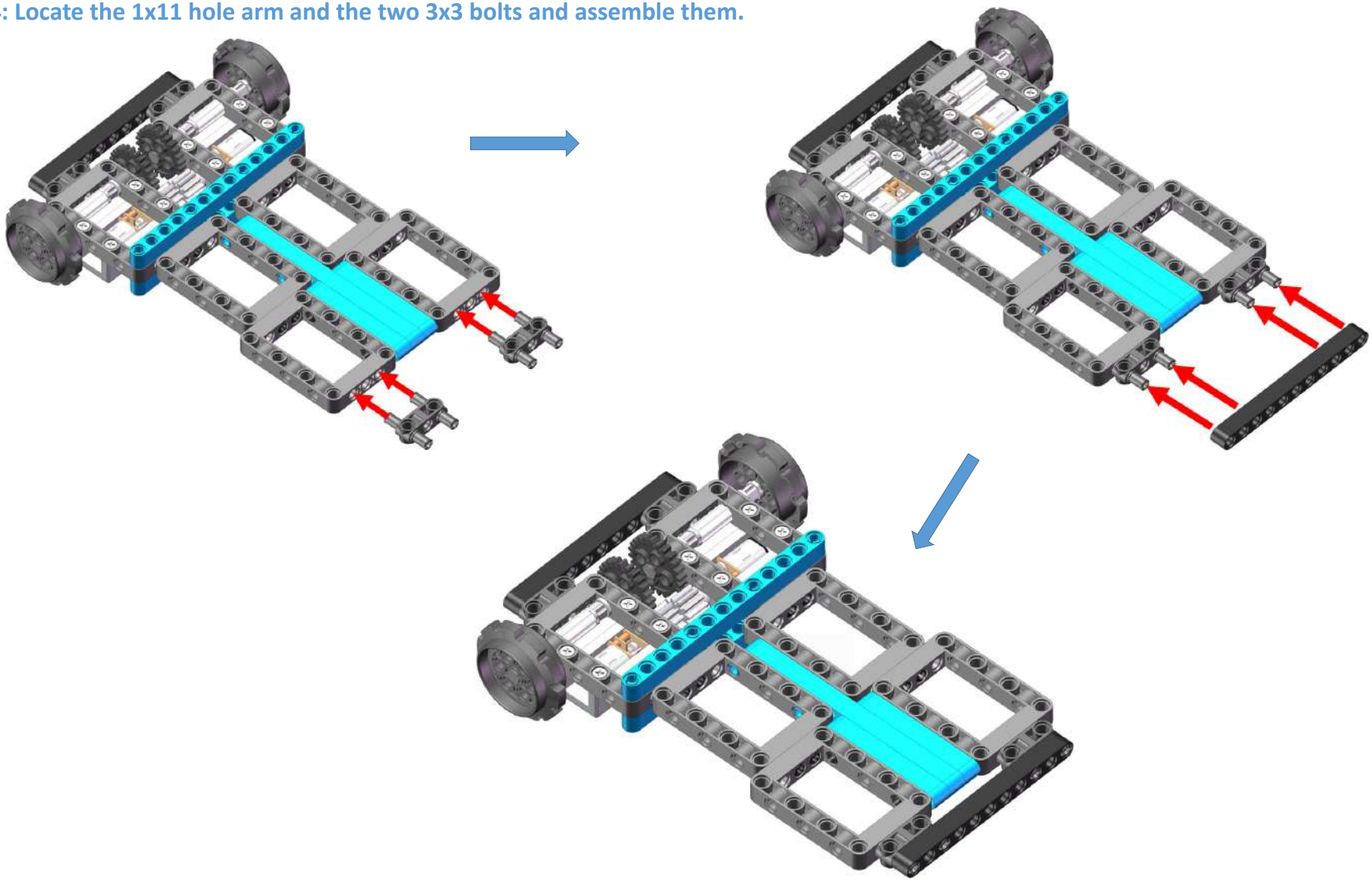
Step 12: Locate two 1x2 friction pins through which the two previously assembled bracket sections are combined.



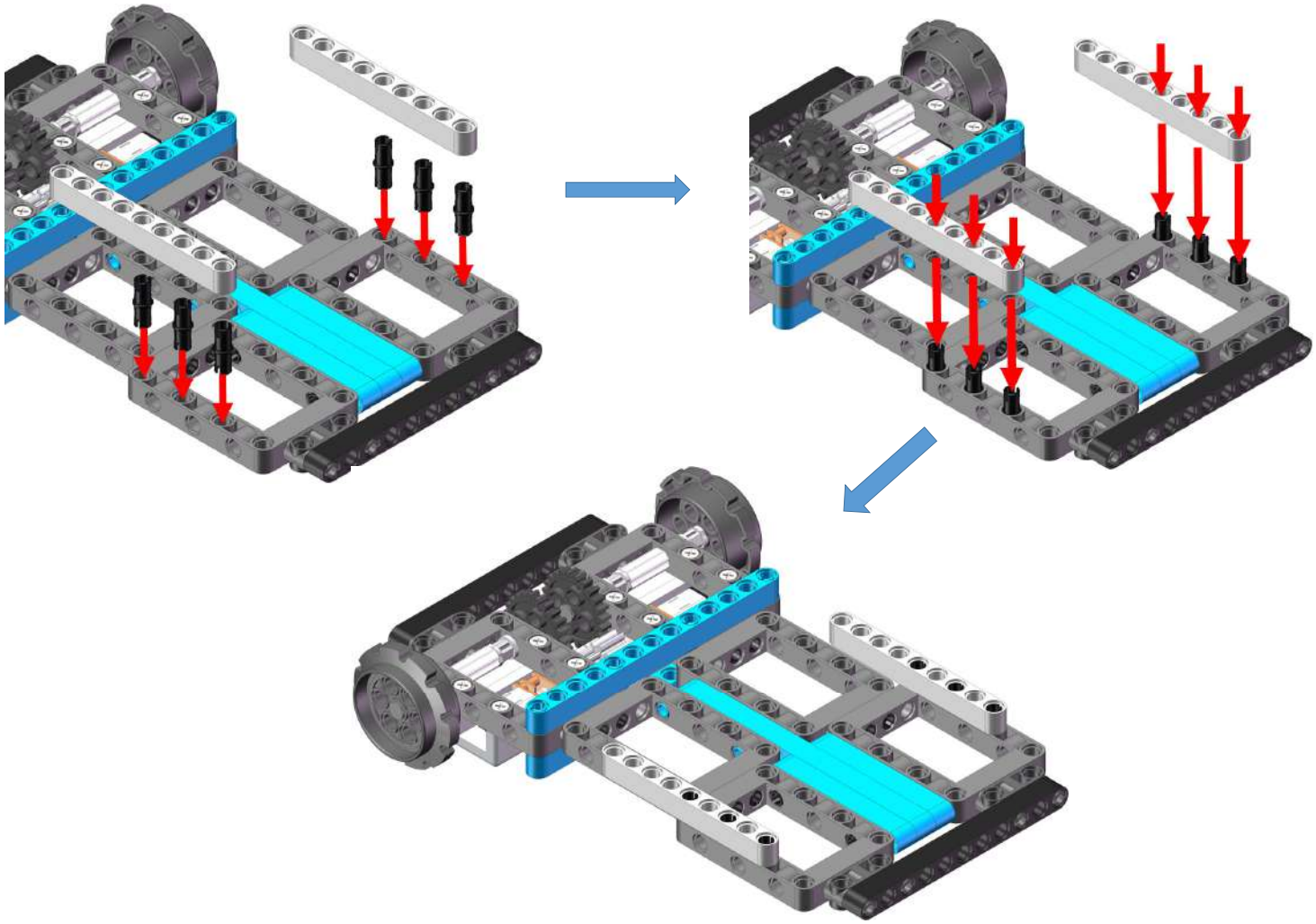
Step 13: Find four 1x2 friction pins and connect the assembled motor gear sections of step 8 and the assembled blocks in step 12.



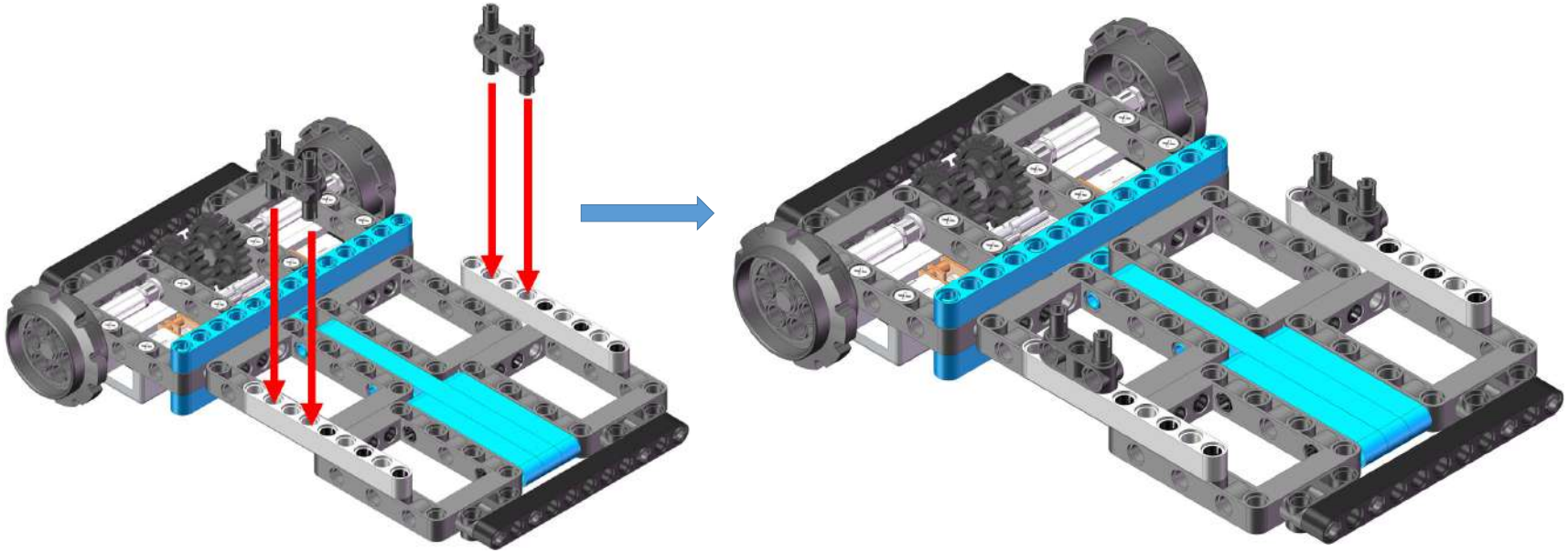
Step 14: Locate the 1x11 hole arm and the two 3x3 bolts and assemble them.



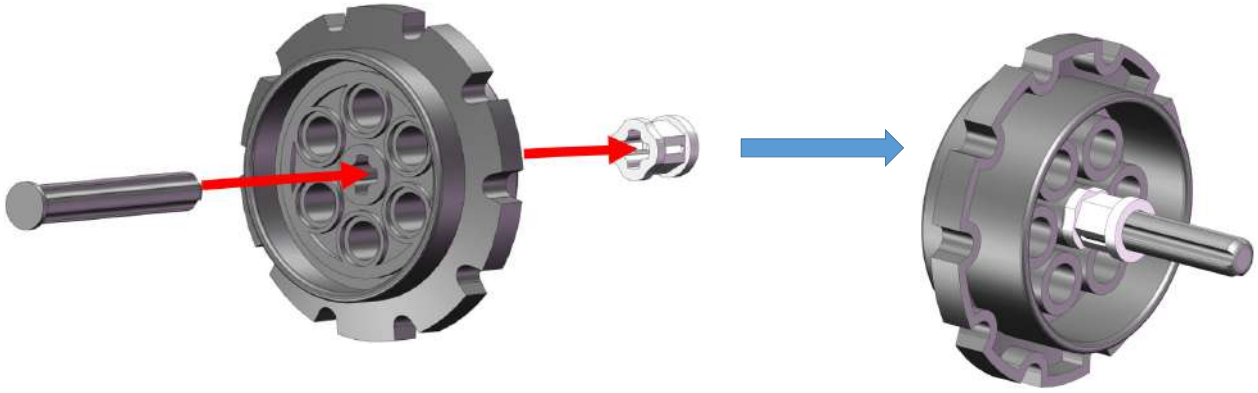
Step 15: Locate the six 1x2 friction pins and the two 1x9 hole arms and assemble them. The friction pins are inserted into the holes No. 1, 3, and 5 of the hole arms.



Step 16: Find two 3x3 bolts and assemble them. After completing this step, we assembled the entire frame of the tank.

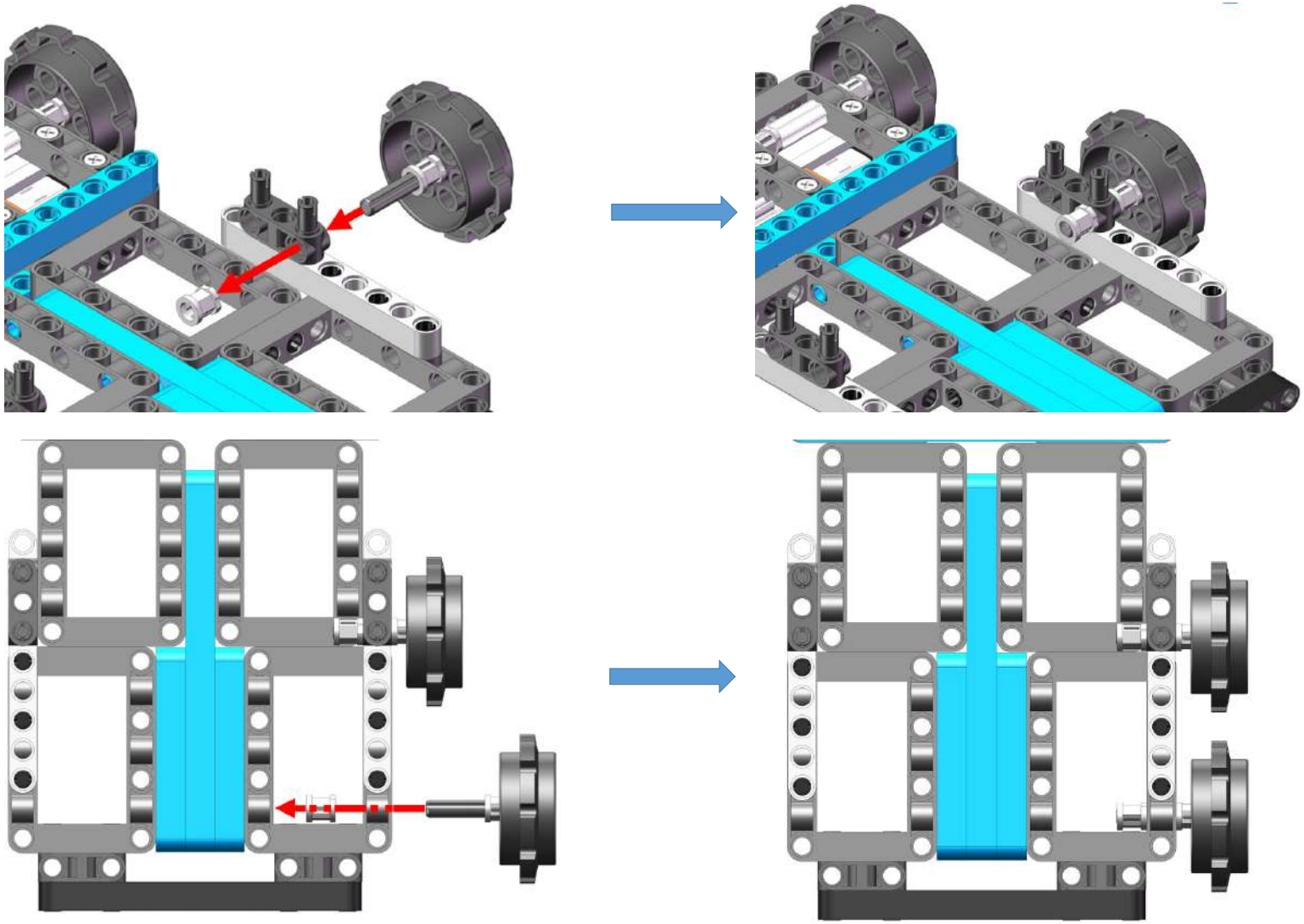


Step 17: Find a crawler wheel, a bushing, and a 1*4 shaft cutoff for assembly.

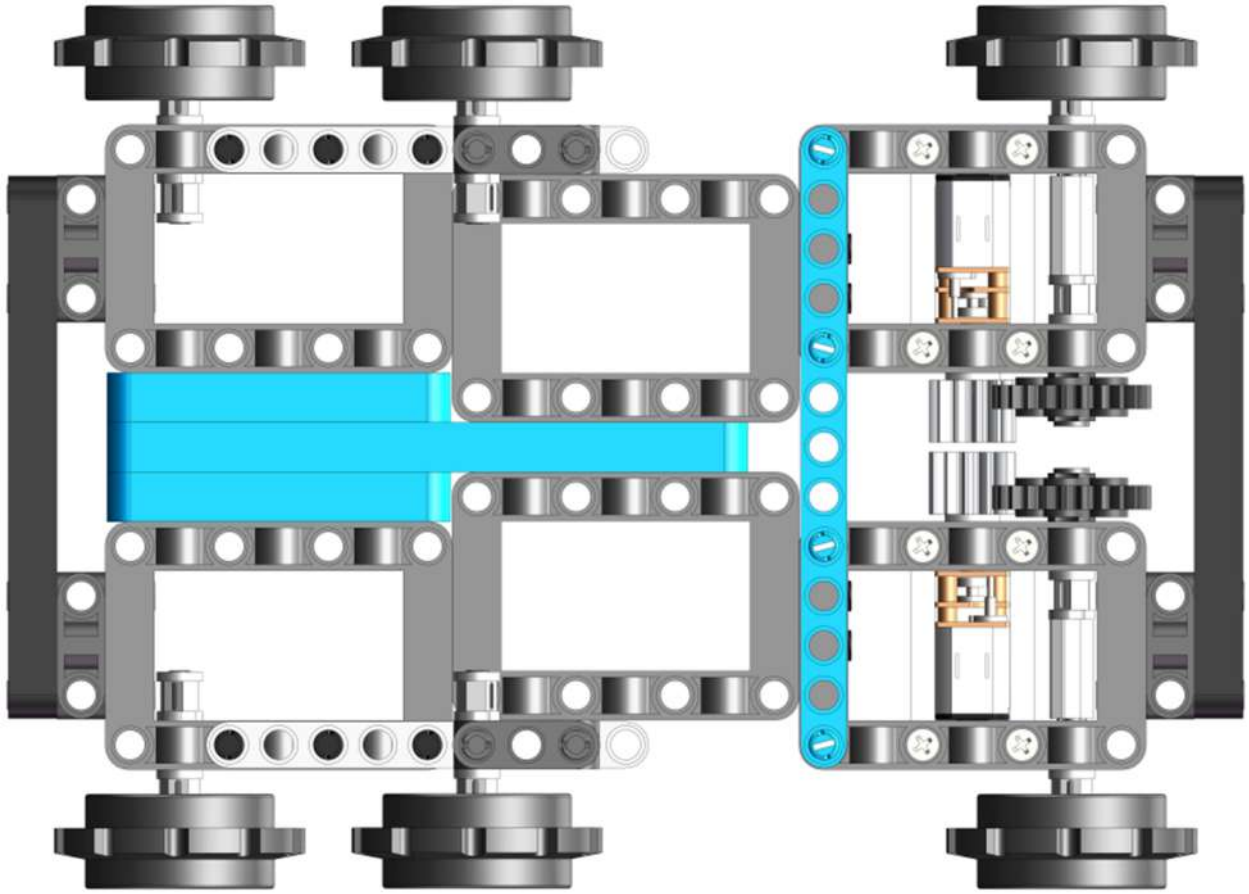


Tip: Here we need four such parts, so we need to repeat the same steps.

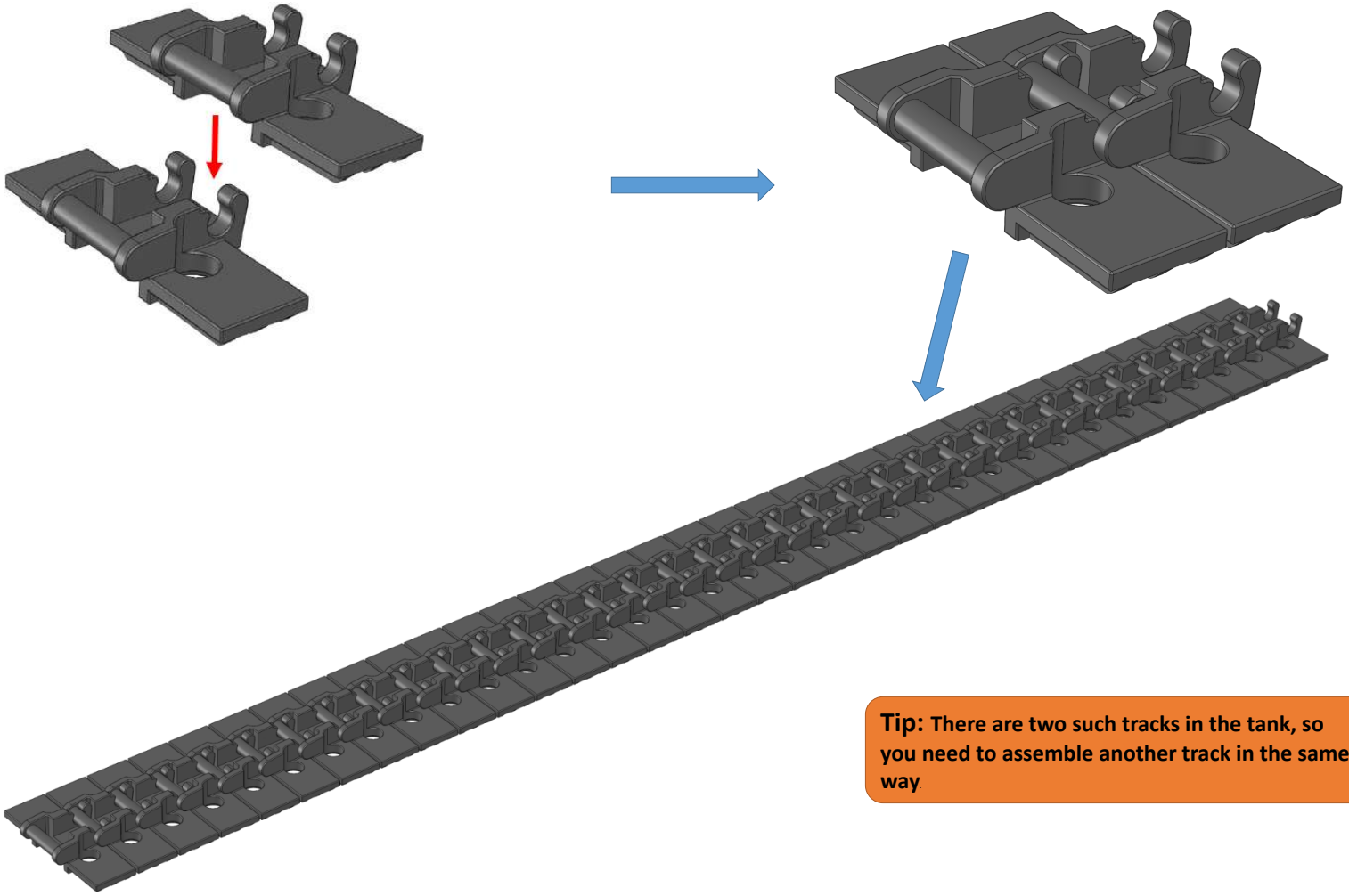
Step 18: Using the bushings, combine the four tracked wheels that we have assembled in the previous one onto the overall frame of the tank.



Step 19: The two crawler wheels on the other side of the tank are assembled in the same way. After the assembly is completed, the following figure is shown.

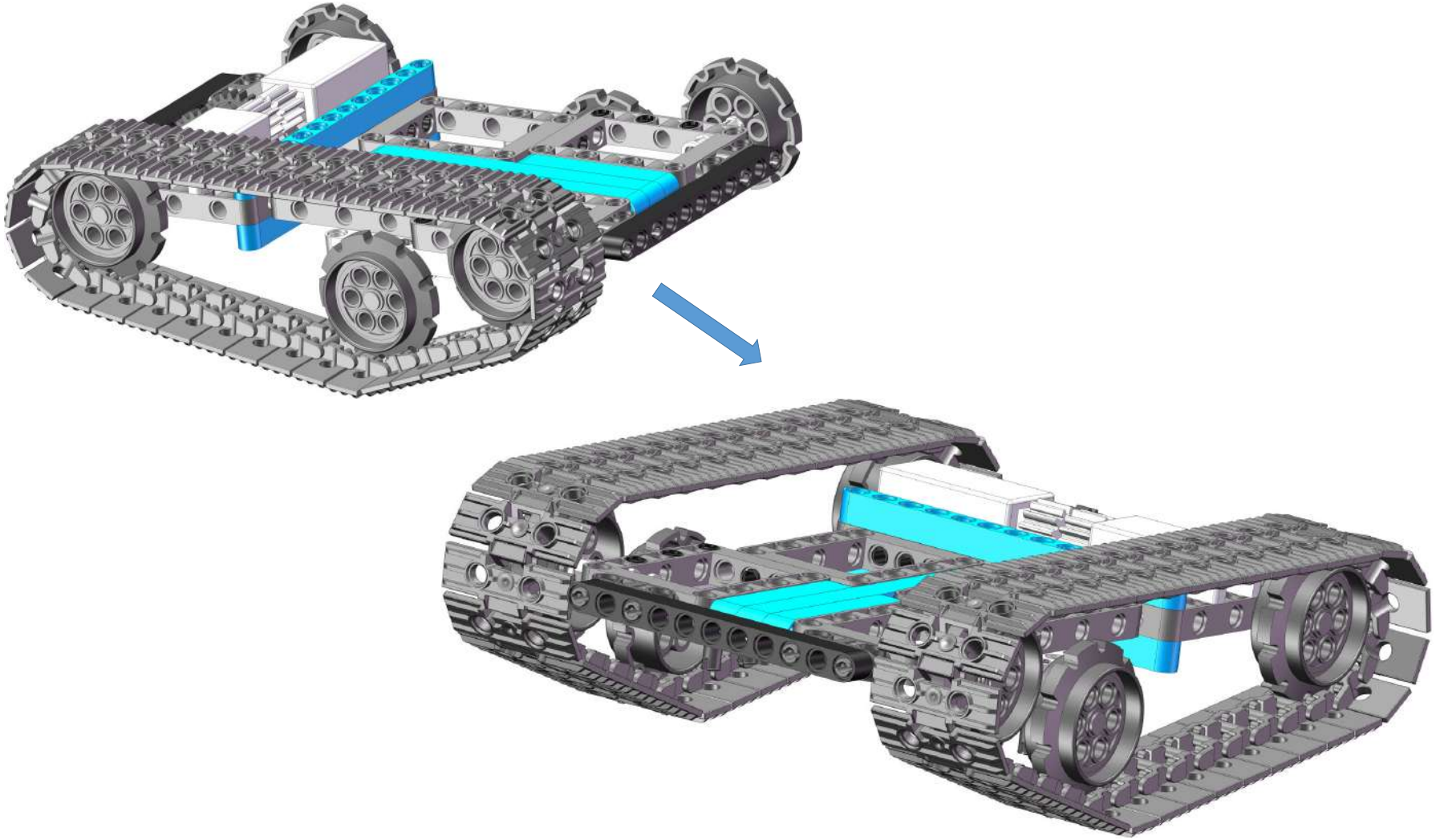


Step 20: Find plastic tracks, and each stitched together to form a track. Each track requires 34 plastic tracks to be spliced together.

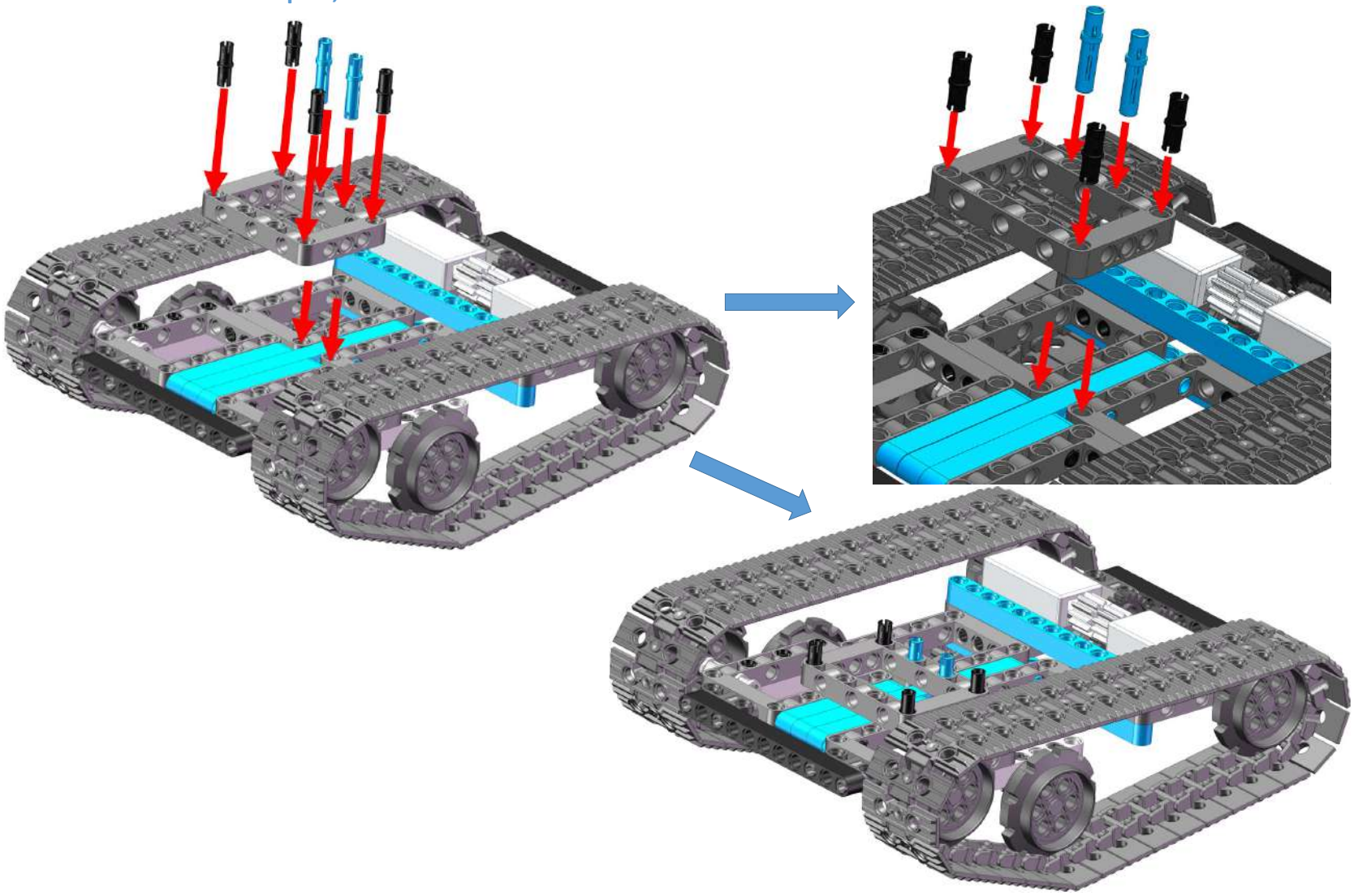


Tip: There are two such tracks in the tank, so you need to assemble another track in the same way

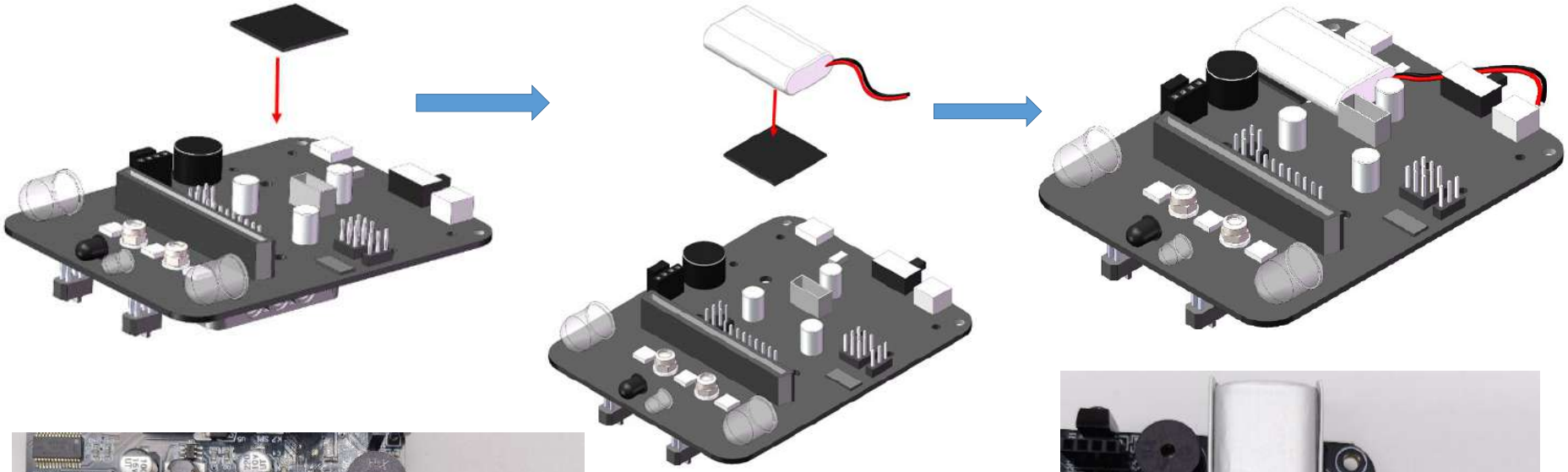
Step 21: Install the track correctly on the wheel of the tank.

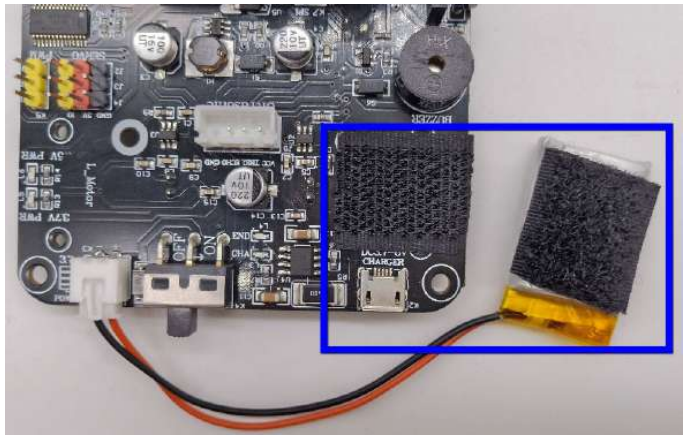


Step 22: Find four 1x2 friction pins, two 1x3 bolts and a 5x7 frame beam to assemble it onto the frame.

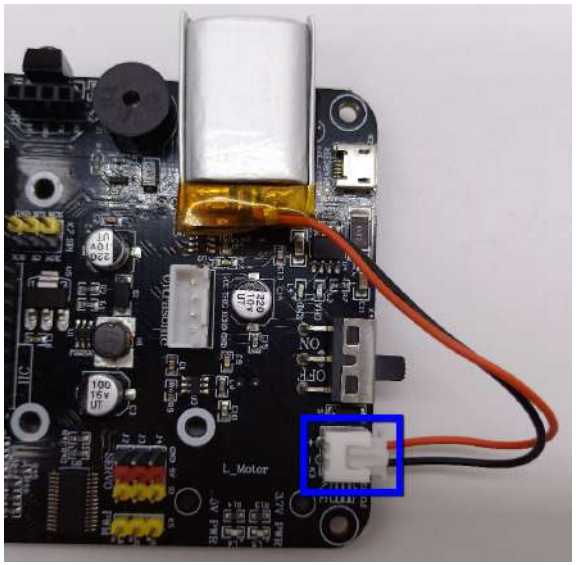


Step 23: Find the Velcro and micro:bit expansion board, remove the protective film on the back of the Velcro, and attach the two Velcro stickers to the lower right corner of the micro:bit expansion board and one side of the battery.

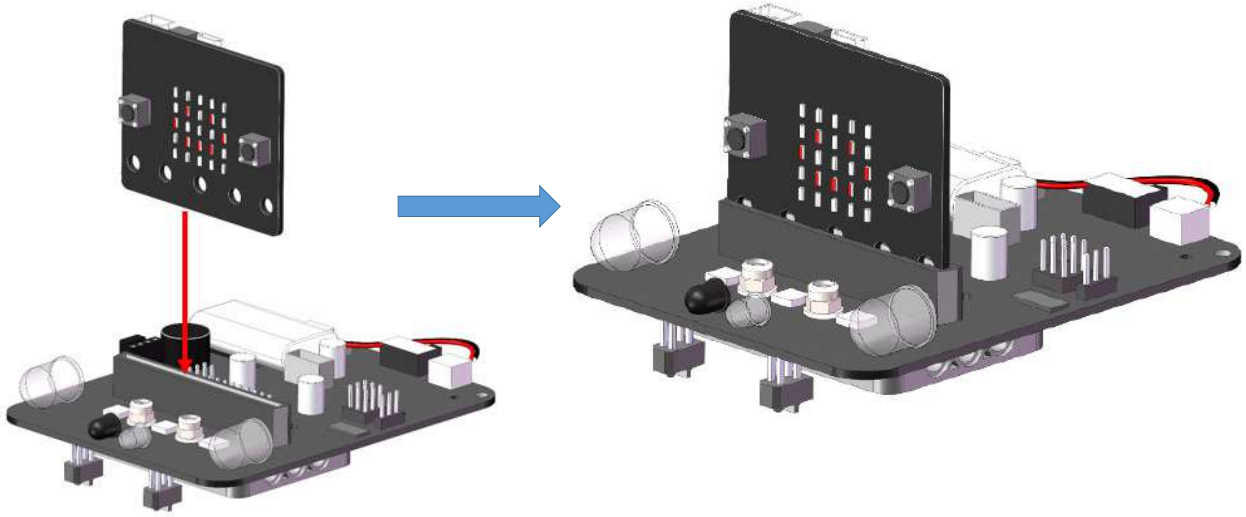




Tip: Battery sockets, we use anti-reverse design, just plug the battery wiring into the socket.



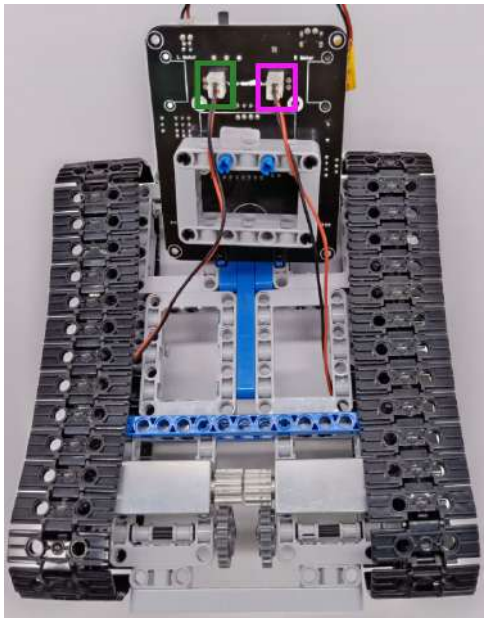
Step 24: Locate the micro:bit board and insert the board into the expansion board correctly.



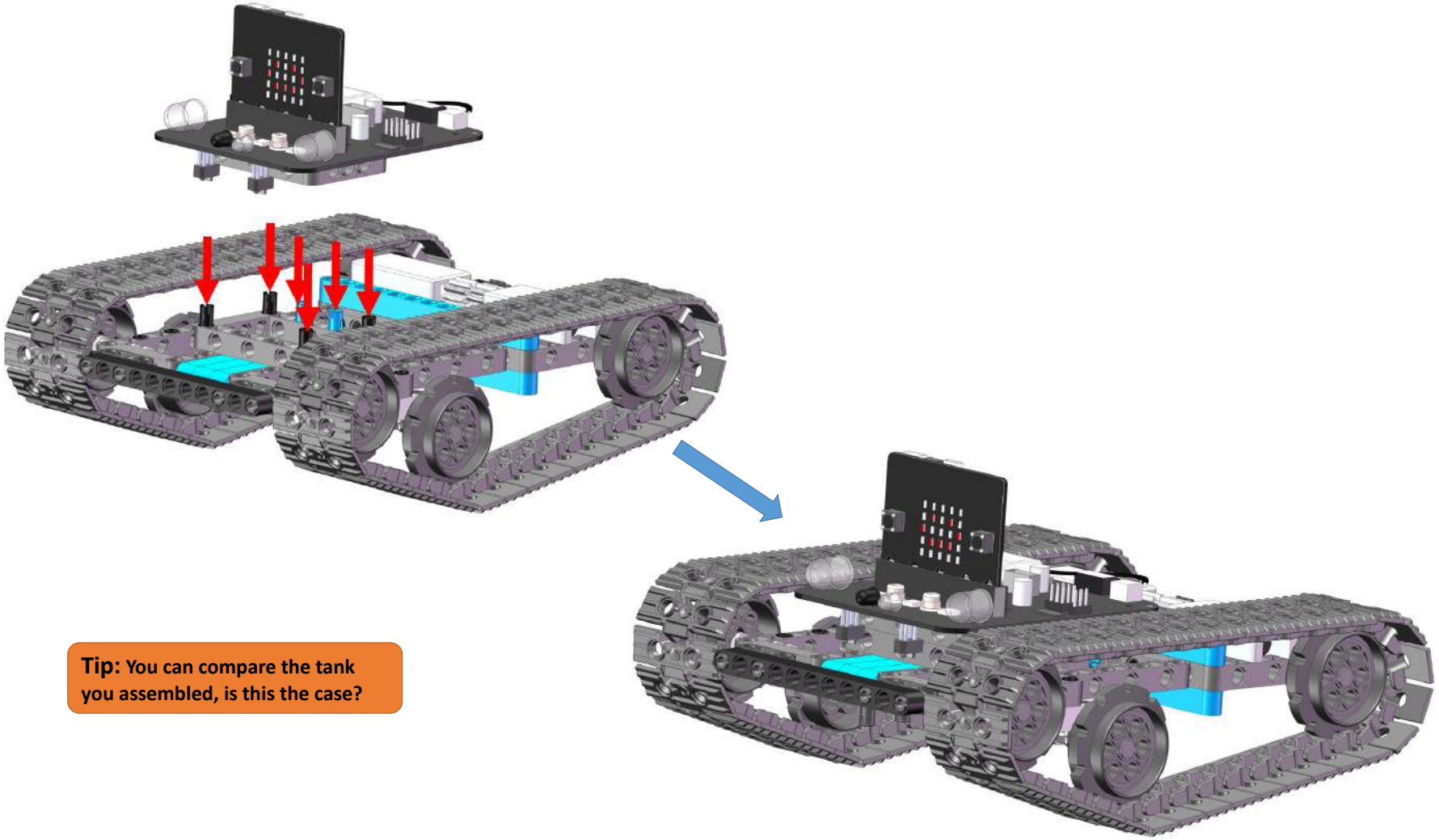
Tip: The micro:bit board is is equivalent to the "brain" of the car, so we need to make sure it is installed correctly. In this case, the tank car will work properly.

Step 25: Connect the wiring of the two motors correctly to the micro:bit expansion board, and then assemble the expansion board.

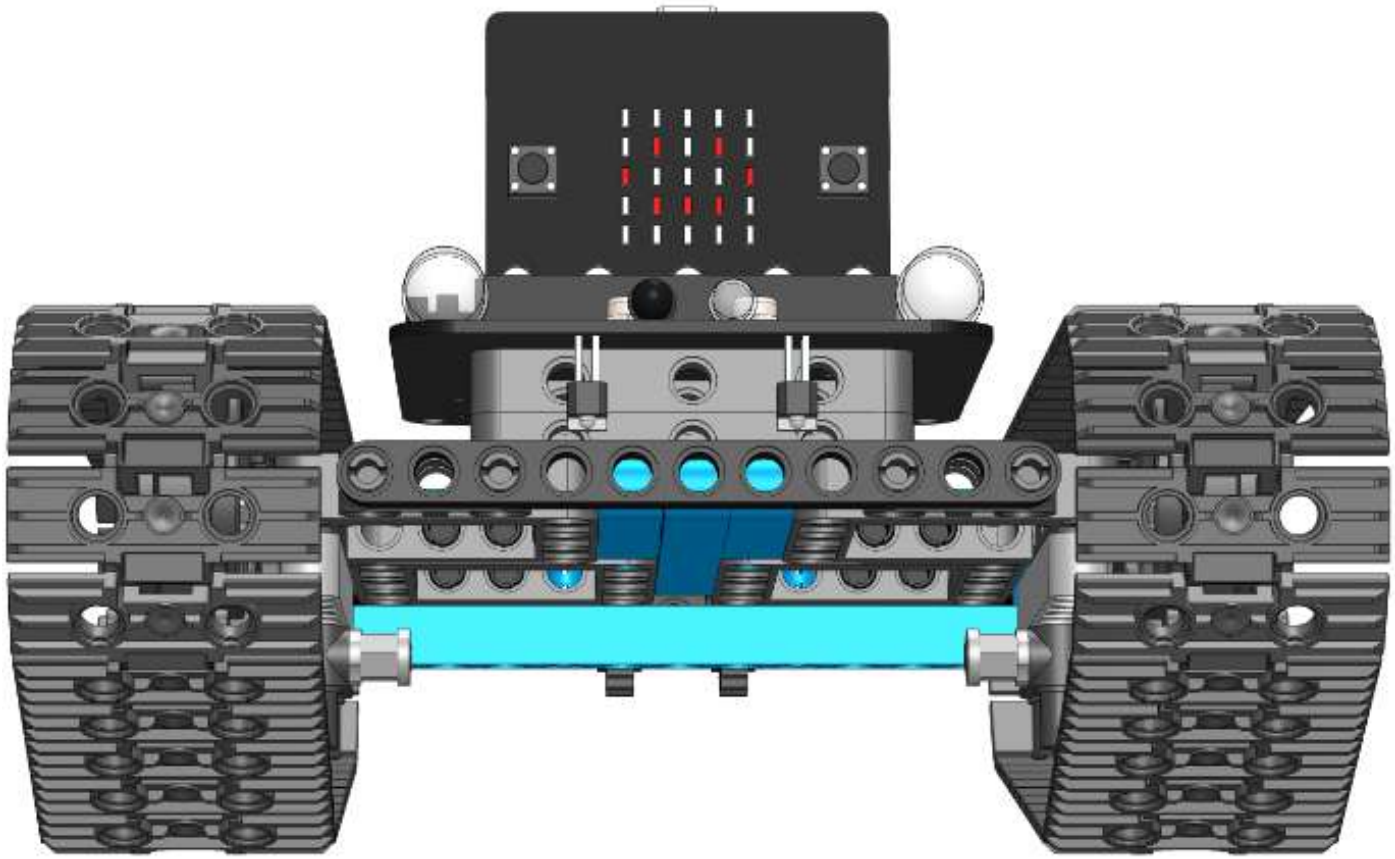
Tip: Please be sure to follow the method shown in the picture on the right. Never reverse the motor cable. If it is reversed, the tank will go backwards.



Step 26: Insert the micro:bit expansion board into the frame we have assembled in step 22.



Tip: You can compare the tank you assembled, is this the case?



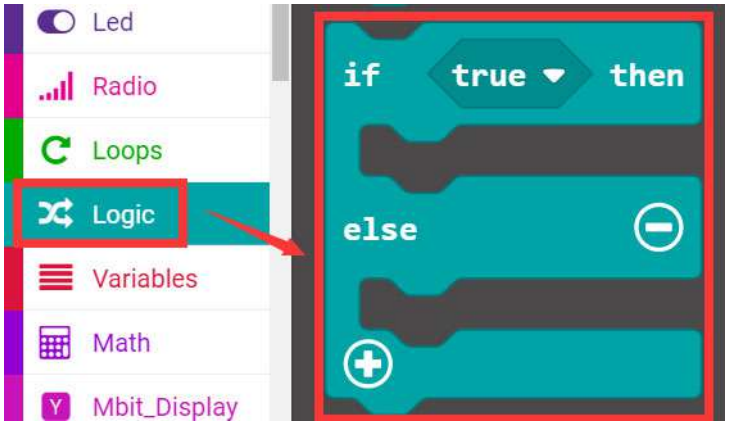
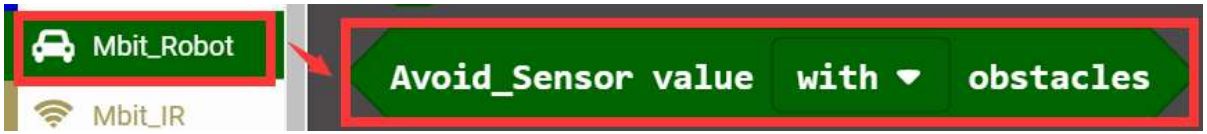
Thinking：This session is mainly to teach you how to use graphical programming to control the tank.

Preparation

- USB cable *1
- Tank car *1

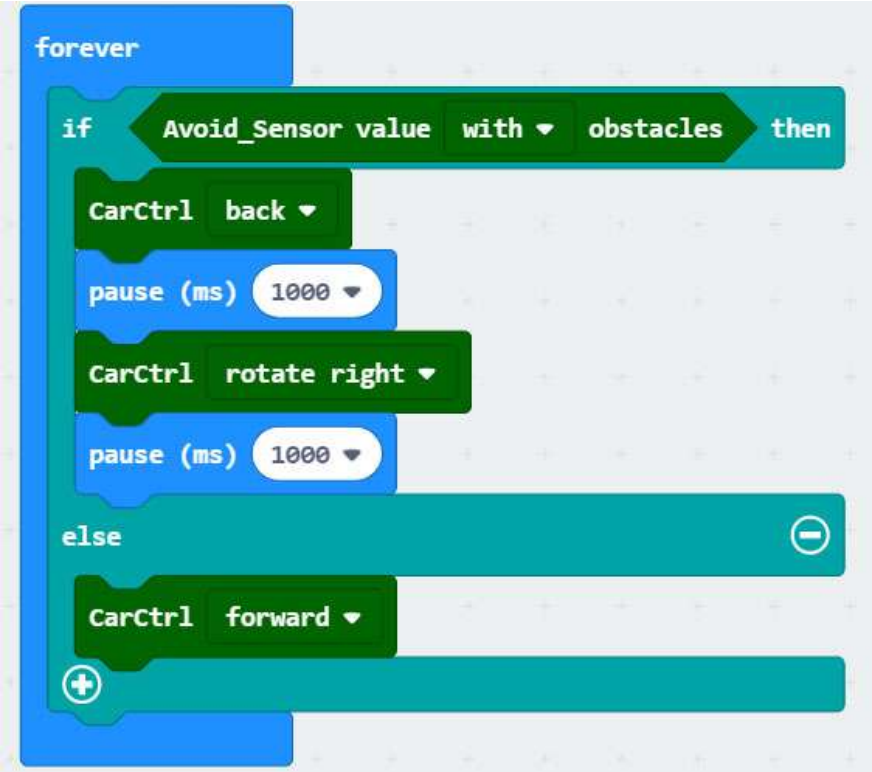
Blocks

Block	Instruction
	The code inside is executed after booting.
	The program pauses for 100 milliseconds and the time can be modified by itself.

Block	Instruction
	If true then execute. If it is false, it will not be executed.
	The infrared sensor detects if there is an obstacle in front.
	The car's motion state selection: forward, back, turn left , turn right , rotate left, rotate right and stop.

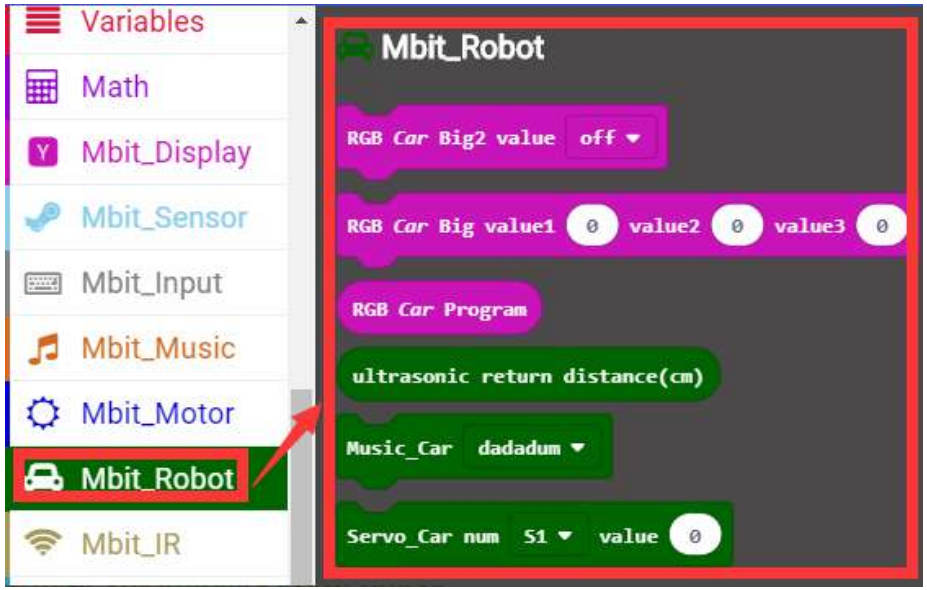
Programming

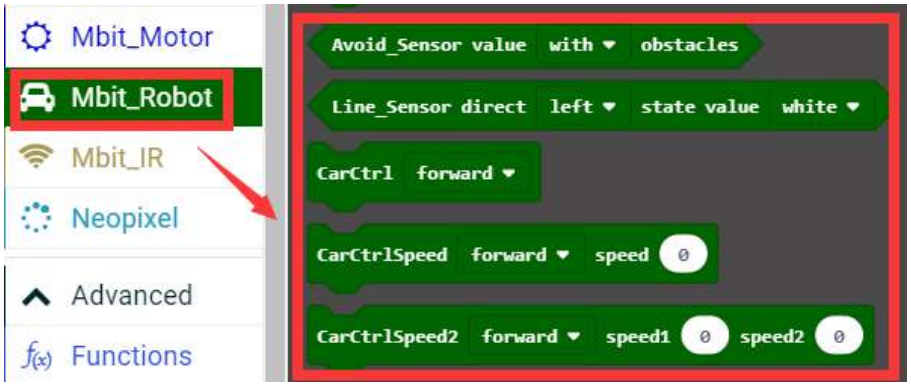
The program of this course is shown in the figure below. After downloading the program, open the power switch of the tank car and the tank car will run forward. If you encounter an obstacle, you will step back for 1 second, then rotate right for 1 second, and finally go straight.



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\B.Tank car\2.Tank car Infrared obstacle avoidance\Tank-car-Infrared-obstacle-avoidance.hex

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





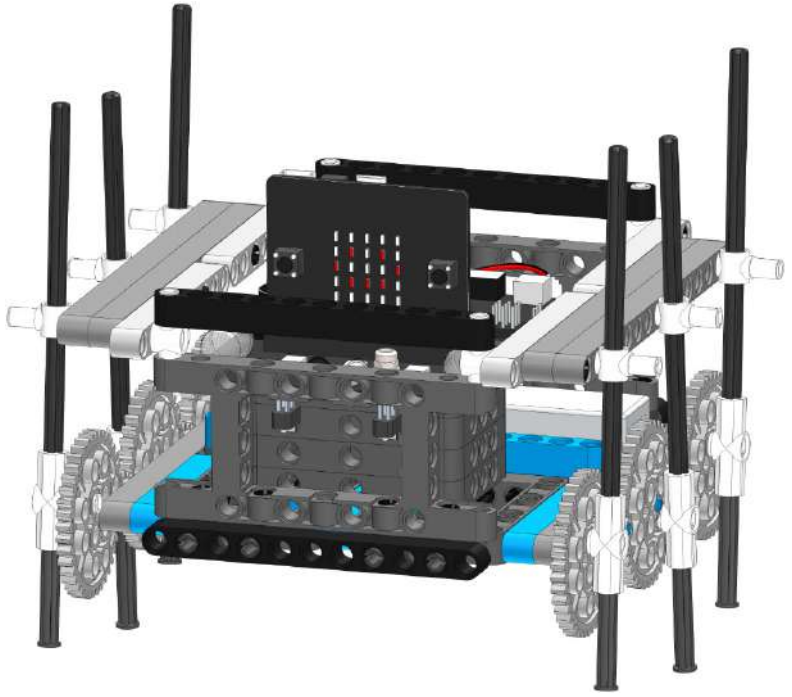
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely.
Drag these blocks and play with our building block tank car.

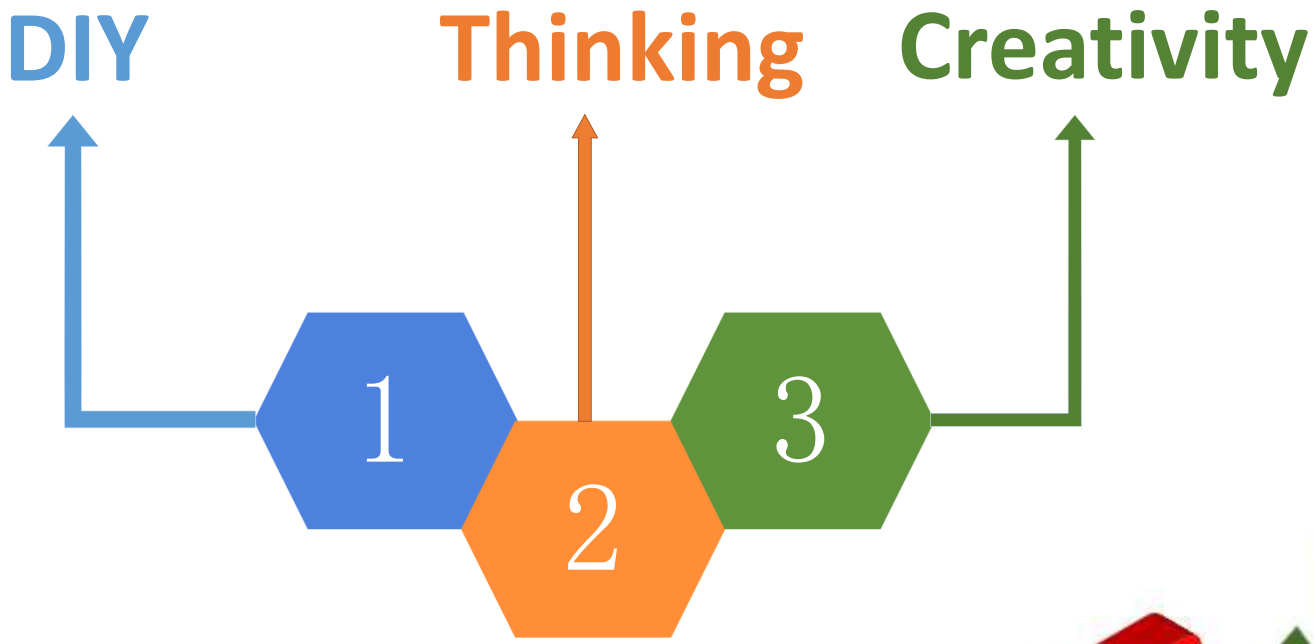


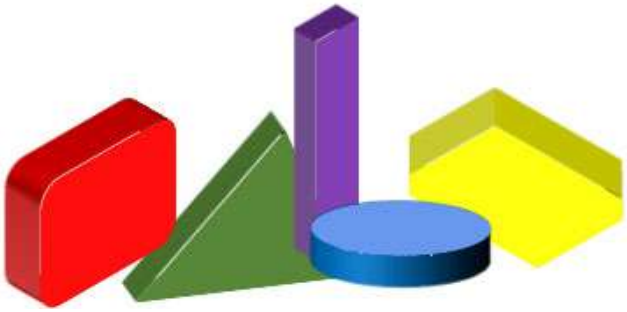
On our official website, we also provides other tutorial: Tank car Infrared remote control, Tank car bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.3 Hexapod robot

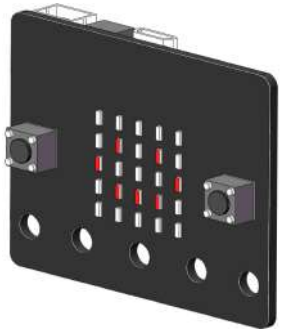
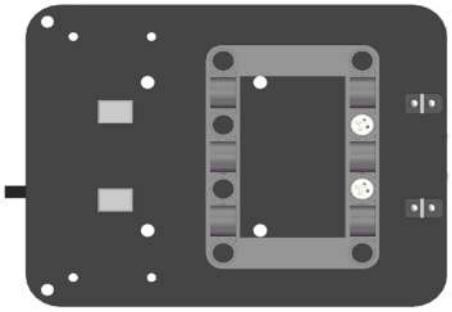
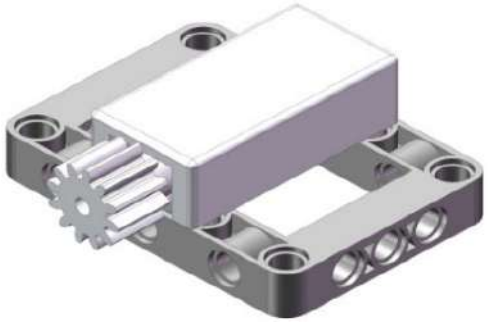
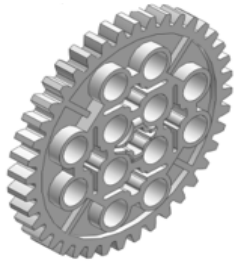
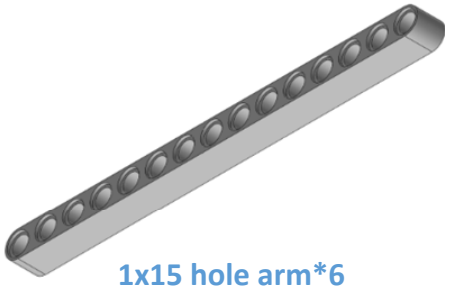
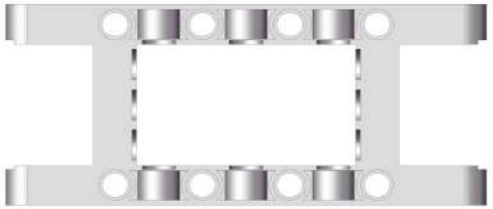
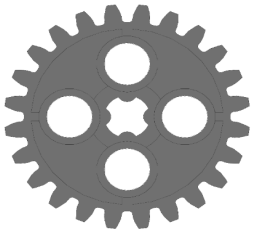
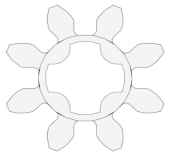
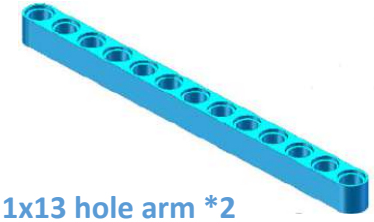
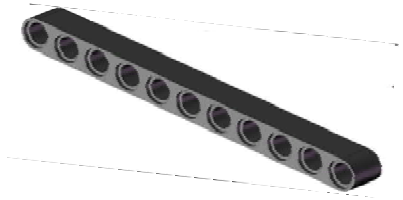
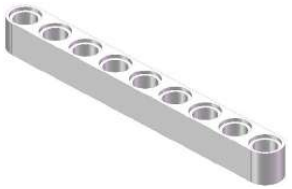
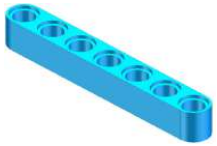


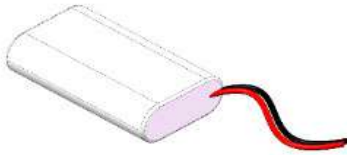
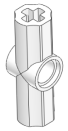
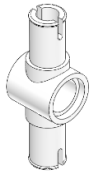
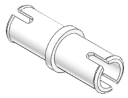

DIY
Thinking
Creativity
1
2
3



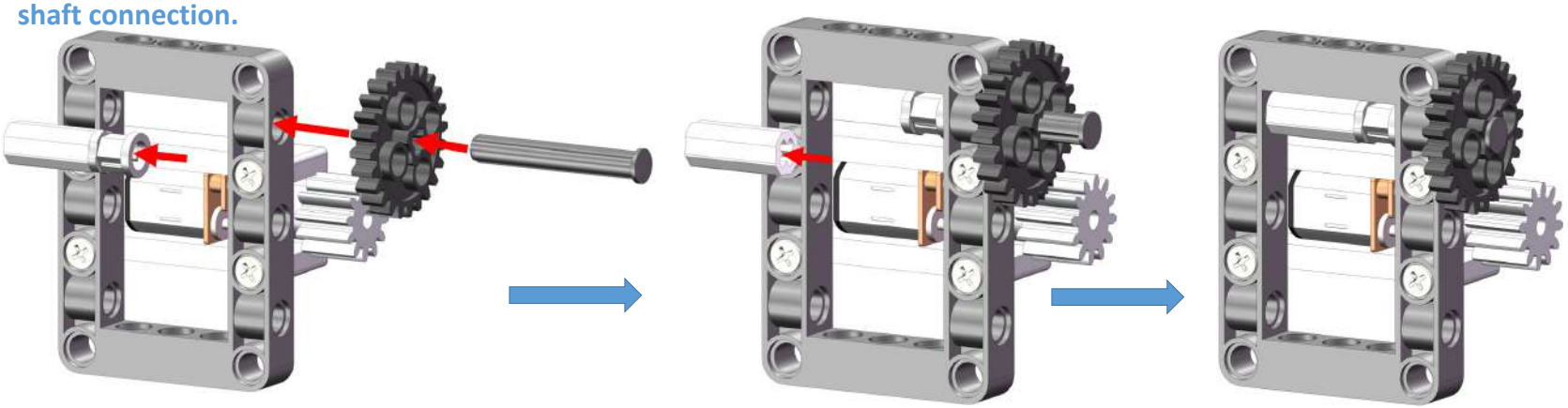
DIY: This session is mainly to teach you to assemble a hexapod robot with building blocks.

Prepare the following blocks and we will assemble a cute building block hexapod robot.

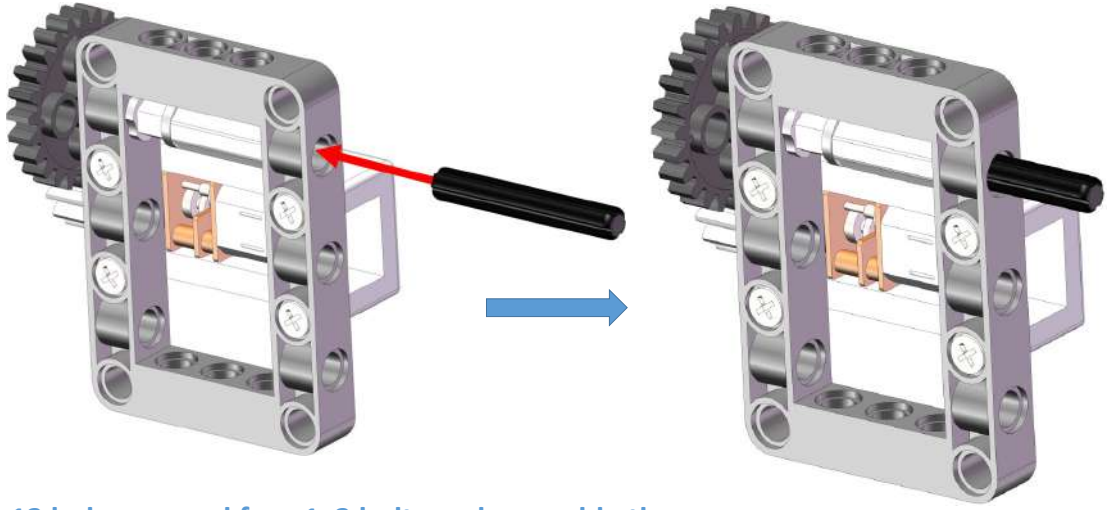
 Micro:bit*1	 Micro:bit expansion board*1	 Motor module*2	 40 toothed-wheel *6	 5x7 beam frame*5
 1x4 Shaft cutoff*8	 1x15 hole arm*6	 5x11 beam frame*2	 24 toothed-wheel*2	 8 toothed-wheel*4
 1x3 hole arm*2	 1x13 hole arm *2	 1x11 hole arm*4	 1x9 hole arm*4	 1x7 hole arm*3

 Battery*1	 2# Bolt connector*6	 1x3 Bolt connector*10	 1x2 Smooth pin*6	 1x2 Shaft and bolt connector*8
 1x12 Cross Axle*6	 1x2 Shaft connector *2	 1x3 Shaft*7	 3x3 Bolt connector*4	 1x2 Frictional pin*50
 1x1 Bushing*4	 1x4 Cross Axle*2			

Step 1: Find a motor module, a 1*4 shaft cutoff, a bushing, a 1*2 shaft connection and a 24-tooth wheel. Pass the shaft cutoff through the 24-toothed wheel, the corresponding hole position of the motor module, the bushing and one end of the 1*2 shaft connection.

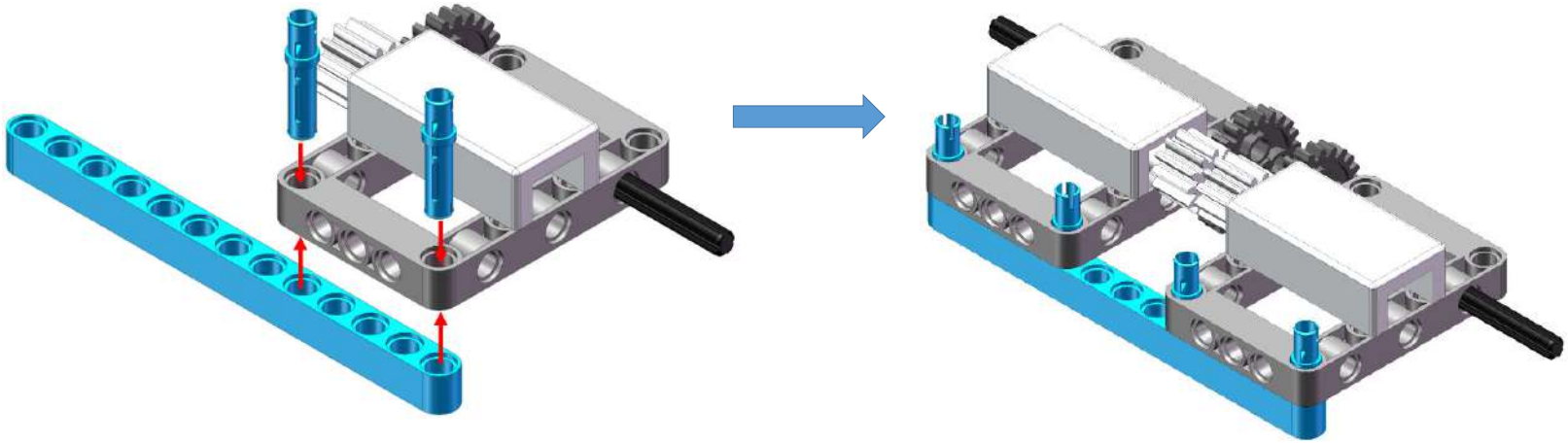


Step 2: Locate a 1x4 cross shaft and pass it through the corresponding hole on the side of the motor module and the other end of the 1x2 shaft connection.

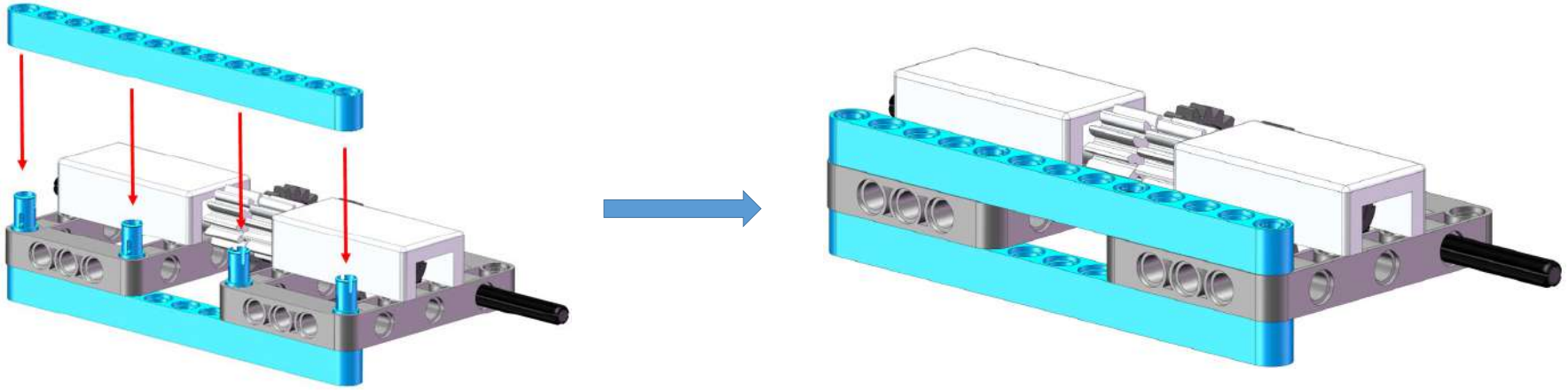


Tip: There are two motor modules that need to be assembled. Please install the other one in the same way.

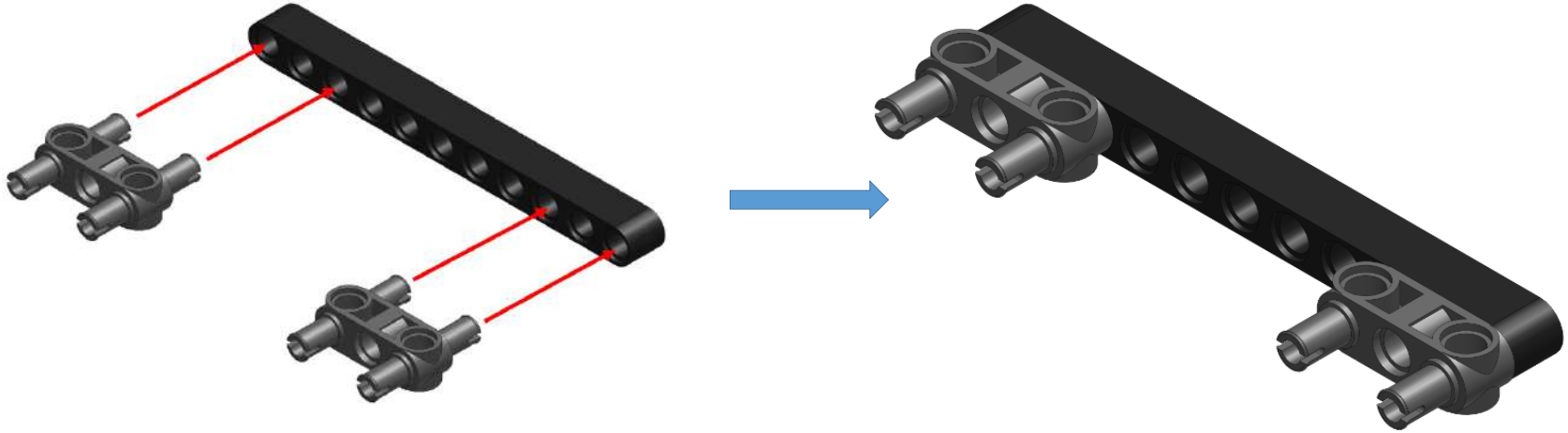
Step 3: Find a 1x13 hole arm and four 1x3 bolts and assemble them.



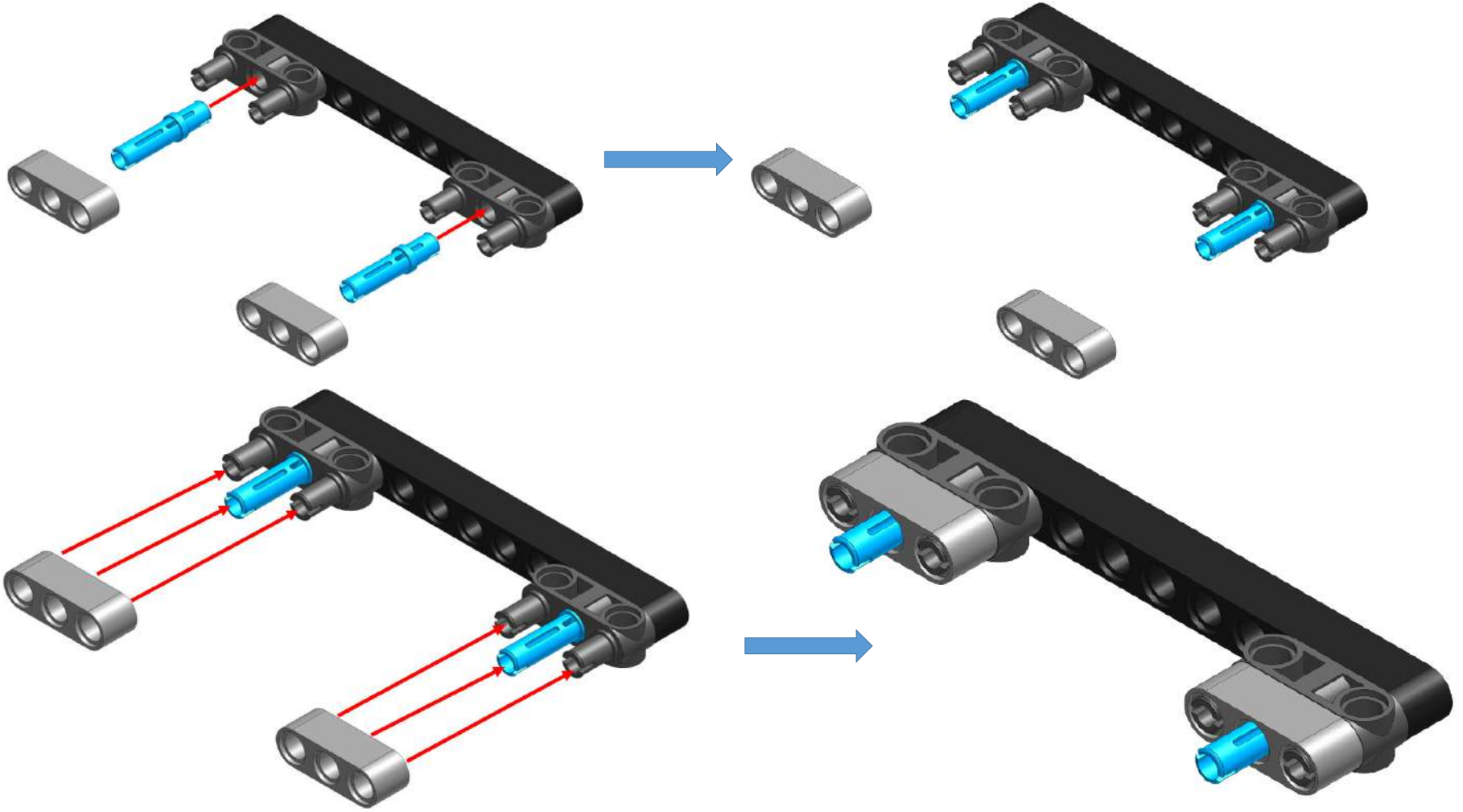
Step 4: Locate a 1x13 hole arm and insert the four 1x3 pins into the holes No. 1, 5, 9, and 13 of the hole arm.



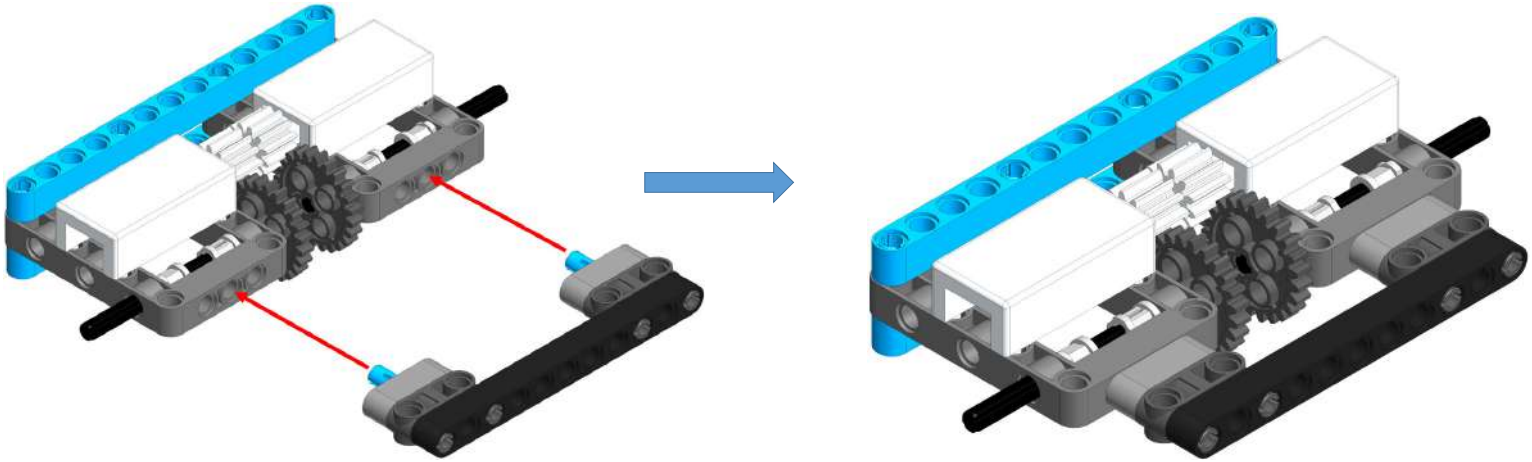
Step 5: Find a 1x11 hole arm , two 3x3 bolts and assemble them.



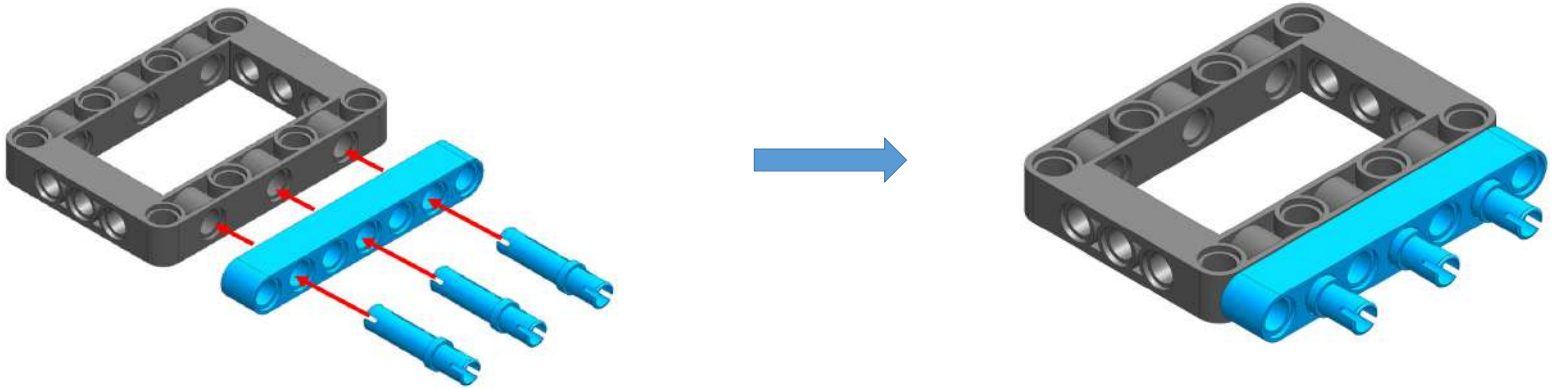
Step 6: Find two 1x3 hole arms and two 1x3 bolts. And assemble them.

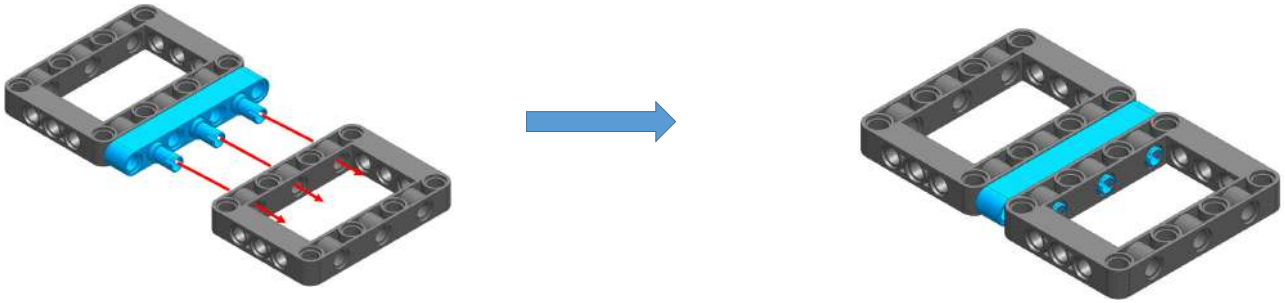


Step 7: Combine the two parts of the building blocks that we have assembled in Step 3 and Step 6

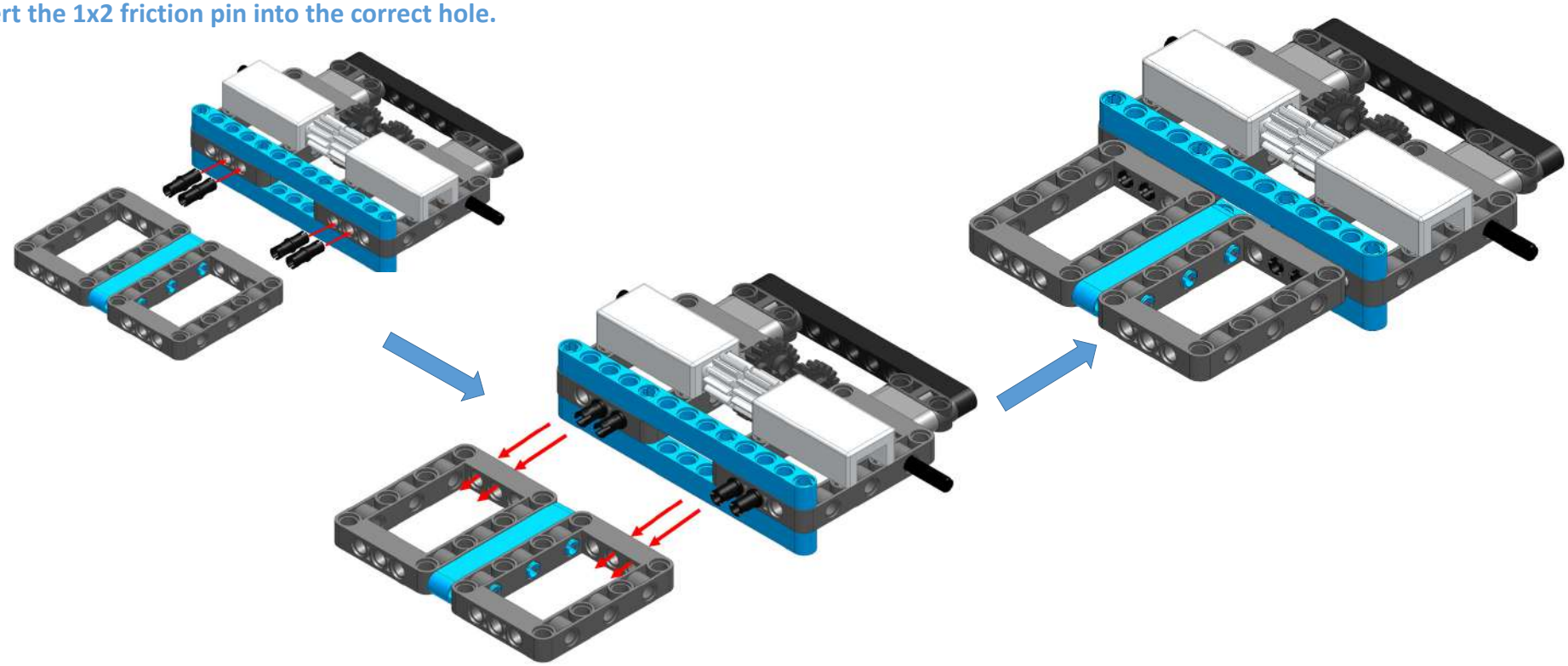


Step 8: Continue to find three 1x3 bolts, a 1x7 hole arm and a 5x7 beam frame and assemble them.

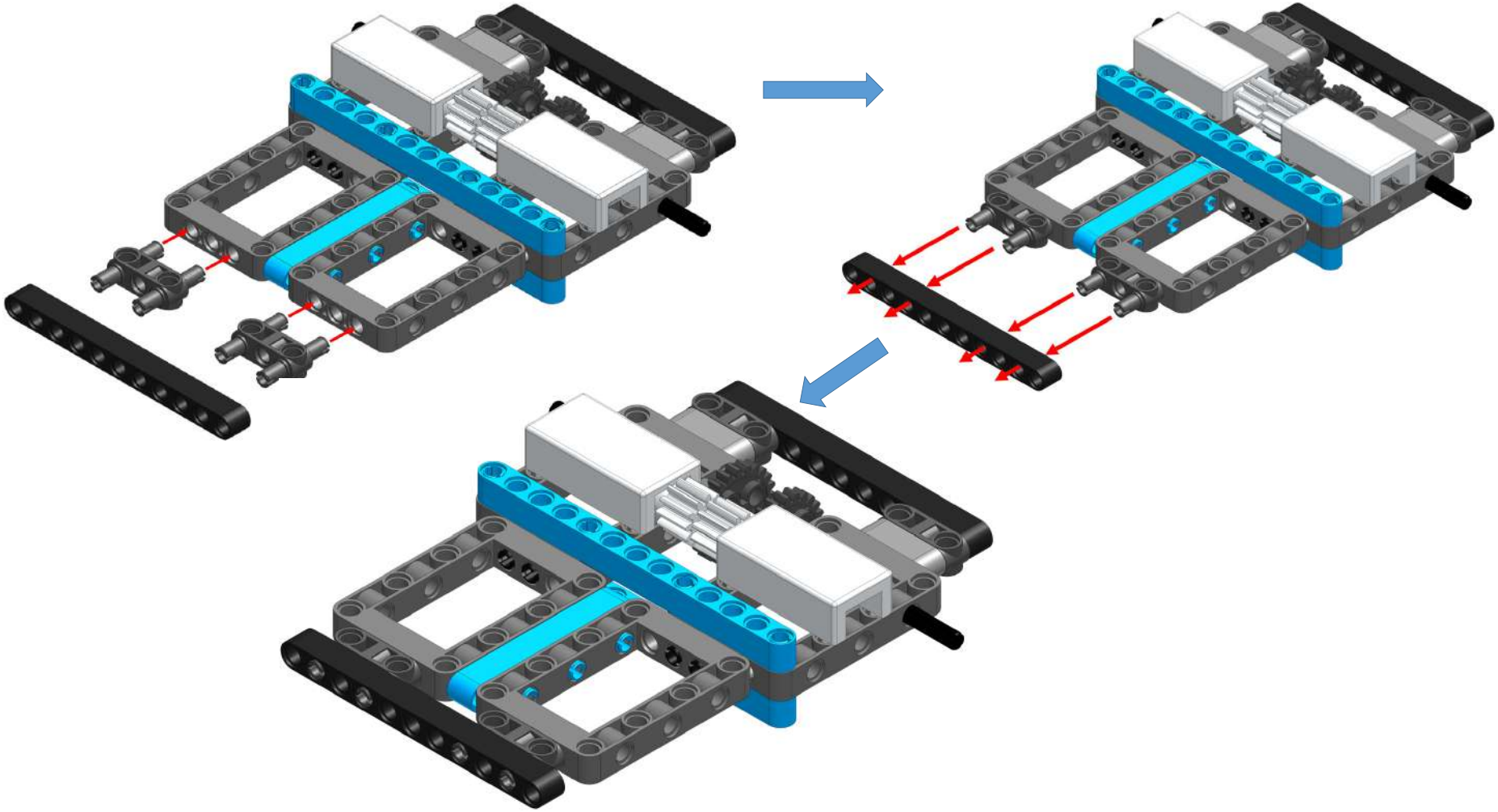




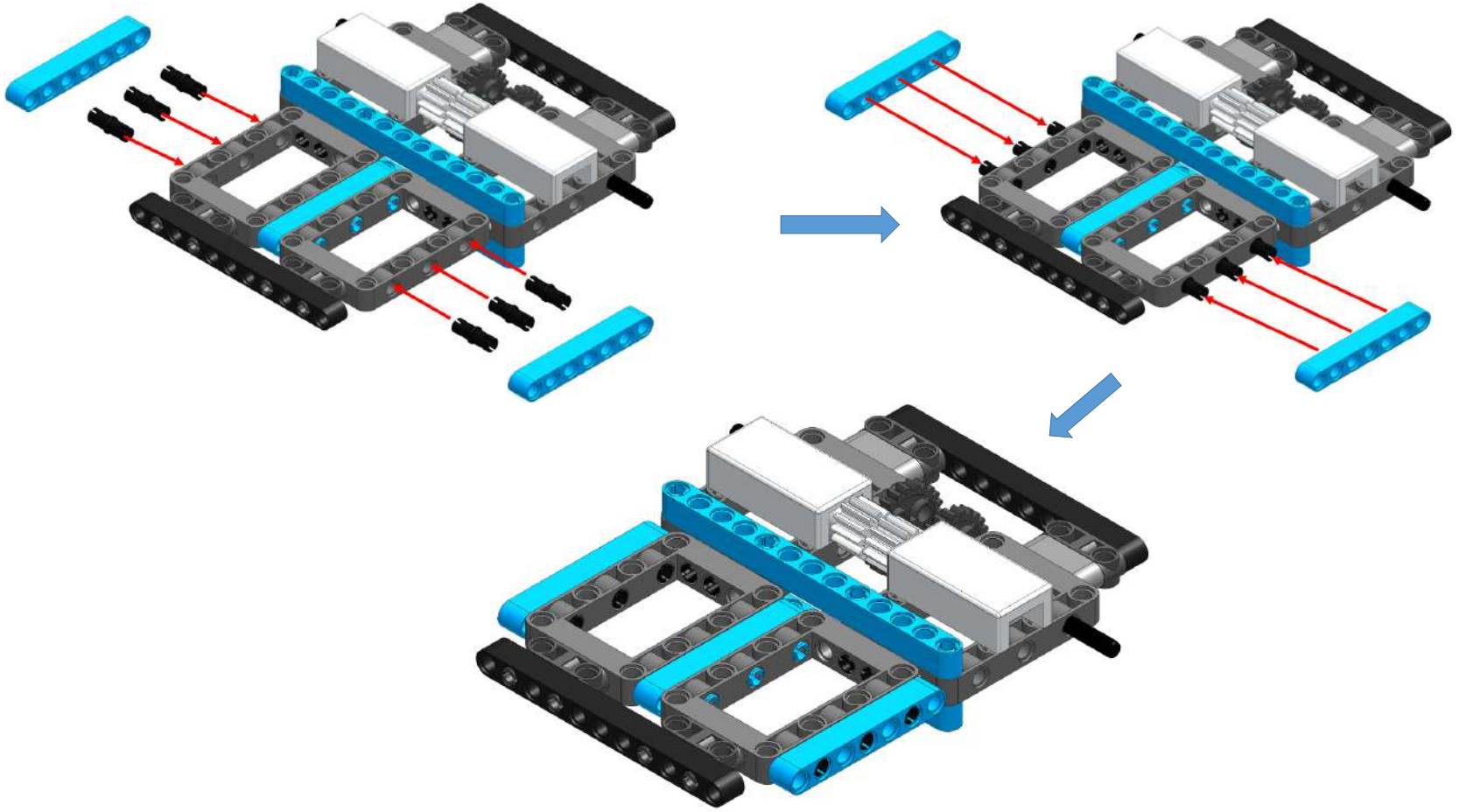
Step 9: Find four 1x2 friction pins and combine the two parts of the blocks that we have assembled in steps 7 and 8. You must insert the 1x2 friction pin into the correct hole.



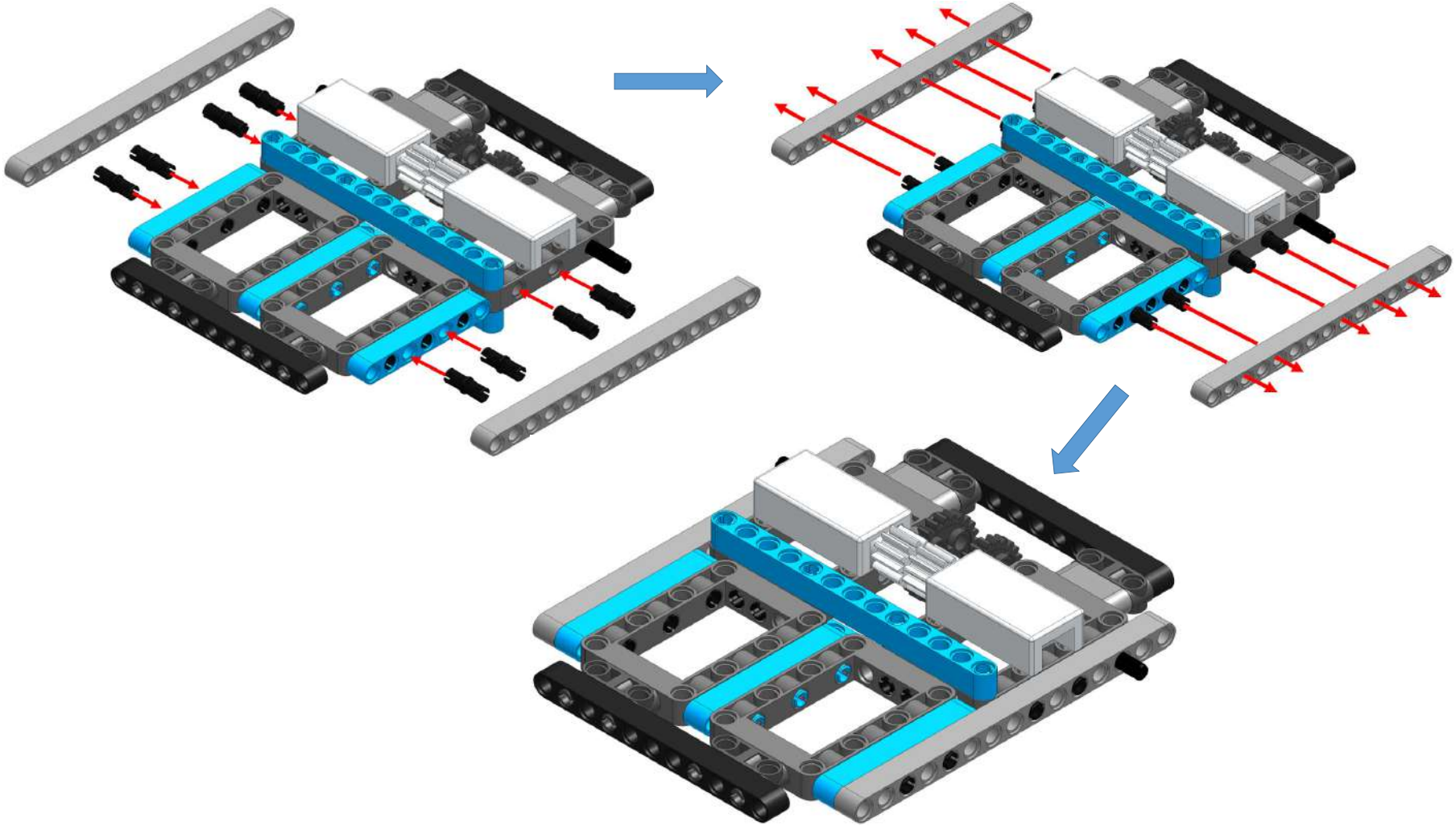
Step 10: Look for two 3x3 bolt connections and a 1x11 hole arm. First insert the 3x3 bolts into the 5x7 beam frame and then install the 1x11 hole arms onto the two 3x3 bolt connections.
Note: Two 3x3 bolt connections are inserted in holes 2nd, 4th, 8th, and 10th of the 1x11 hole arm.



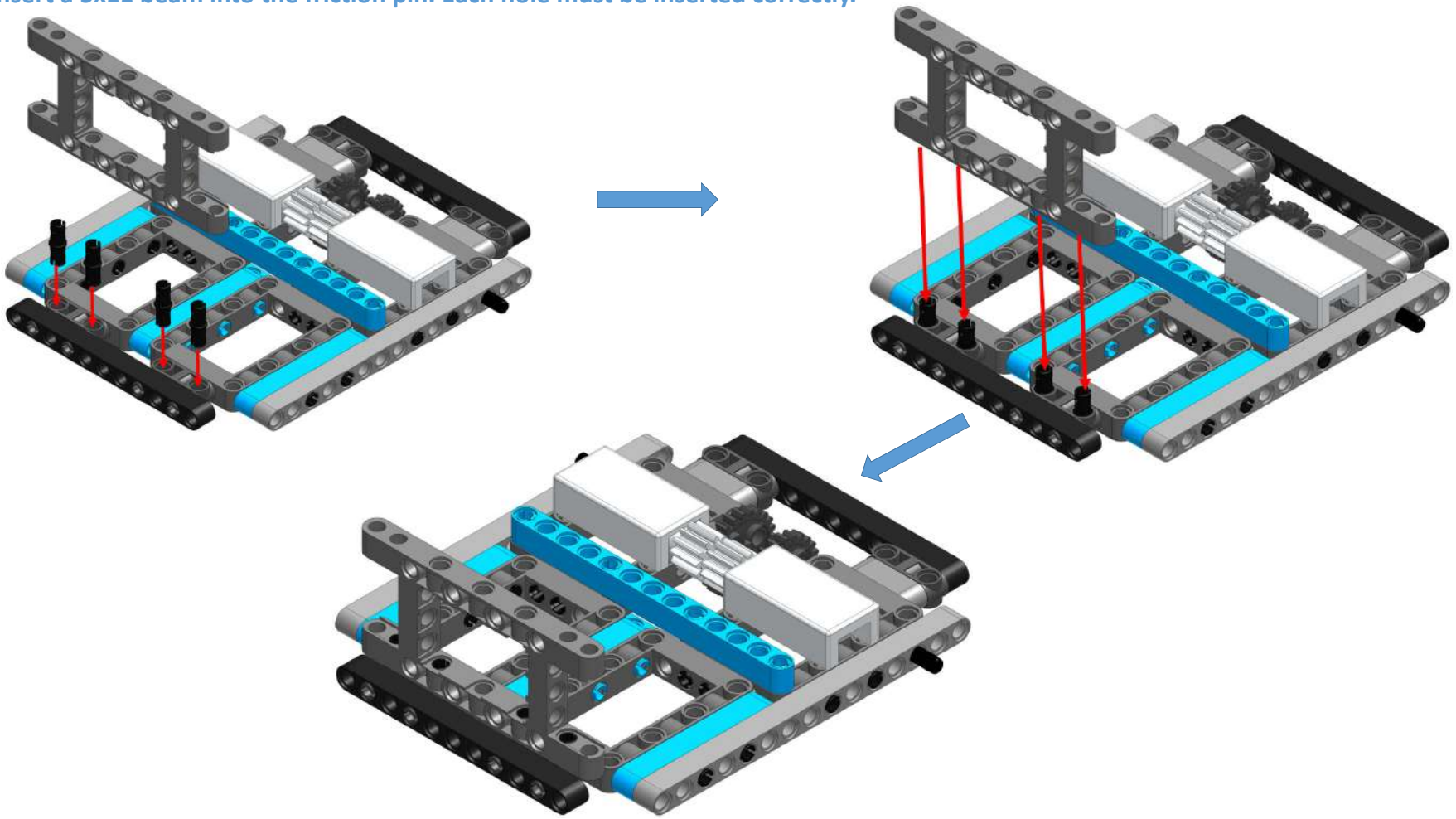
Step 11: Locate the six 1x2 friction pins and the two 1x7 hole arms. First insert the 1x2 friction pin into the hole on the side of the 5x7 beam frame and insert the 1x7 hole arm into the friction pin.
Note: The 1x2 friction pin is inserted into the 2nd, 4th, and 6th holes of the 1x7 hole arm.



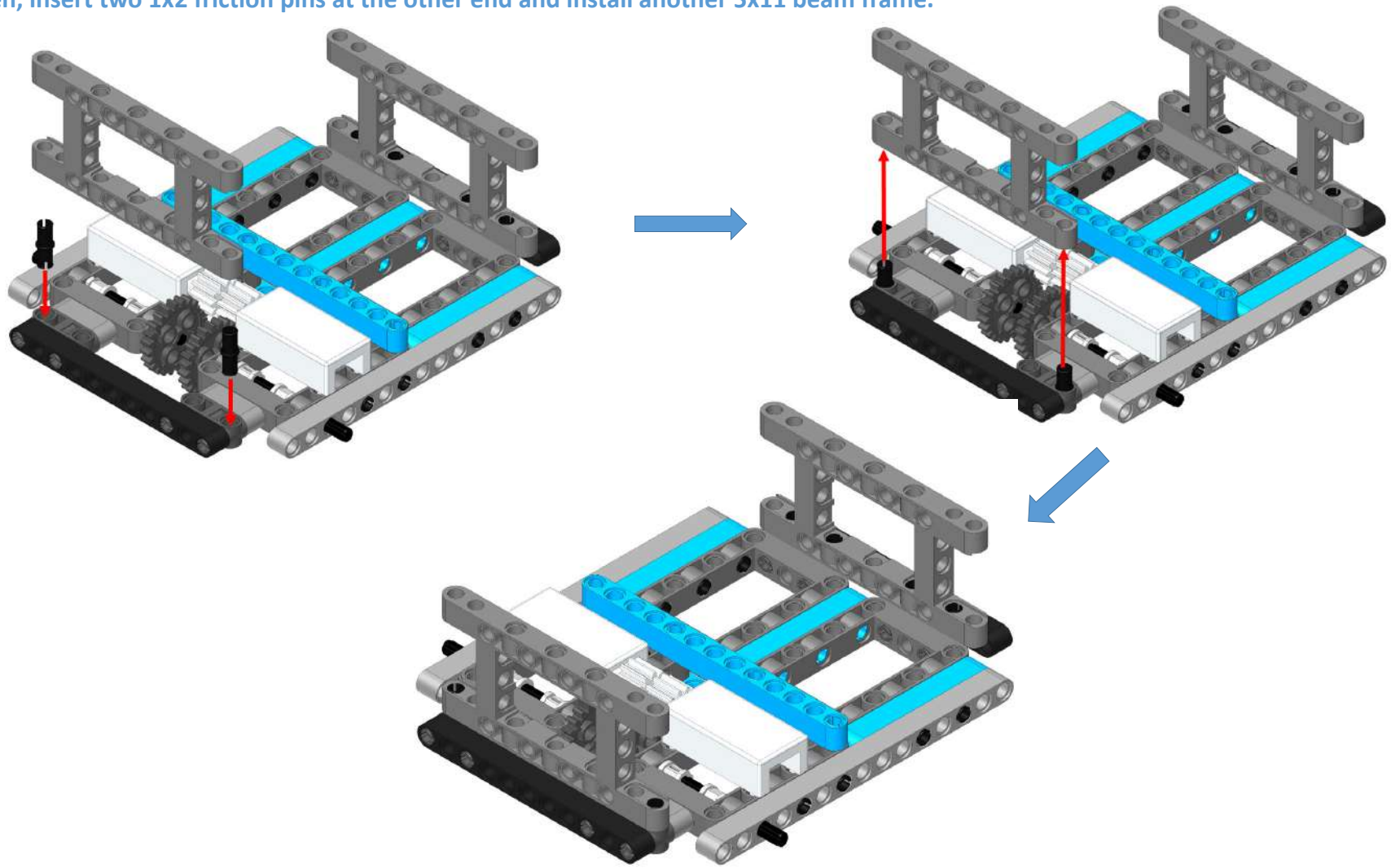
Step 12: Locate the eight 1x2 friction pins and the two 1x15 hole arms and assemble them with symmetrical sides. Each hole must be inserted correctly.



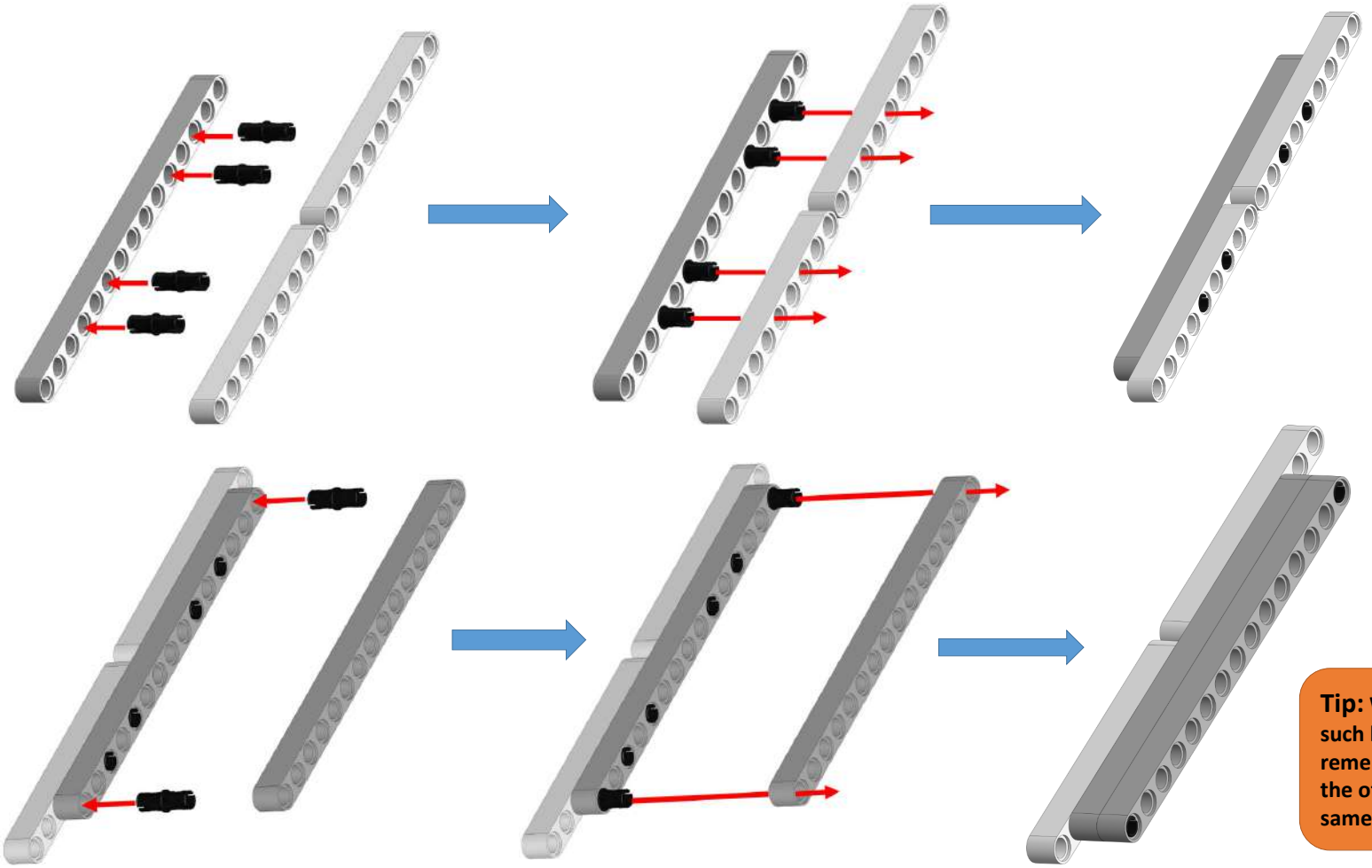
Step 13: Locate the six 1x2 friction pins and the two 5x7 beams. First, insert the four 1x2 friction pins into the appropriate positions and insert a 5x11 beam into the friction pin. Each hole must be inserted correctly.



Then, insert two 1x2 friction pins at the other end and install another 5x11 beam frame.

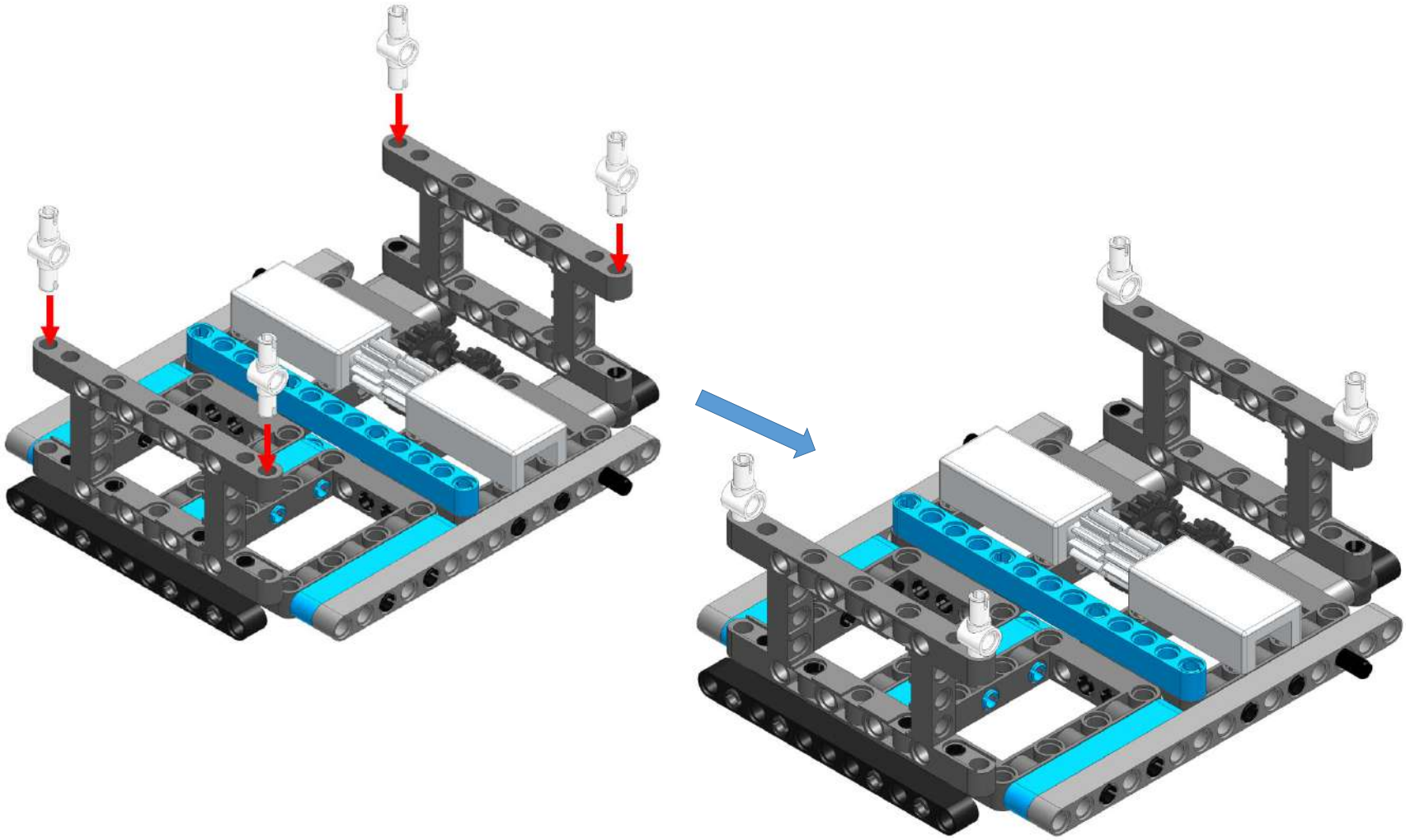


Step 14: Locate the six 1x2 friction pins, two 1x15 hole arms and two 1x9 hole arms for assembly.

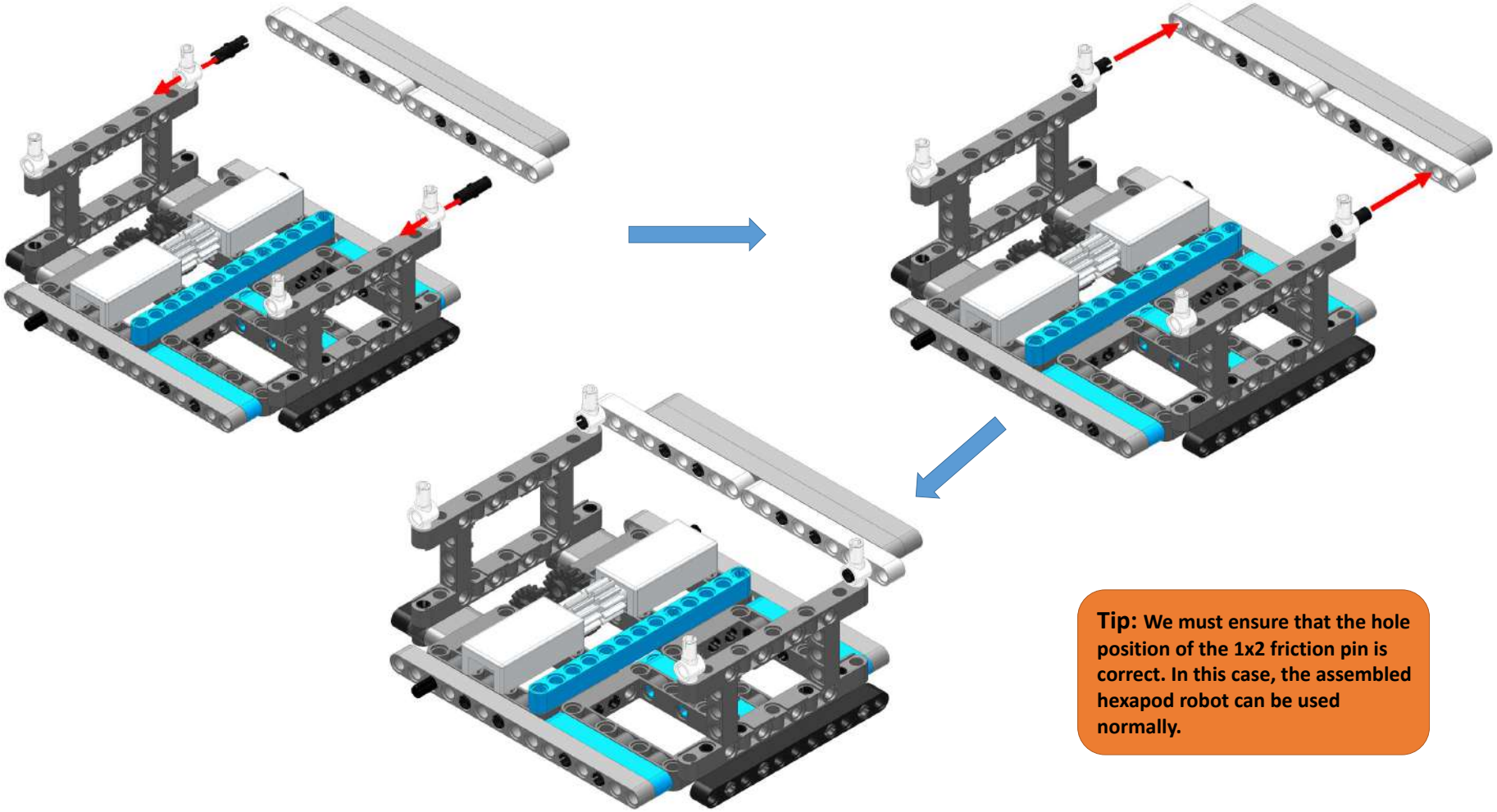


Tip: We need two such blocks. Please remember to assemble the other one in the same way.

Step 15: Locate the four 1x3 bolt connectors and install them on top of the building blocks we have assembled in step 13.



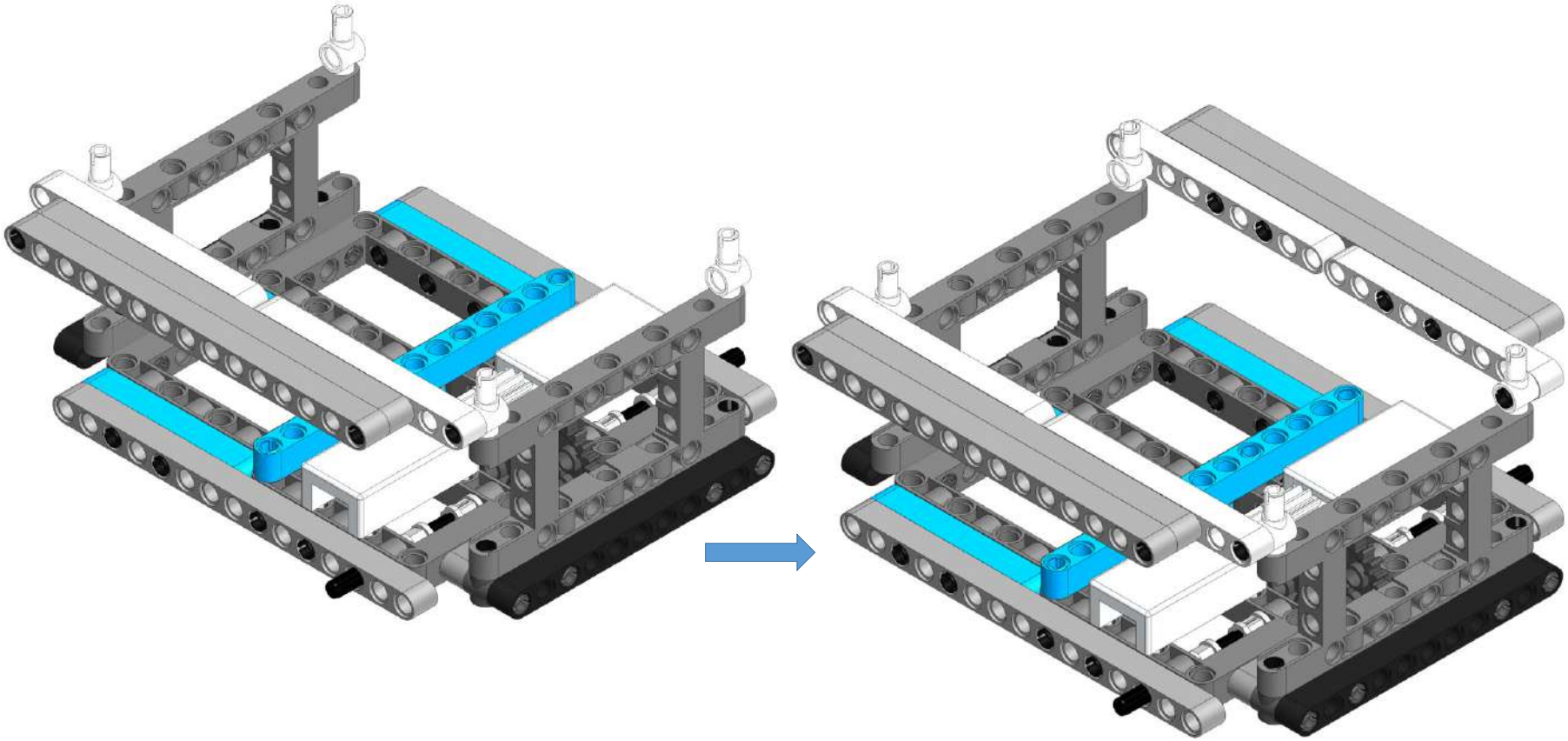
Step 16: Find two 1x2 friction pins, and use them to combine the blocks that we have assembled in step 14 and step 15.



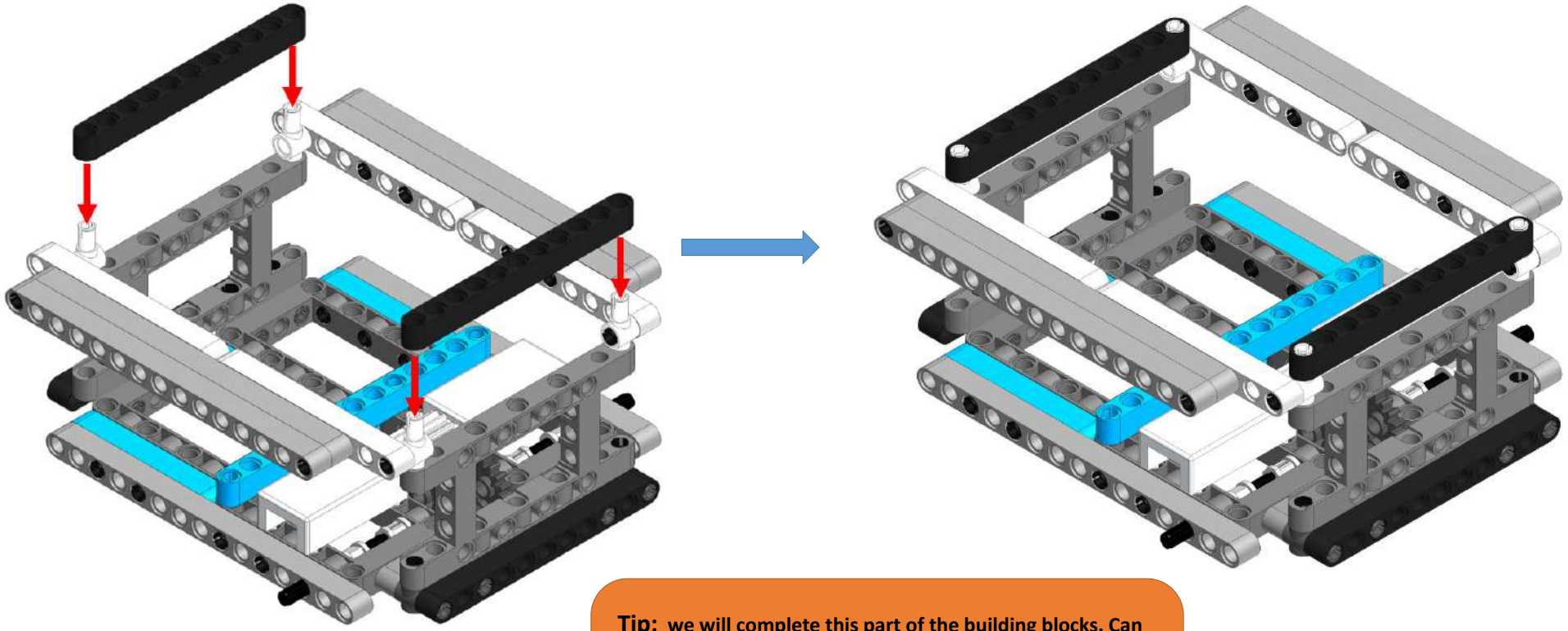
Tip: We must ensure that the hole position of the 1x2 friction pin is correct. In this case, the assembled hexapod robot can be used normally.

Step 17: Install the other side in the same way.

Tip: **The orientation of the picture in this step is different from the previous step. When you install the other side. The hole position must also be correct. If you do not know the specific orientation of the building blocks, you can judge according to the direction of the motor in the diagram. Therefore, every time you install, you should carefully check which side of the motor is on to ensure the correctness of the installation position.**

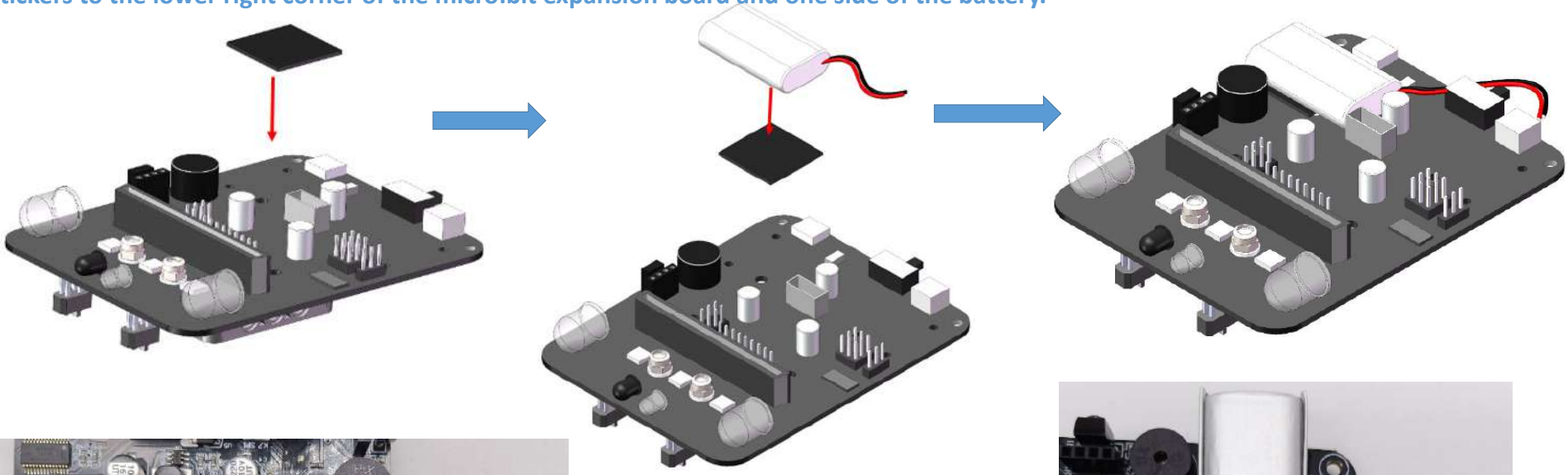


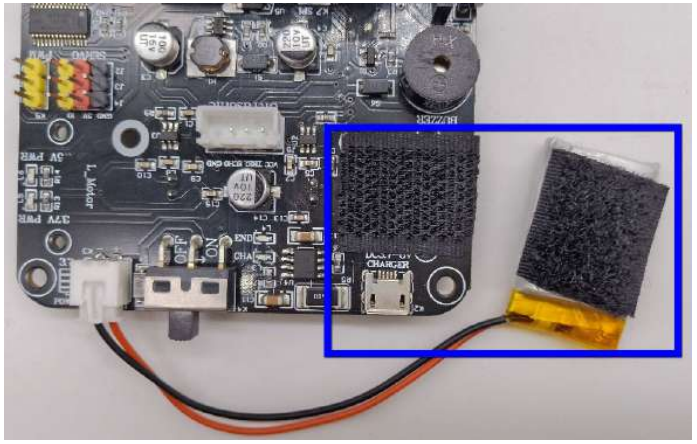
Step 18: Locate the two 1x11 hole arms and install them on the top of the four 1x3 bolt connectors on the top of the frame. The 1x3 bolt connectors are inserted into the hole at the most ends of the 1x11 hole arm.



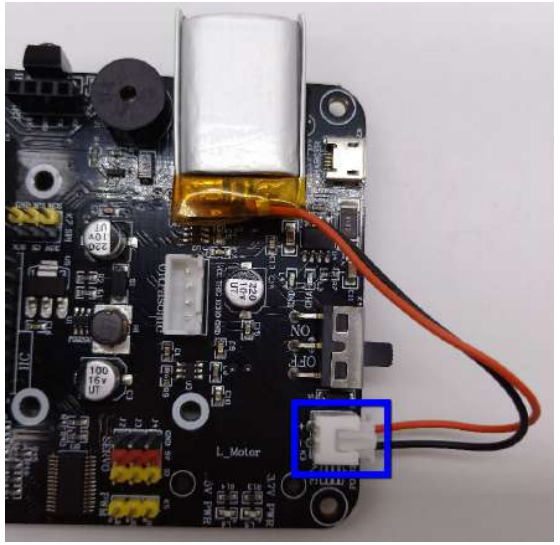
Tip: we will complete this part of the building blocks. Can you compare the blocks that you have stitched together with the pictures? If it is not the same, then you have to go back and carefully check our assembly steps to see if you have made a mistake. Put the assembled blocks aside and let's move on to the next steps.

Step 19: 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.

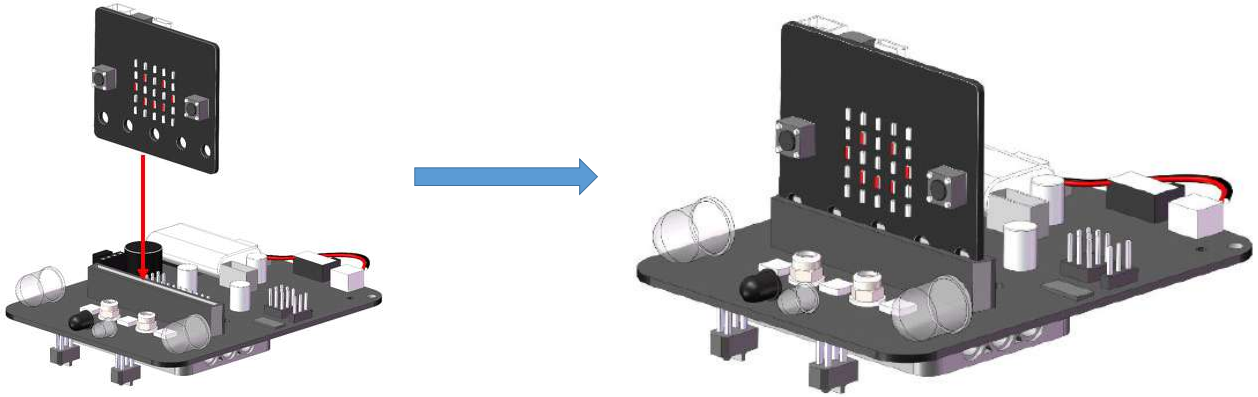




Tip: Battery sockets, we use anti-reverse design, just plug the battery into the socket.

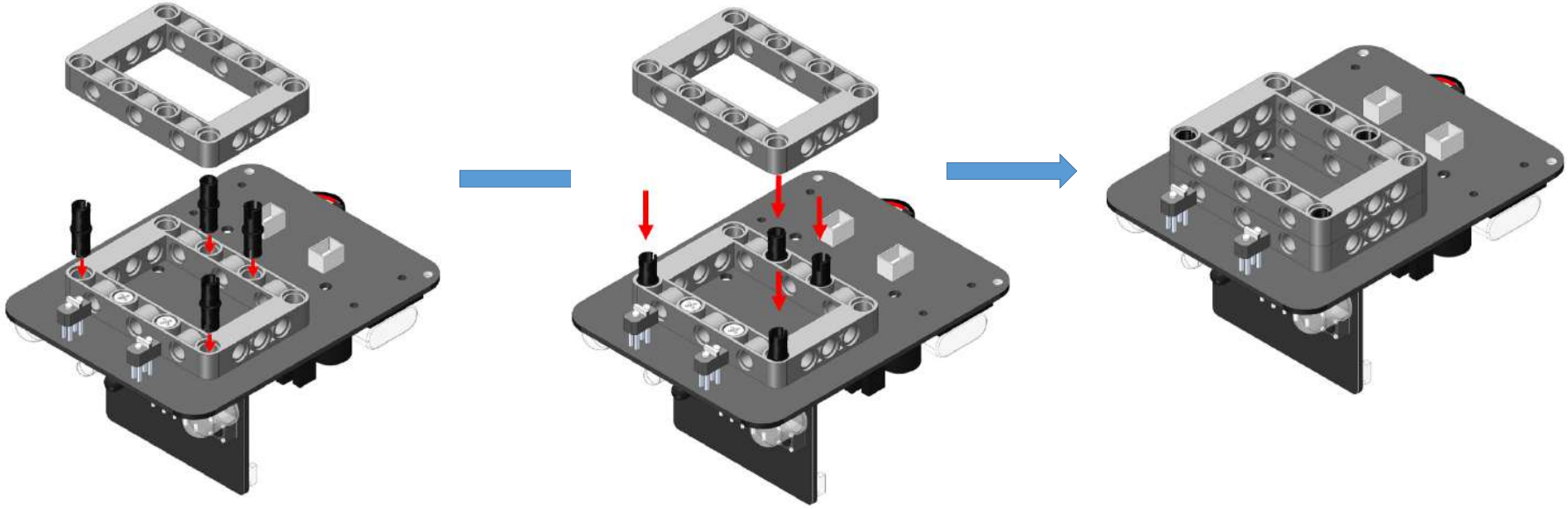


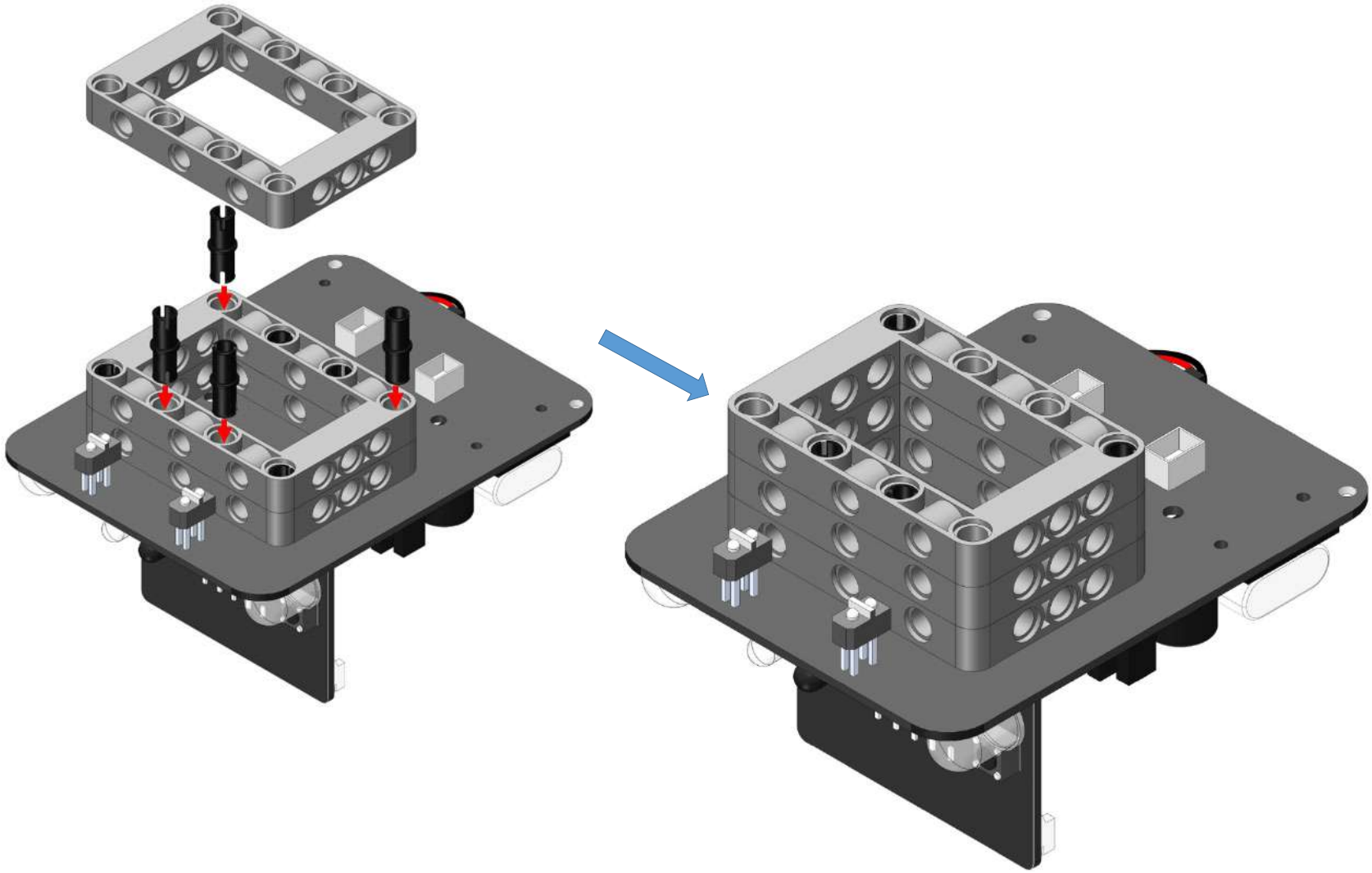
Step 20: Locate the micro:bit motherboard and insert the board into the expansion board correctly.

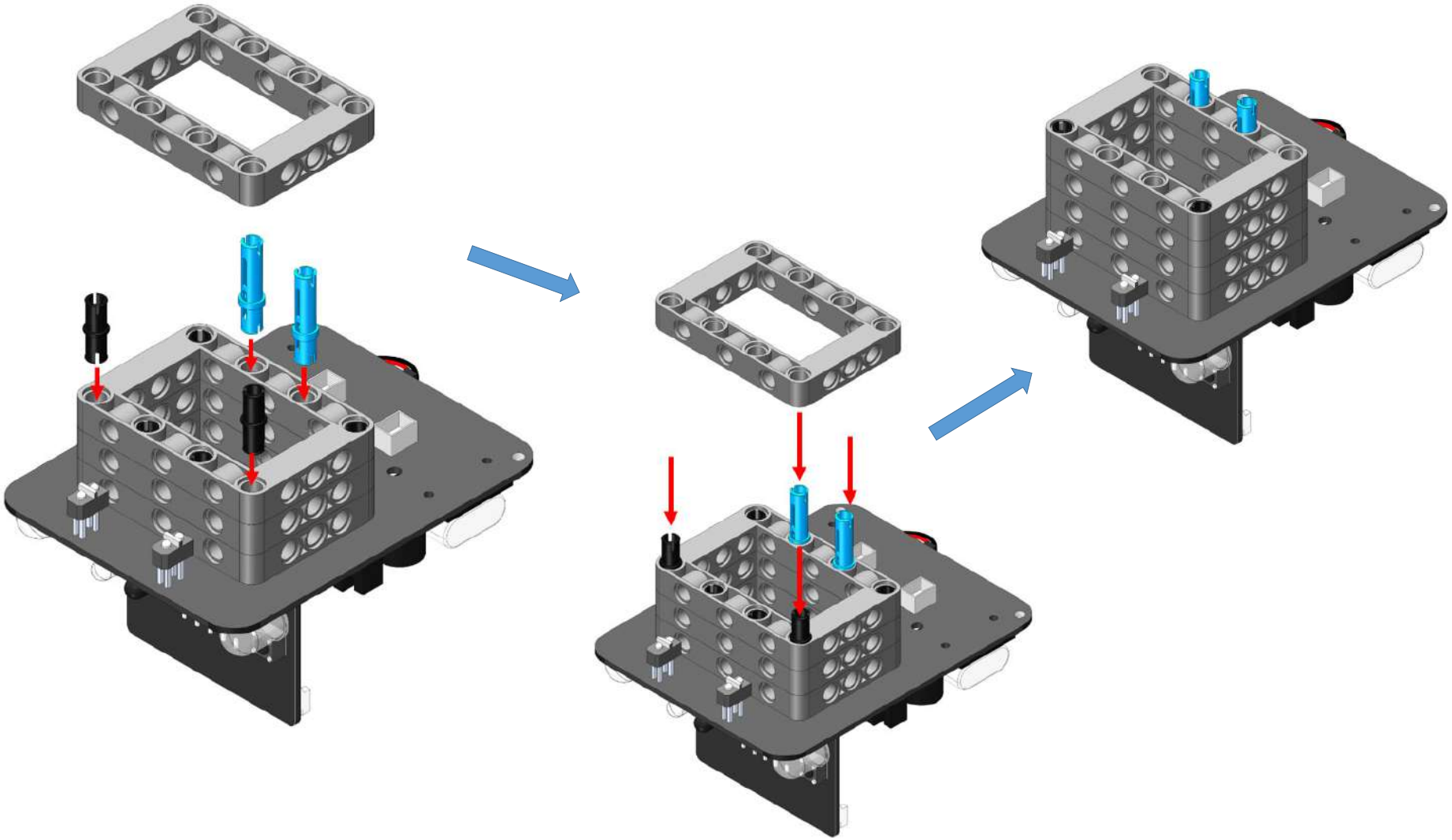


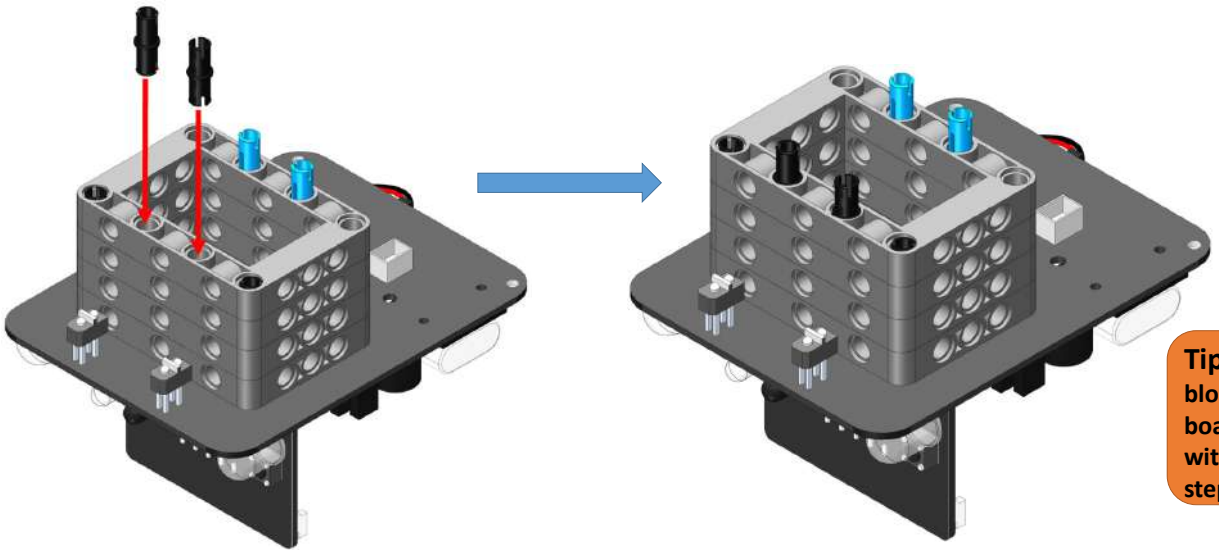
Tip: The micro:bit board is is equivalent to the "brain" of the hexapod robot, so we need to make sure it is installed correctly. In this case, the hexapod robot will work properly.

Step 21: Find the micro:bit expansion board, twelve 1x2 friction pins, two 1X3 bolts and three 5x7 beam frames to assemble them.



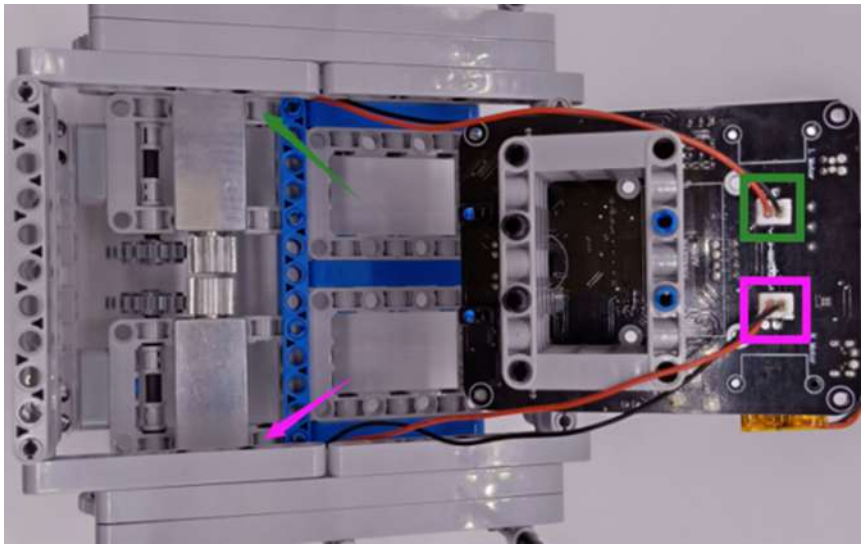






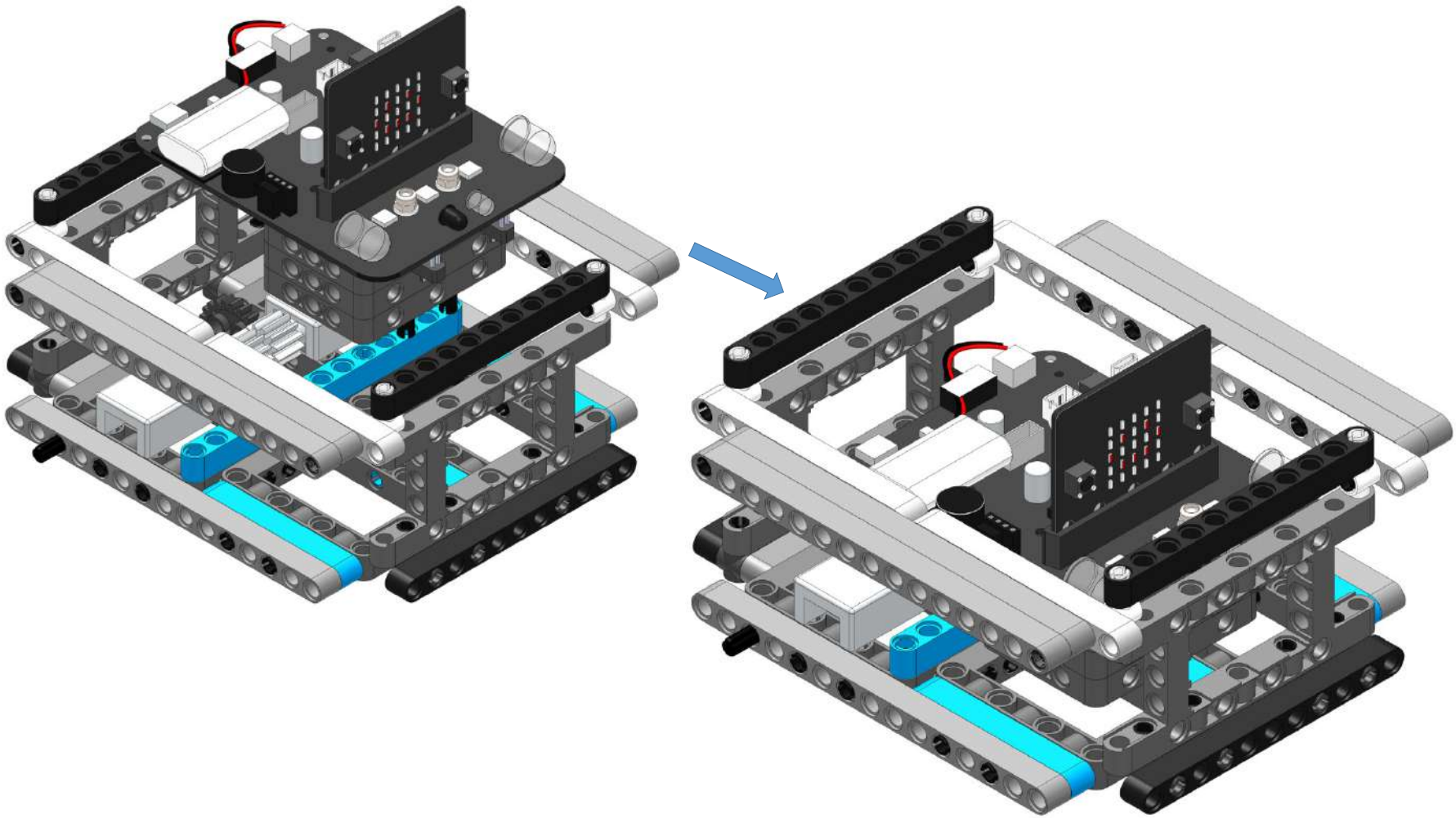
Tip: Go here, we will complete the building blocks of this part of the micro:bit expansion board. Next we need to combine this part with the blocks we have completed in the step 18.

Step 22: Connect the line of the left motor to the motor interface on the left side of the expansion board, and the line of the right motor to the motor interface on the right side of the expansion board.

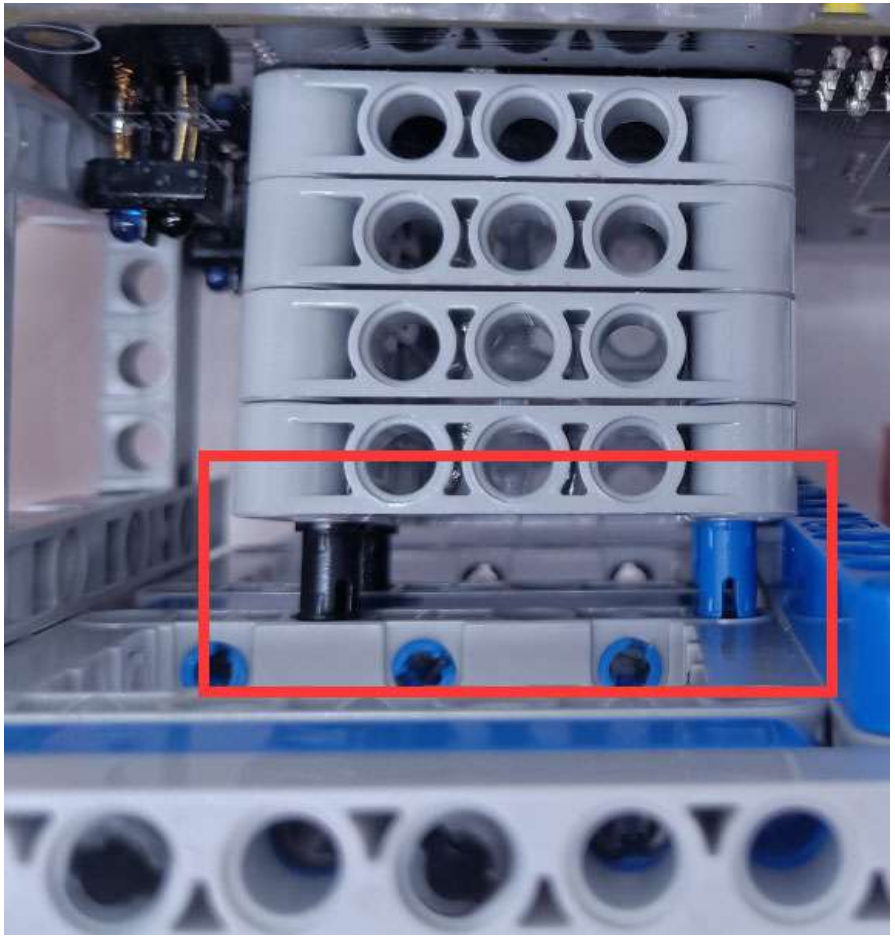


Tip: Be sure to follow the instructions shown in the figure. In this case, the hexapod robot can walk normally.

Step 23: Combine the two pieces of building blocks that we have assembled in steps 17 and steps 21.

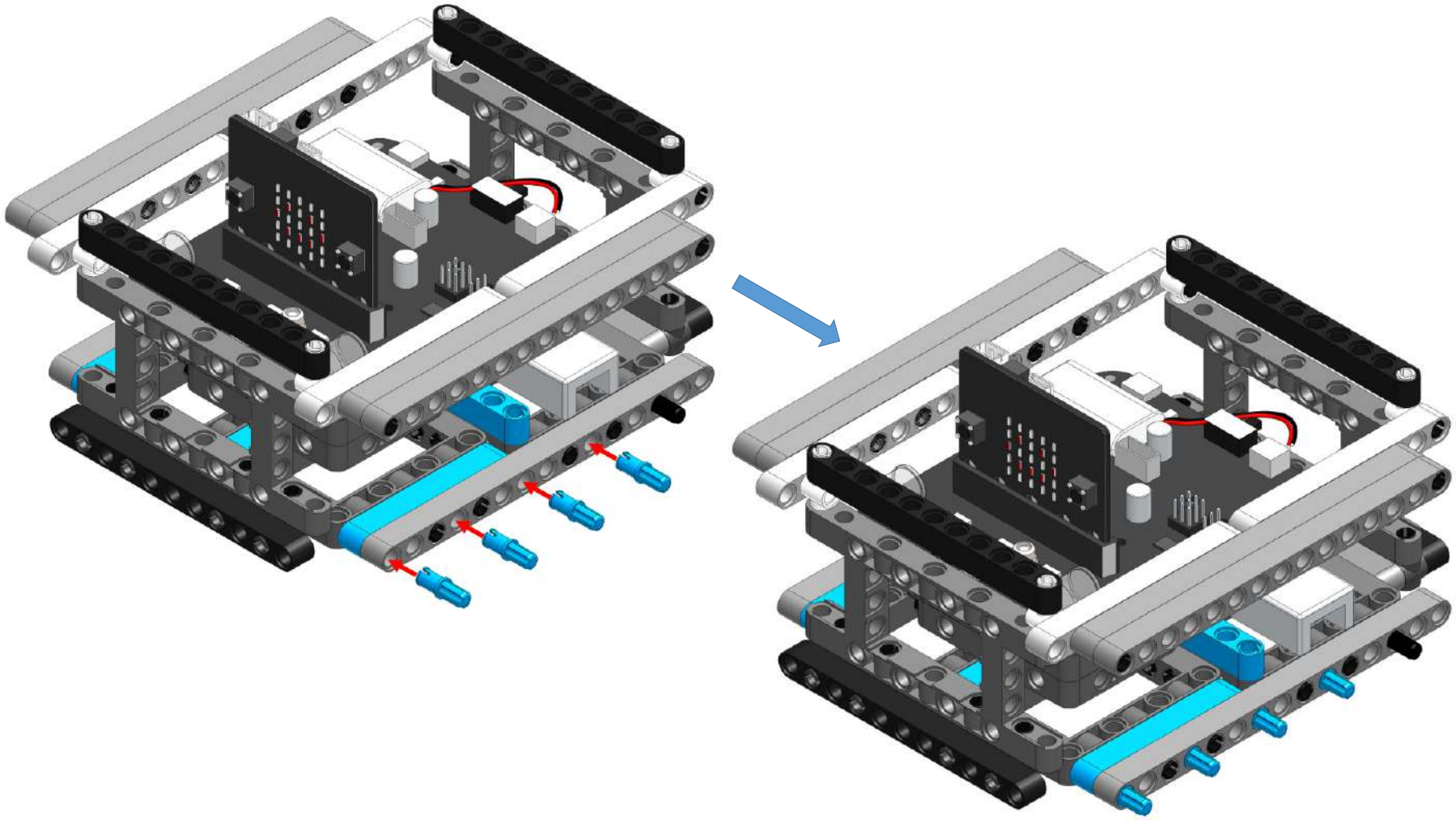


The side view of the joint part of the building block in step 23 is shown in the figure below.

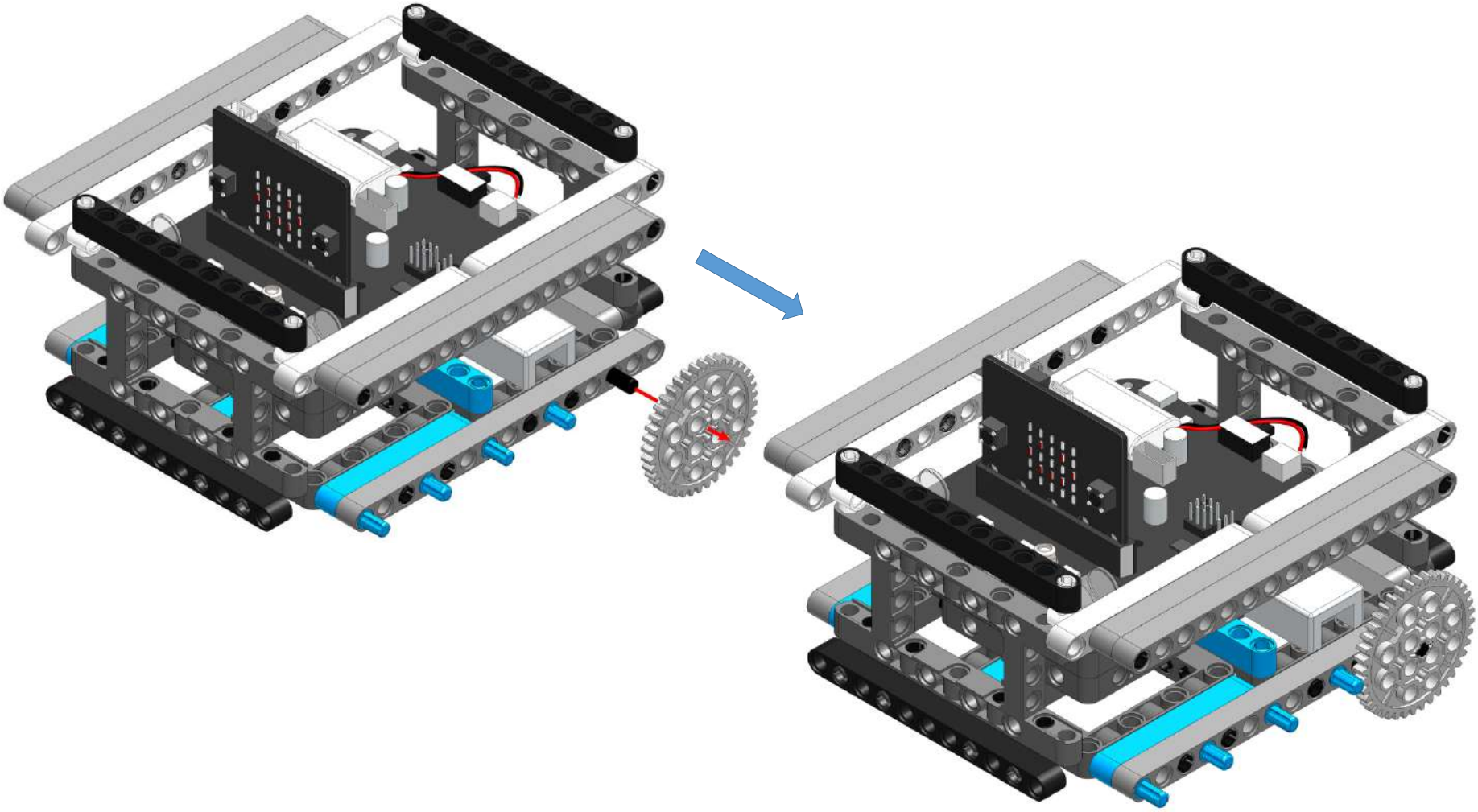


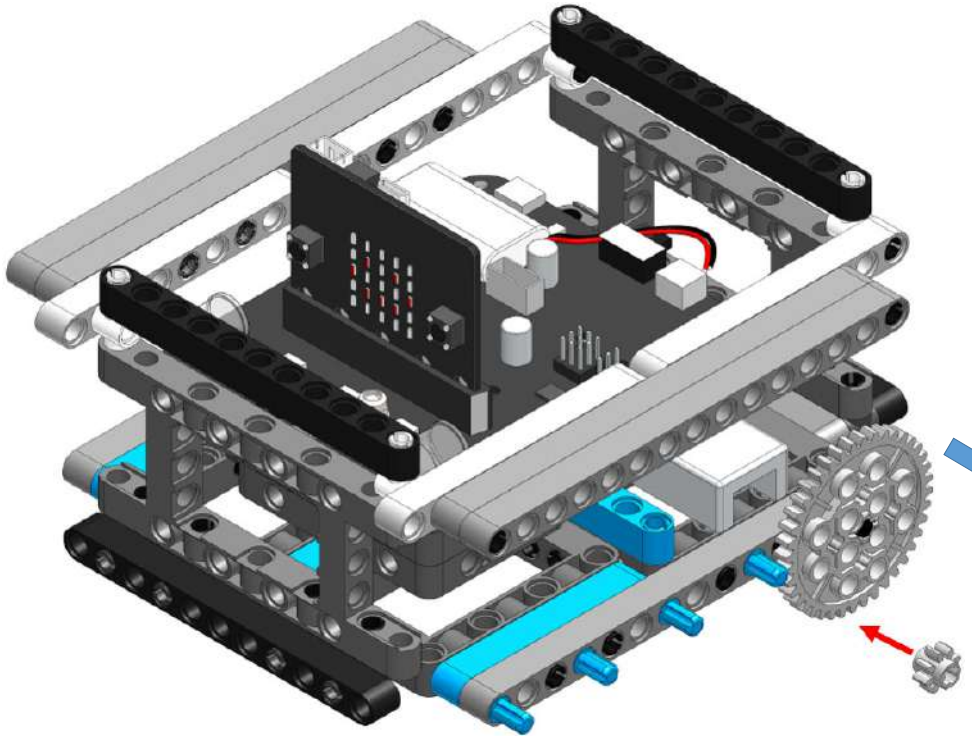
Tip: To get here, the overall frame of this hexapod robot has been assembled. Next we will assemble the six "foot" of the hexapod robot.

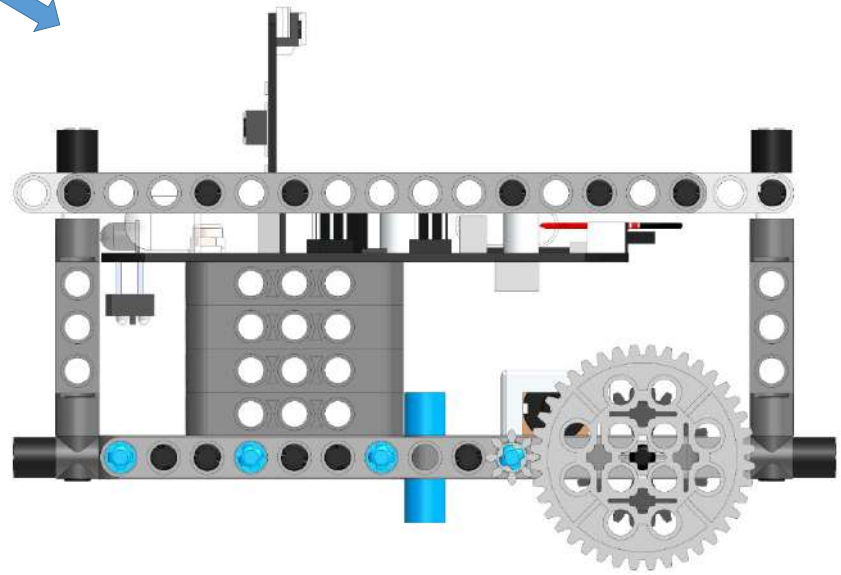
Step 24: Look for four 1x2 shaft couplings and insert them into the corresponding holes on the side 1x15 hole arms.

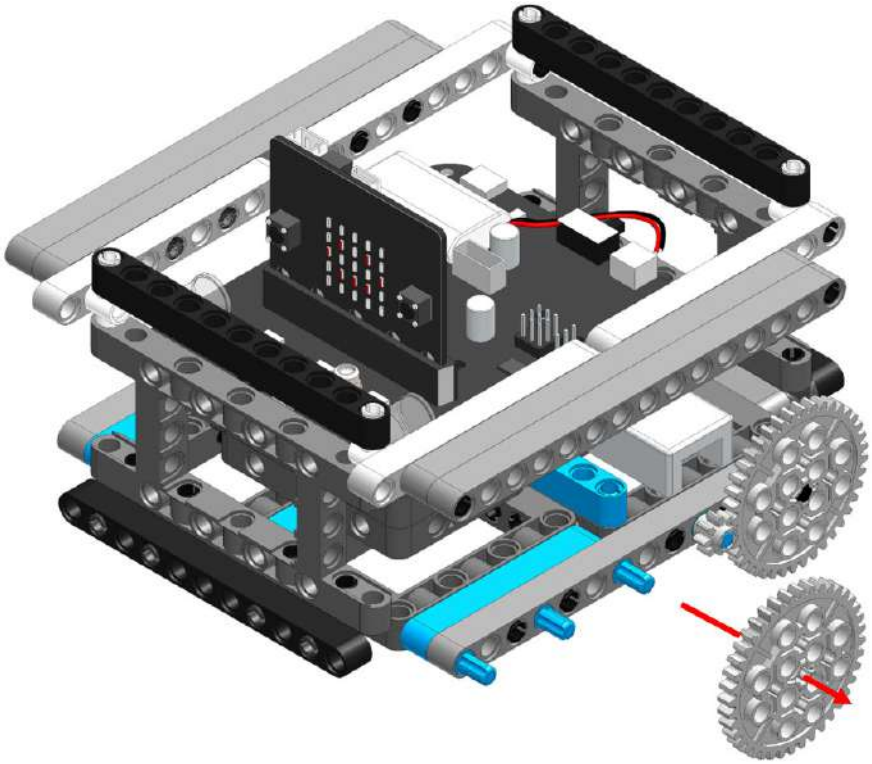


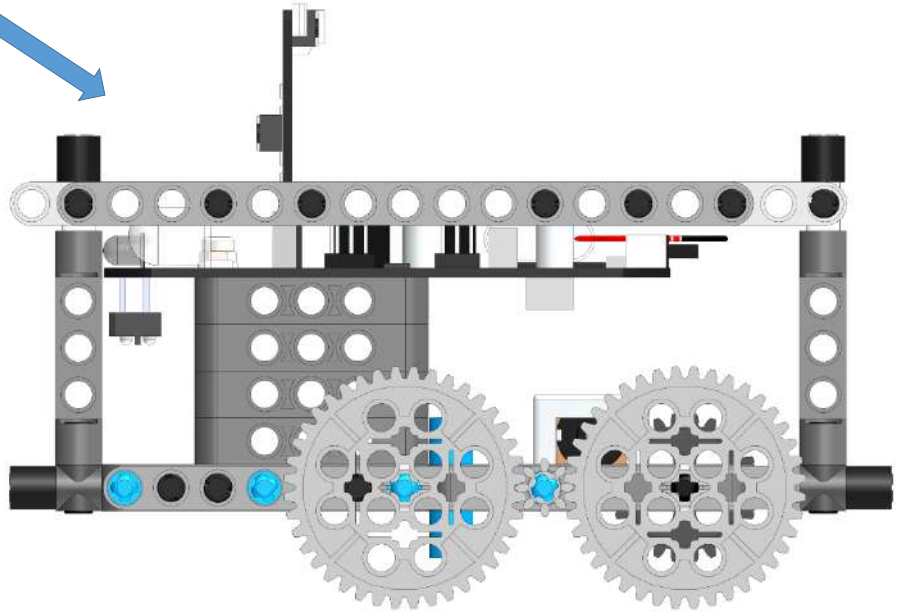
Step 25: Look for three 40-toothed, two 8-toothed wheel, and install them. As shown in the figure below.

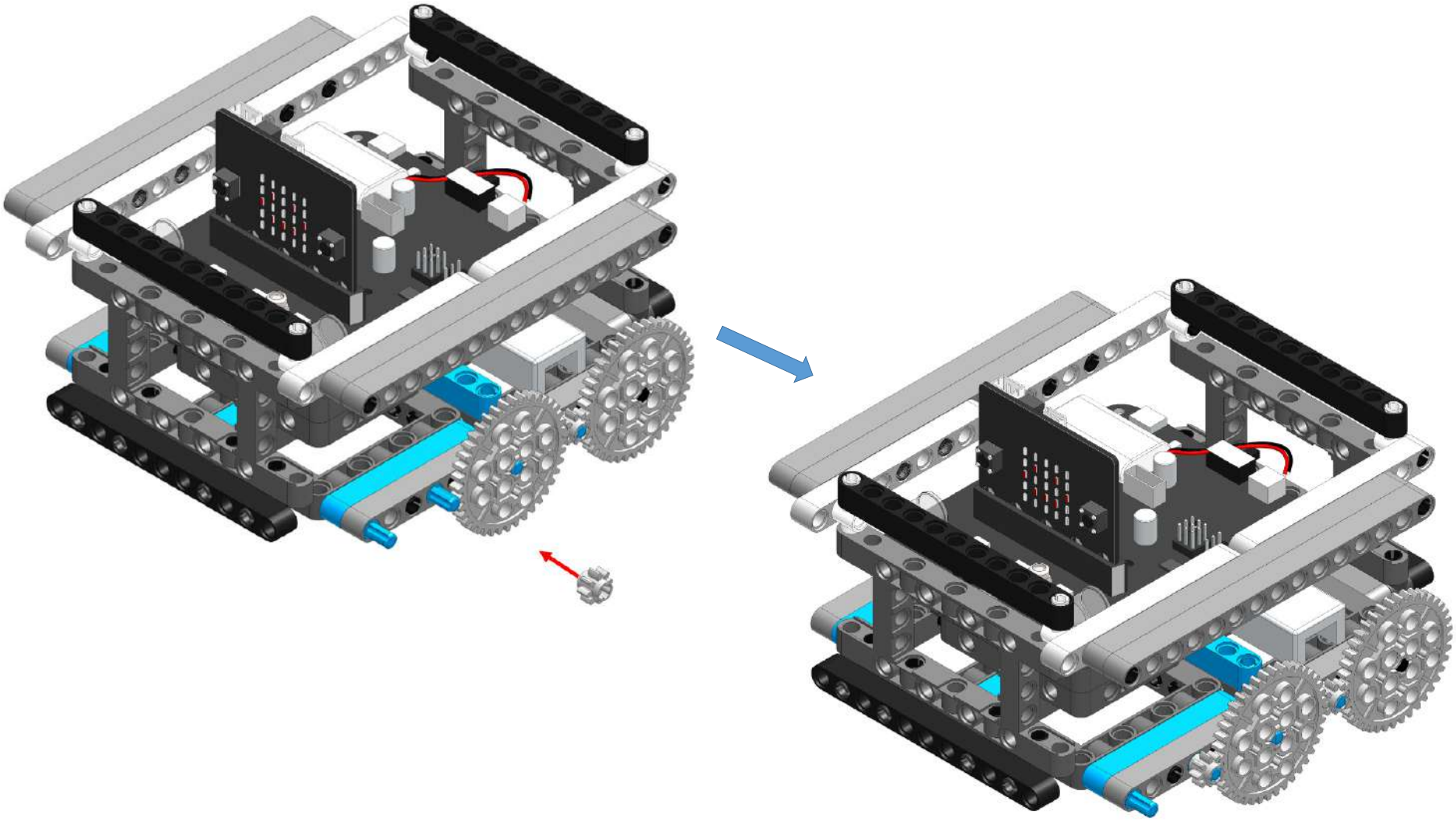


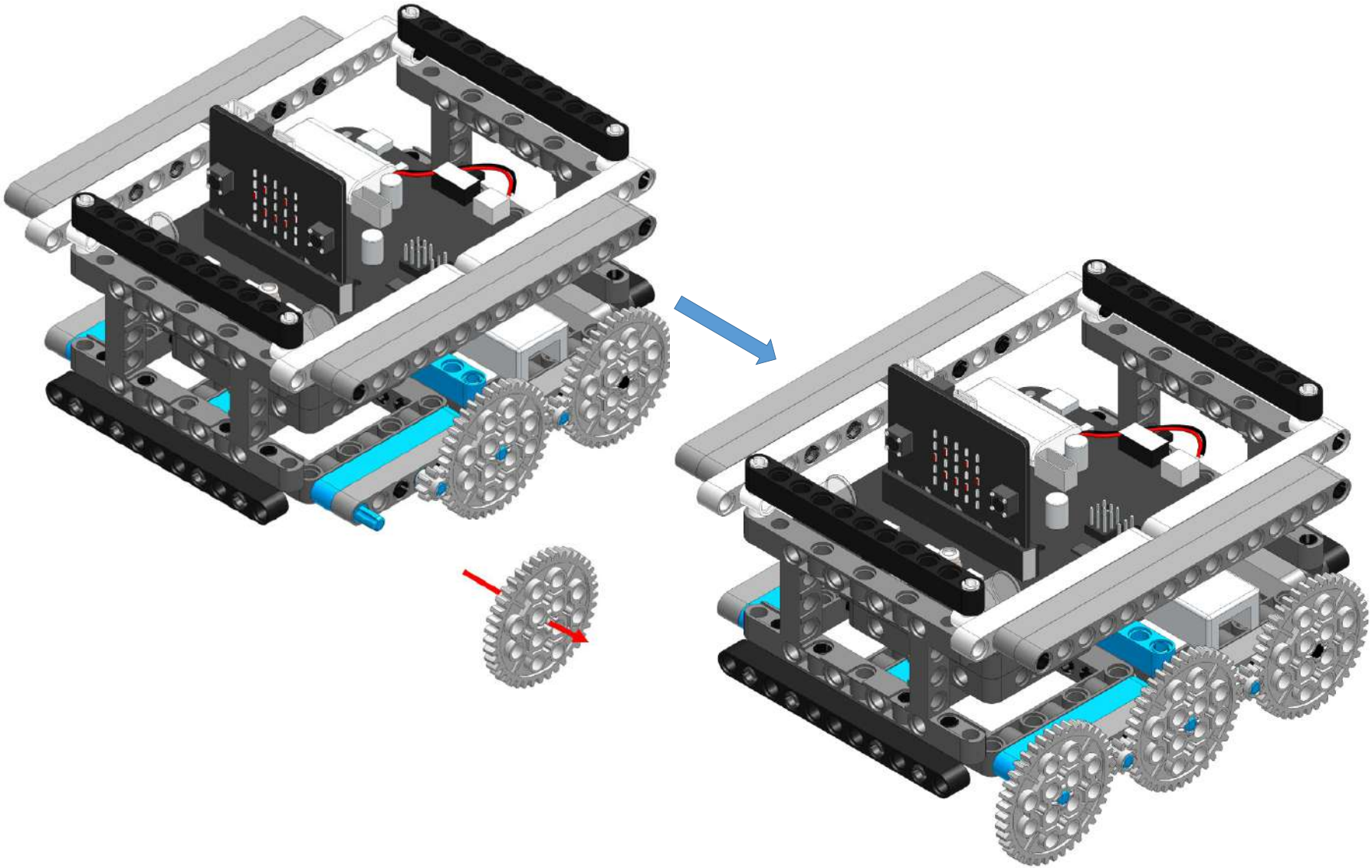






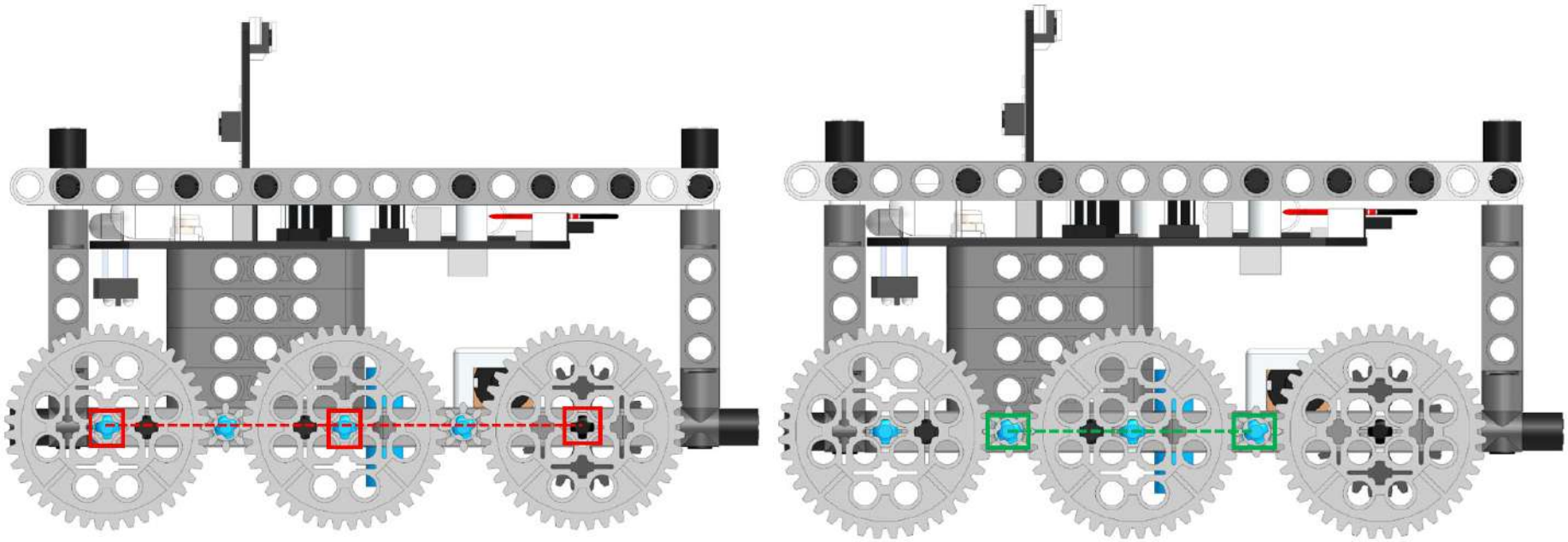






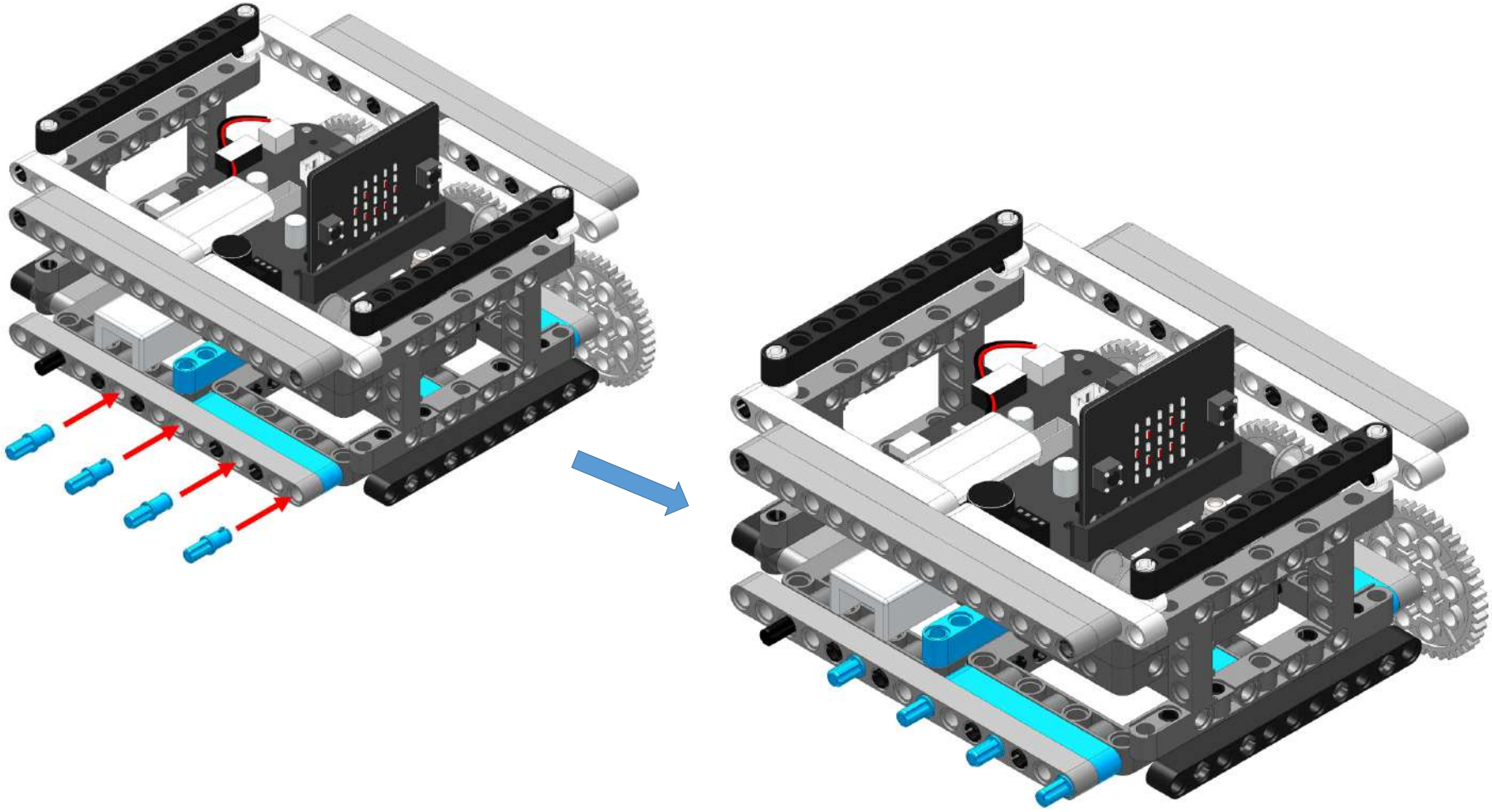
LOOK!

In order to ensure that the wheel is installed, the robot can walk normally. We need to adjust the direction of the central axis of each gear to the same direction on the same horizontal line.
Here we need to adjust the direction of the central axes of the three 40-toothed wheels (a small cross) to the same direction on the same horizontal line, and adjust the central axis of the eight 8-toothed wheel (a small cross) to the same direction on the same horizontal line.
You can also install directly according to the picture.

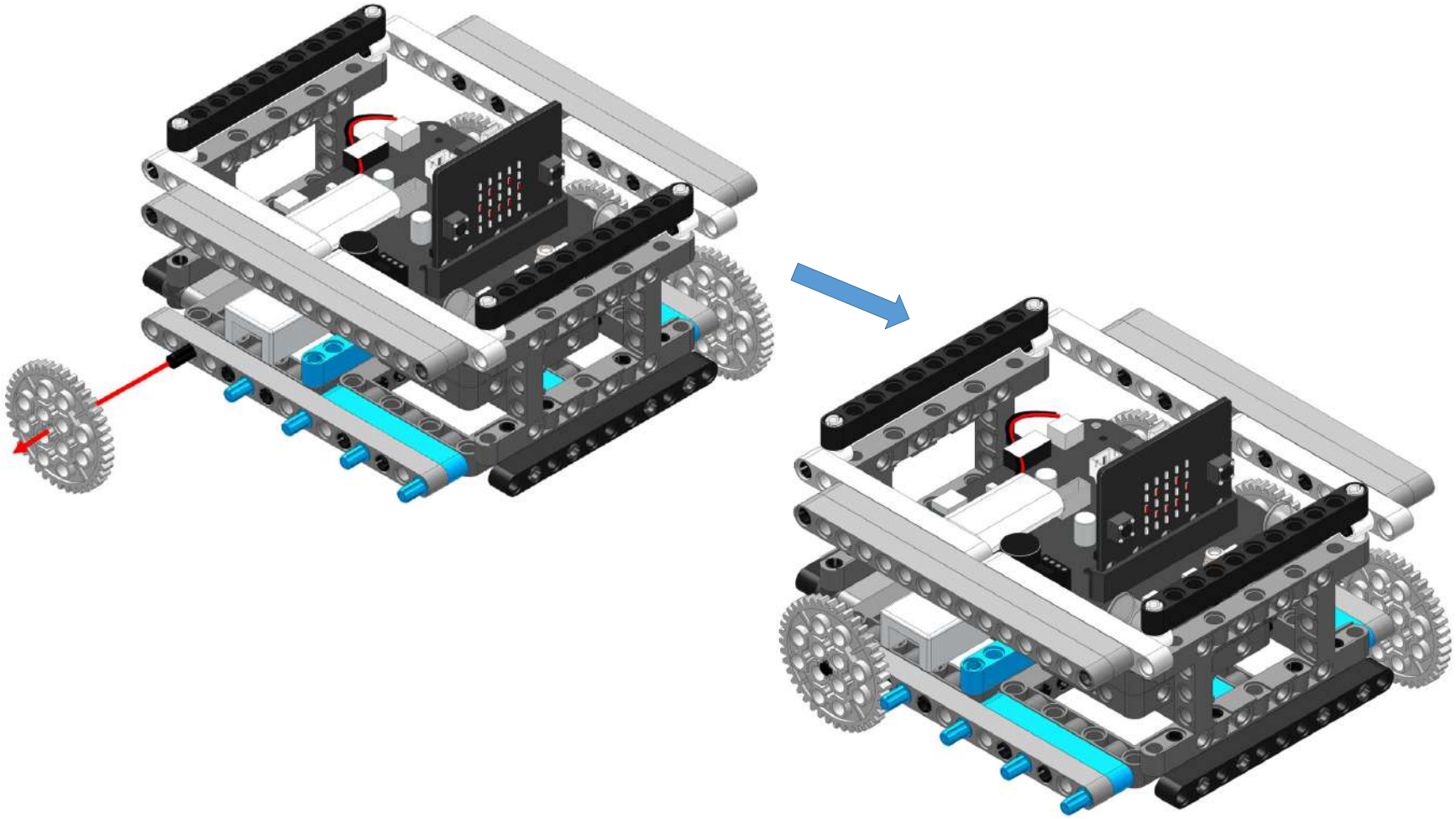


DIY

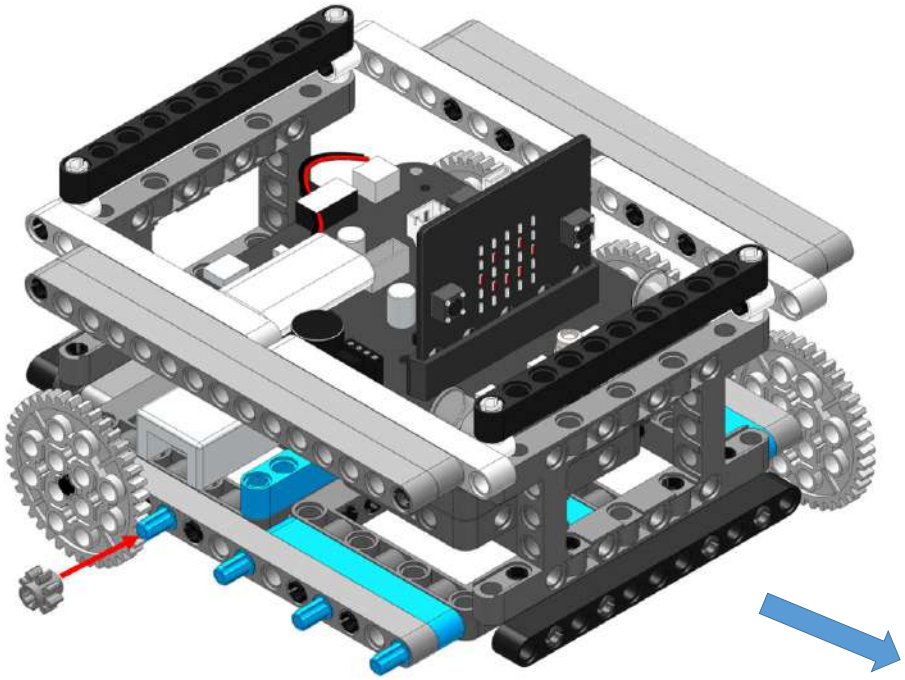
Step 26: Look for four 1x2 shaft bolts and insert them into the corresponding holes on the 1x15 hole arm on the other side of the frame.

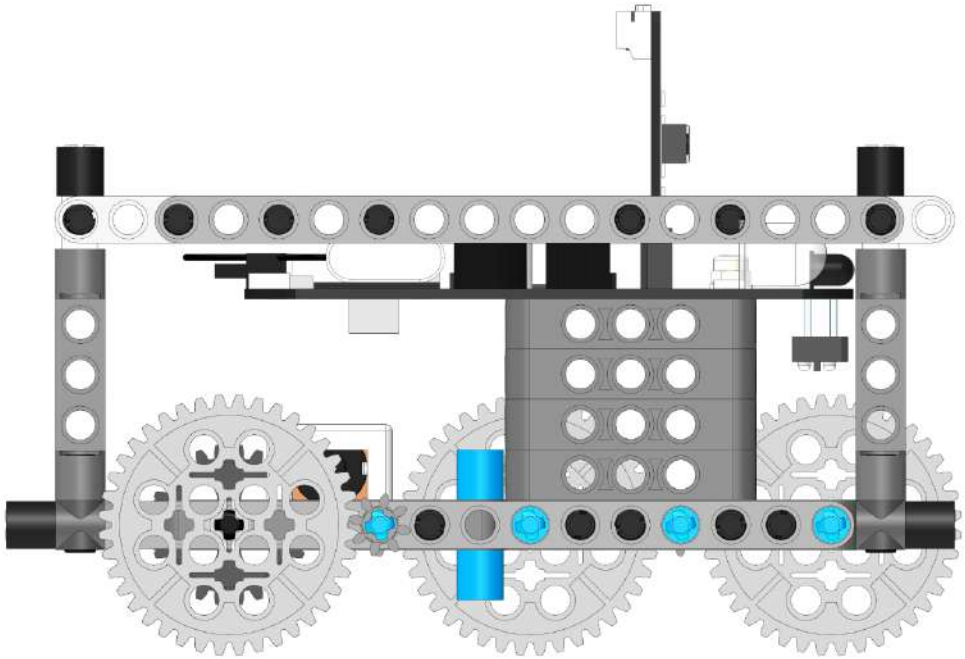


Step 27: Install the wheel on the other side of the hexapod robot. Look for four 1x2 shaft bolts, three 40-toothed wheel, and two 8-toothed wheel to mount them. As shown in the figure below.

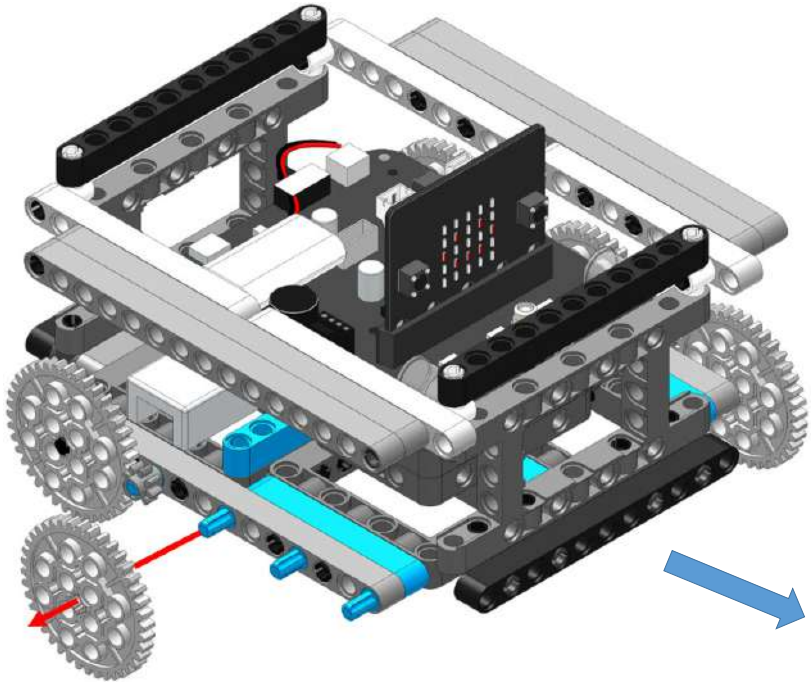


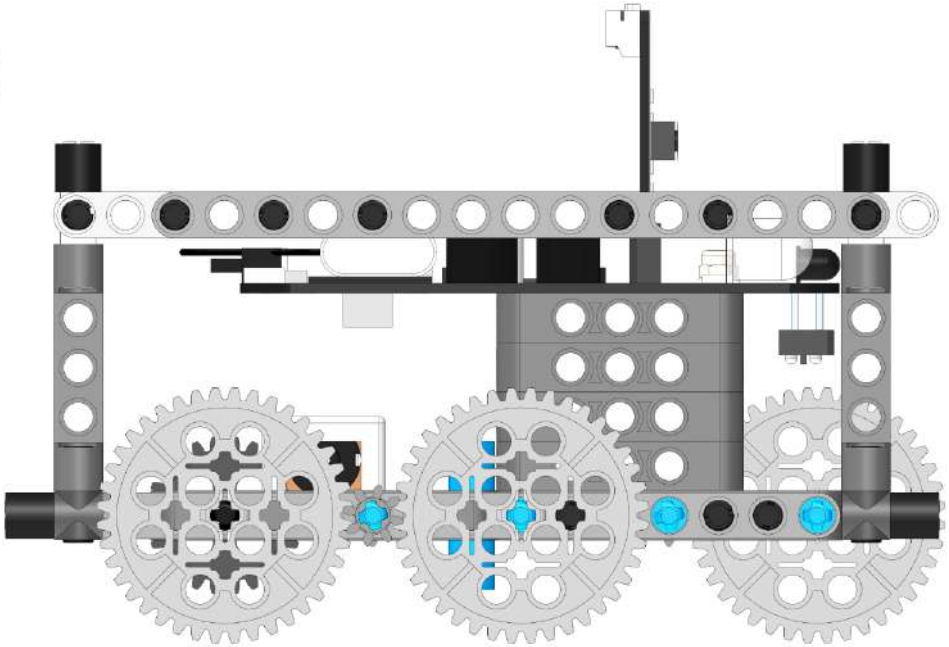
DIY



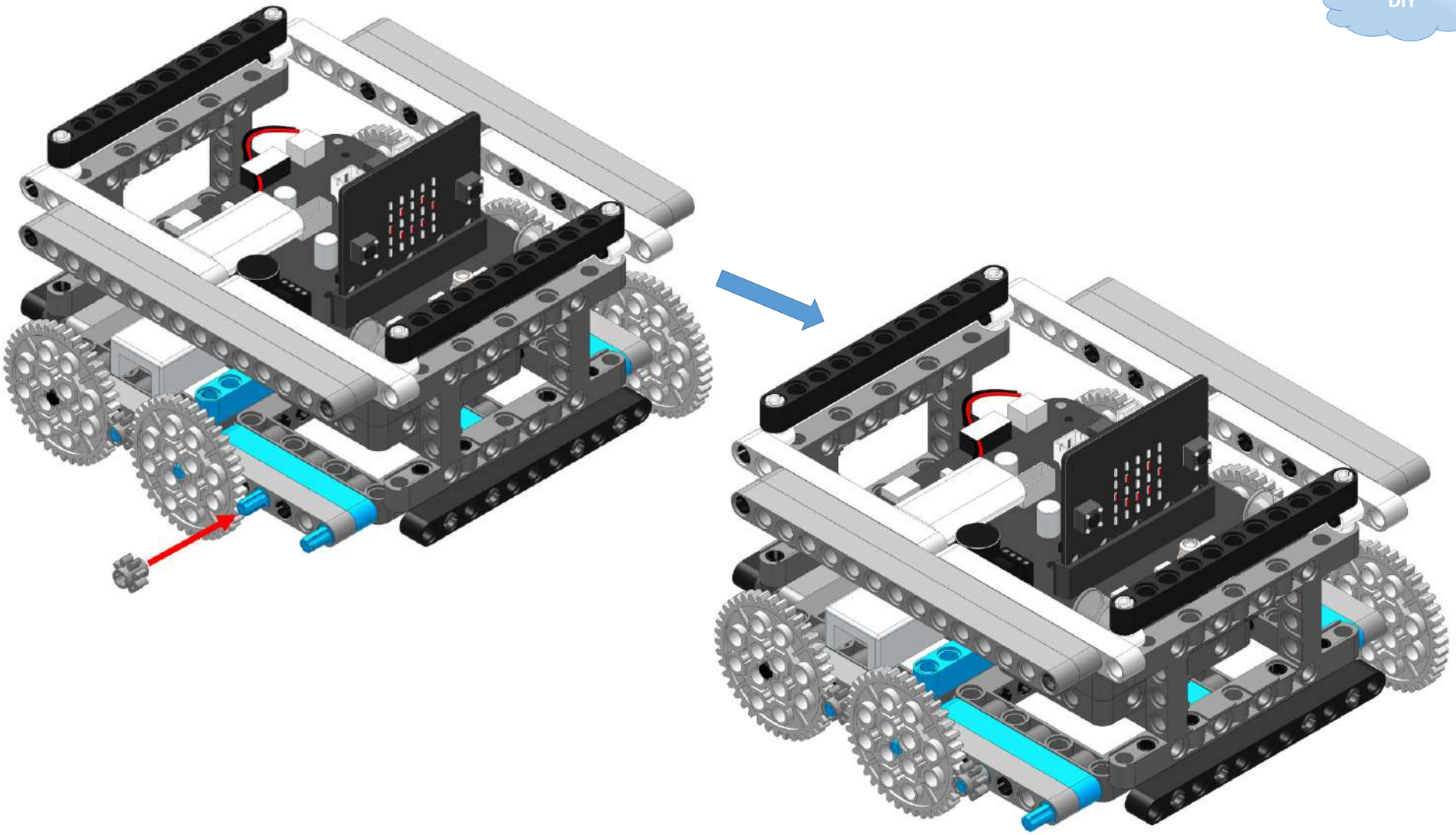


DIY

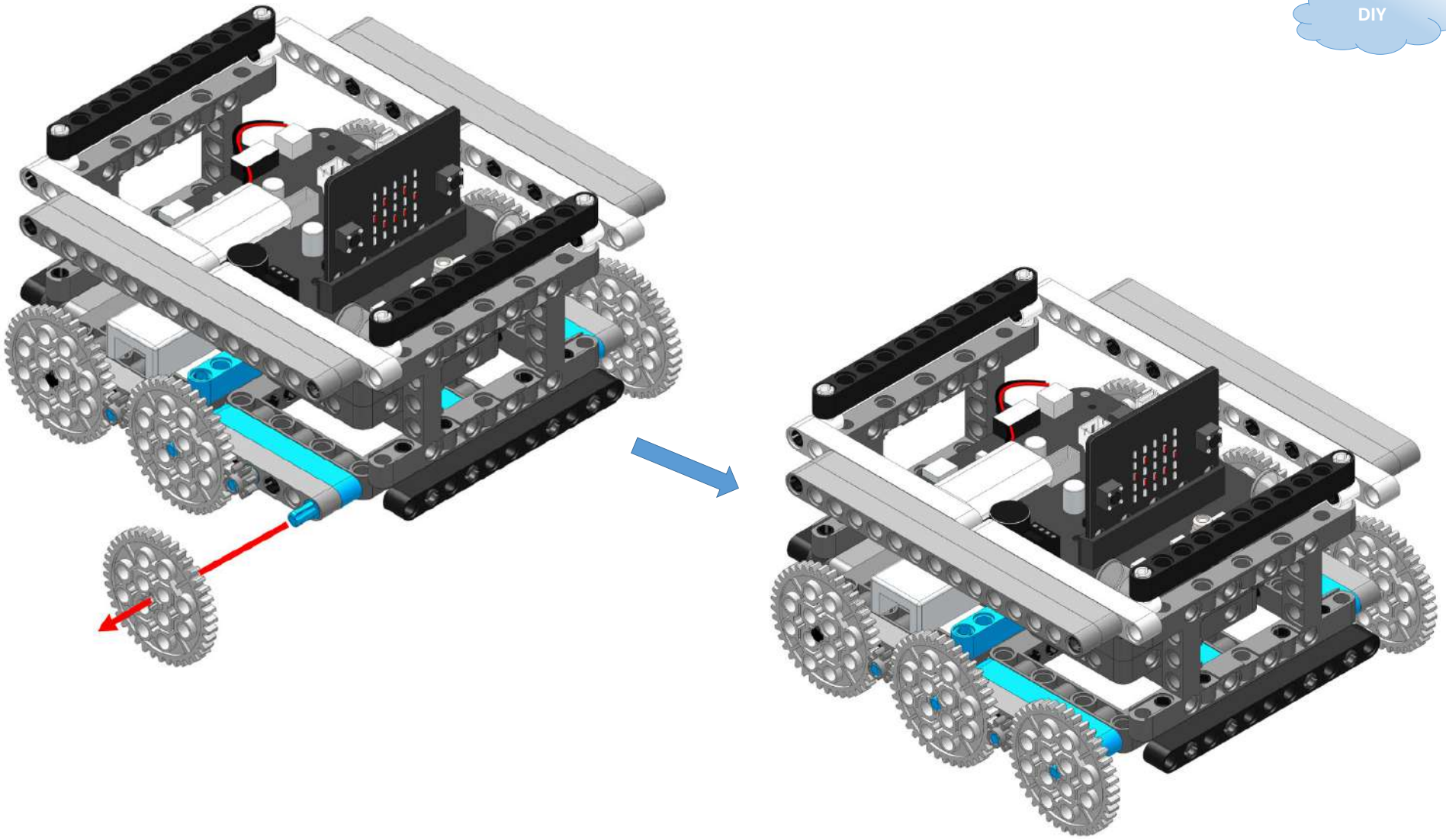




DIY



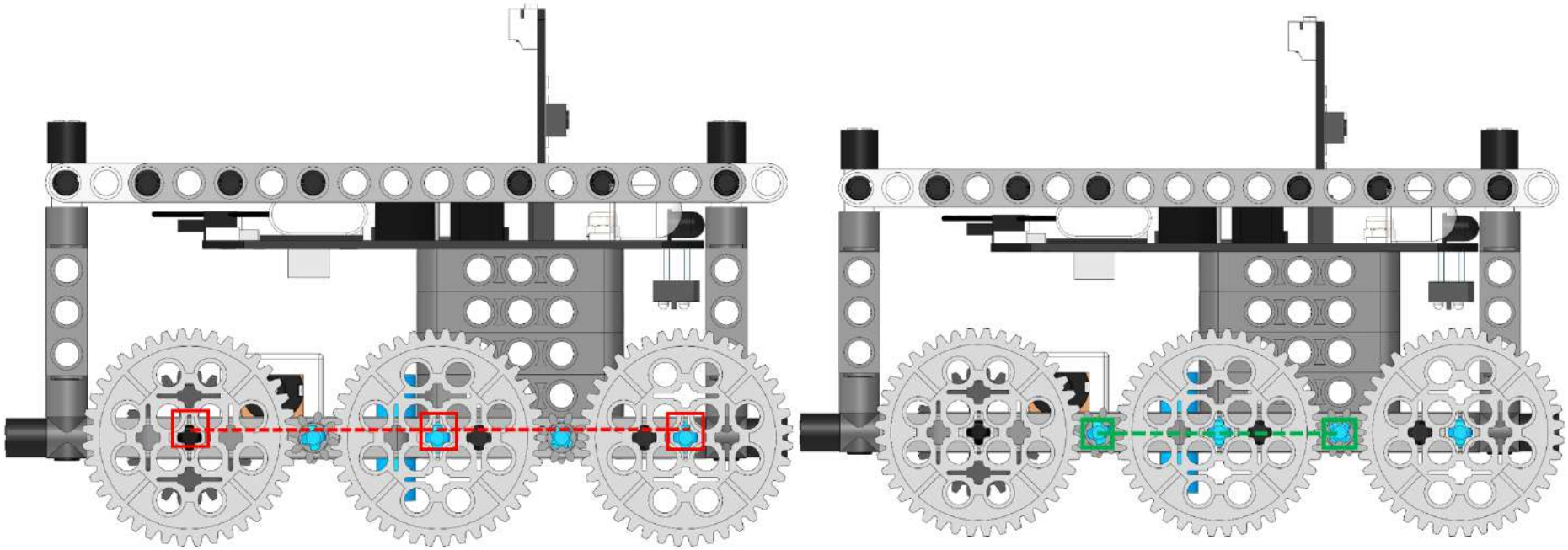
DIY



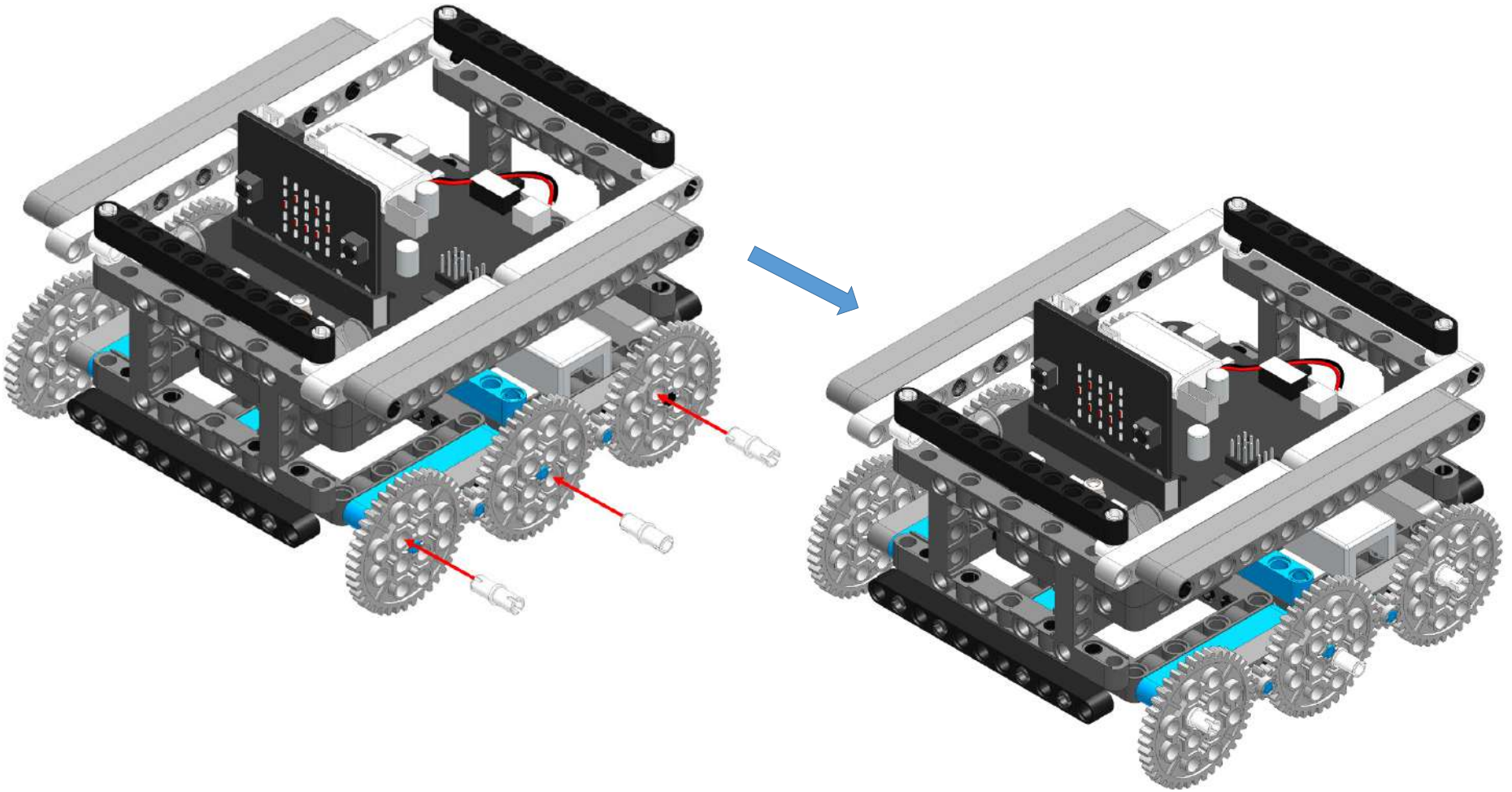
DIY

LOOK!

In order to ensure that the wheel is installed, the robot can walk normally. We need to adjust the direction of the central axis of each gear to the same direction on the same horizontal line.
Here we need to adjust the direction of the central axes of the three 40-toothed wheels (a small cross) to the same direction on the same horizontal line, and adjust the central axis of the eight 8-toothed wheels (a small cross) to The same direction on the same horizontal line.
You can also install directly according to the picture.

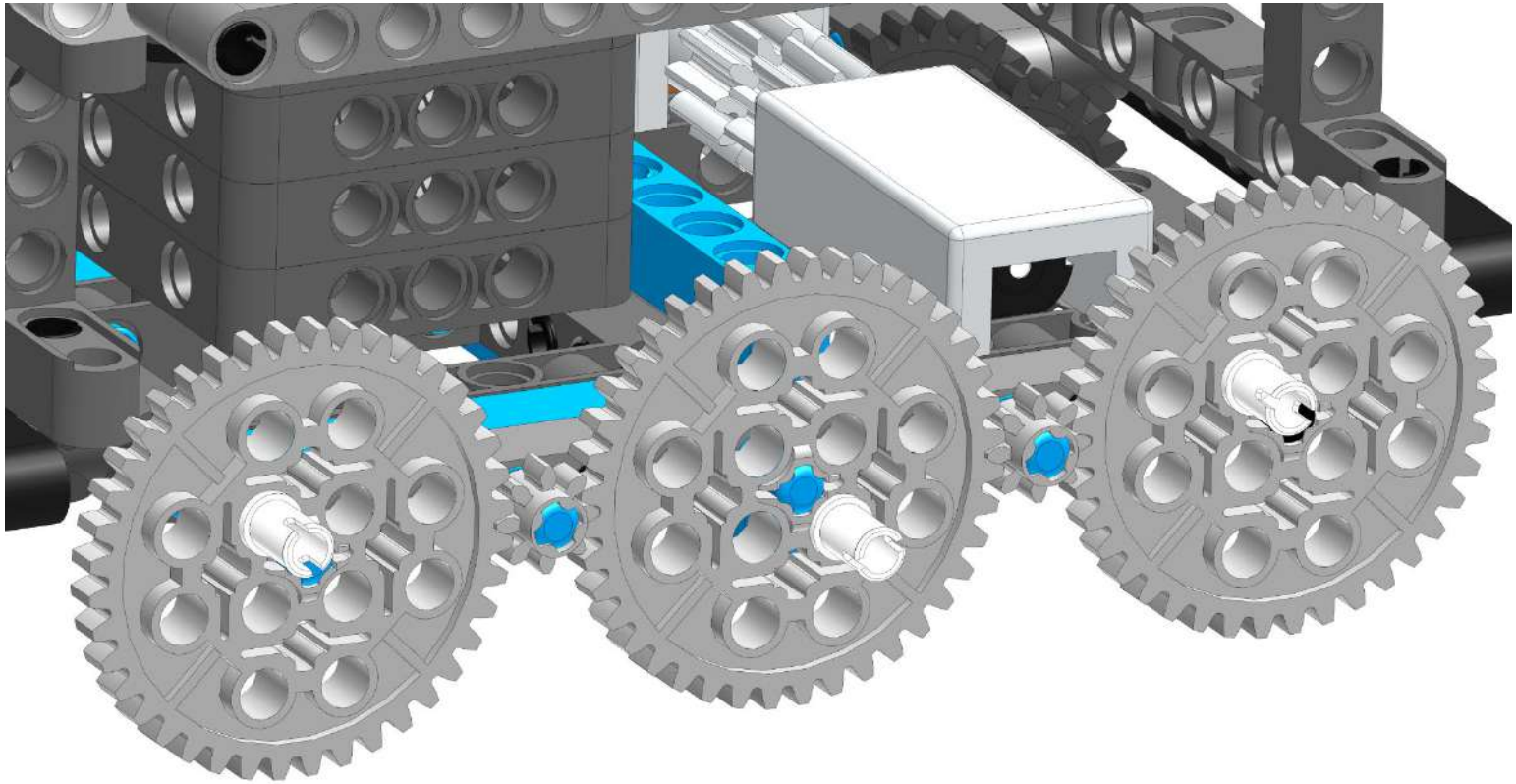


Step 28: Look for three smooth pins and insert them into the corresponding positions of the side 40-toothed wheel.

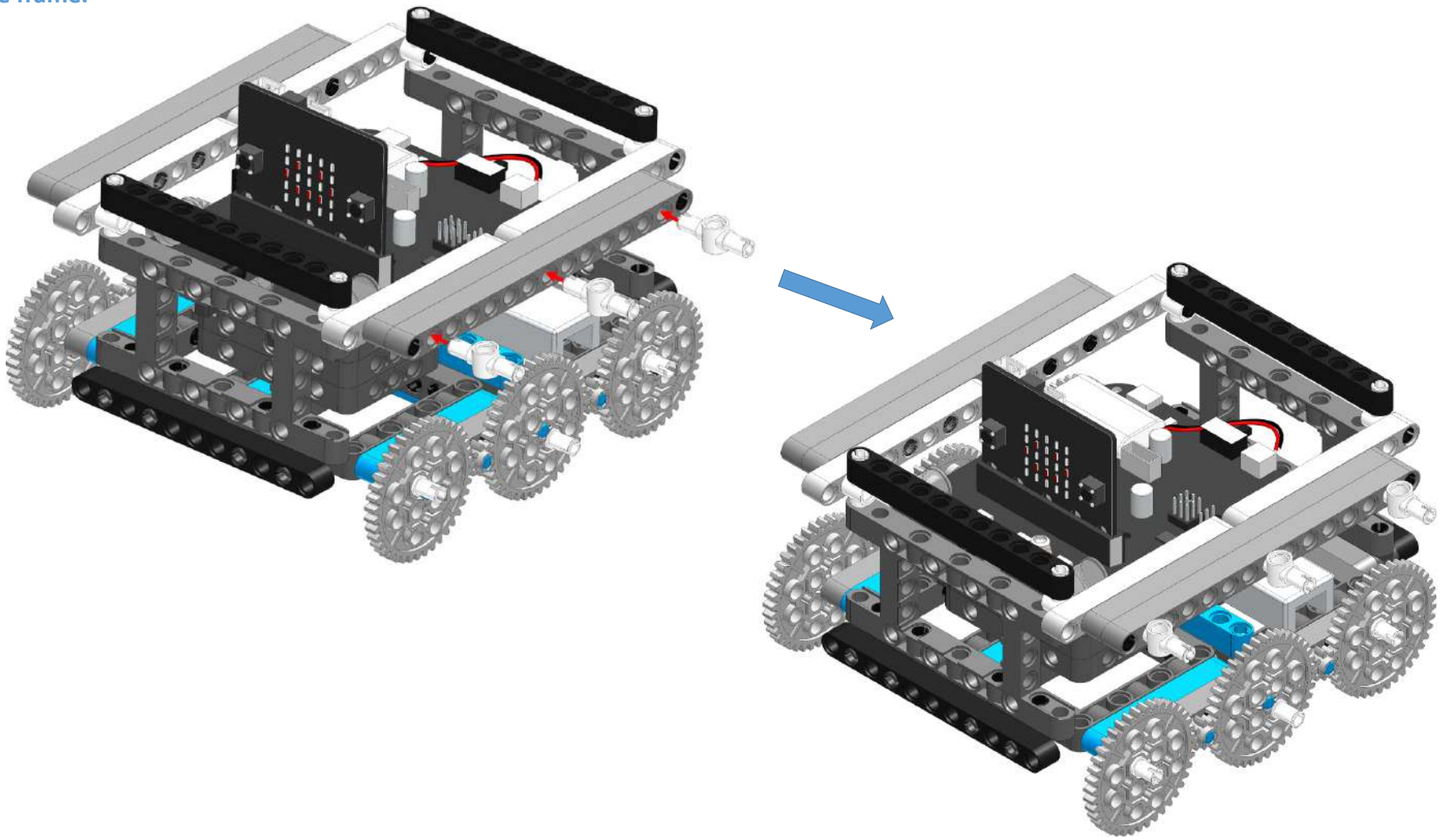


LOOK!

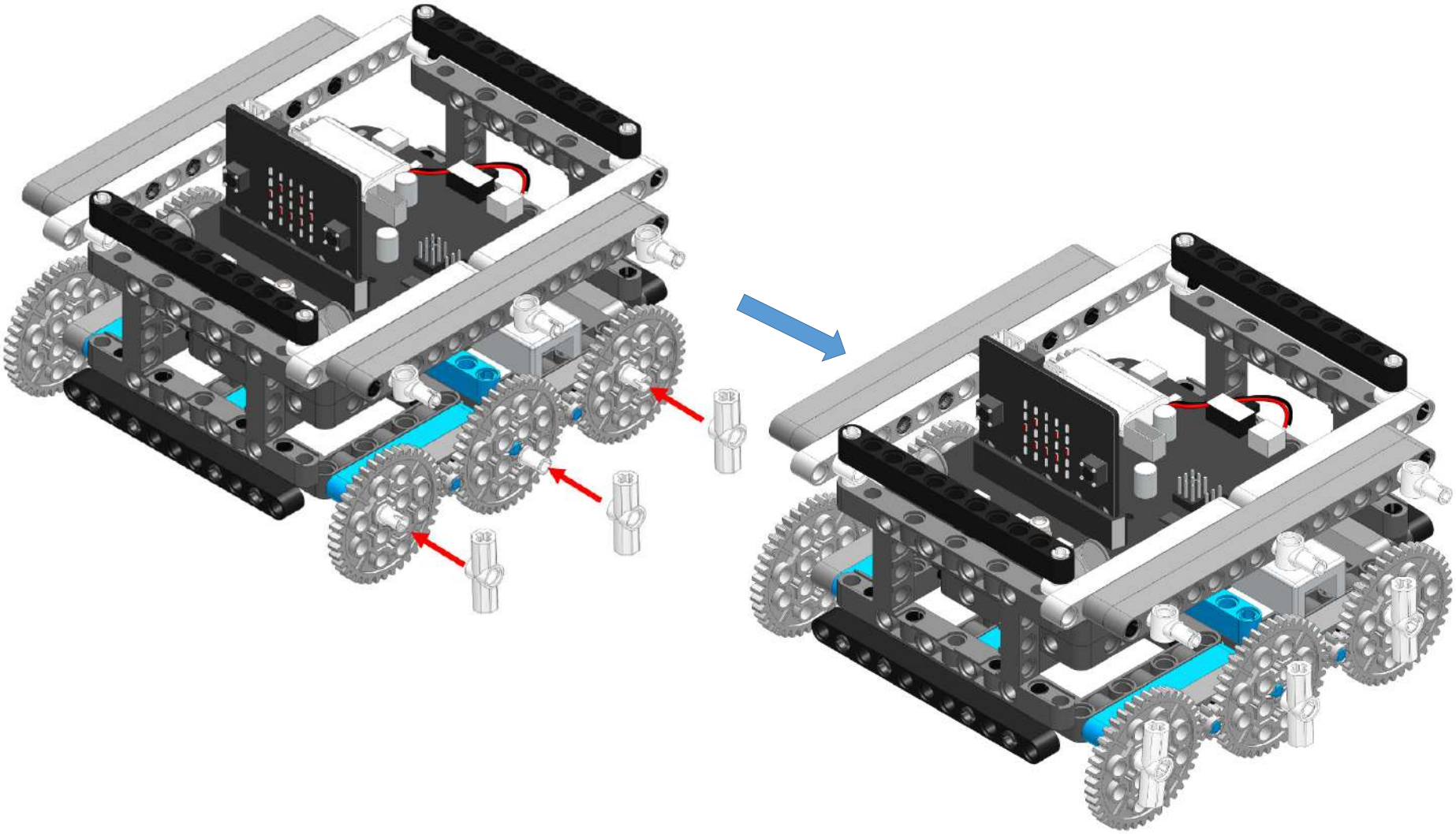
The three smooth pins must be inserted into the position shown in the figure below.
If the installation position is wrong, the hexapod robot cannot "walk" normally.



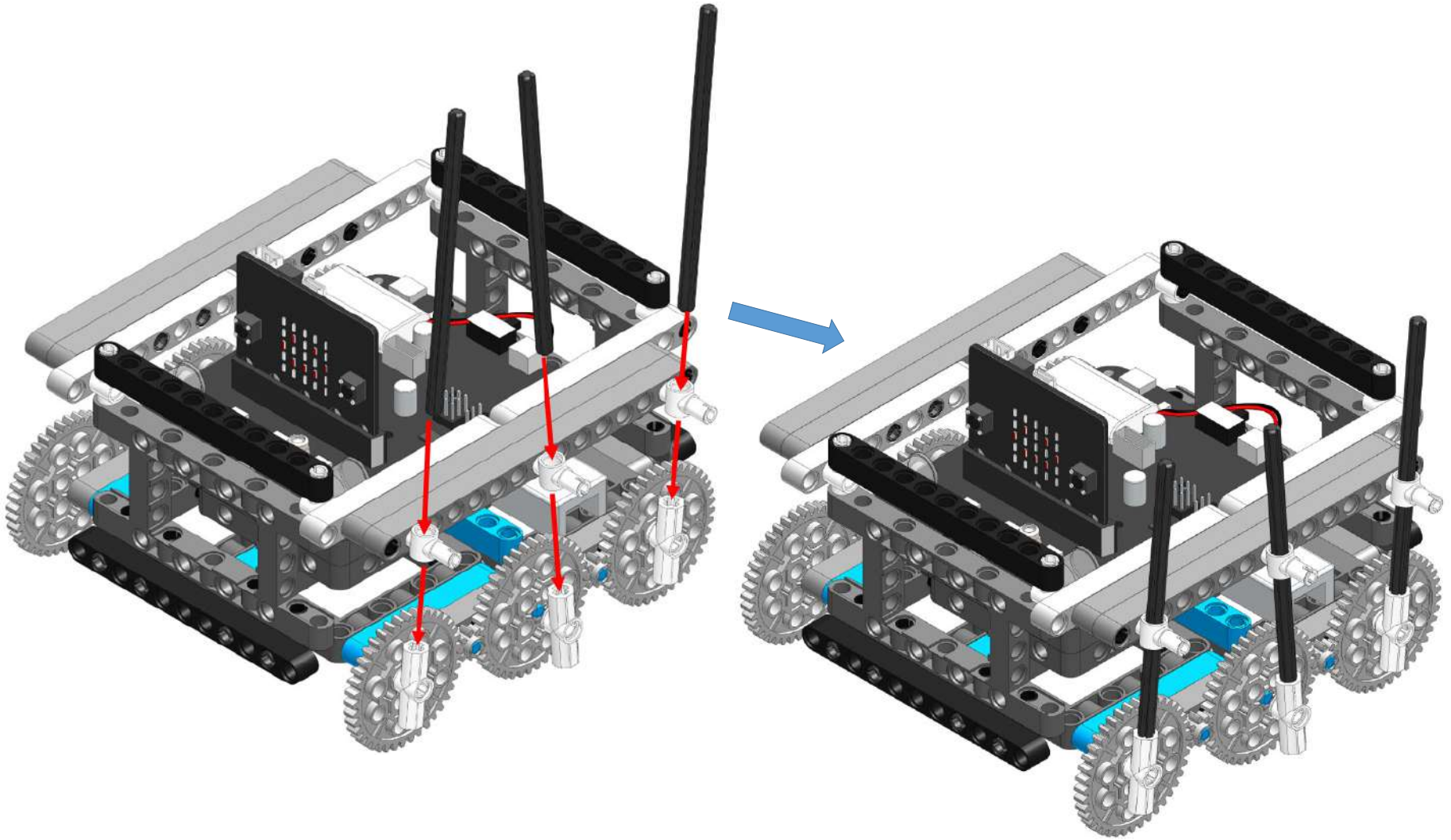
Step 29: Look for three 1x3 bolt connectors, which are installed in the 2nd, 8th and 14th holes of the 1x15 hole arm on the side of the frame.



Step 30: Look for three 2# bolt connections that are mounted on the side of the three 1x2 smooth pins.

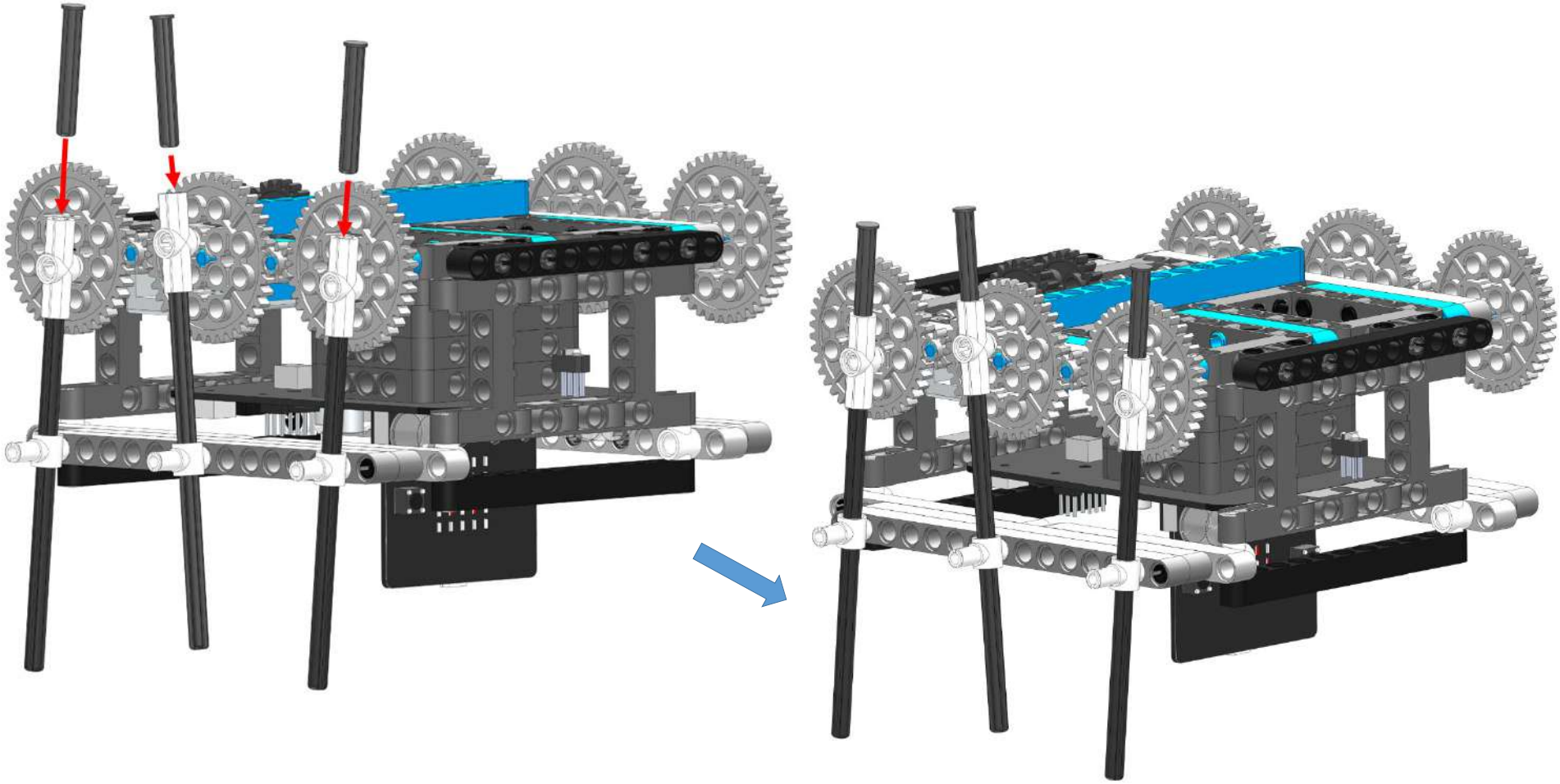


Step 31: Look for three 1x12 cross shafts, pass them through the upper 1x3 bolt connector, and insert the 2# bolt connection below.

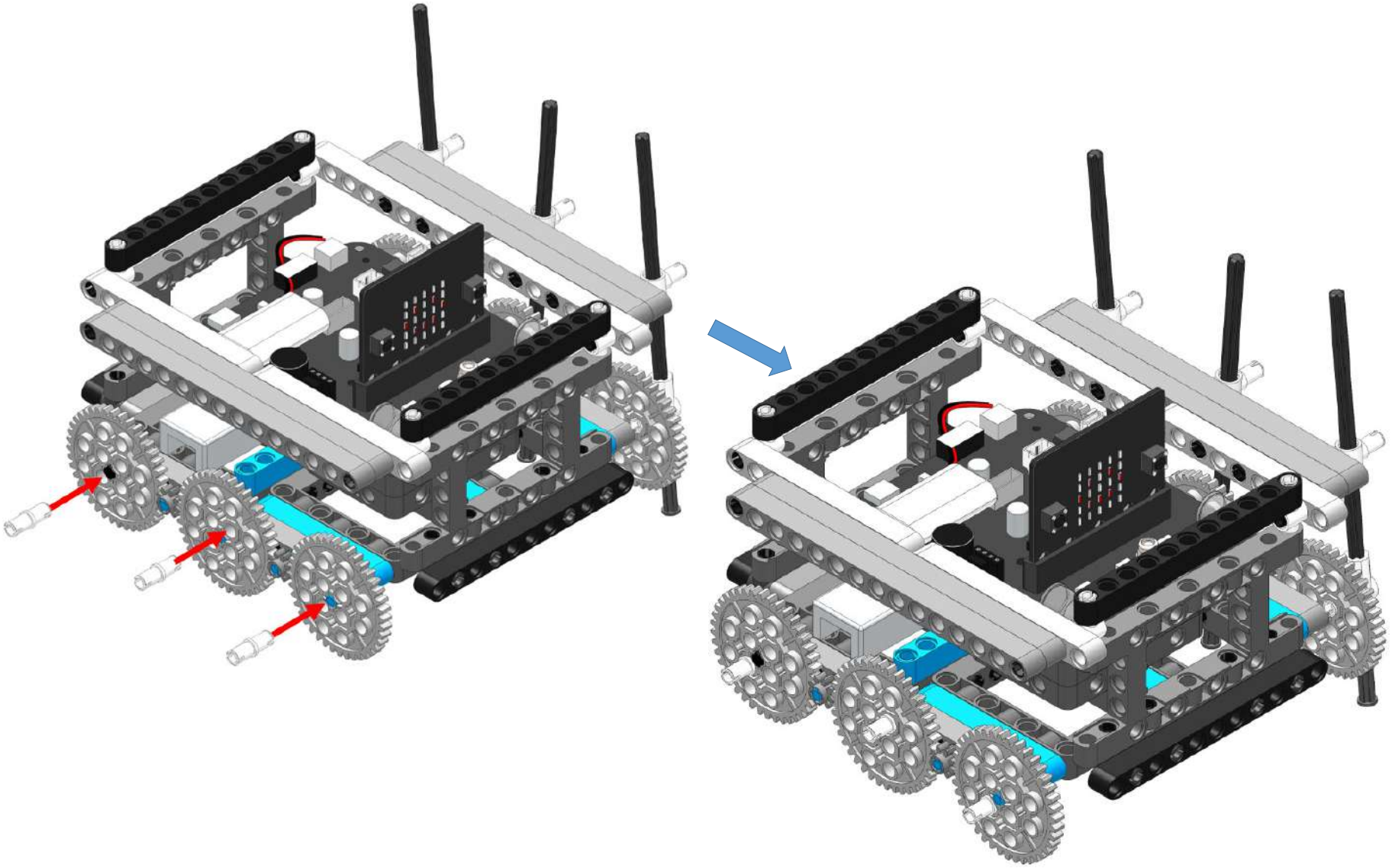


Step 32: Look for three 1*4 shafts with cut-offs and insert them into the 2# bolt connection.

Tip: When doing this, we need to invert the hexapod.

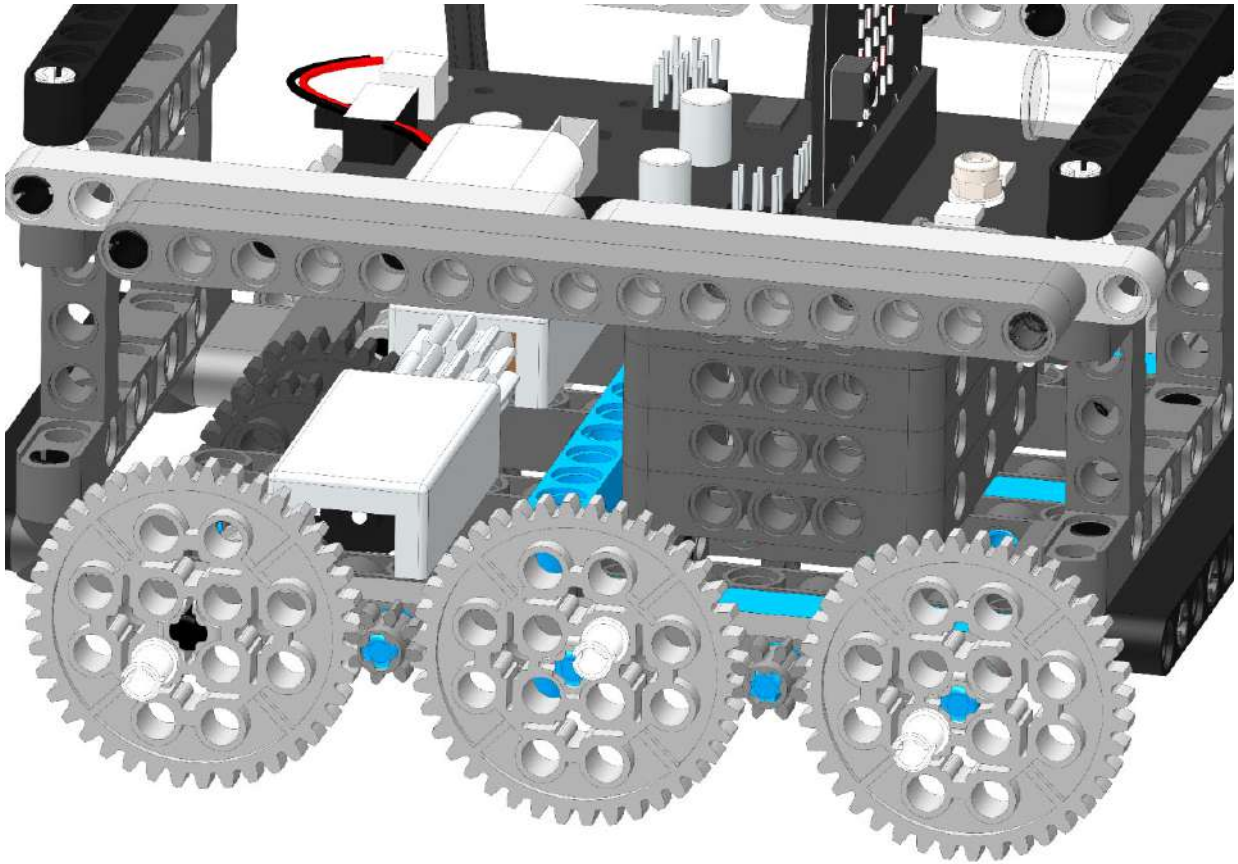


Step 33: Look for three smooth pins and insert them into the corresponding positions of the side 40-toothed wheels.

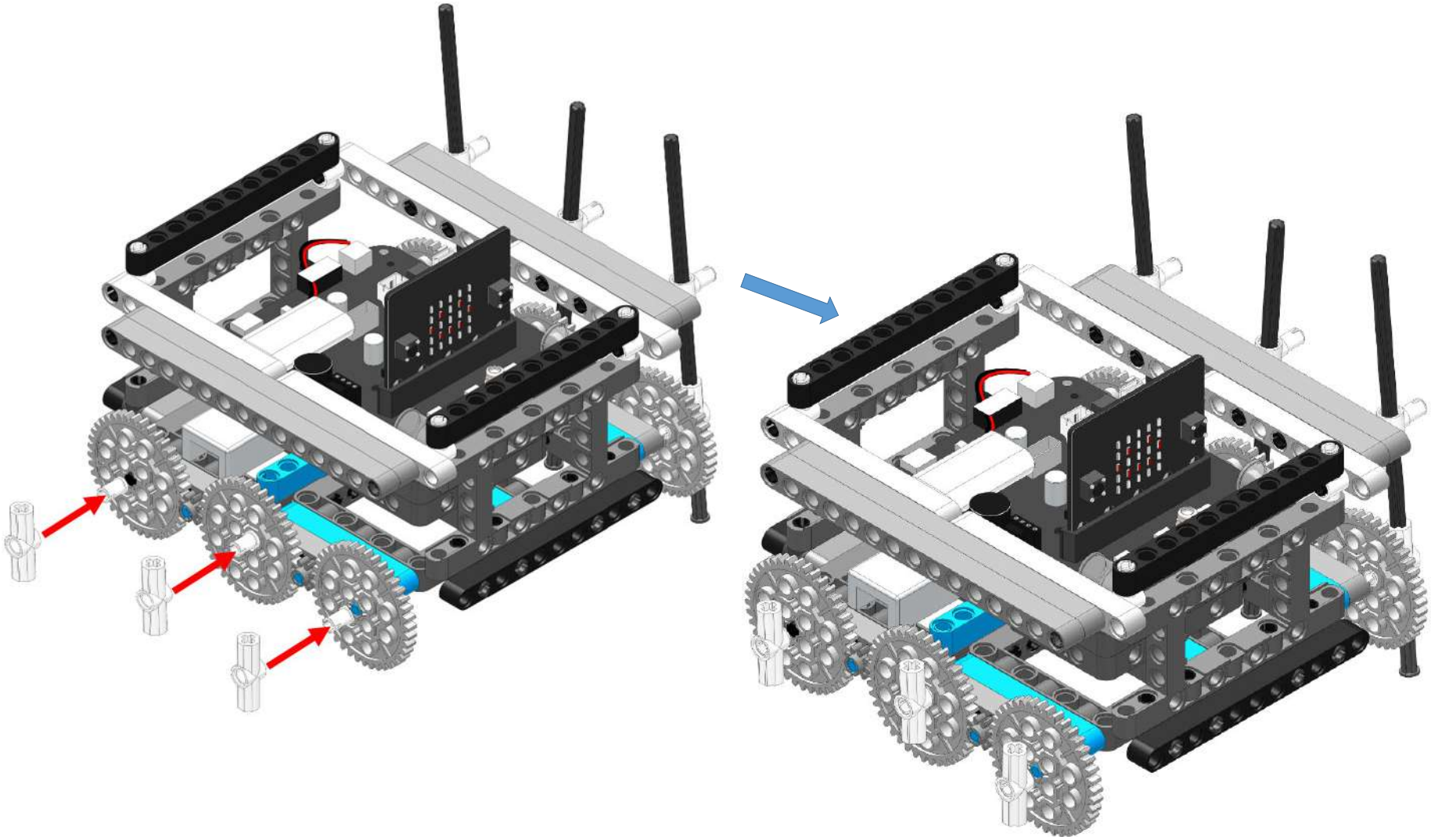


LOOK!

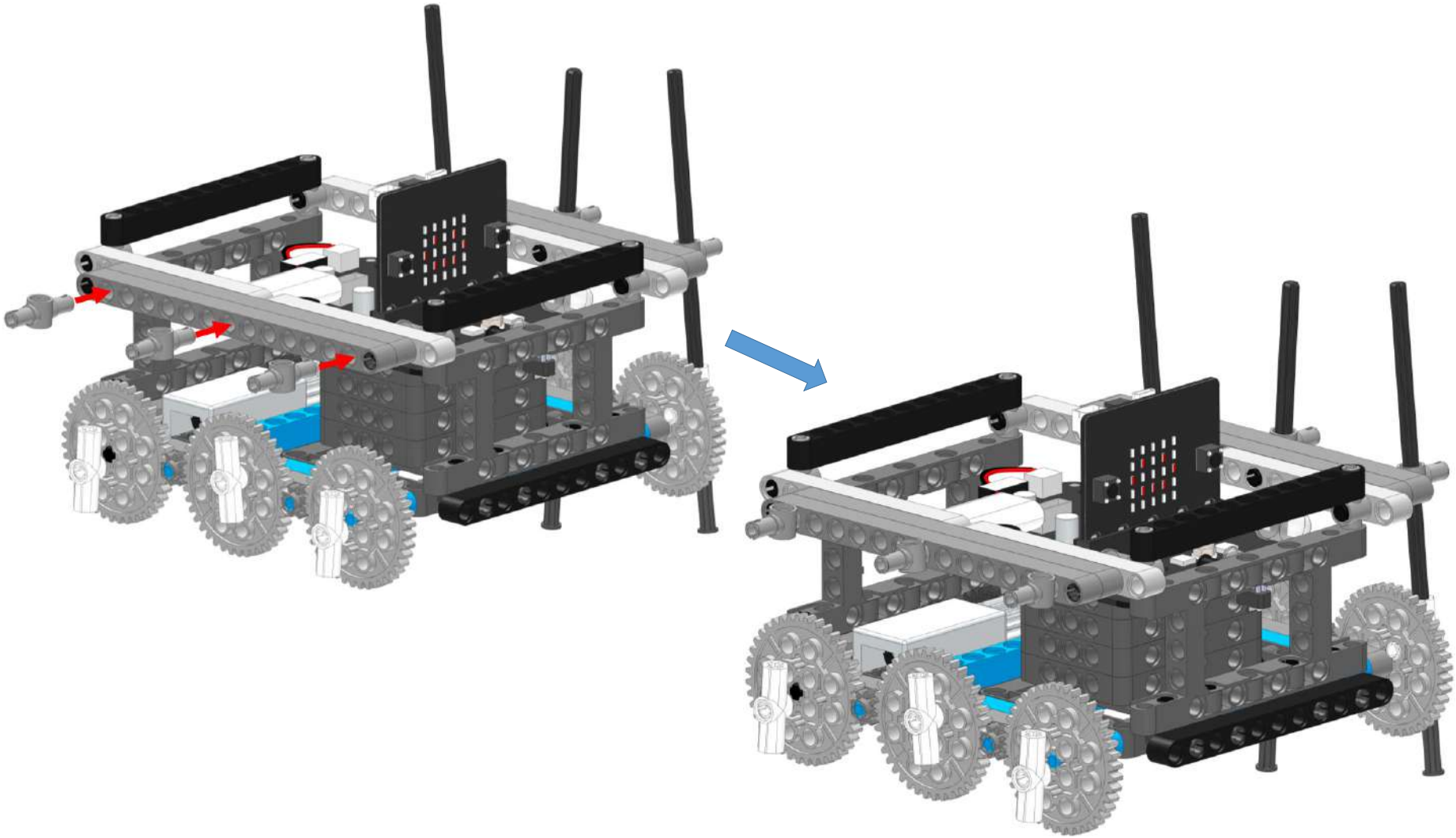
The three smooth pins must be inserted into the position shown in the figure below.
If the installation position is wrong, the hexapod robot cannot "walk" normally.



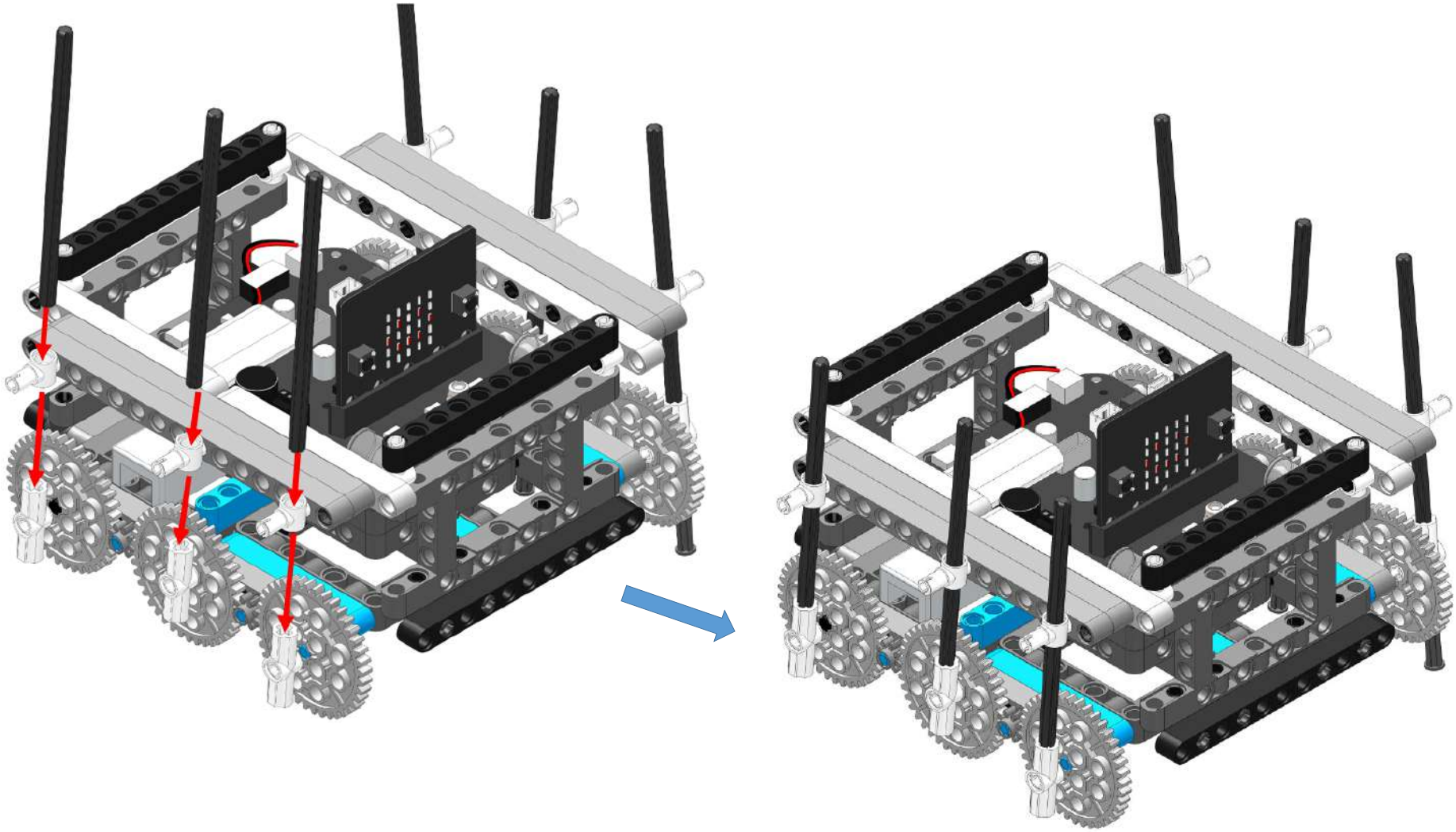
Step 34: Look for three 2# bolt connections that are mounted on the side of the three 1x2 smooth pins.



Step 35: Find three 1x3 bolt connectors, which are installed in the 2nd, 8th and 14th holes of the 1x15 hole arm on the side of the frame.

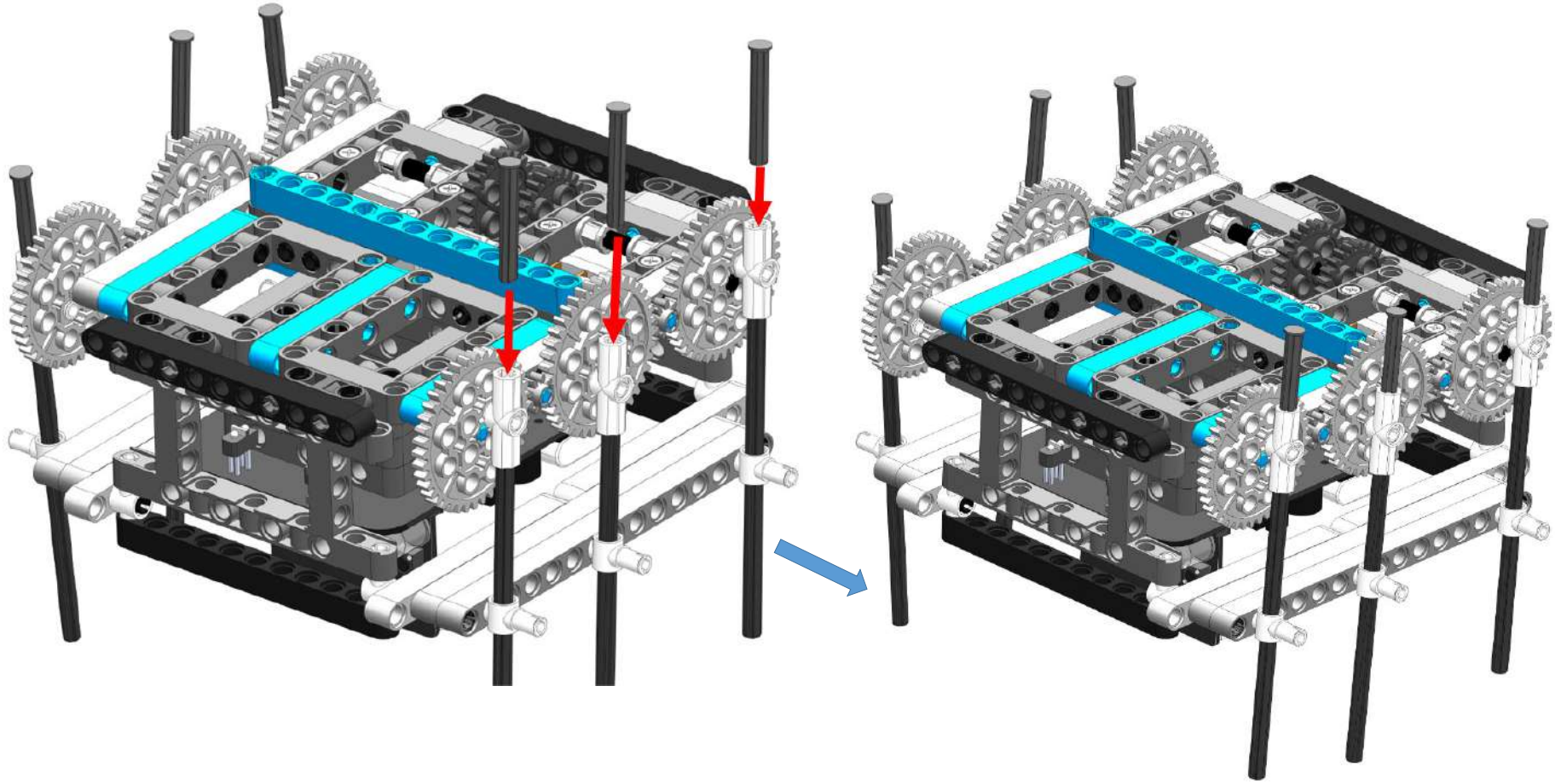


Step 36: Look for three 1x12 cross shafts, pass them through the upper 1x3 bolt connector, and insert the 2# bolt connection below.

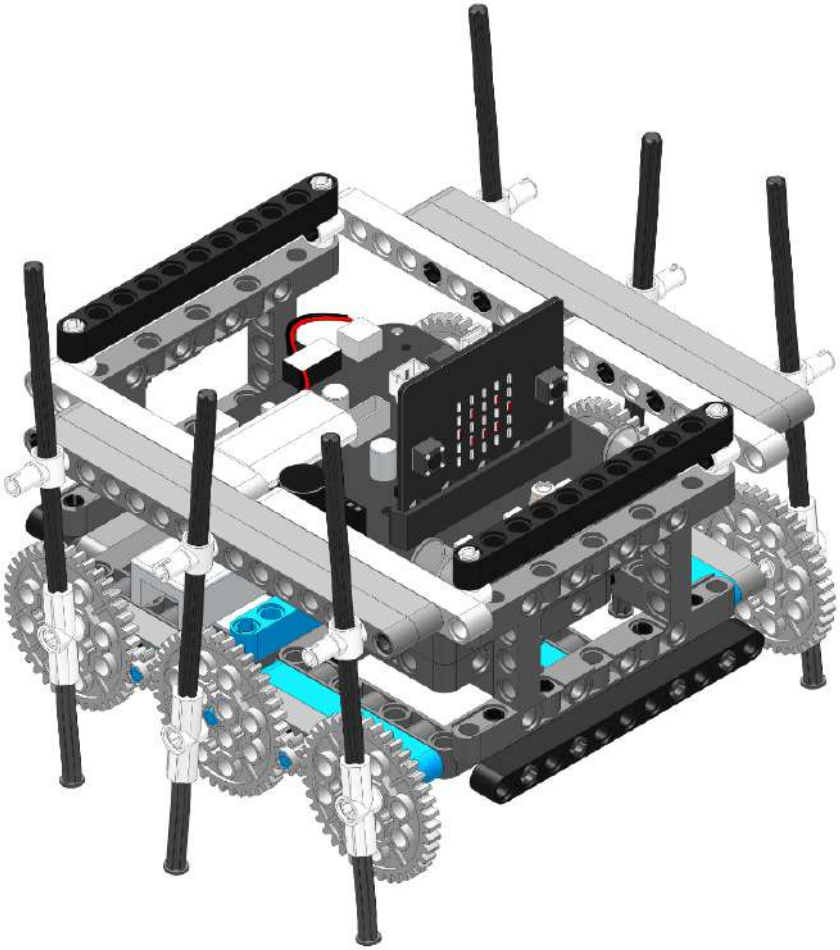


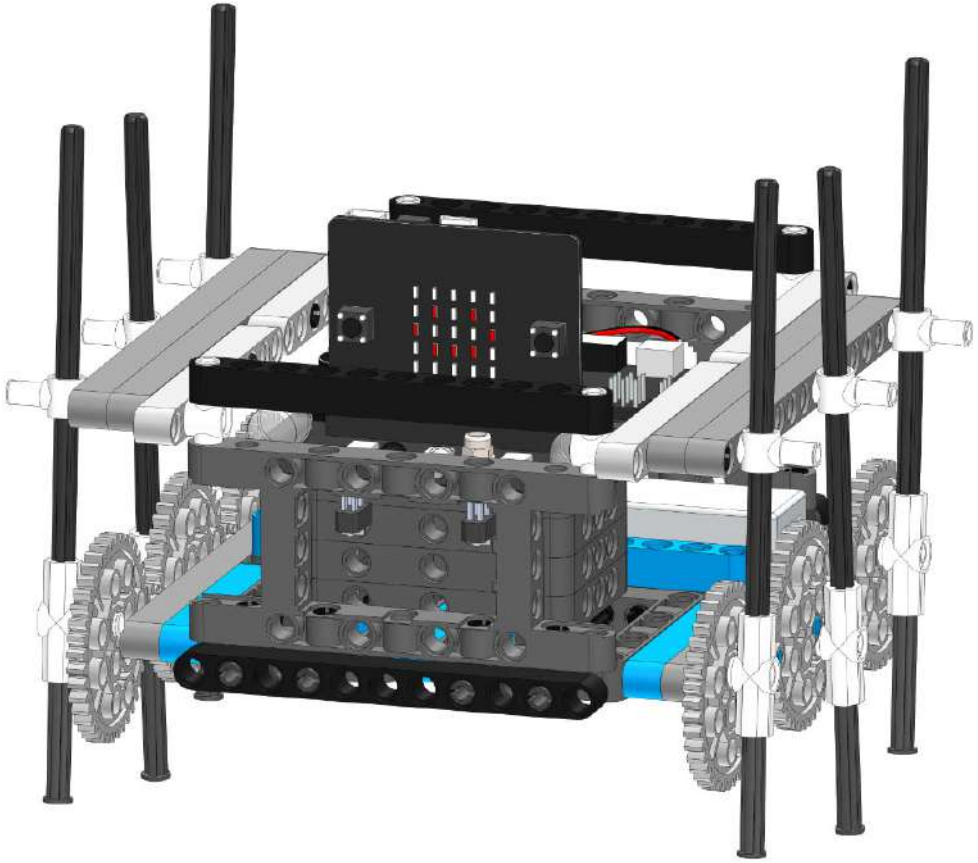
Step 37: Look for three 1*4 shafts with cut-offs and insert them into the 2# bolt connection.

Tip: When doing this, we need to invert the hexapod.



The hexapod robot after assembly is the one shown below.



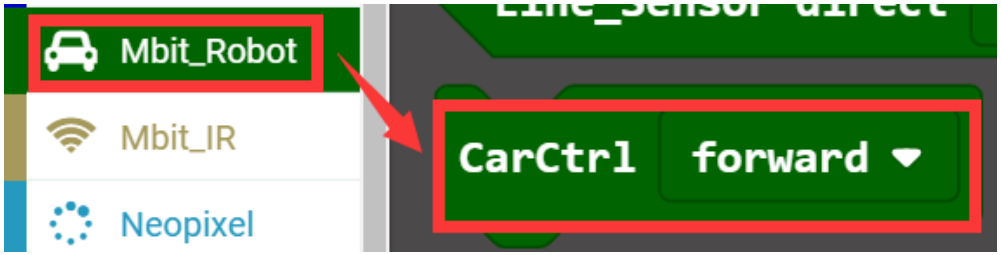


Thinking： This session is mainly to teach you how to use graphical programming to control the hexapod robot.

Preparation

- USB cable *1
- Hexapod robot *1

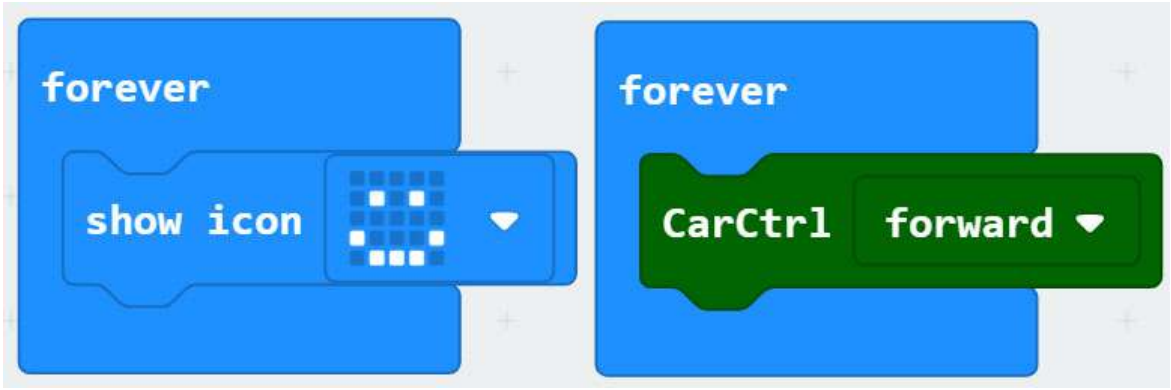
Blocks

Block	Instruction
	The code inside is executed after booting.
	The car's motion state selection: forward, back, turn left , turn right , rotate left, rotate right and stop.

Block	Instruction
	Display the pattern on the micro:bit dot matrix.

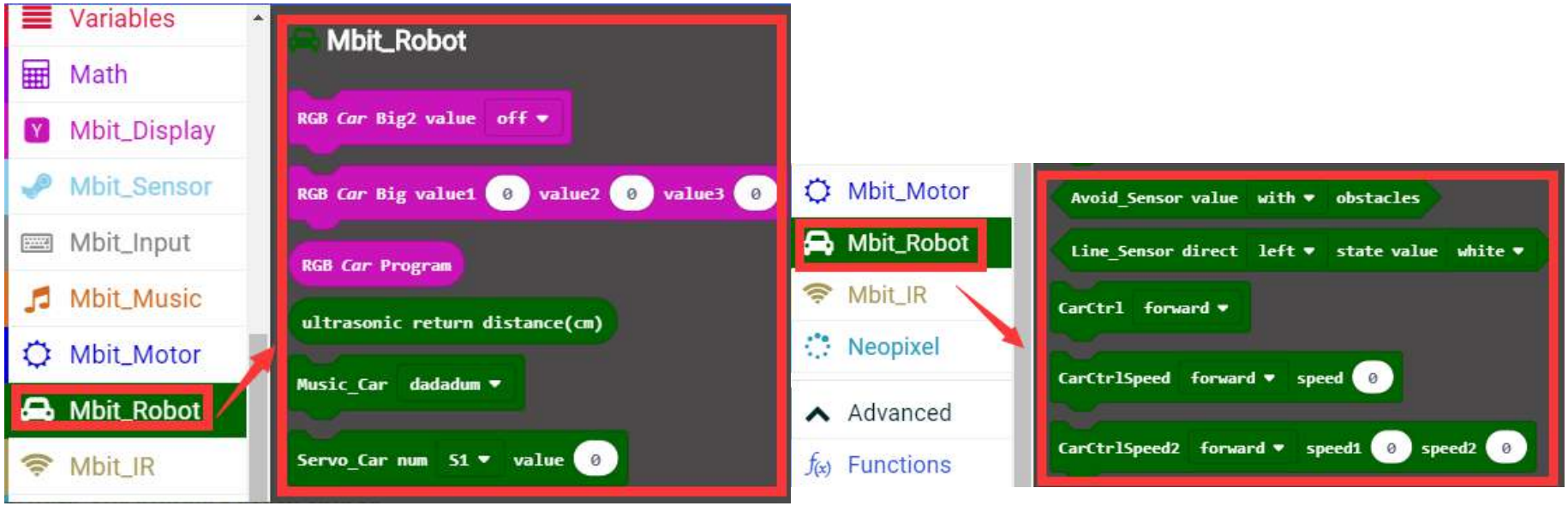
Programming

The program of this course is shown in the figure below. After downloading the program, open the power switch of the hexapod robot, it will automatically advance and display a smile on the dot matrix.



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\C.Hexapod robot\2.Hexapod robot advance\Hexapod-robot-advance.hex

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



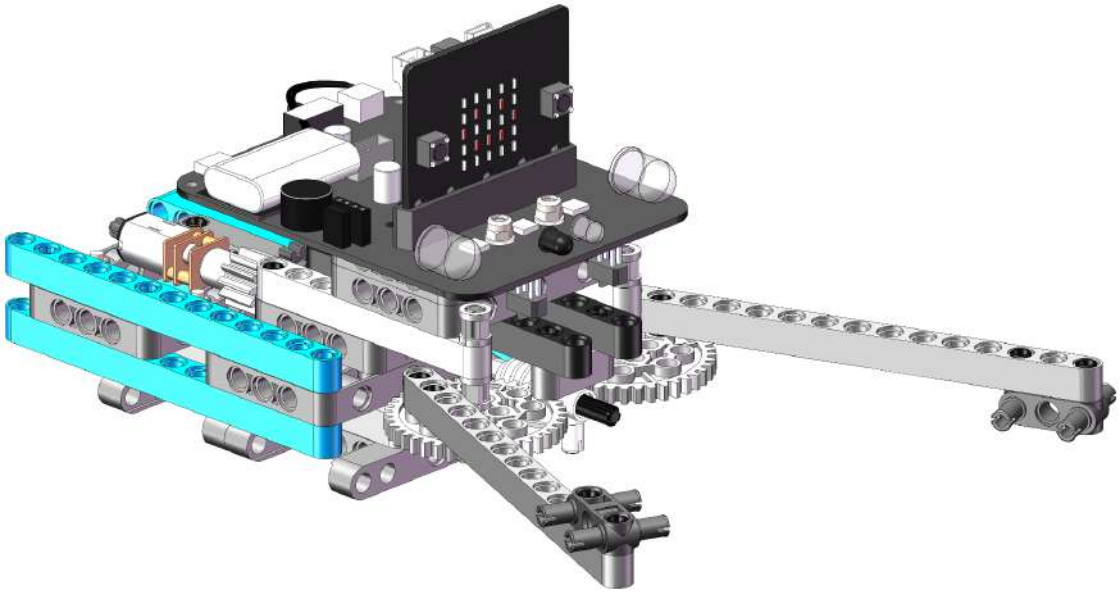
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely. Drag these blocks and play with our building block hexapod robot.

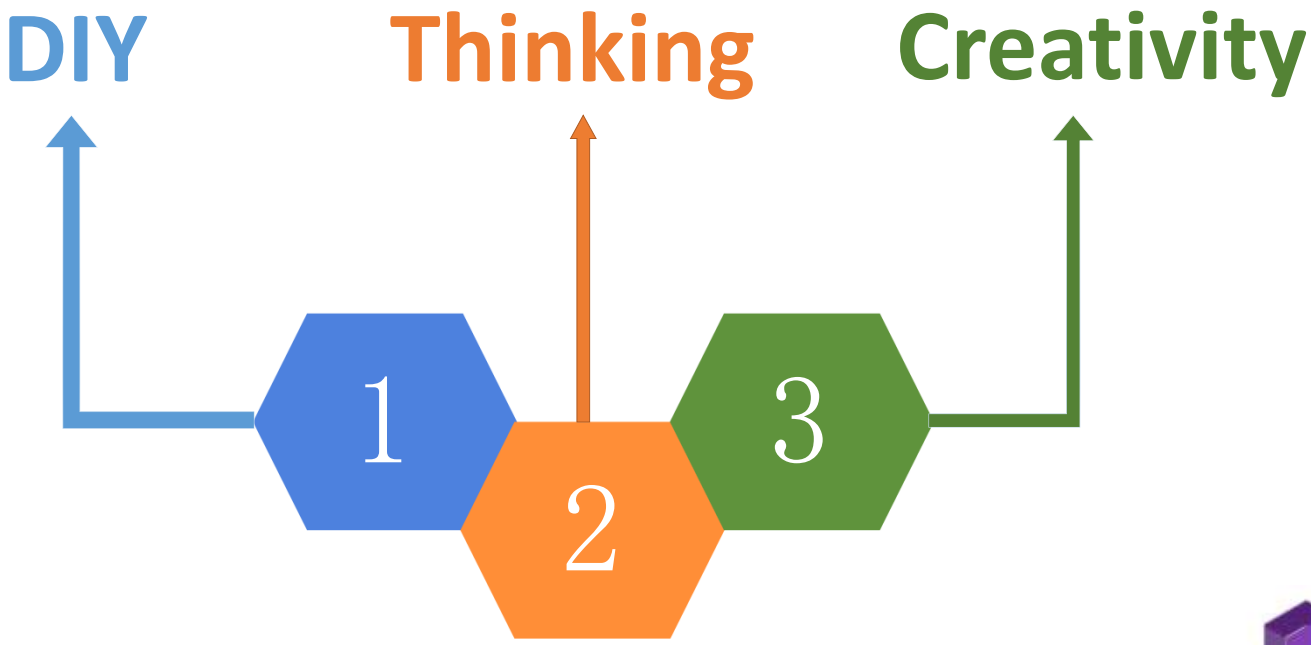


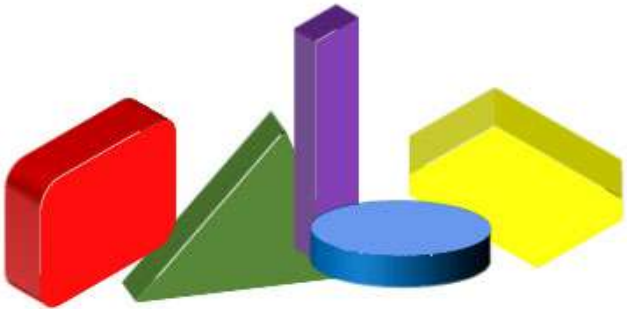
On our official website, we also provides other tutorial: Hexapod robot Infrared remote control, Hexapod robot bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.4 Mechanical Clip

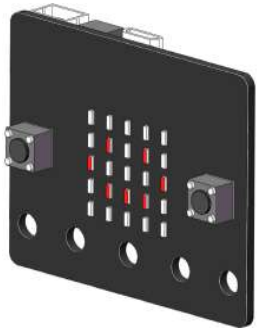
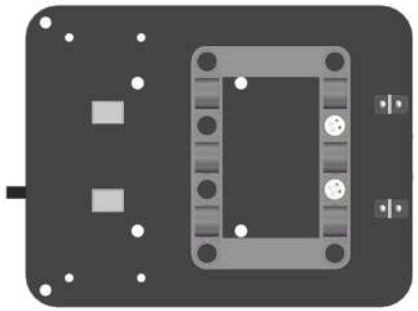
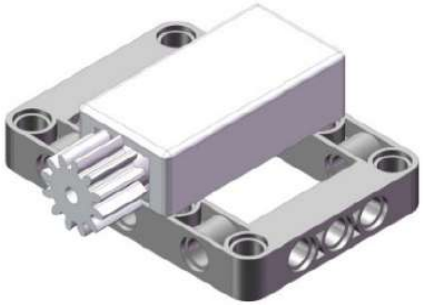
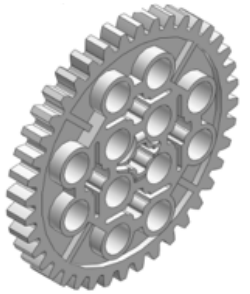
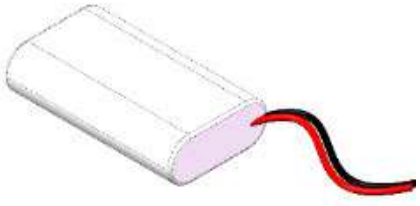
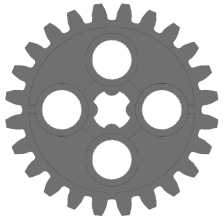
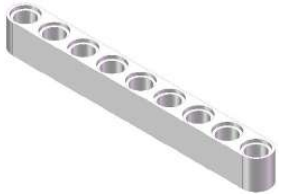
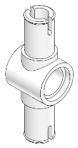
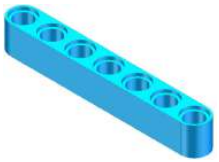


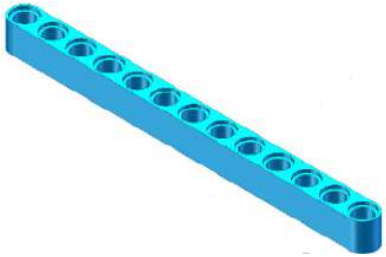
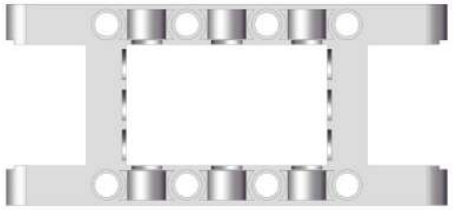
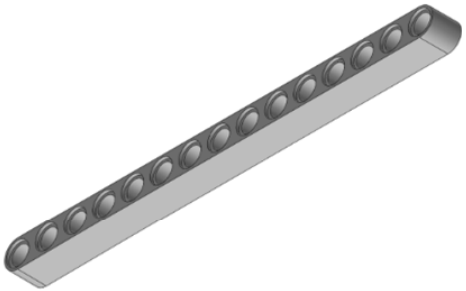
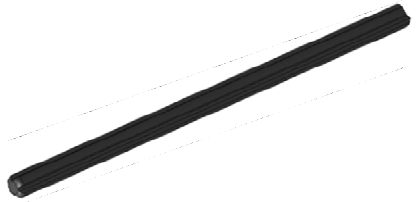

DIY
Thinking
Creativity
1
2
3



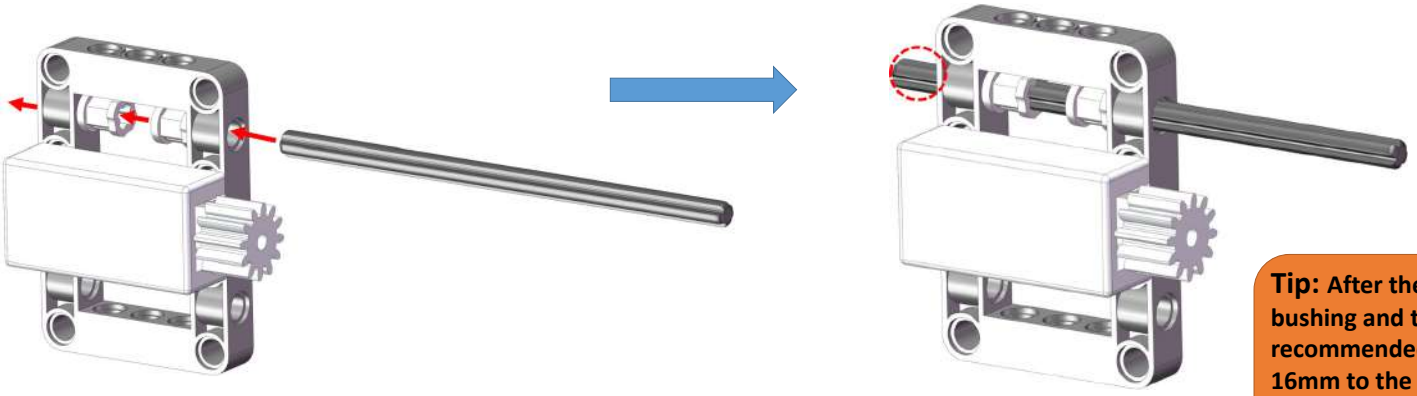
DIY: This section is mainly to teach you to assemble mechanical clip with building blocks.

Prepare the following blocks and we will assemble a building block mechanical clip.

 Micro:bit*1	 Micro:bit expansion board*1	 Motor module*1	 5x7 beam frame*3	 40 toothed wheel *2
 1x4 Shaft cutoff *2	 Battery*1	 24 toothed wheel*1	 1x9 hole arm *3	 1x3 hole arm*2
 Bushing*8	 1x3 Bolt connector*1	 1x2 Frictional pin*40	 3x3 Bolt connector*2	 1x7 hole arm*3

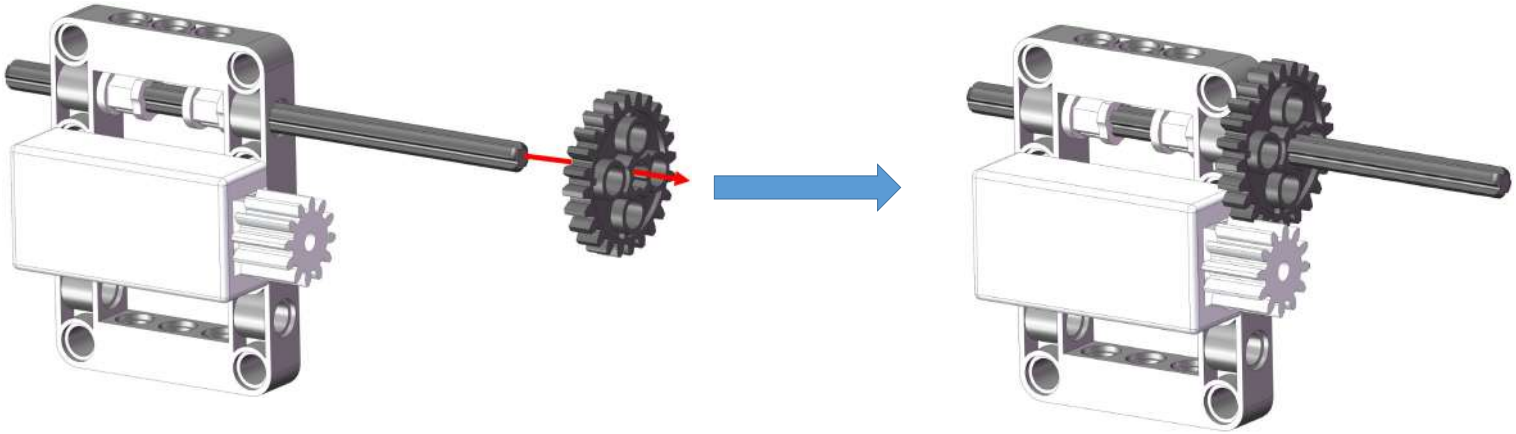
 1x11 hole arm*2	 1x13 hole arm*2	 5x11 beam frame*2	 1x3 Shaft*10	 Spiral wheel*1
 1x15 hole arm*3	 1x8 Cross Axle*1	 1x12 Cross Axle*1	 1x2 Shaft connector*1	

Step 1: Find a motor module, two bushings and a 1x12 cross axle for assembly.

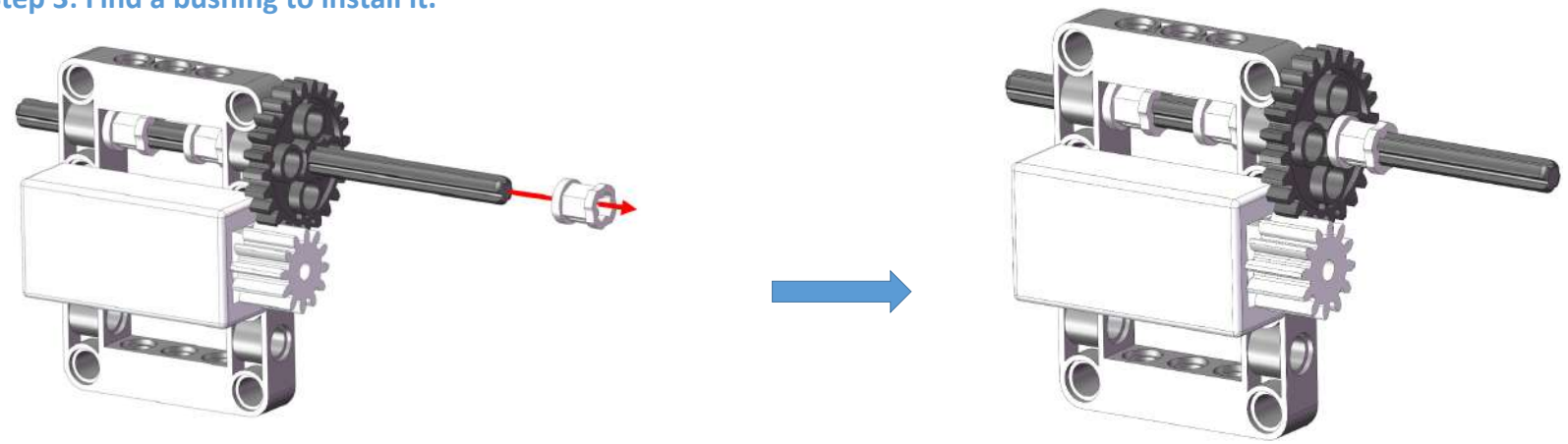


Tip: **After the cross shaft passes through the bushing and the motor module, it is recommended that you reserve a length of 16mm to the left (where the red circle is). This is to facilitate the installation of the next building block.**

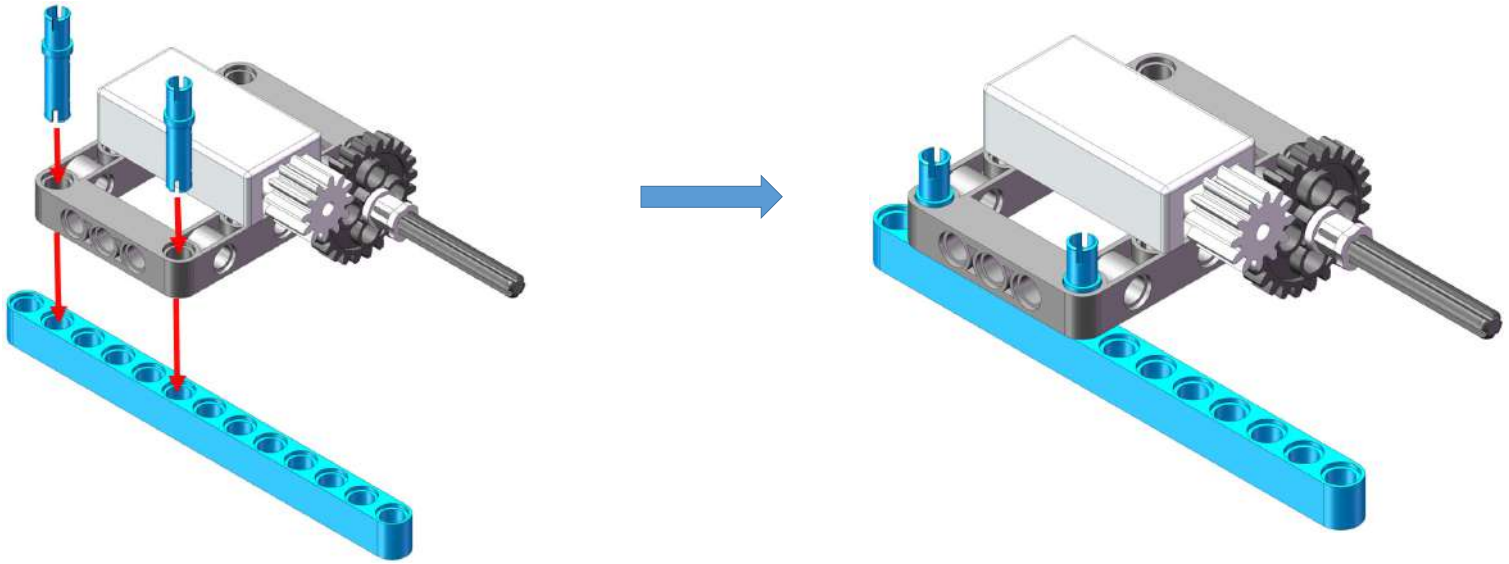
Step 2: Find a 24-toothed wheel and install it.



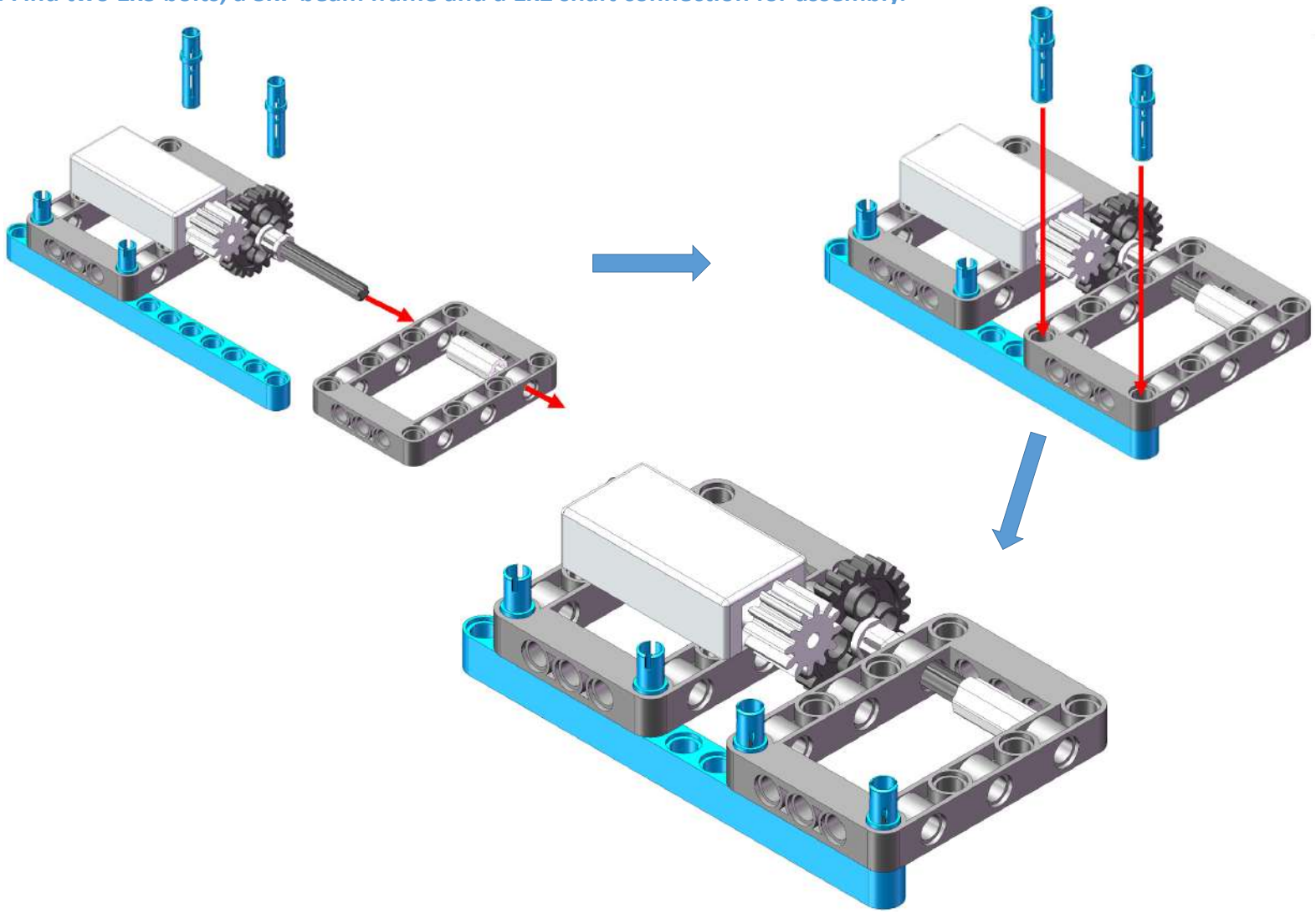
Step 3: Find a bushing to install it.



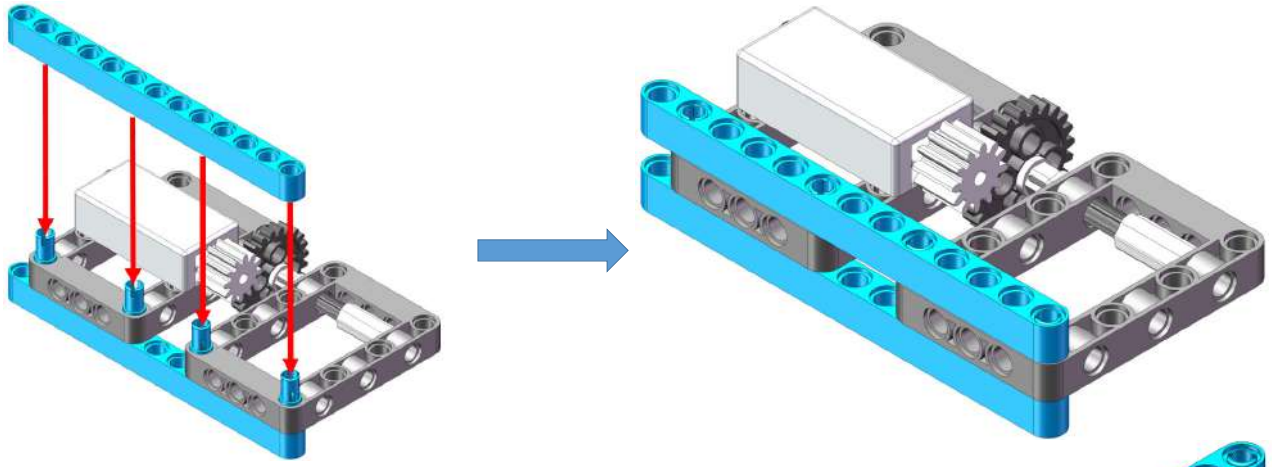
Step 4: Find two 1x3 bolts and a 1x13 hole arm and assemble them.



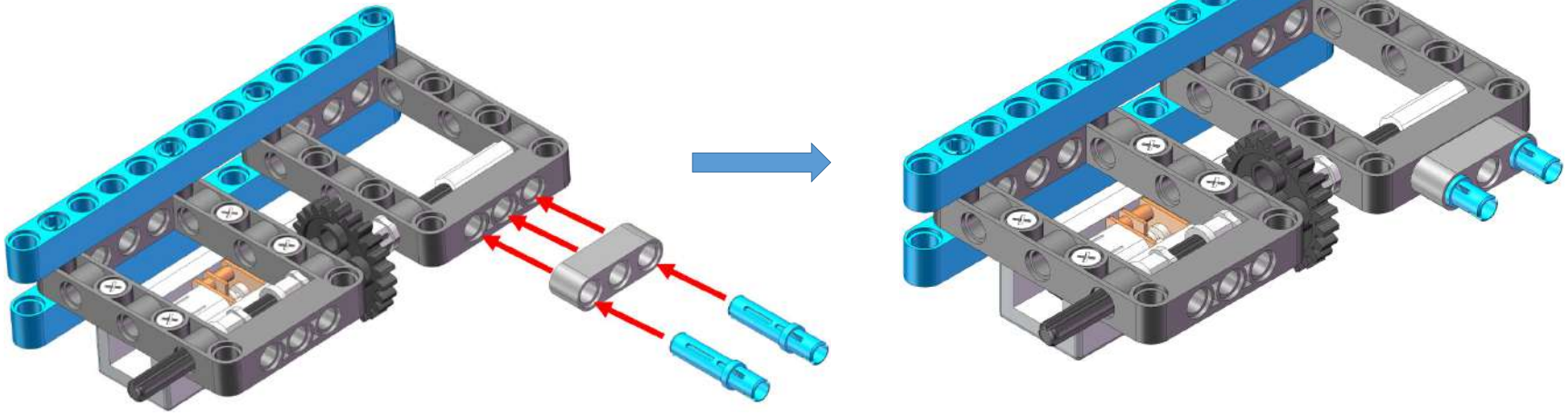
Step 5: Find two 1x3 bolts, a 5x7 beam frame and a 1x2 shaft connection for assembly.



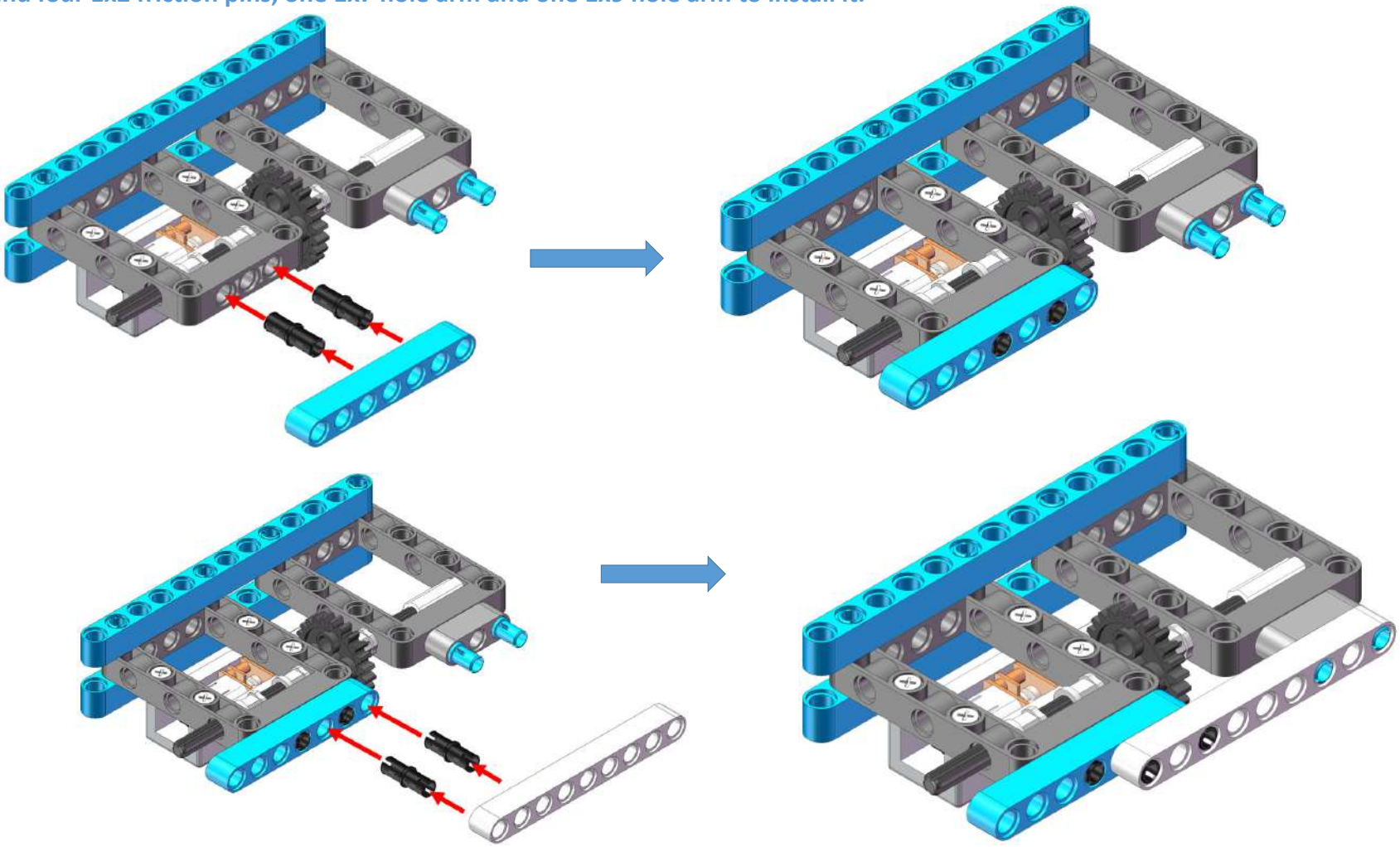
Step 6: Find a 1x13 hole arm and install it. The four 1x3 bolts that have been installed are inserted into the 1st, 5th, 8th, and 12th holes from the right side of the 1x13 hole arm.



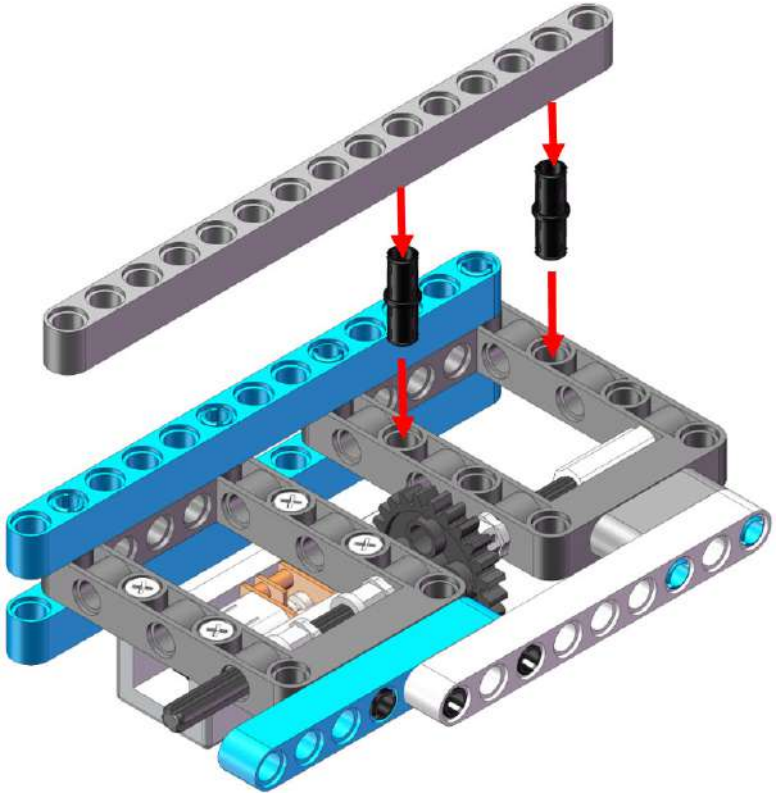
Step 7: Locate the two 1x3 bolts and a 1x3 hole arm and install them.

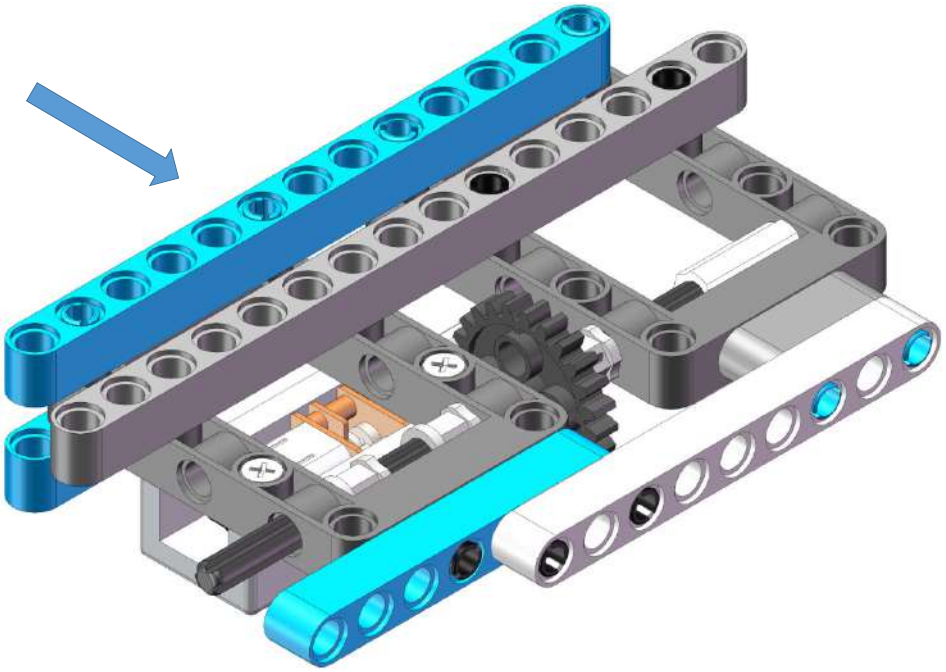


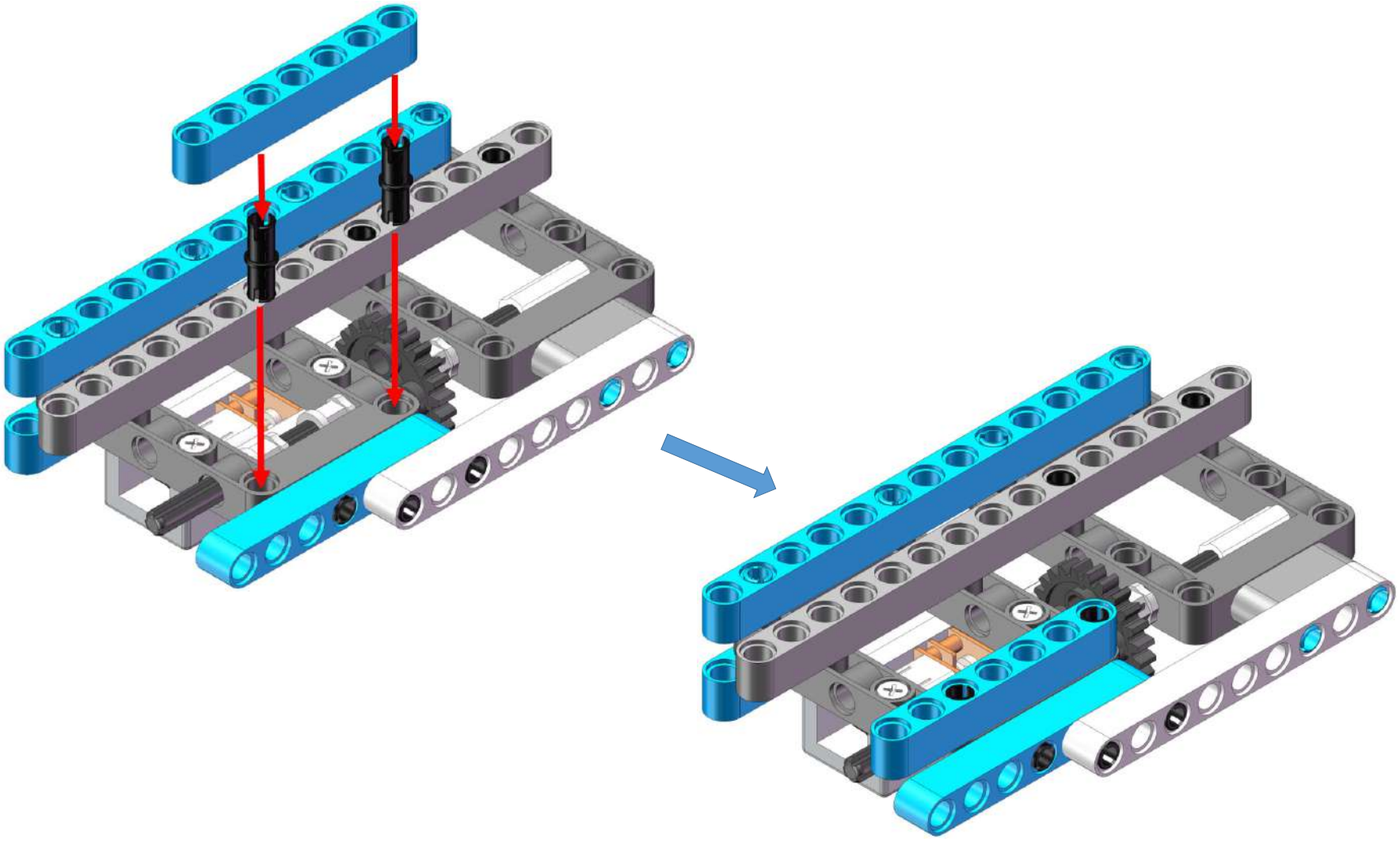
Step 8: Find four 1x2 friction pins, one 1x7 hole arm and one 1x9 hole arm to install it.



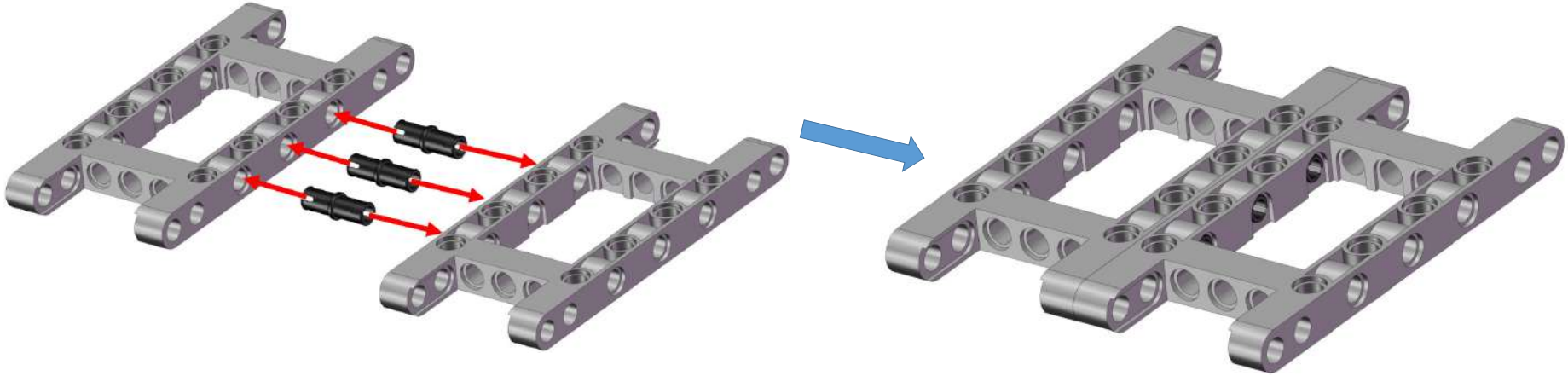
Step 9: Locate the four 1x2 friction pins, a 1x7 hole arm and a 1x15 hole arm for assembly.



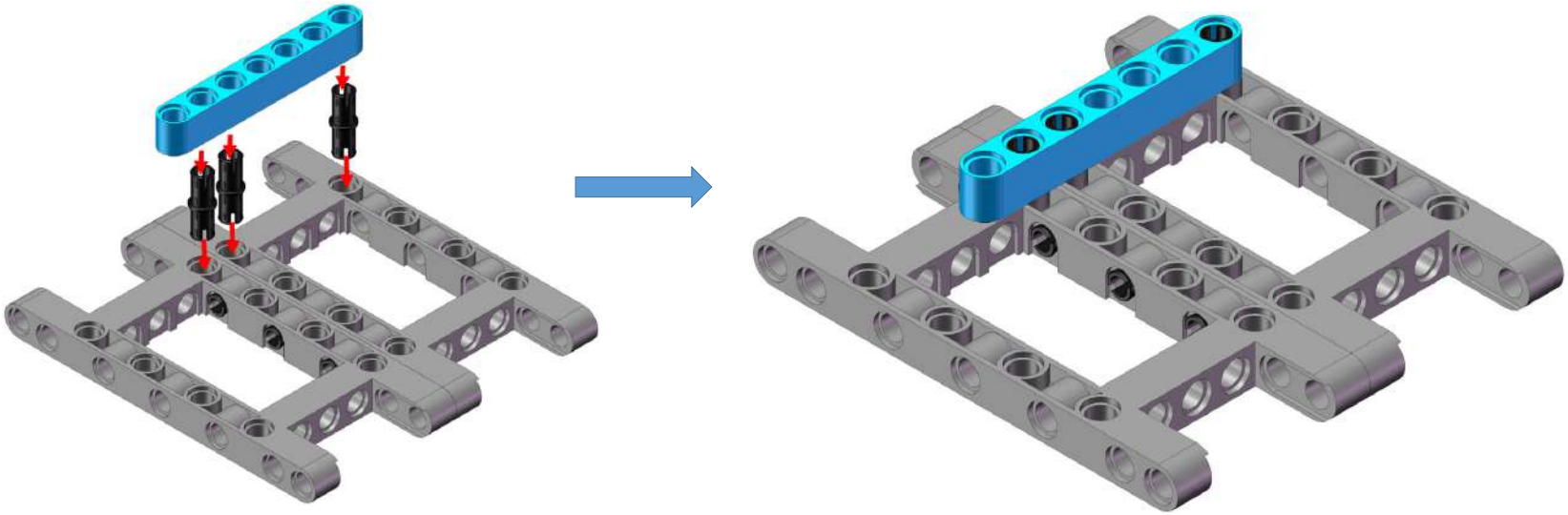




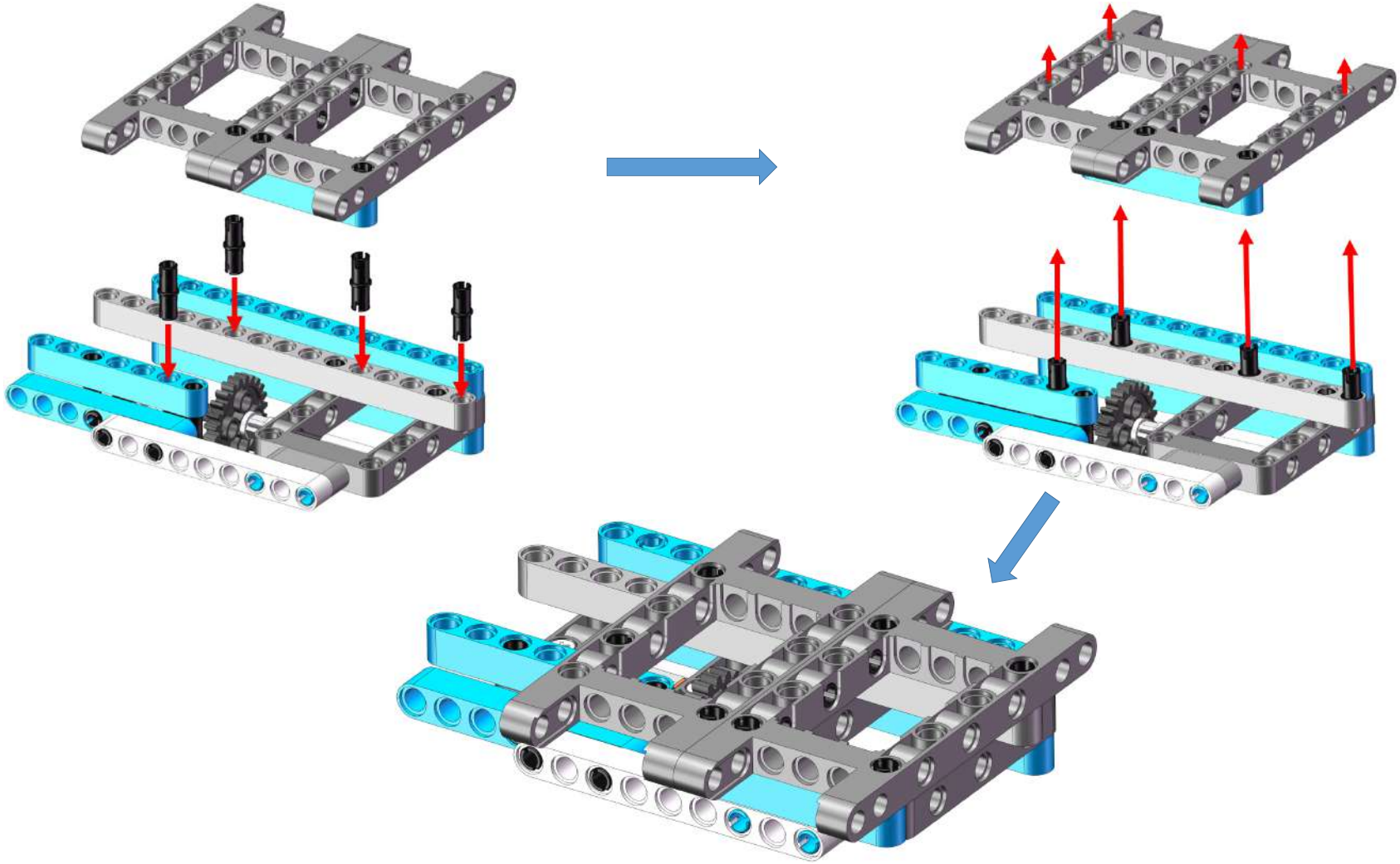
Step 10: Find three friction pins and two 5x11 beam frames and assemble them.



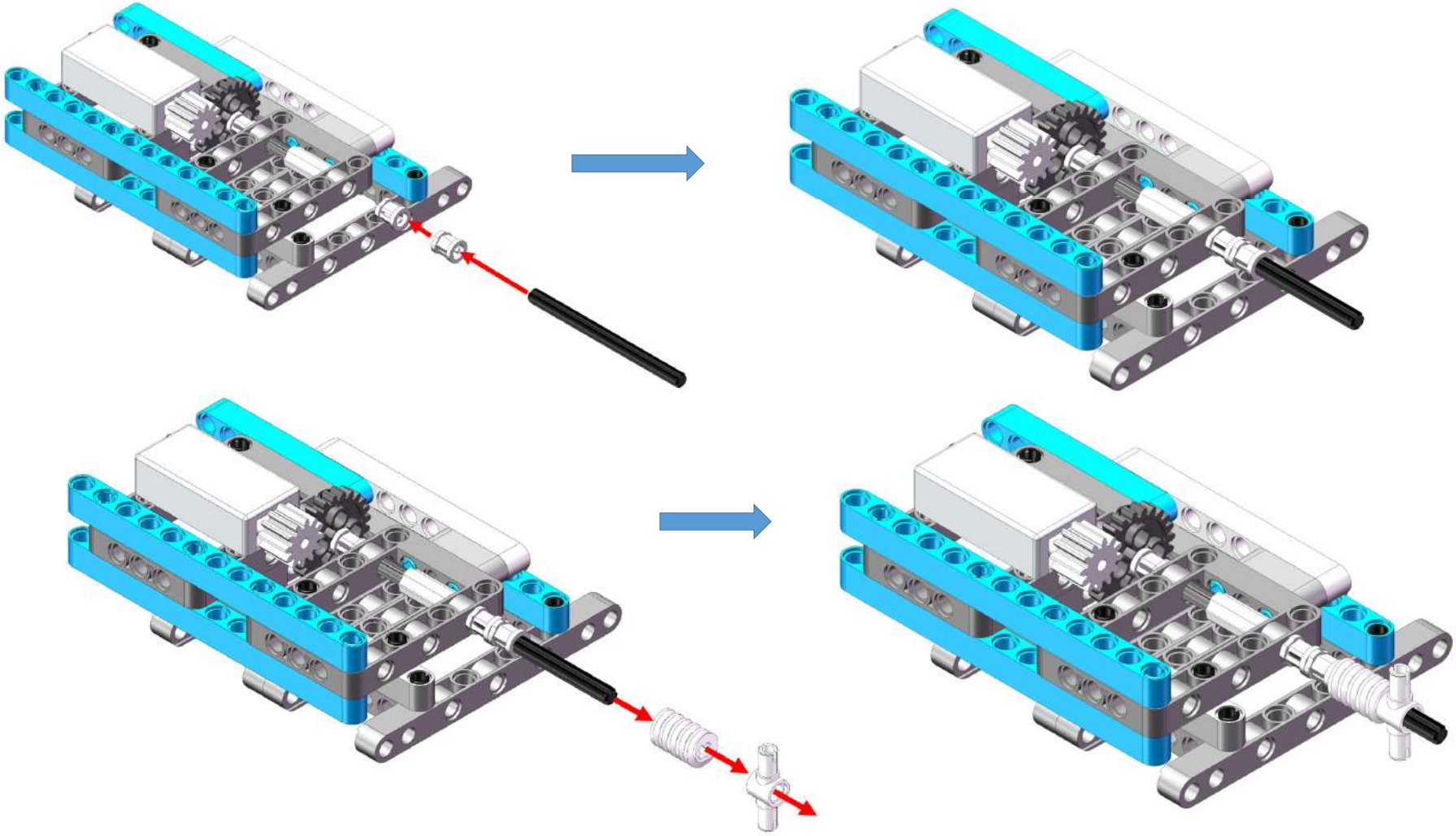
Step 11: Find three 1x2 friction pins and a 1x7 hole arm for assembly.



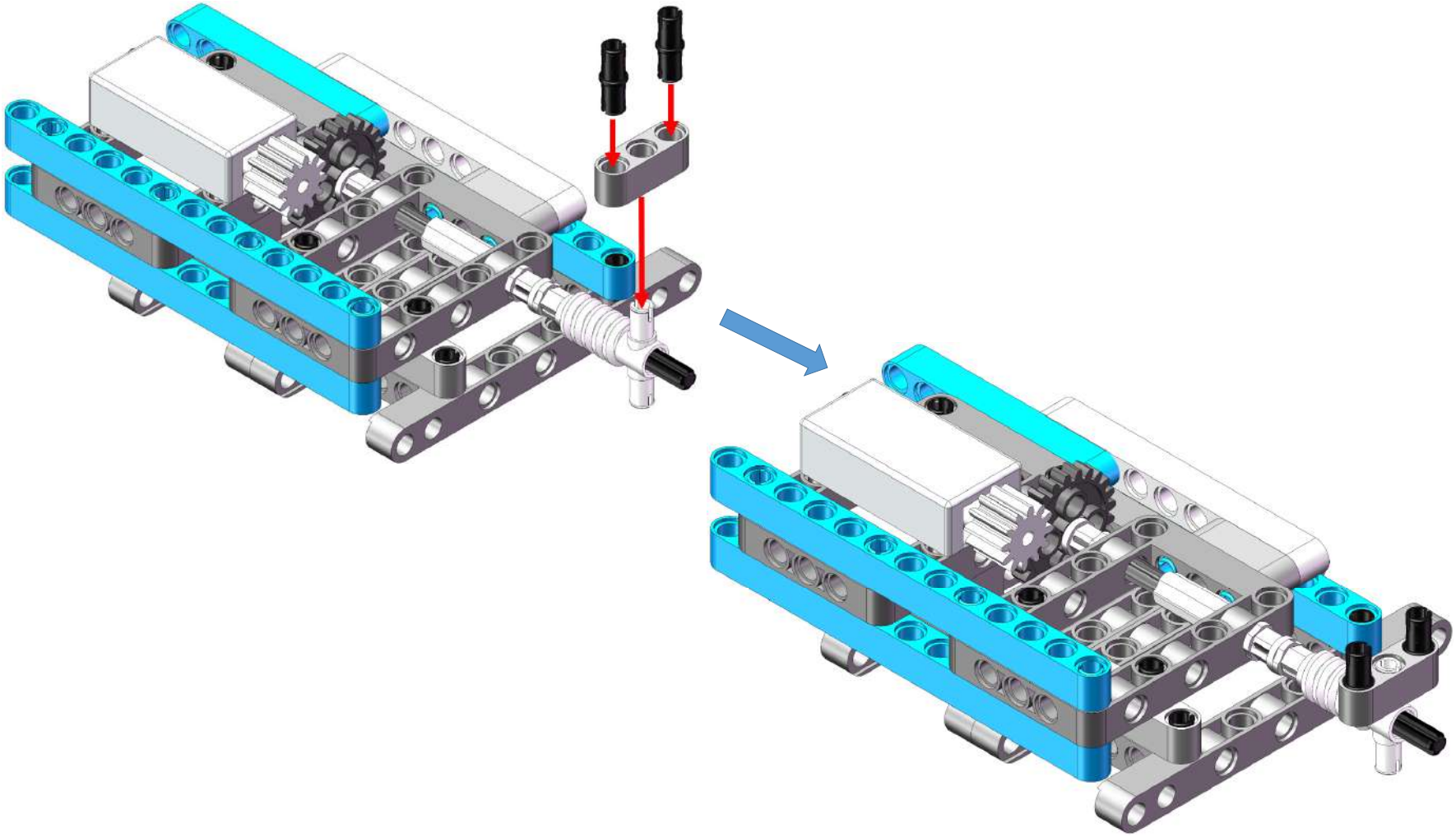
Step 12: Find four 1x2 friction pins and combine the blocks that we have assembled in step 9 and step 11.



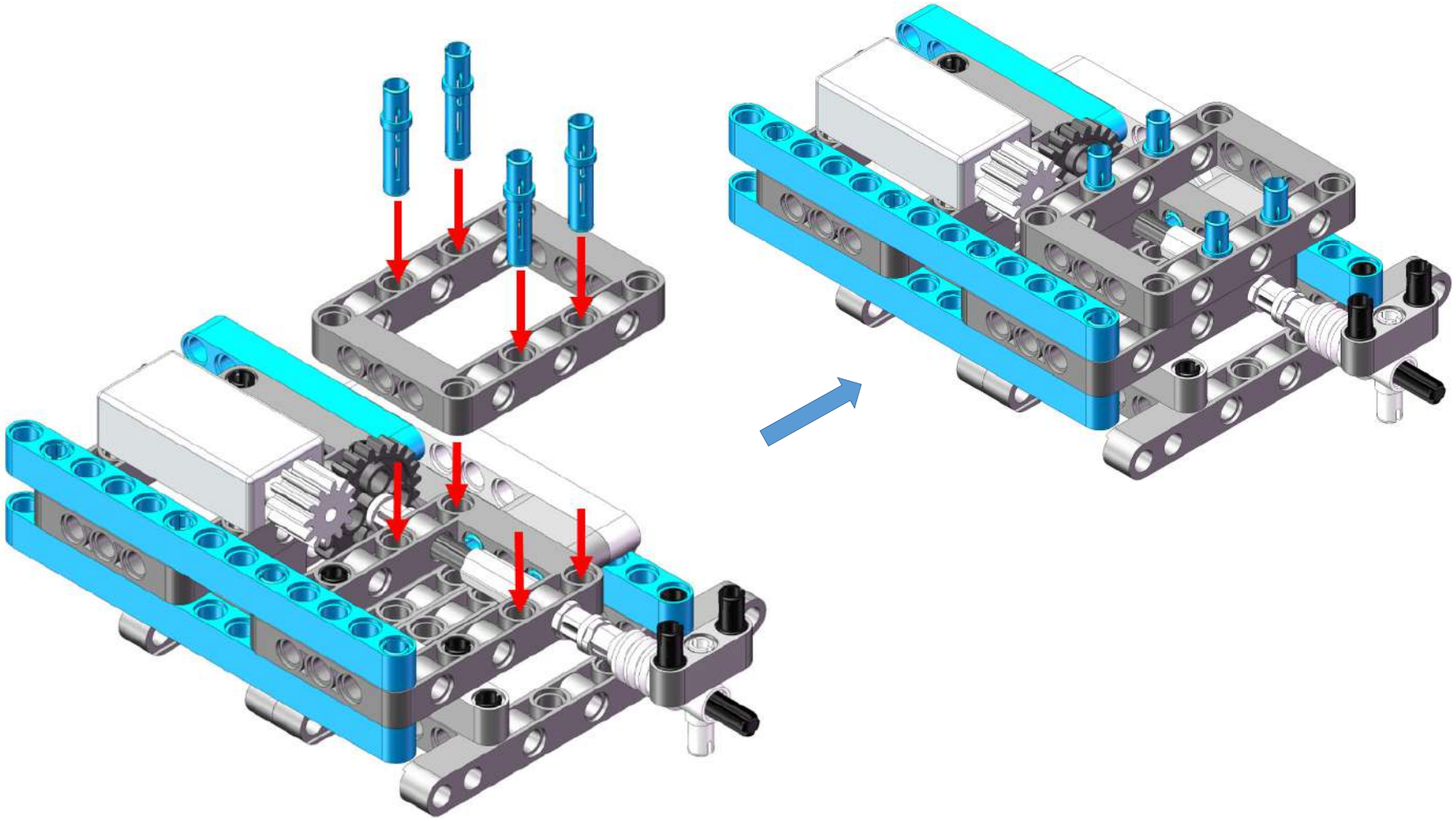
Step 13: Find two bushings, a 1x8 cross shaft, a spiral wheel and a 1x3 bolt connector for assembly.



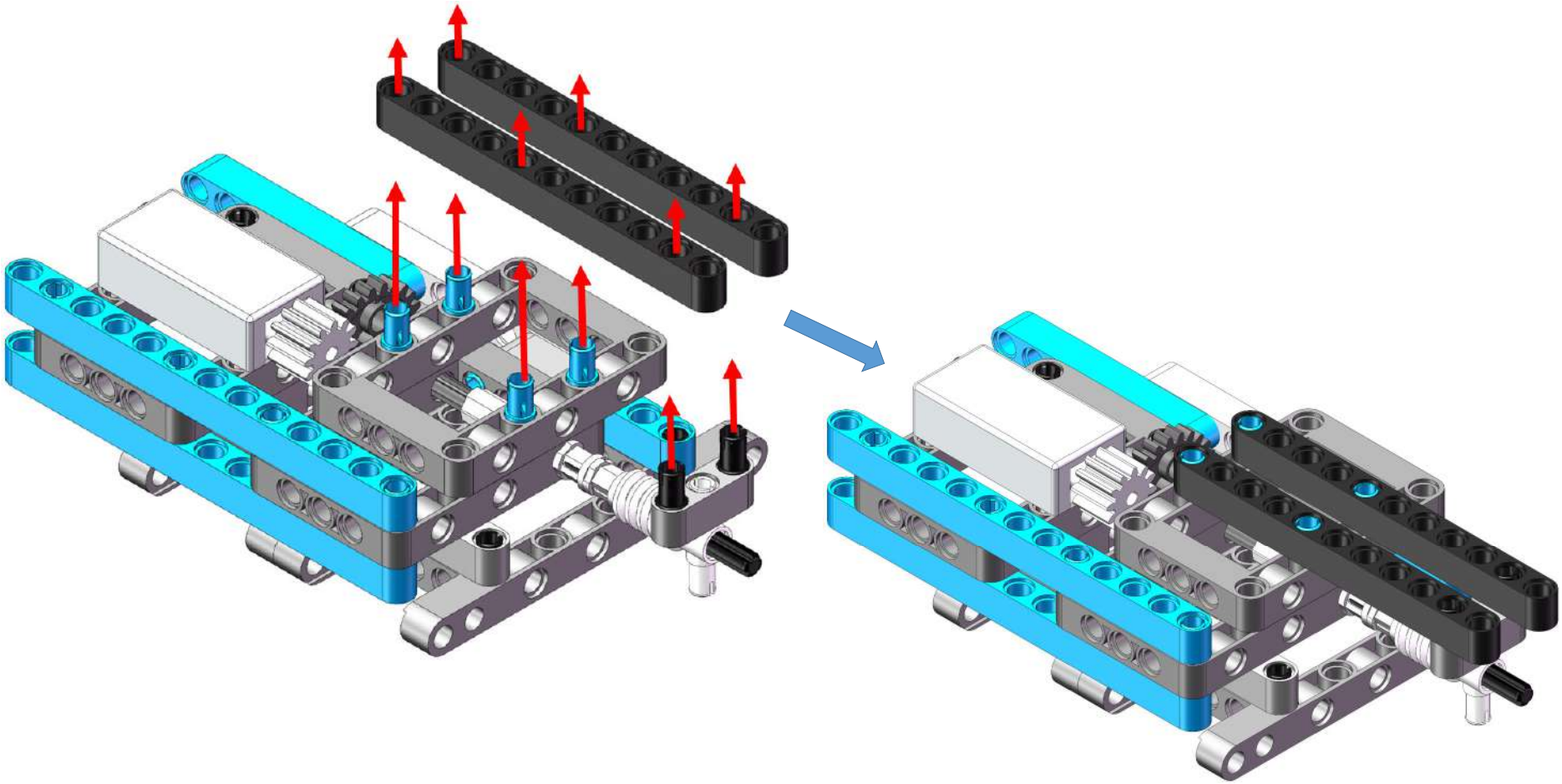
Step 14: Locate the two 1x2 friction pins and a 1x3 hole arm and assemble them.



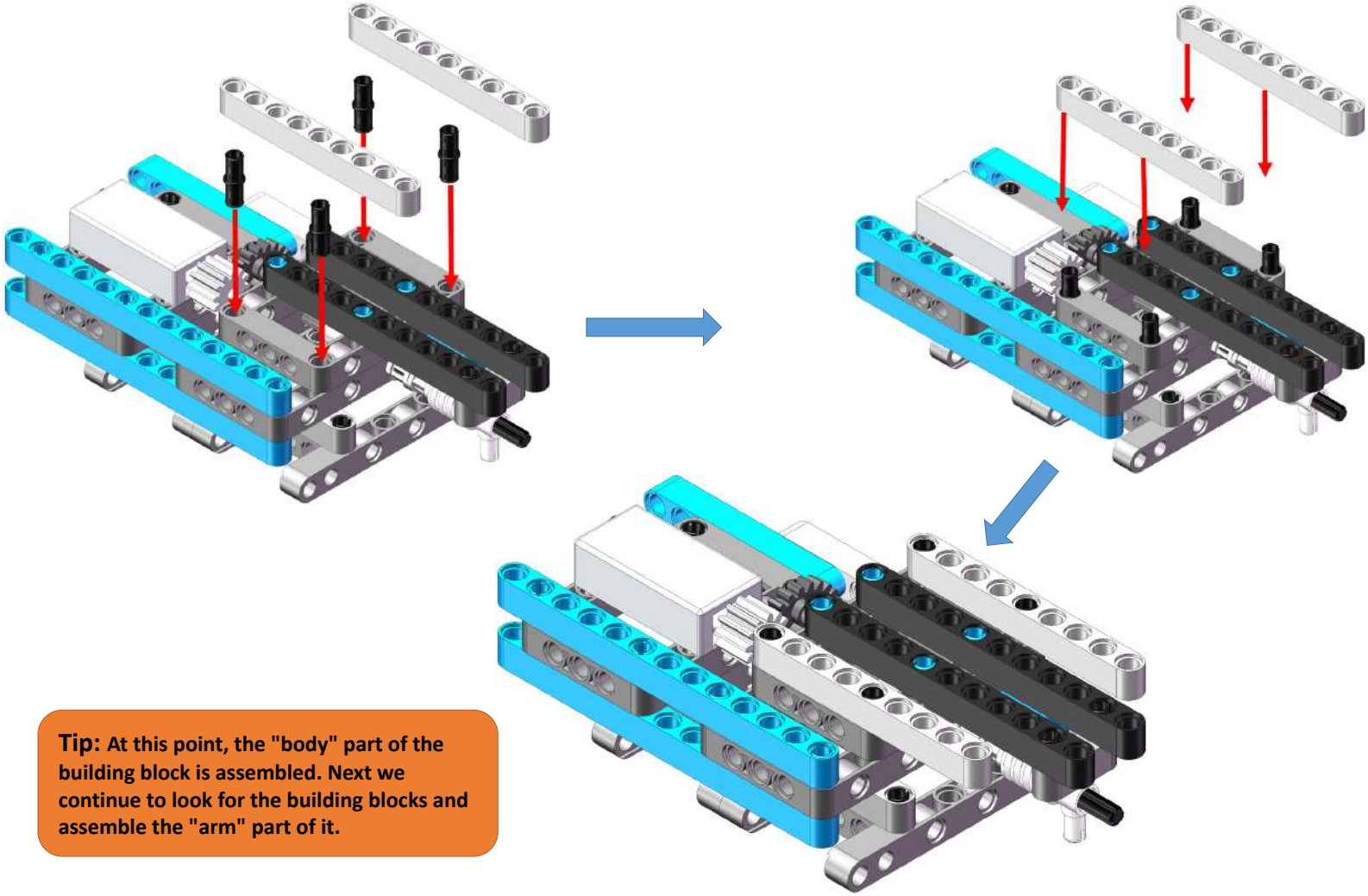
Step 15: Find four 1x3 bolts and a 5x7 beam frame and assemble them.



Step 16: Find two 1x11 hole arms and assemble them.

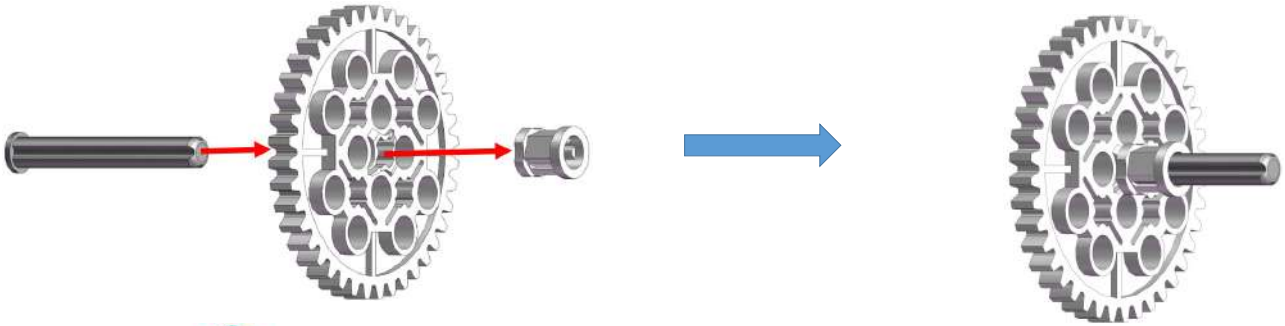


Step 17: Locate the four 1x2 friction pins and the two 1X9 hole arms for assembly.

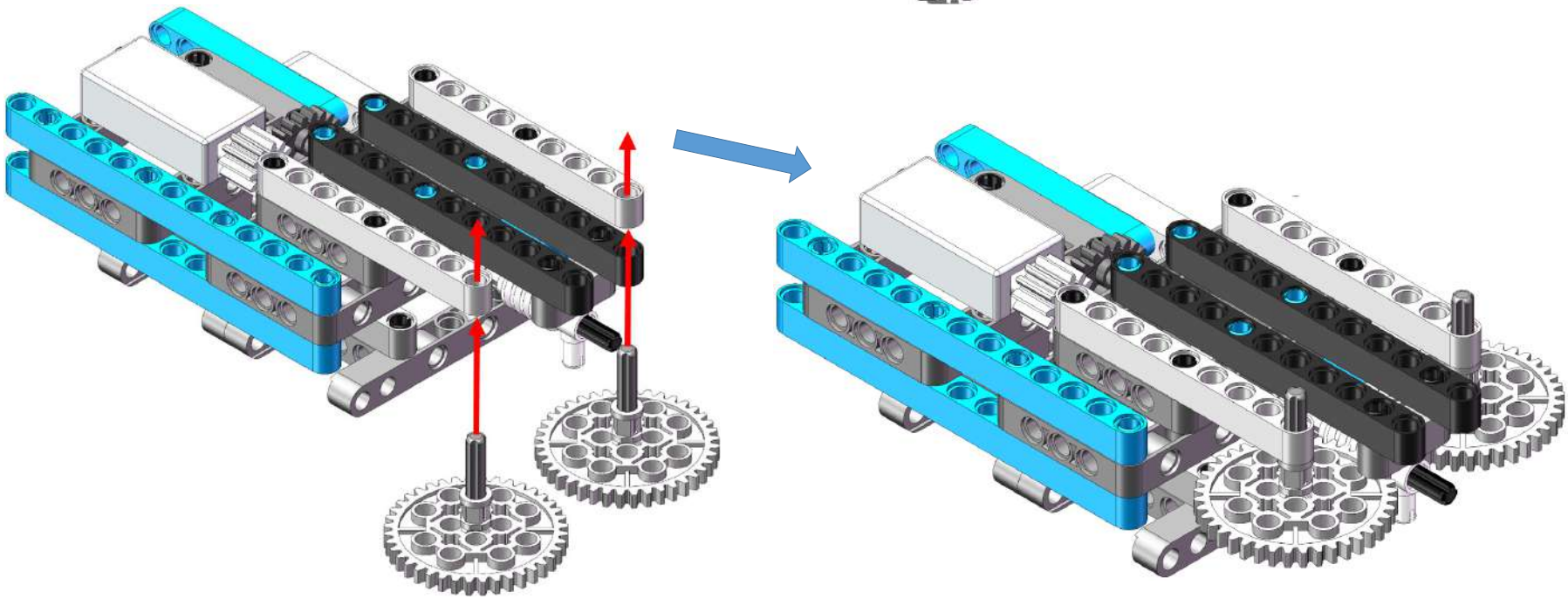


Tip: At this point, the "body" part of the building block is assembled. Next we continue to look for the building blocks and assemble the "arm" part of it.

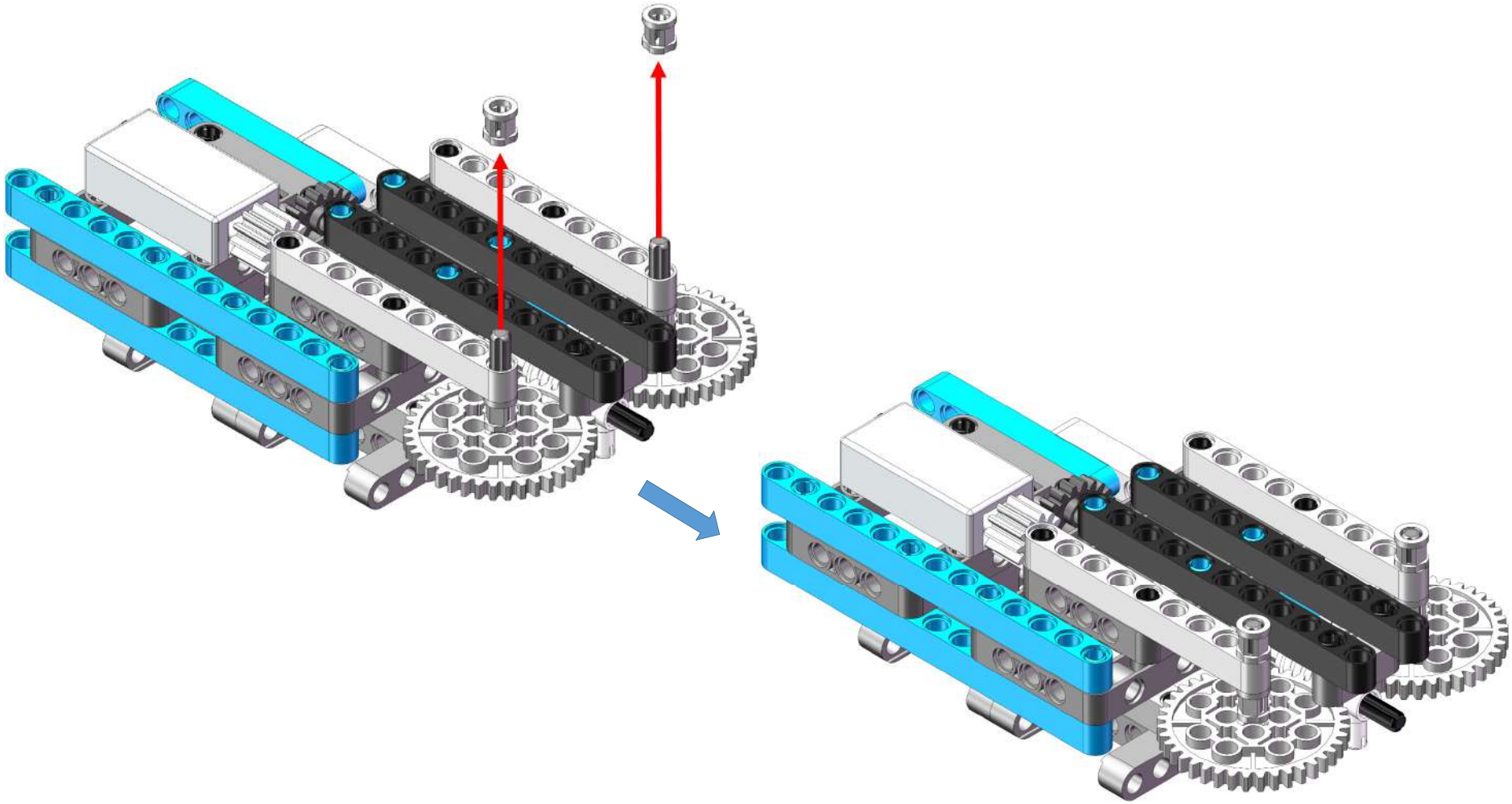
tep 18: We need to find a bushing, a 1*4 shaft cutoff, a 40-toothed wheel, and install it.



Tip: Our mechanical clips require two such gear sections, so you also need to find the same bricks and assemble another identical gear section according to the steps.

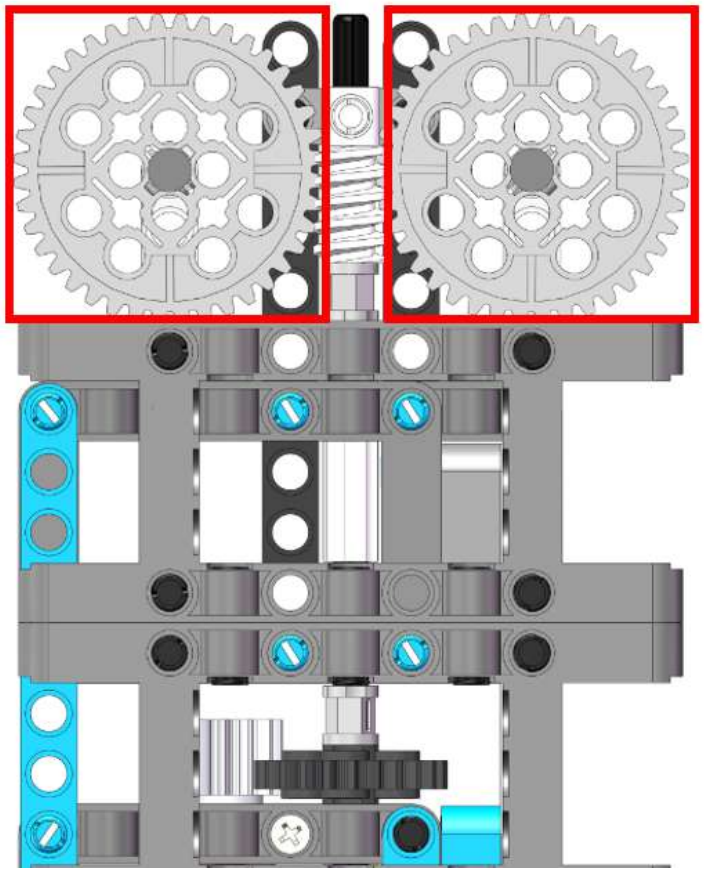


Step 19: Fix the gears we installed in the previous step with two bushings.

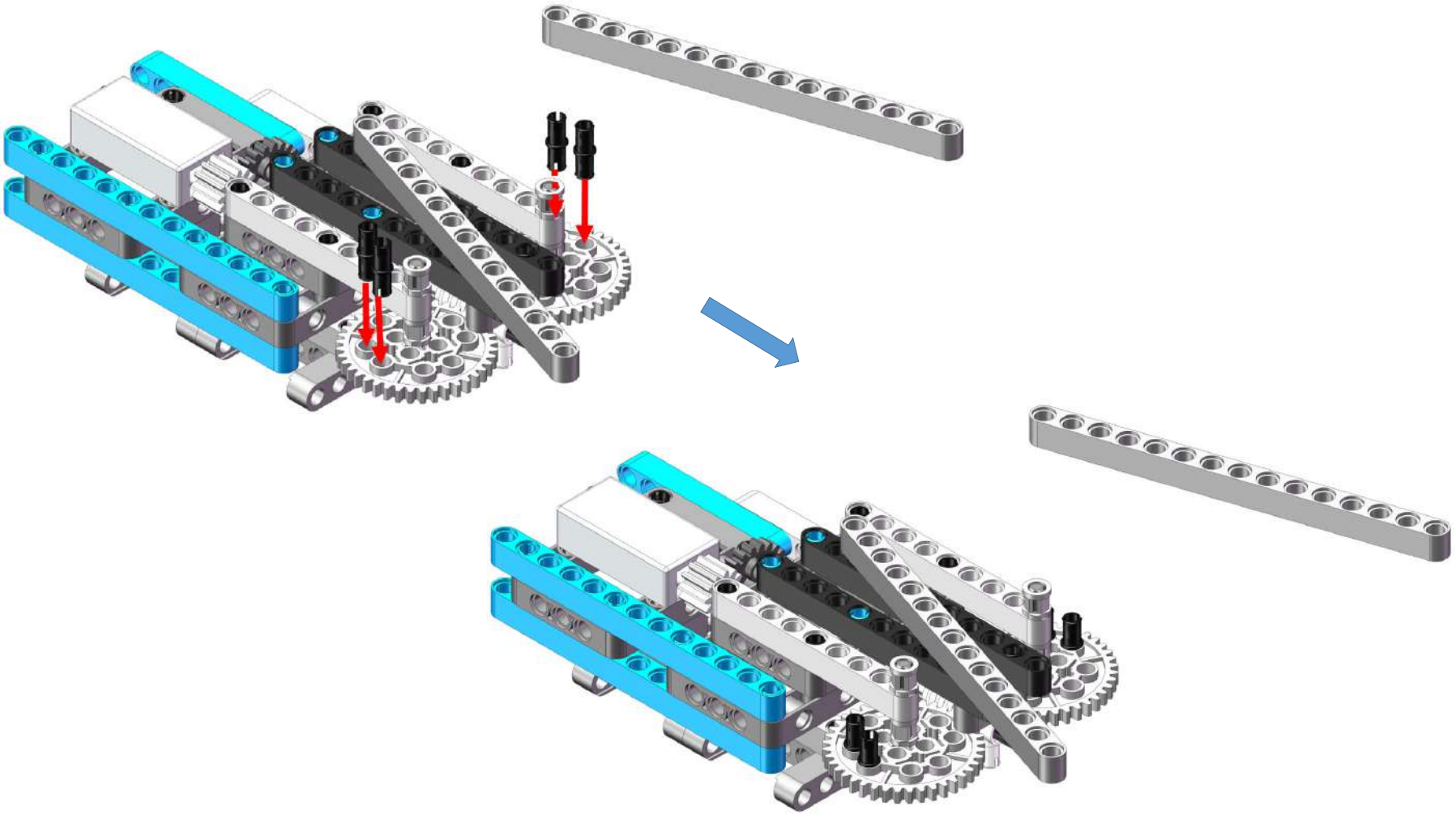


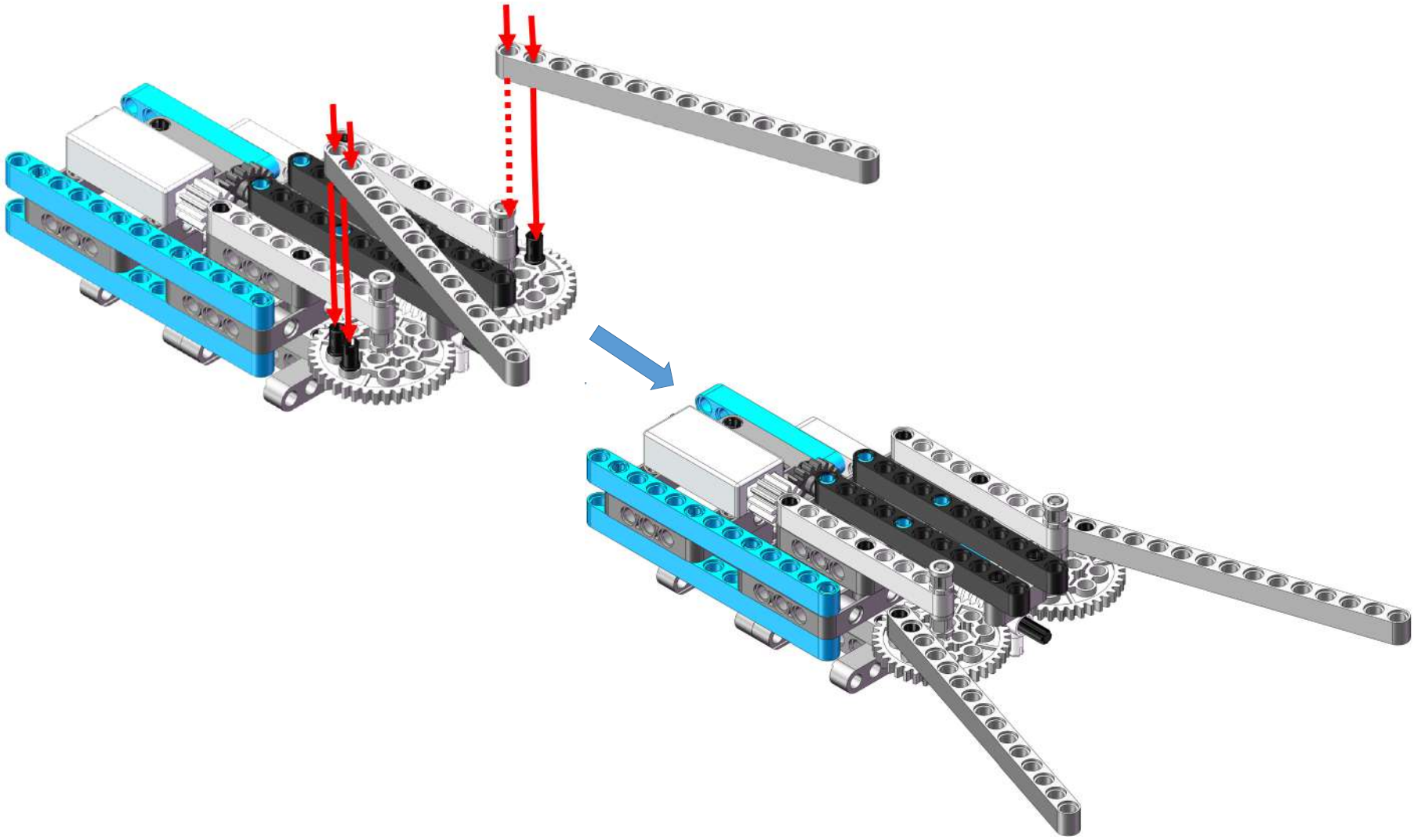
LOOK!

In order to ensure that the arm can be opened or closed normally after the gear is installed, we need to ensure that the two 40 toothed wheel are completely symmetrical.
Please check according to the picture below.

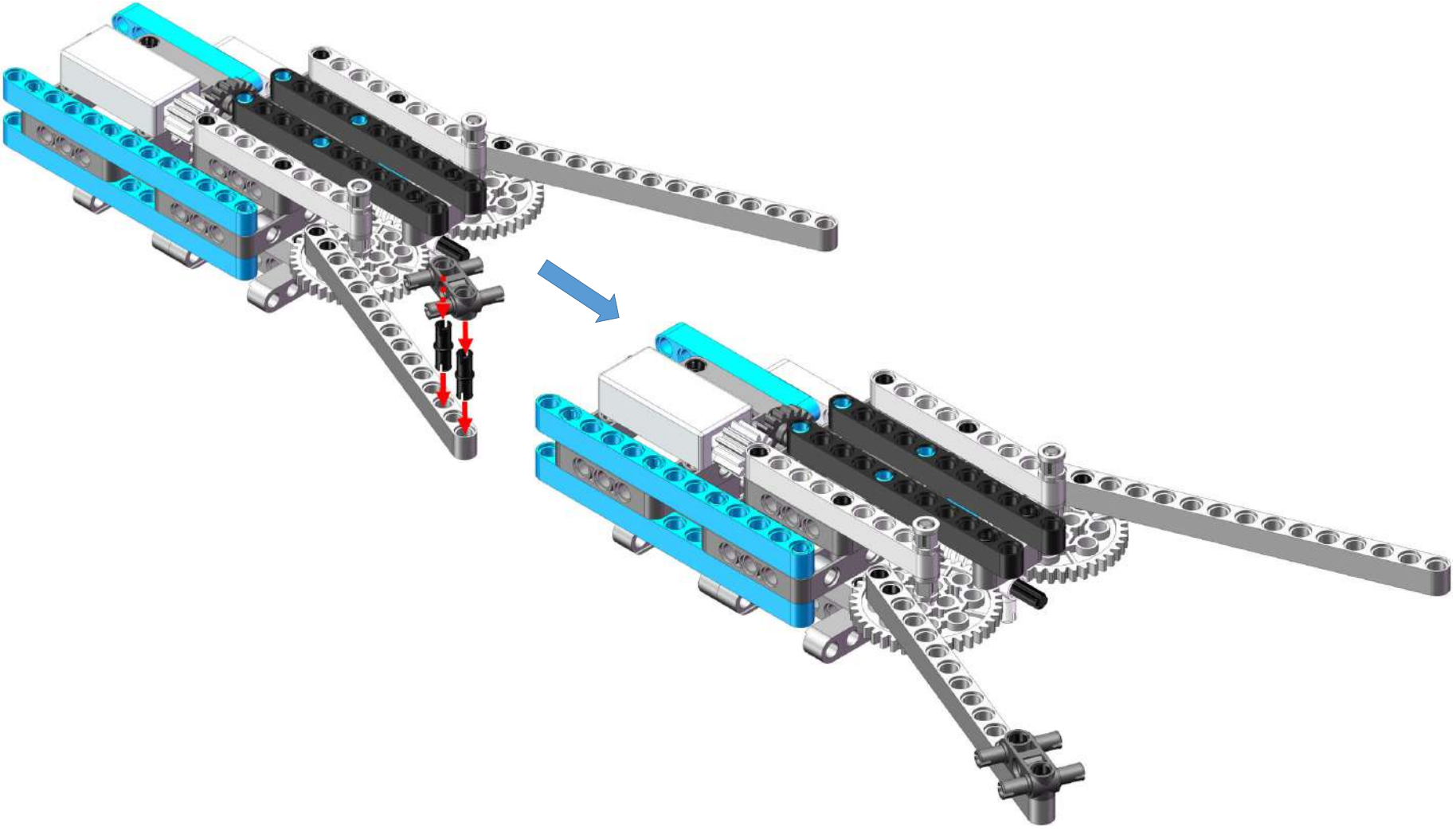


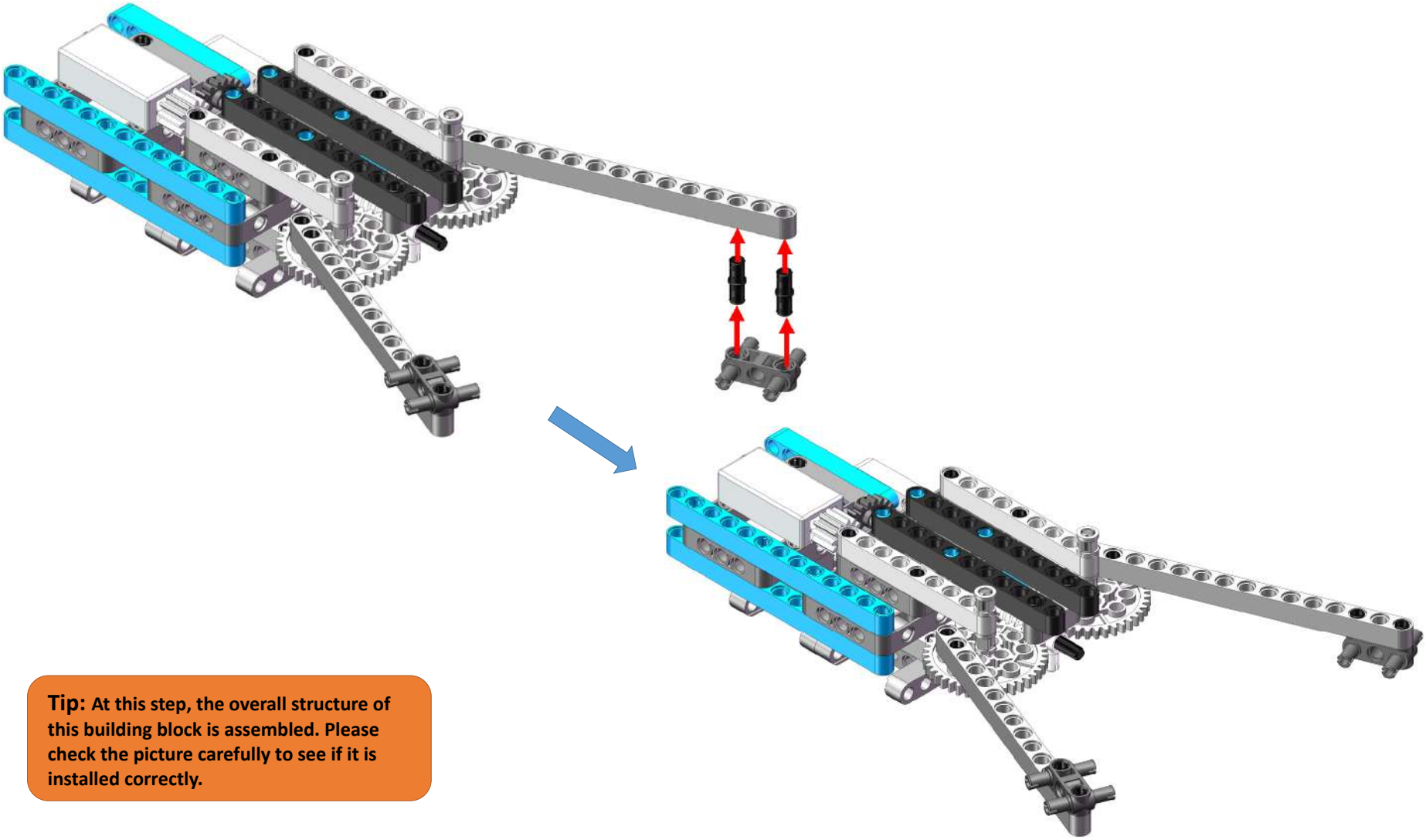
Step 20: Locate the four 1x2 friction pins and the two 1x15 hole arms. First insert the 1x2 friction pins into the corresponding holes of the two 40-toothed wheels, and then install the 1x15 hole arms on the 1x2 friction pins. After the installation is completed, their positions are bilaterally symmetrical.





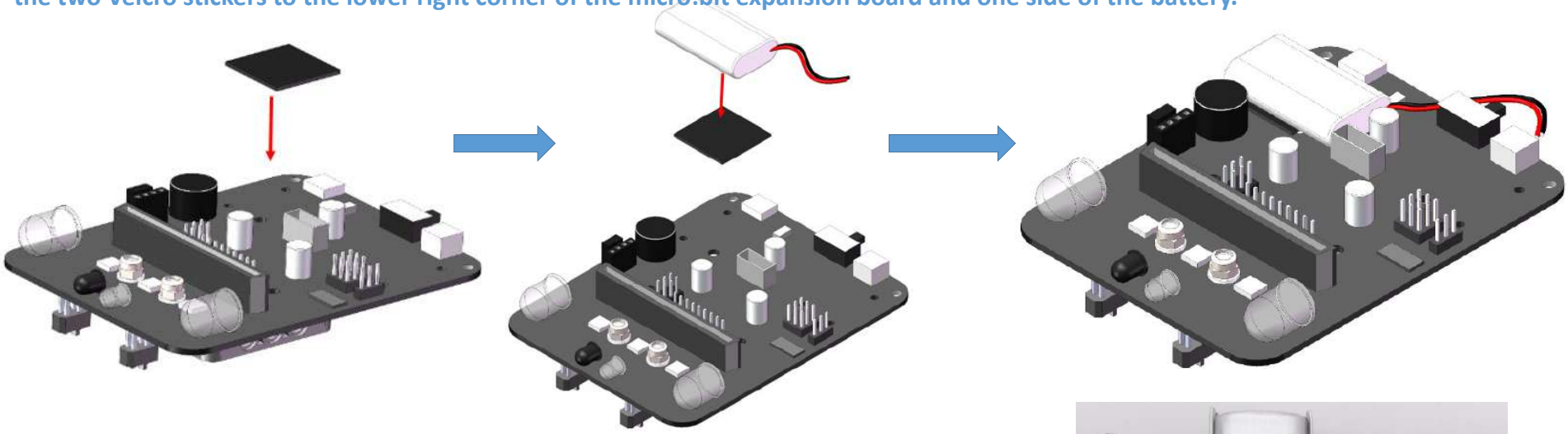
Step 21: Find four 1x2 friction pins and two 3X3 bolts to assemble them.

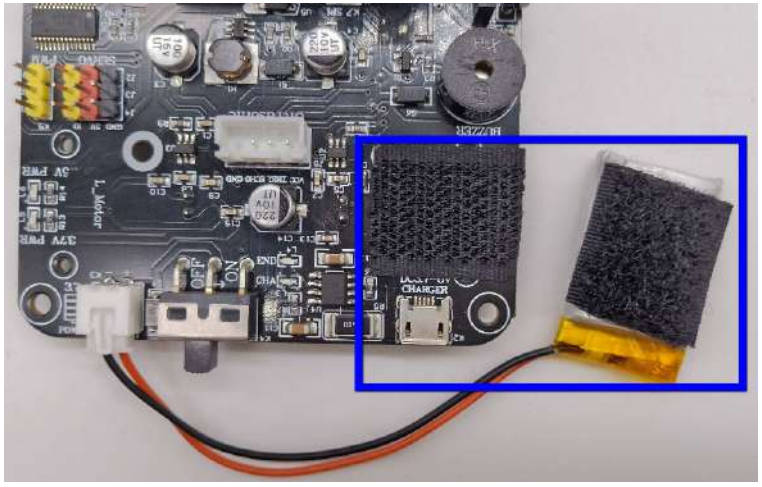




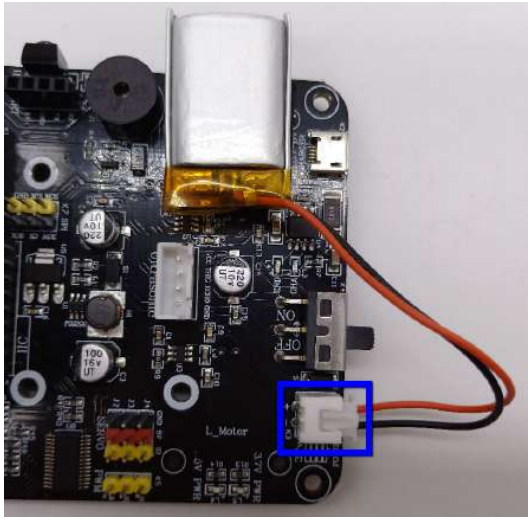
Tip: At this step, the overall structure of this building block is assembled. Please check the picture carefully to see if it is installed correctly.

Step 22: 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.

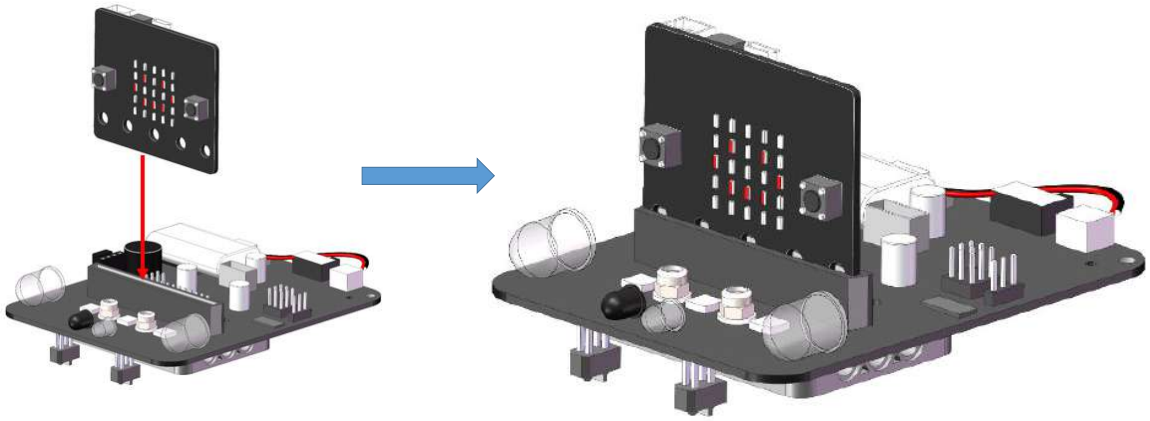




Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

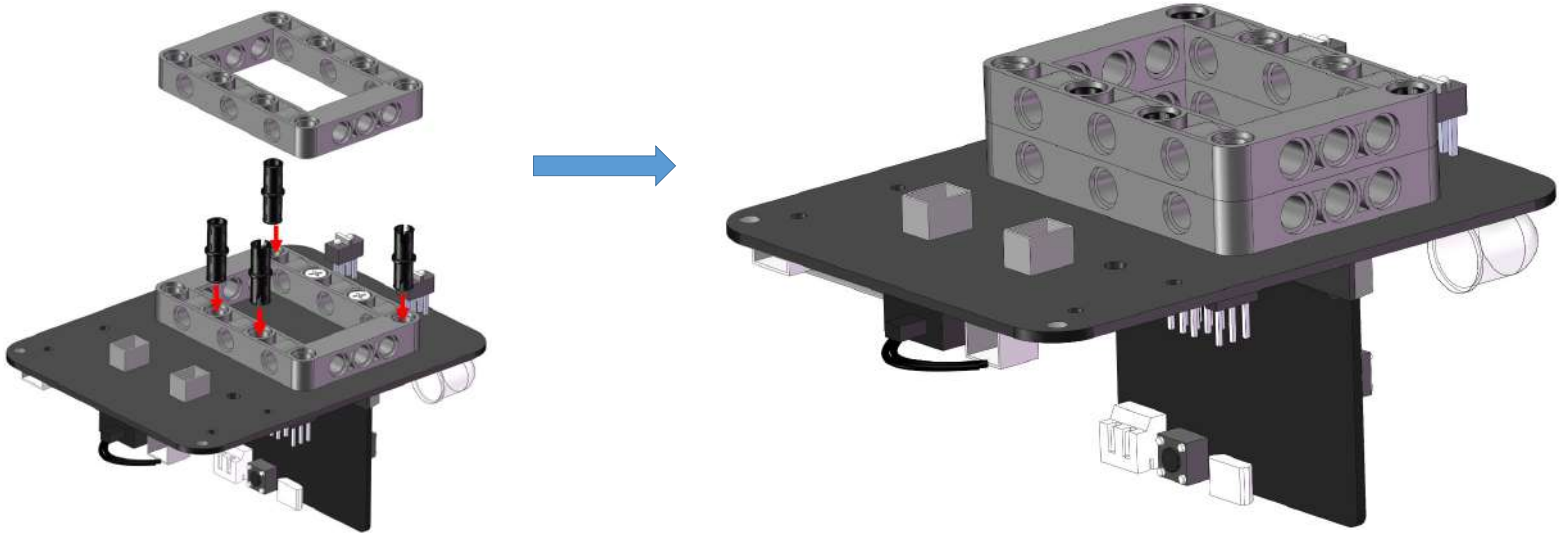


Step 23: Find the micro:bit motherboard and insert it correctly into the micro:bit expansion board.

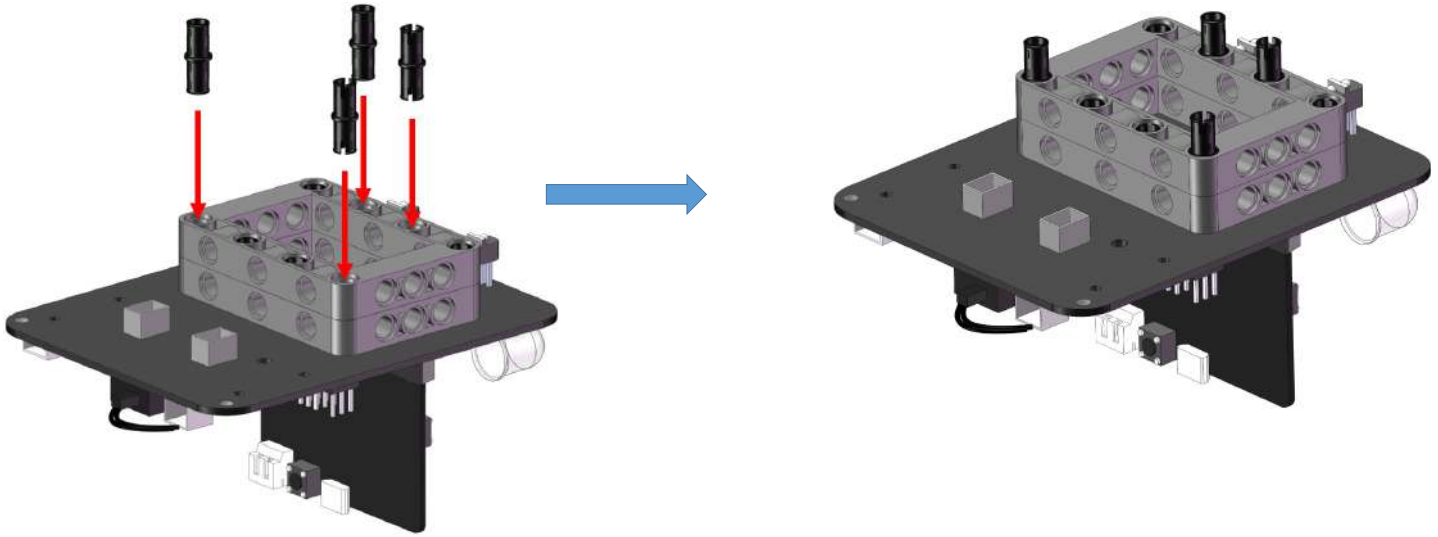


Tip: The micro:bit board is equivalent to the "brain" of the mechanical clip, so be sure to remember to install it properly. In this case, the mechanical clamp can work normally.

Step 24: Locate the four 1x2 friction pins and a 5x7 beam frame and assemble them with the expansion board.

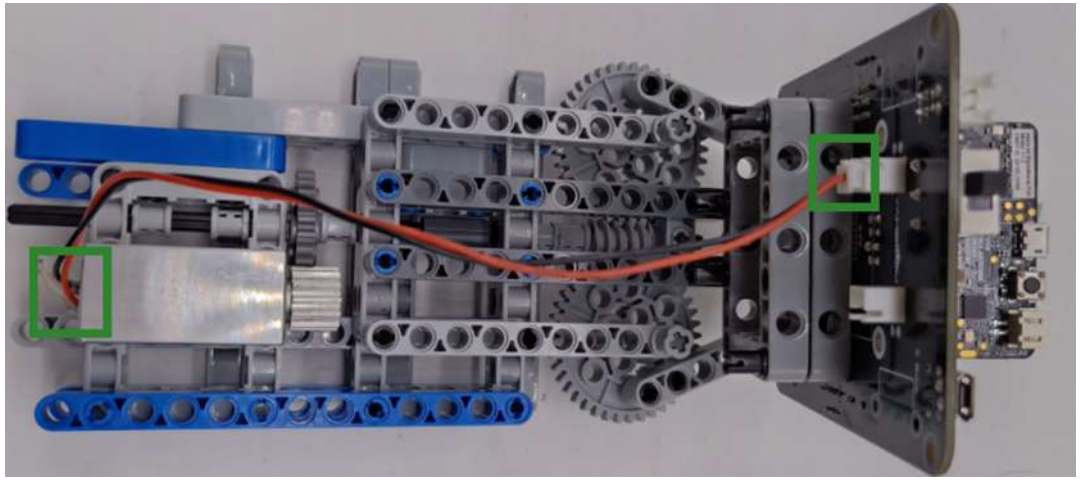


Step 25: Continue to find the four 1x2 friction pins and insert them into the 5x7 beam frame we have assembled in the previous step.

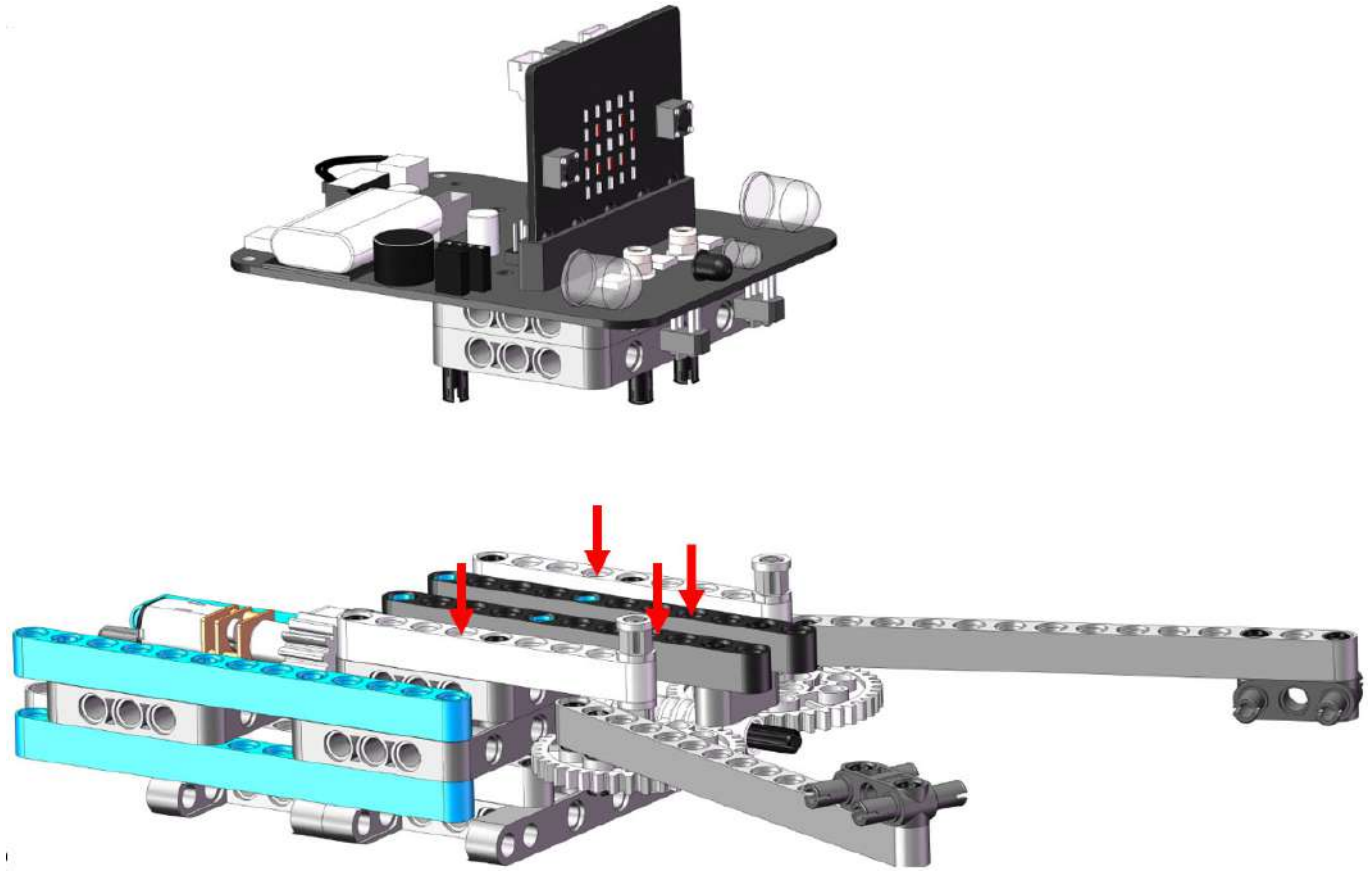


Step 26: Wire as shown on the right.

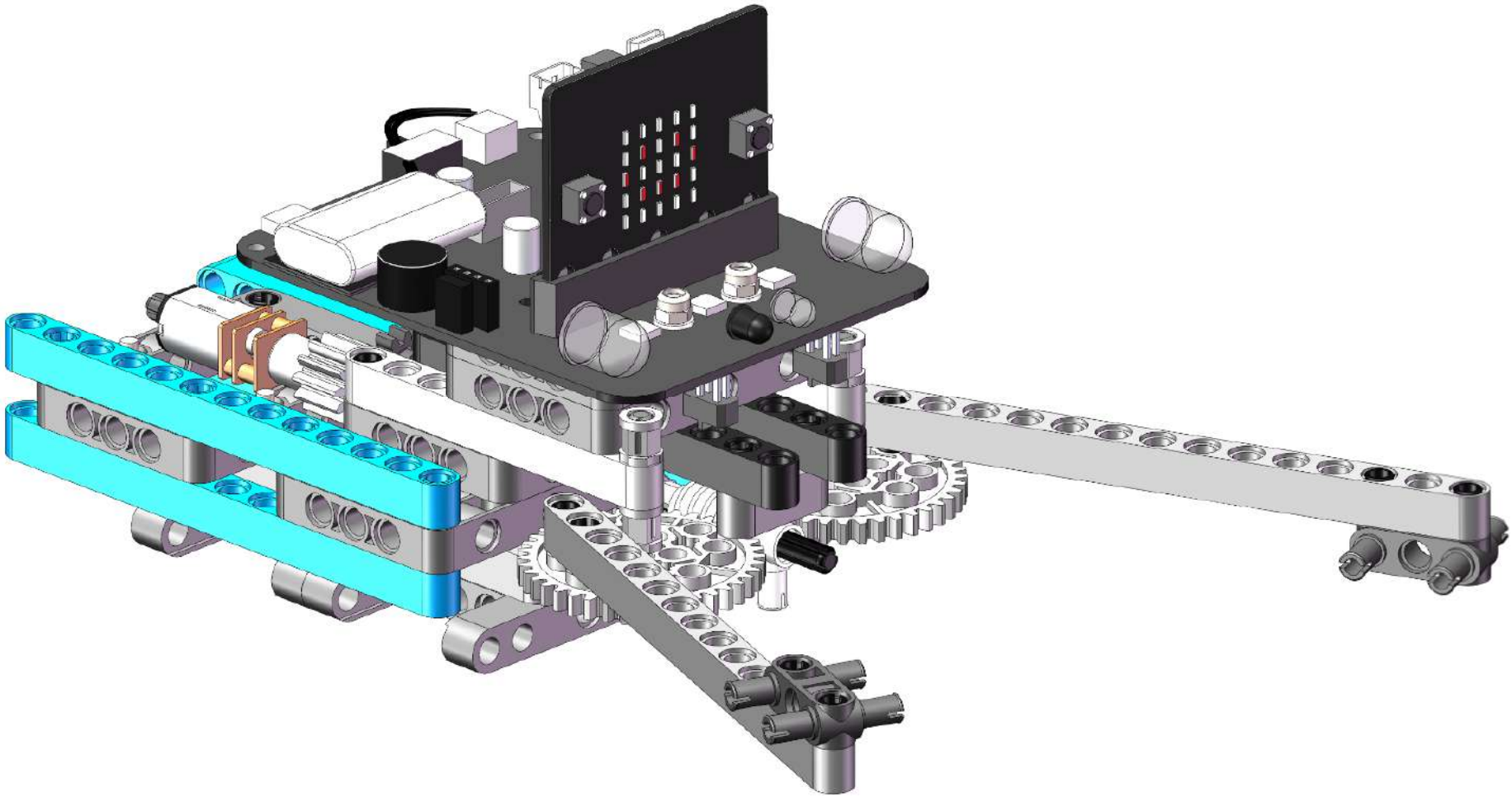
Tip: After the assembly is complete, please insert the motor wiring into the correct position. As shown on the right picture.



Step 27: Combine the blocks that we have completed in step 21 and step 25. Two of the 1x2 friction pins are inserted into the fourth hole position of the two 1x11 hole arms from the front side, and the other two 1x2 friction pins are inserted into the sixth hole position of the two outer 1x9 hole arms from the front.



The building block robot arm after assembly is the same as shown in the figure below.

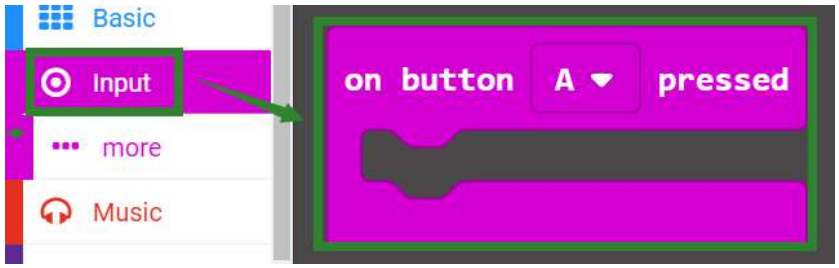
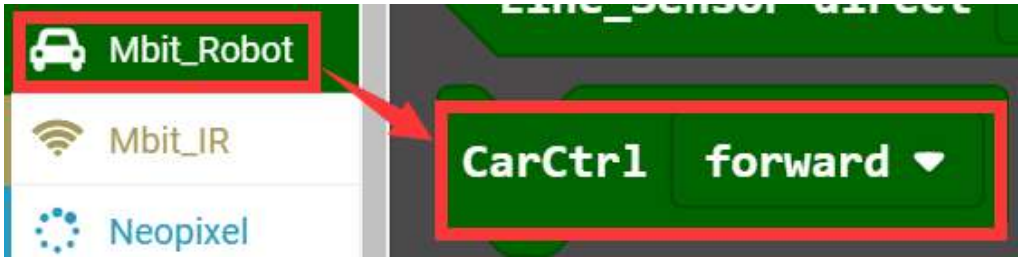


Thinking：This session is mainly to teach you how to use graphical programming to control the mechanical clip.

Preparation

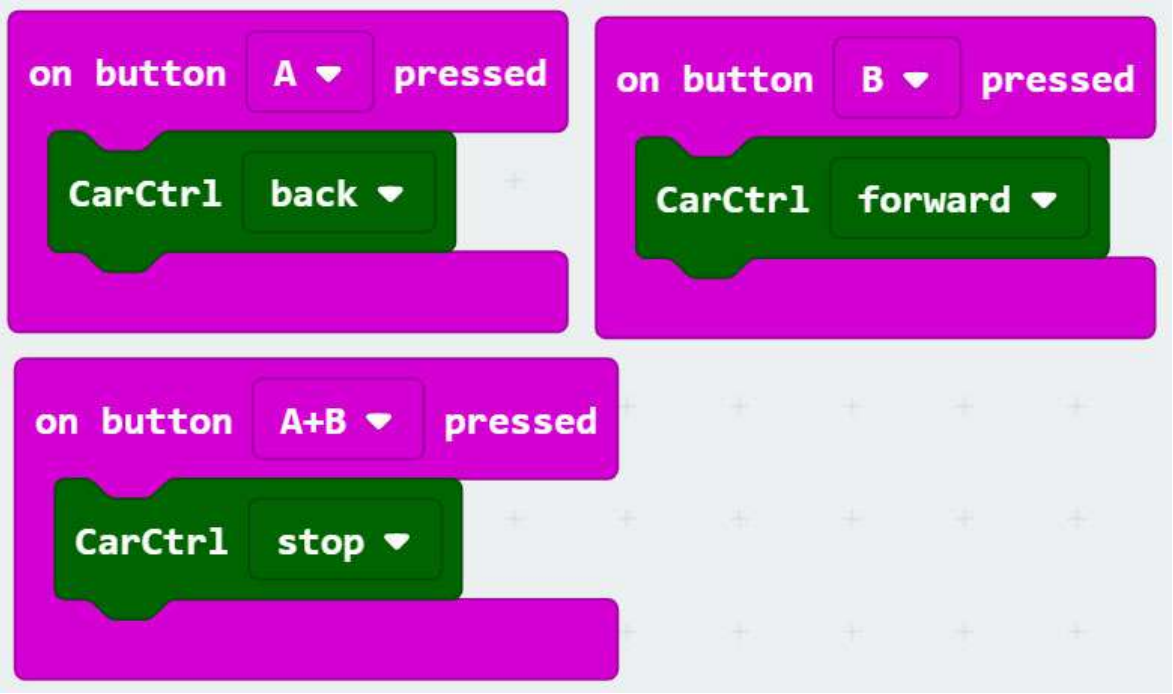
- USB cable *1
- Mechanical clip *1

Blocks

Block	Instruction
	When the button on the micro:bit board is pressed, the corresponding content is executed.
	The Cartrl forward represents the forward rotation of the motor, and the Cartrl back represents the reverse rotation of the motor.

Programming

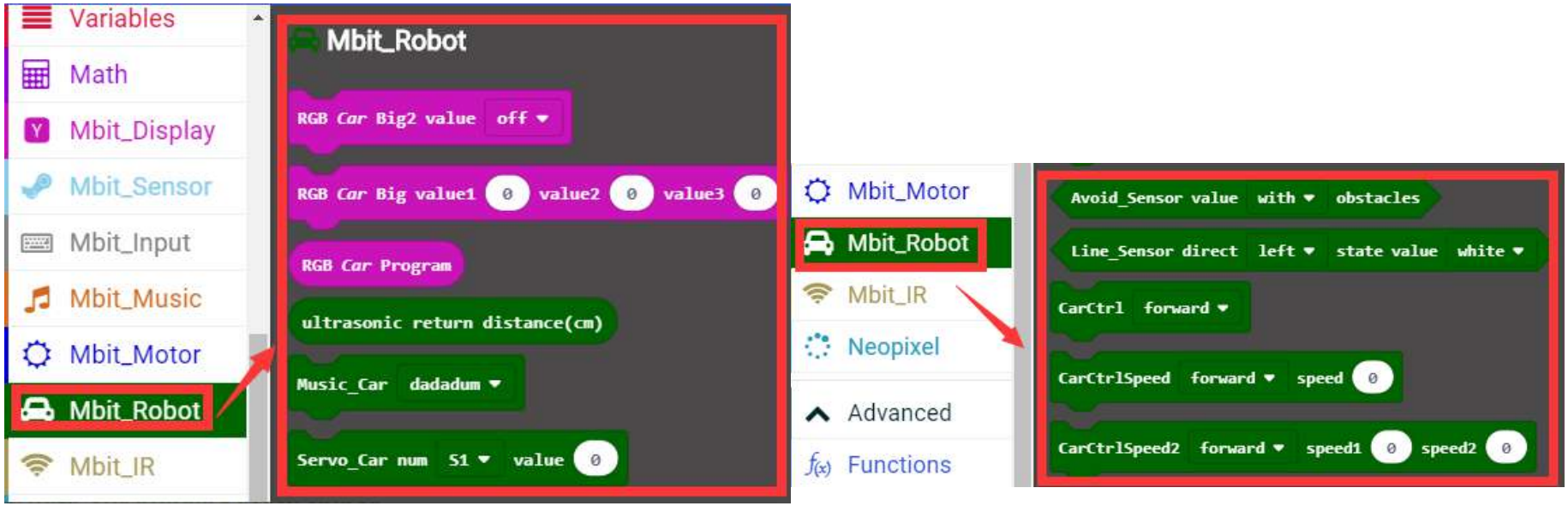
The program of this course is shown in the figure below. After downloading the program, after downloading the program, open the power switch of the mechanical clamp. Press the A button on the micro:bit board, the clip will open. Press the B button on the micro:bit board, the clip will close. And press the A and B button on the micro:bit board, the motors stop rotating, that is, both mechanical clips remain stationary.



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\D.Mechanical Clip\2.Mechanical Clip\Mechanical-Clip.hex

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



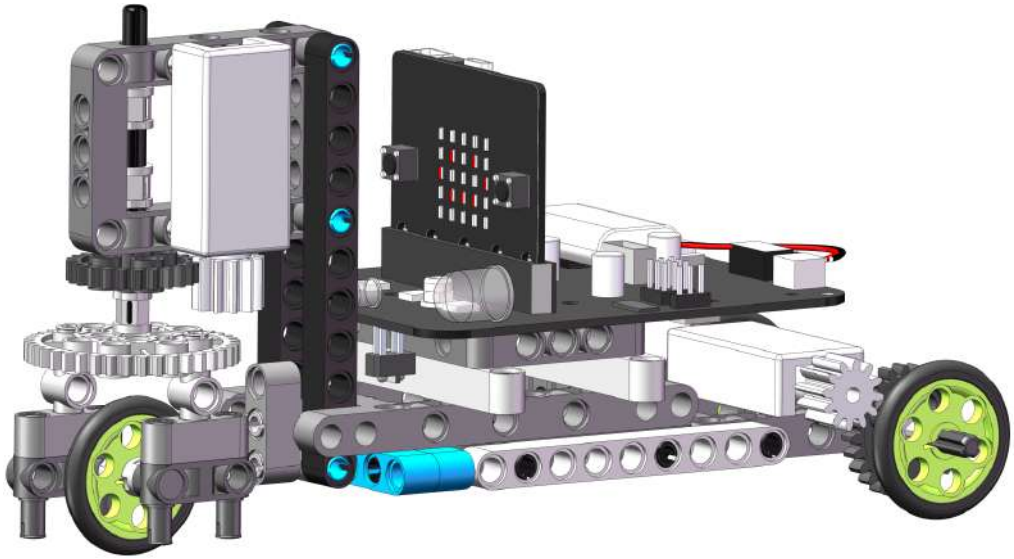
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely. Drag these blocks and play with our building block mechanical clip.

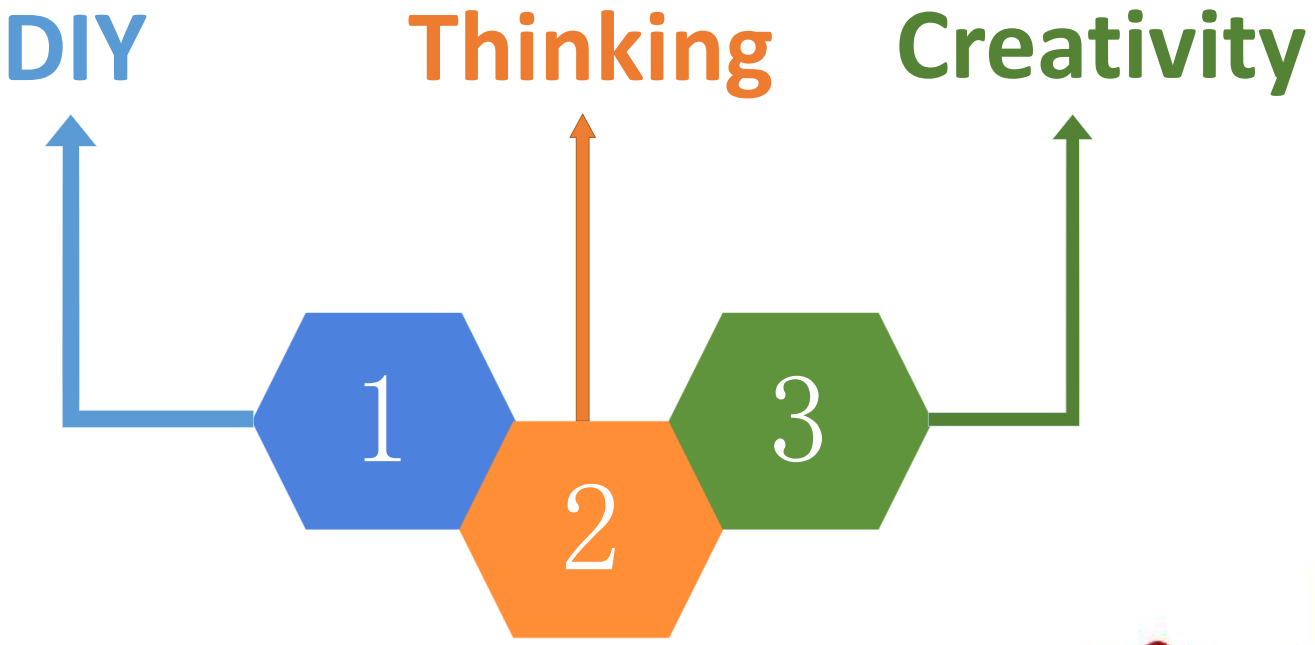


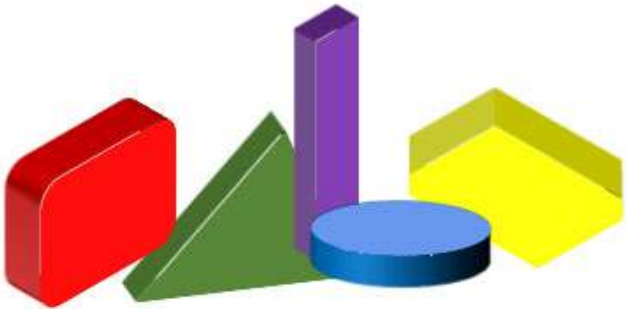
On our official website, we also provides other tutorial: Mechanical Clip Infrared remote control, Mechanical Clip bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.5 Independent steer car

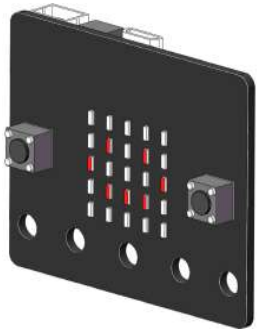
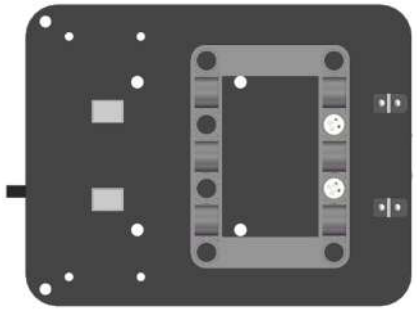
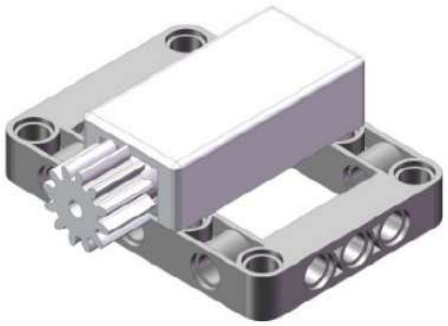
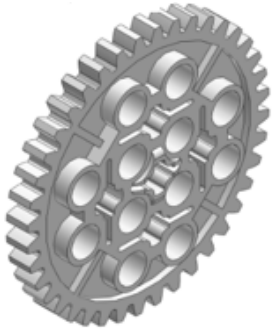
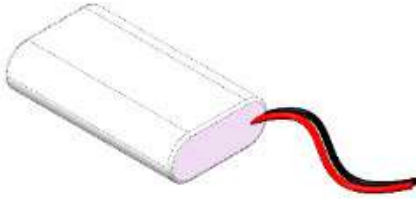
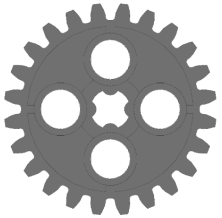
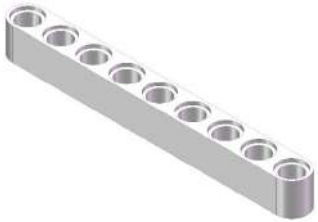
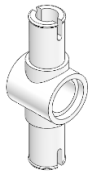
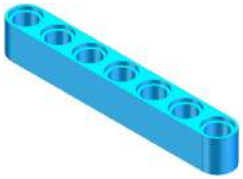


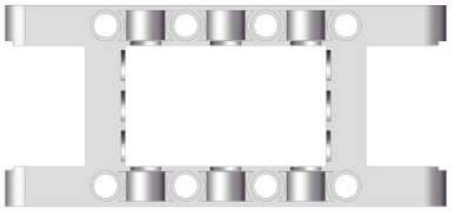
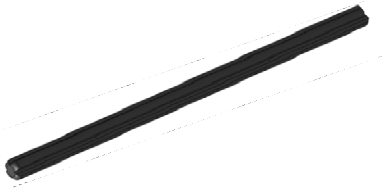

DIY
Thinking
Creativity
1
2
3



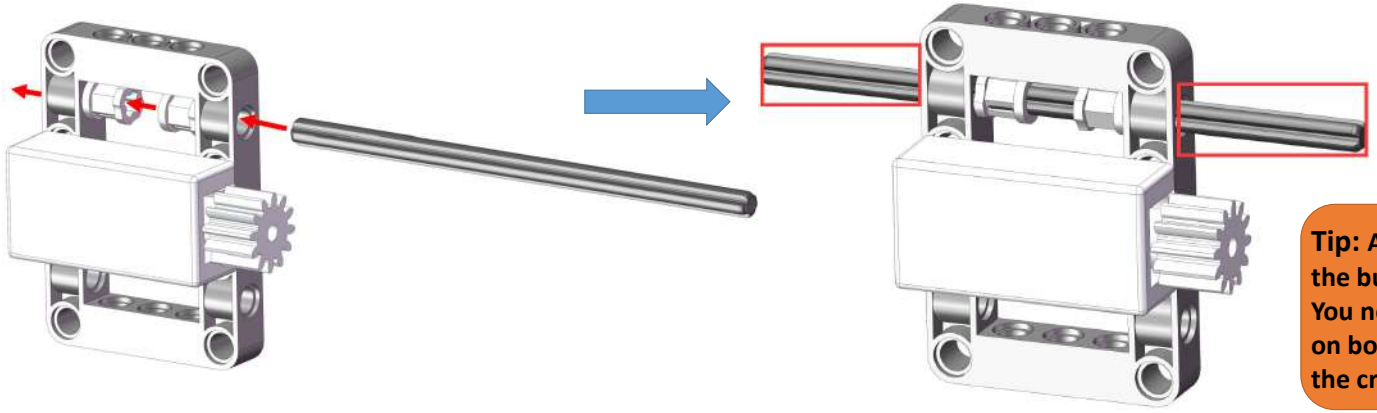
DIY: This part is mainly to teach you to assemble independent steer car with building blocks.

Prepare the following blocks and we will assemble a building block independent steer car.

 Micro:bit*1	 Micro:bit expansion board*1	 Motor module*2	 5x7 beam frame*3	 40 toothed wheel *1
 1x4 Shaft cutoff *1	 Battery*1	 24 toothed wheel*2	 1x9 hole arm*4	 1x3 hole arm*3
 Bushing*8	 1x3 Bolt connector *4	 1x2 Frictional pin*16	 3x3 Bolt connector*2	 1x7 hole arm*2

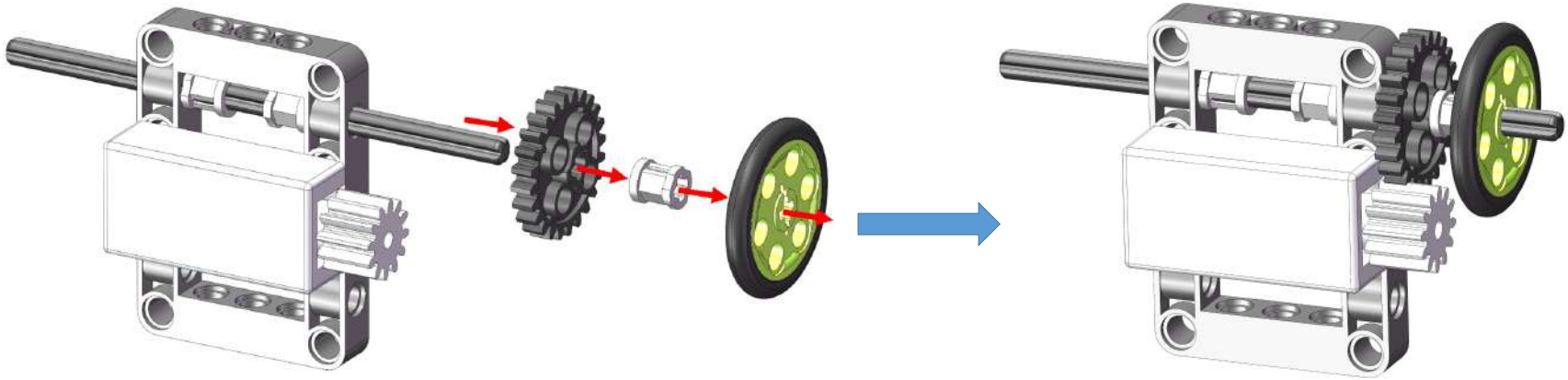
 1x11 hole arm*2	 1x3 Shaft*8	 5x11 beam frame*1	 1x12 Cross Axle*1	 Rubber ring+24 pulley *3
 1x8 Cross Axle*1	 1/2 Bushing *2			

Step 1: Find a motor module, two bushings and a 1x12 cross shaft to install it.

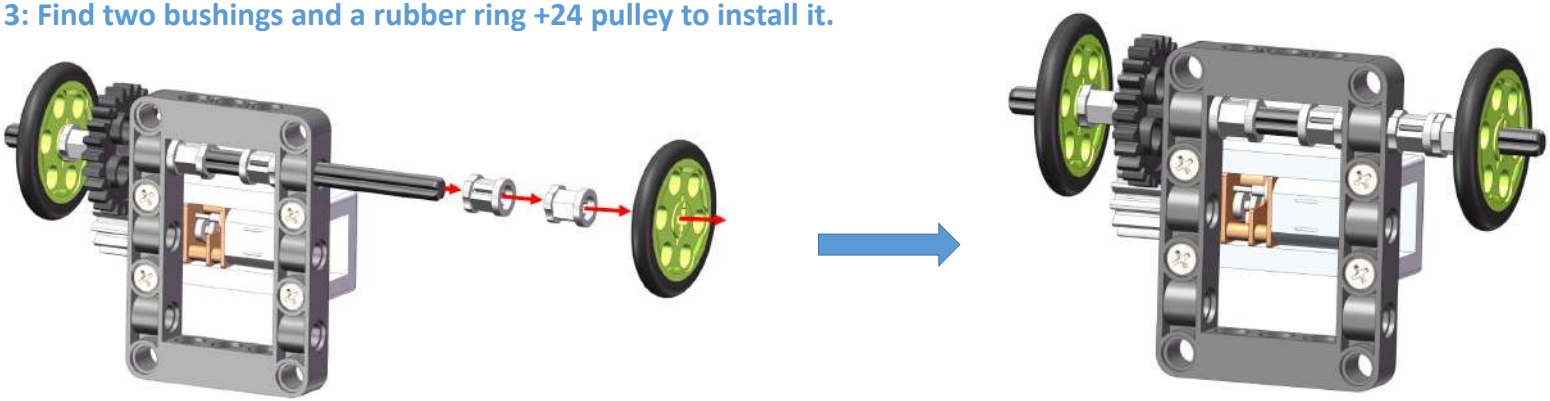


Tip: After 1 x12 cross shaft through the bushing and motor module, You need to leave the same length on both the left and right sides of the cross shaft.

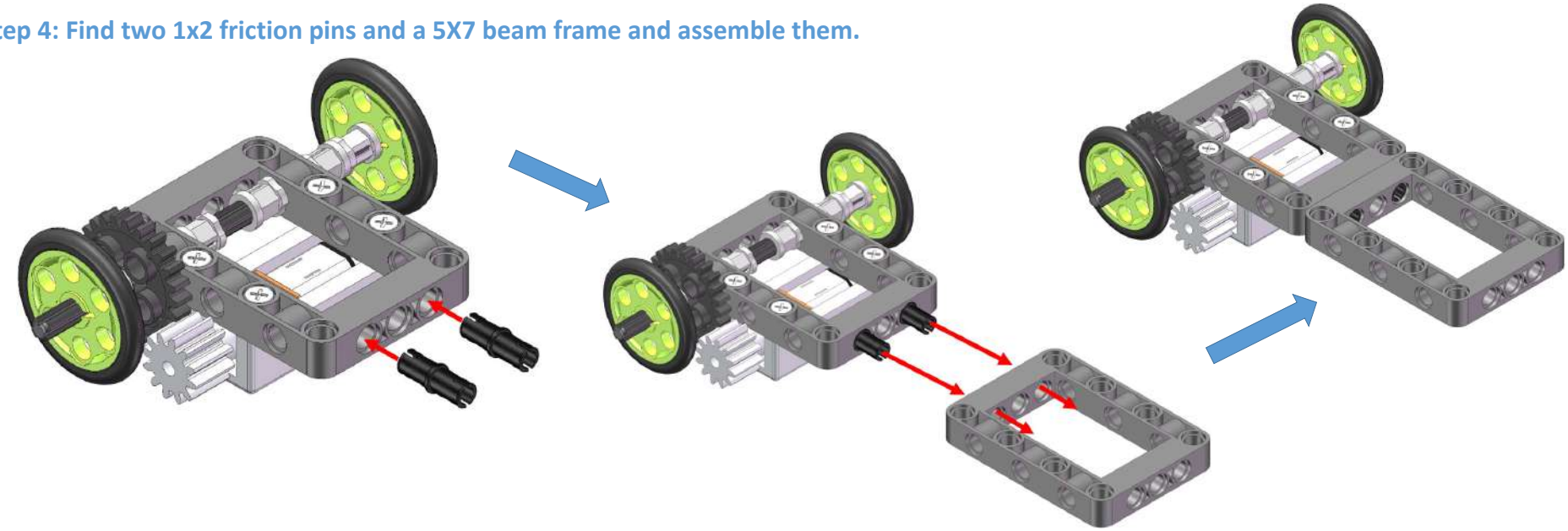
Step 2: Find a rubber ring +24 pulley, a bushing and a 24-toothed wheel to install them.



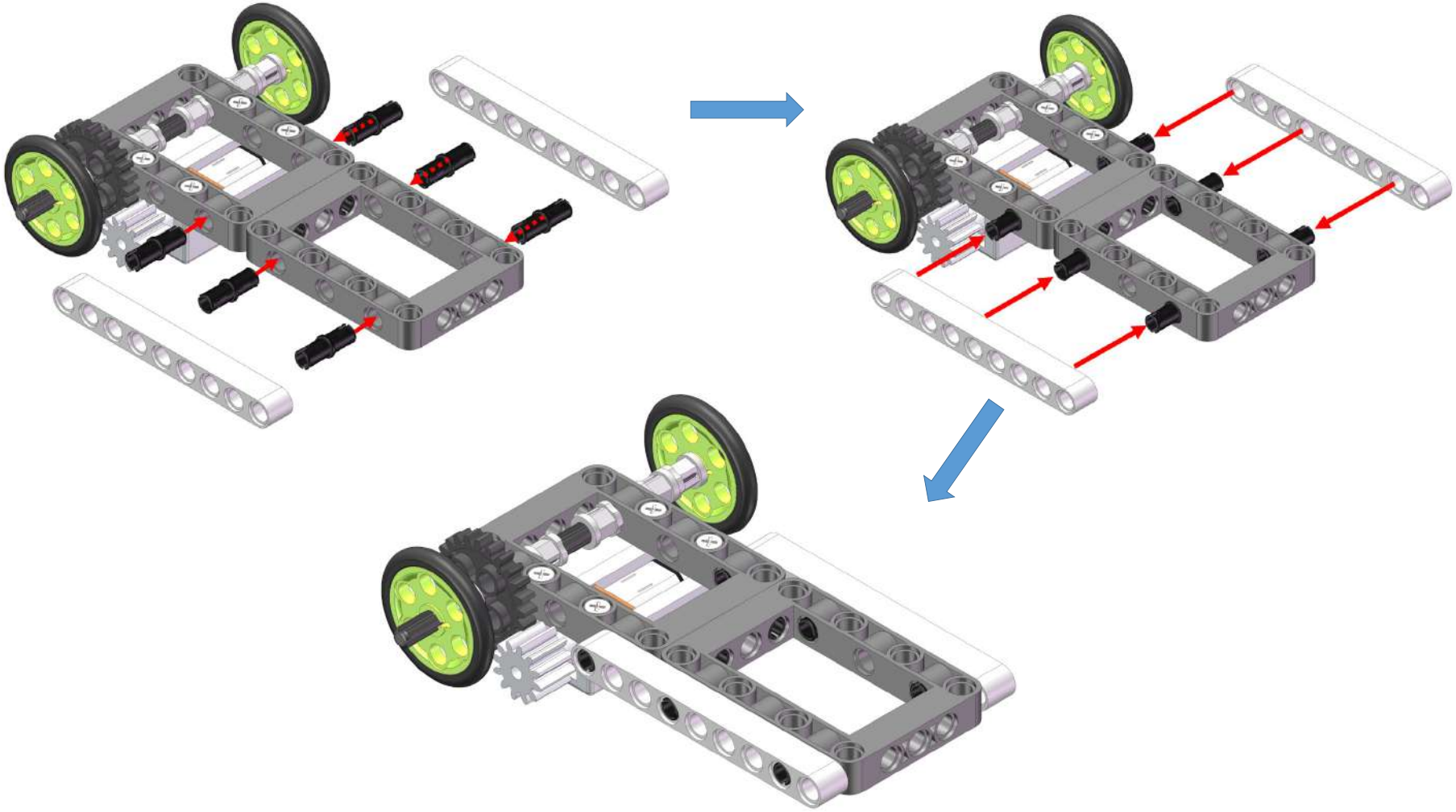
Step 3: Find two bushings and a rubber ring +24 pulley to install it.



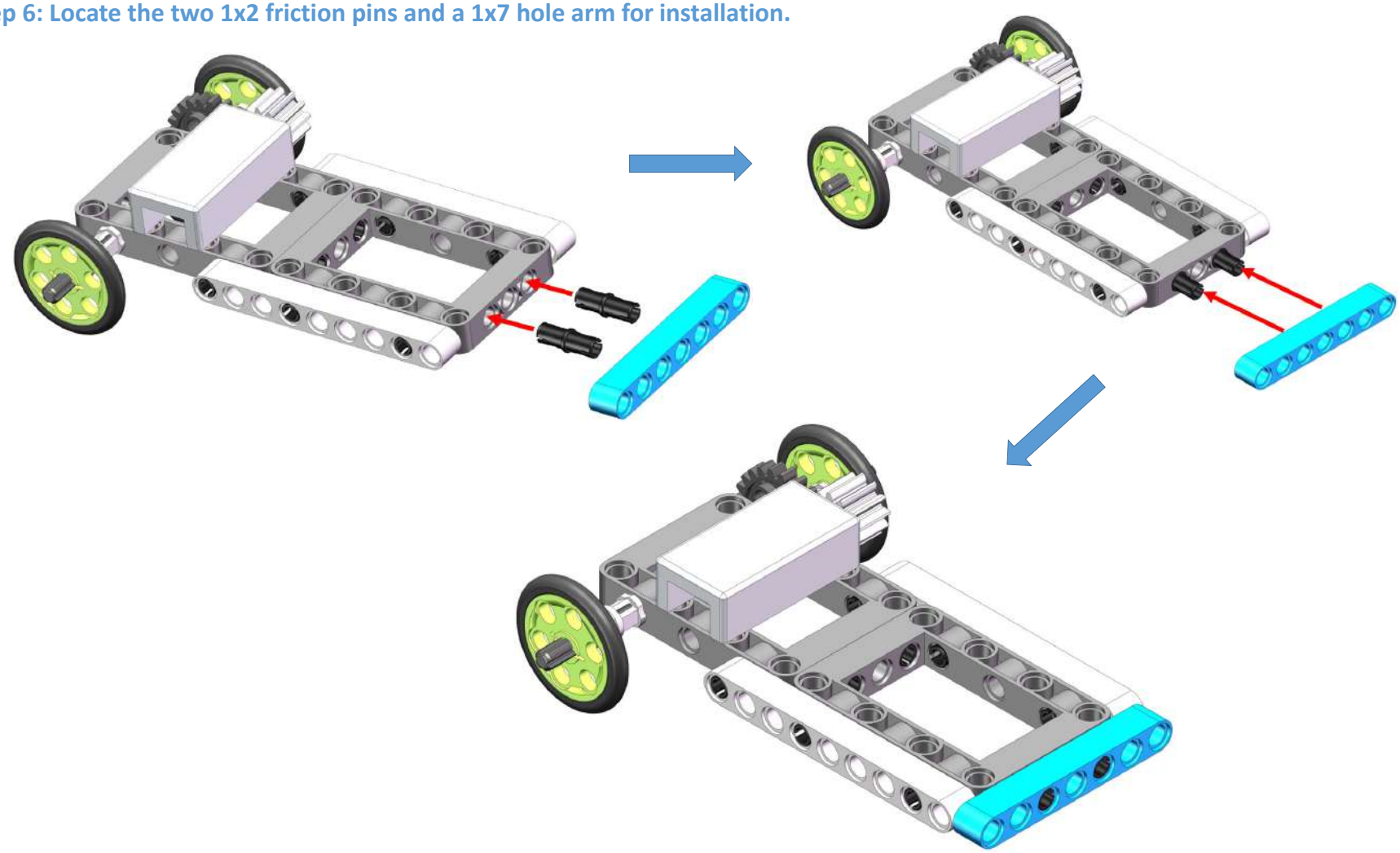
Step 4: Find two 1x2 friction pins and a 5X7 beam frame and assemble them.



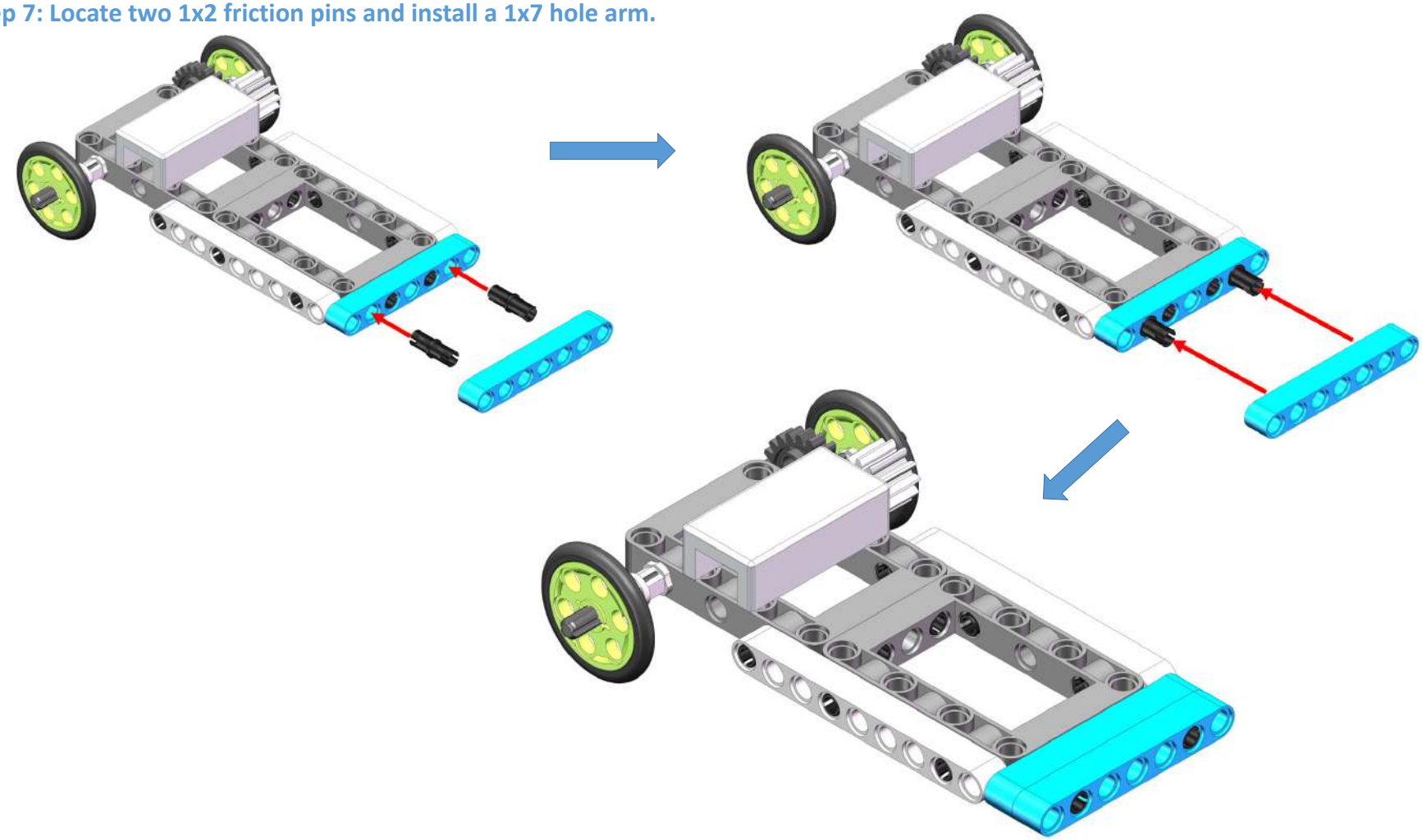
Step 5: Locate two 1x9 hole arms and six 1x2 friction pins for assembly.



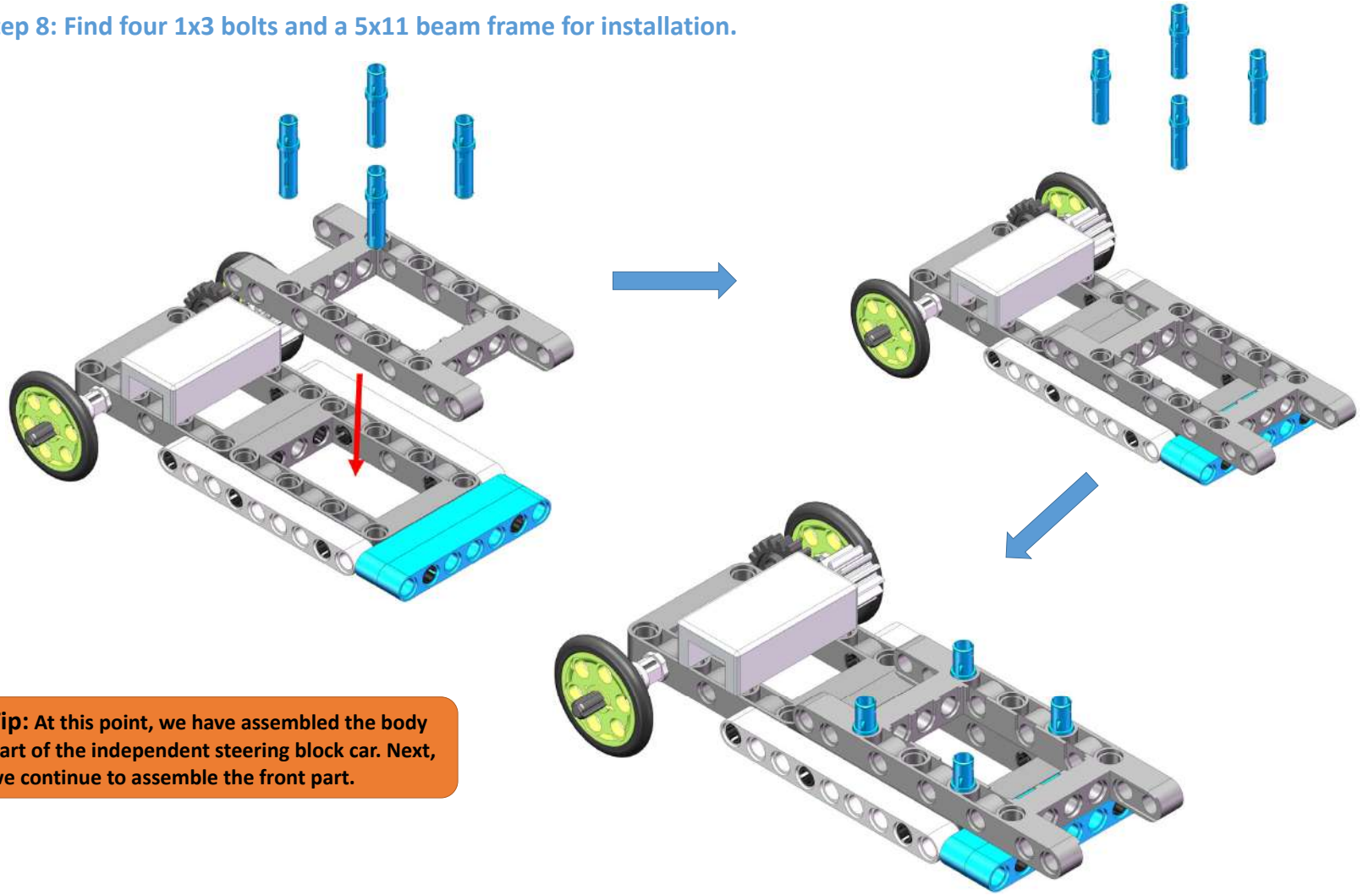
Step 6: Locate the two 1x2 friction pins and a 1x7 hole arm for installation.



Step 7: Locate two 1x2 friction pins and install a 1x7 hole arm.

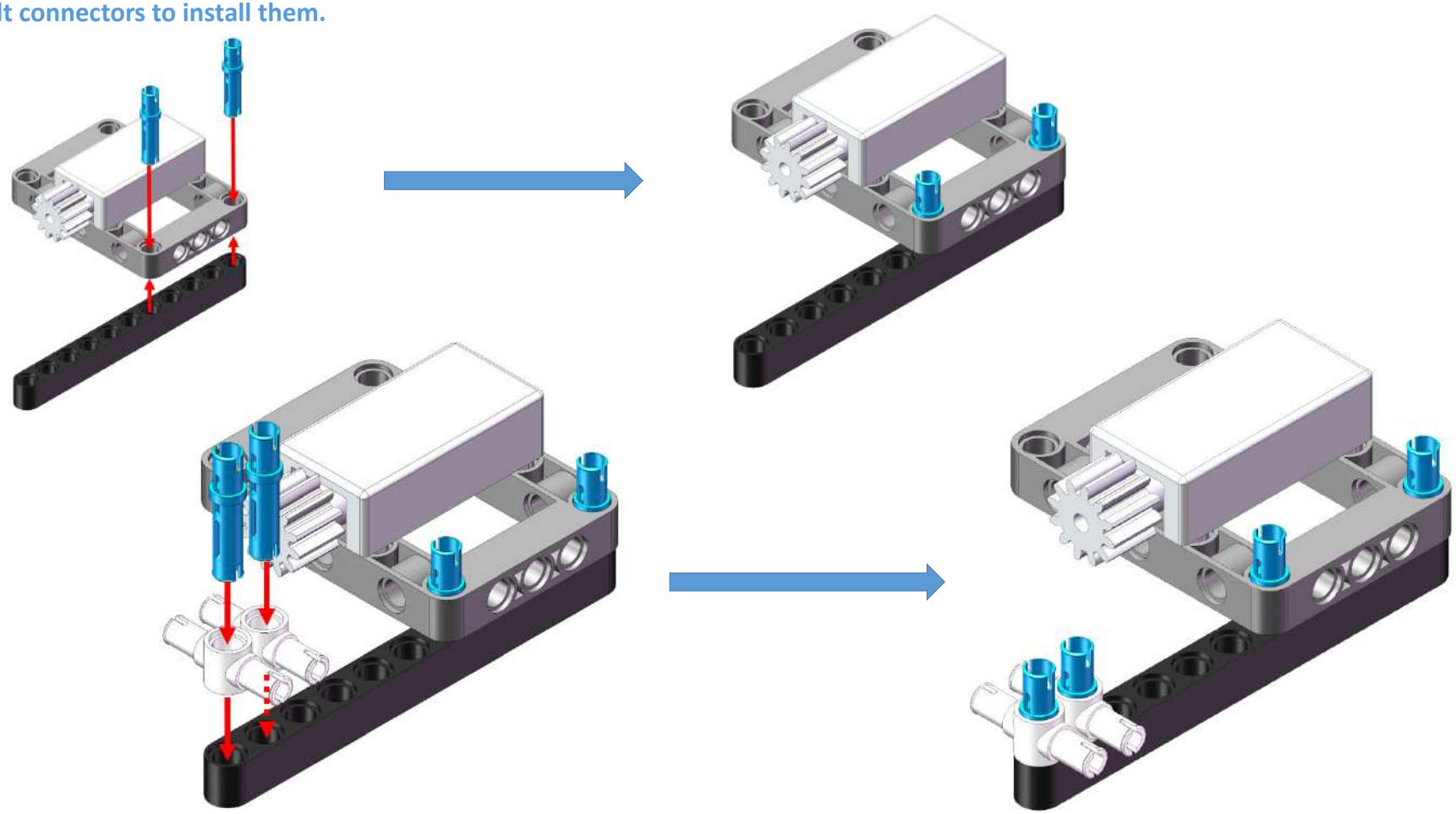


Step 8: Find four 1x3 bolts and a 5x11 beam frame for installation.

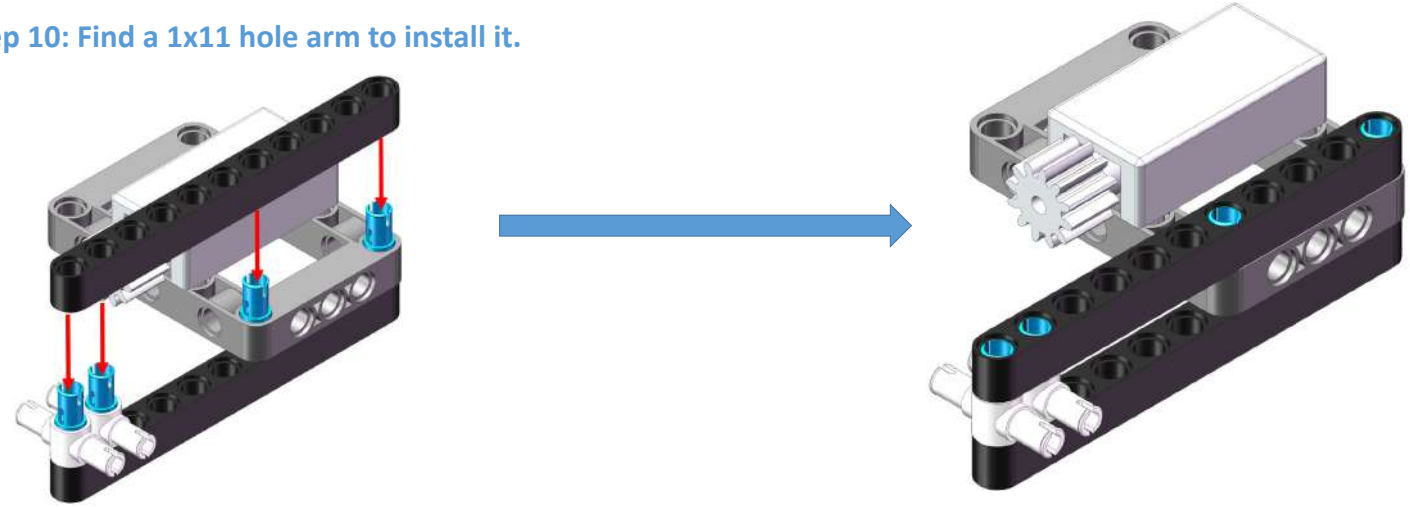


Tip: At this point, we have assembled the body part of the independent steering block car. Next, we continue to assemble the front part.

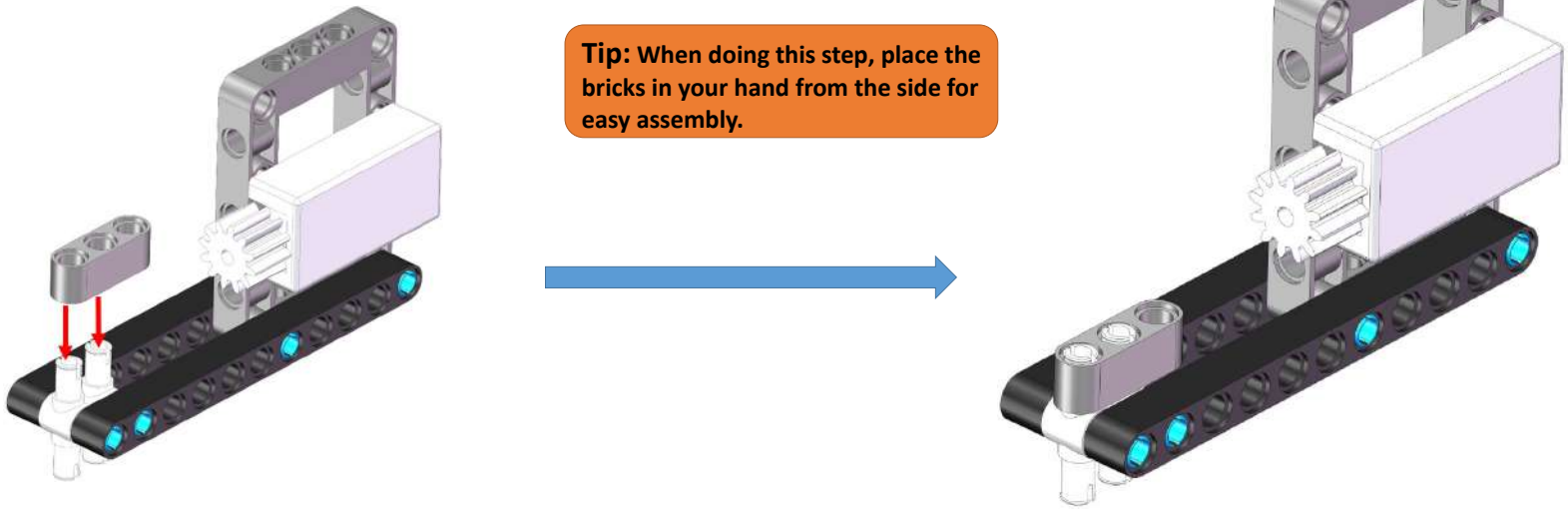
Step 9: We started assembling the front part of the car and found another motor module, four 1x3 bolts, one 1x11 hole arm, and two 1x3 bolt connectors to install them.



Step 10: Find a 1x11 hole arm to install it.

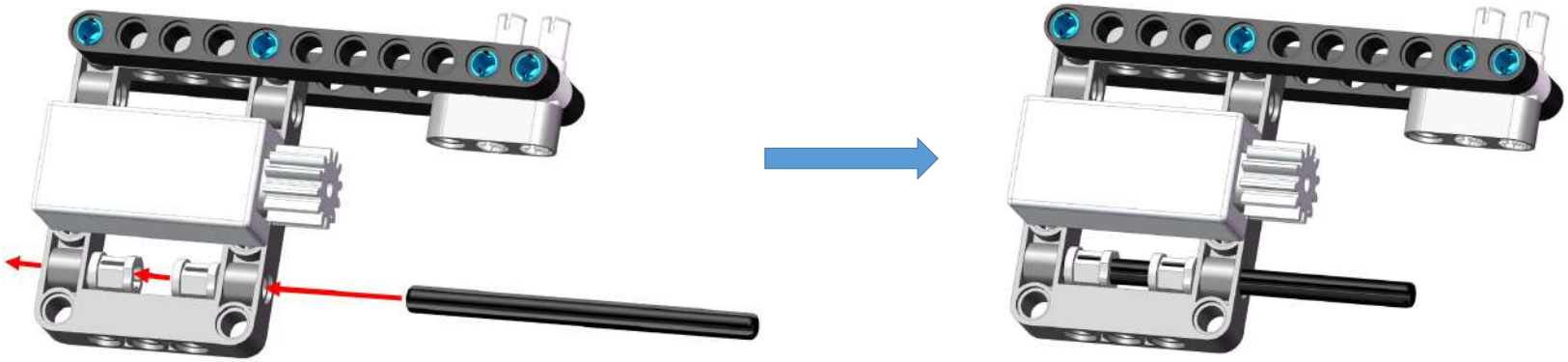


Step 11: Find a 1x3 hole arm to install it.

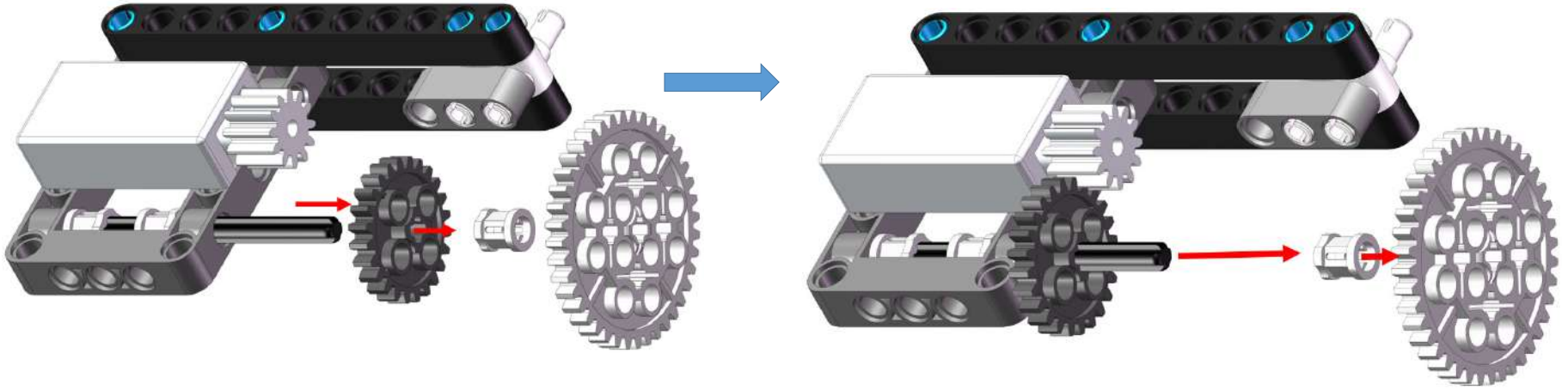


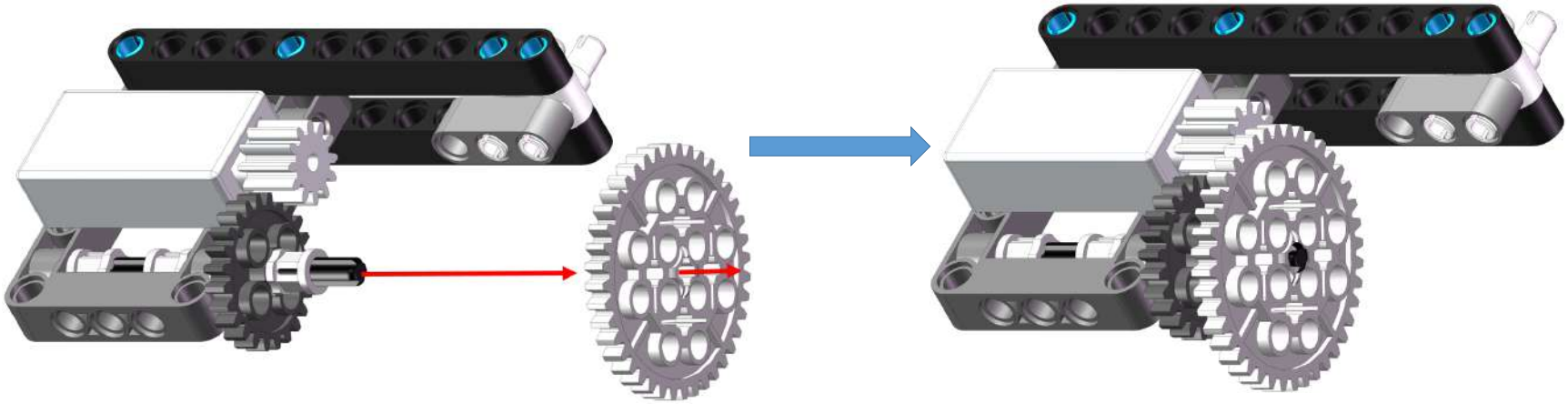
Tip: When doing this step, place the bricks in your hand from the side for easy assembly.

Step 12: Find a 1x8 cross and two bushings to install it.

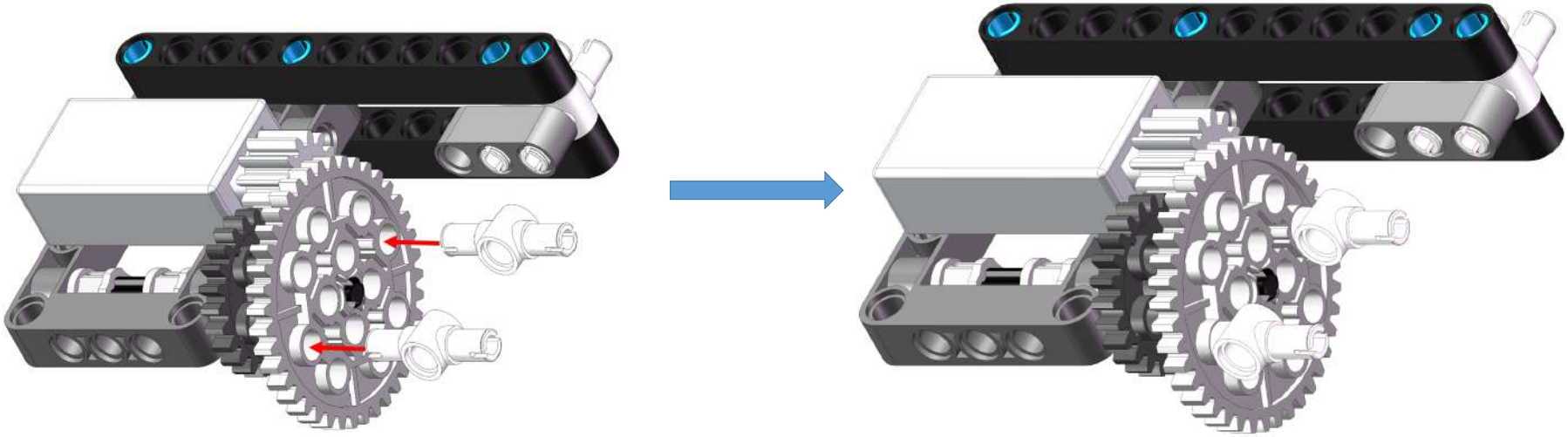


Step 13: Find a 24-toothed wheel, a bushing, a 40 toothed wheel, and insert the assembled 1x8 cross shaft into the 24 toothed wheel, the bushing and the center hole of the 40 toothed wheel.



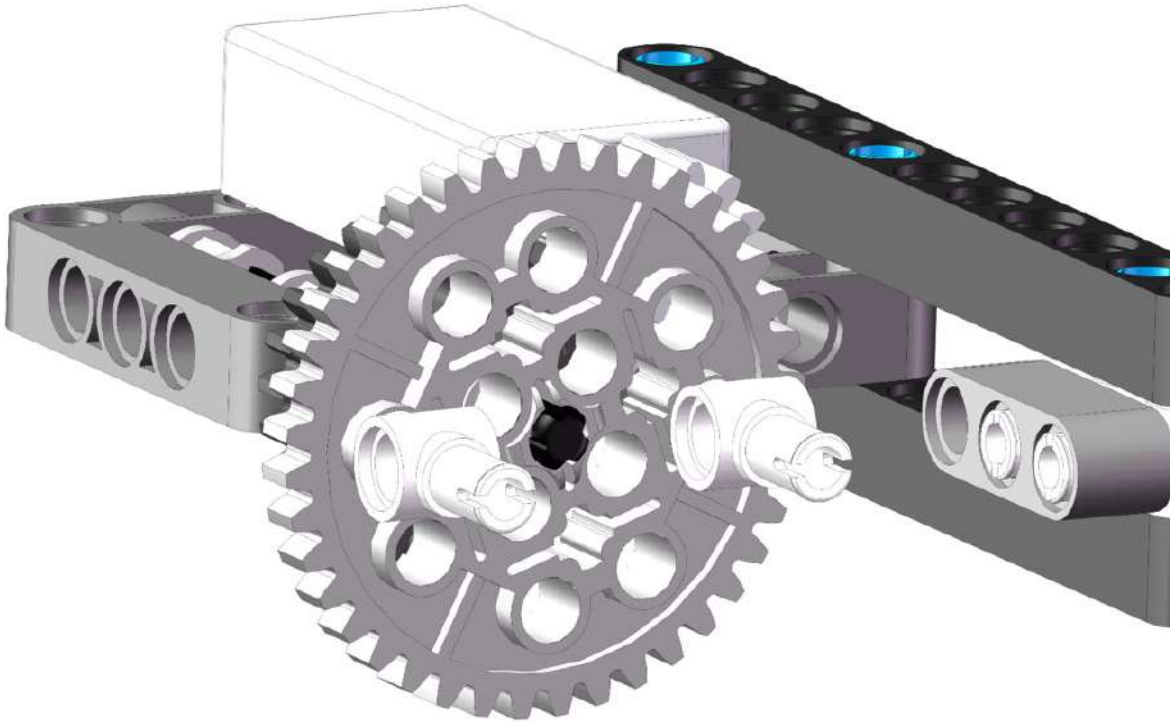


Step 14: Locate the two 1x3 bolt connectors and insert them into the corresponding holes of the 40 toothed wheel.

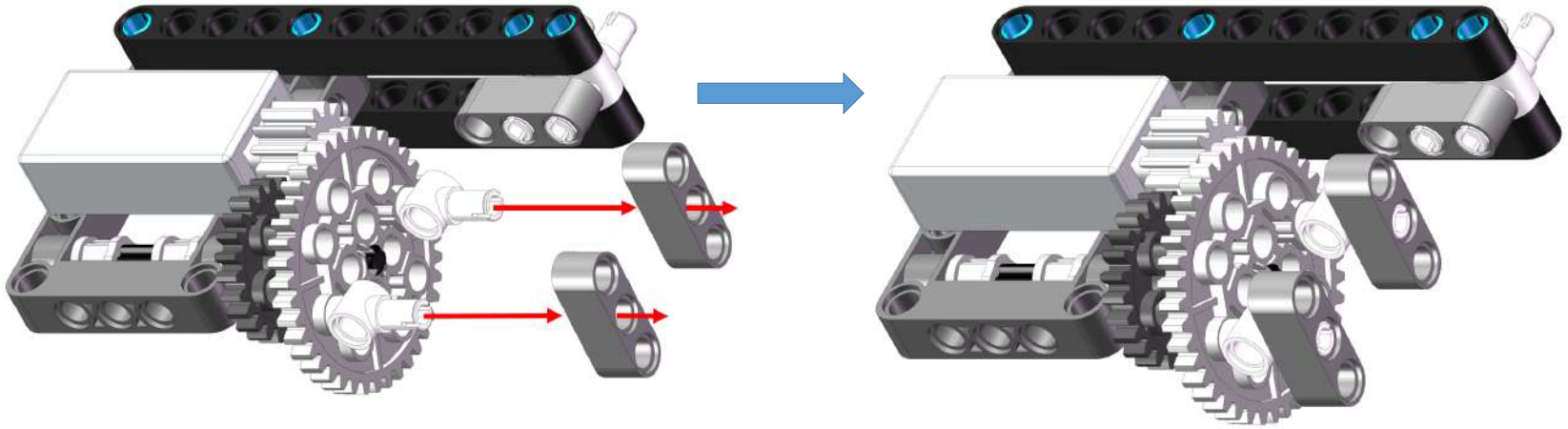


LOOK!

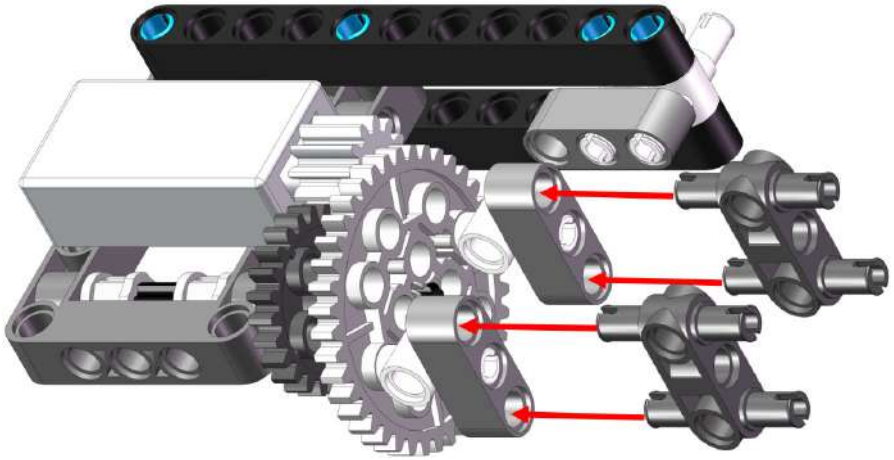
In order to ensure that the steering part of the car can be used normally after the gear is installed, we need to ensure that the two 1x3 bolt connectors are symmetrical when installing.
Please follow the picture below to install.



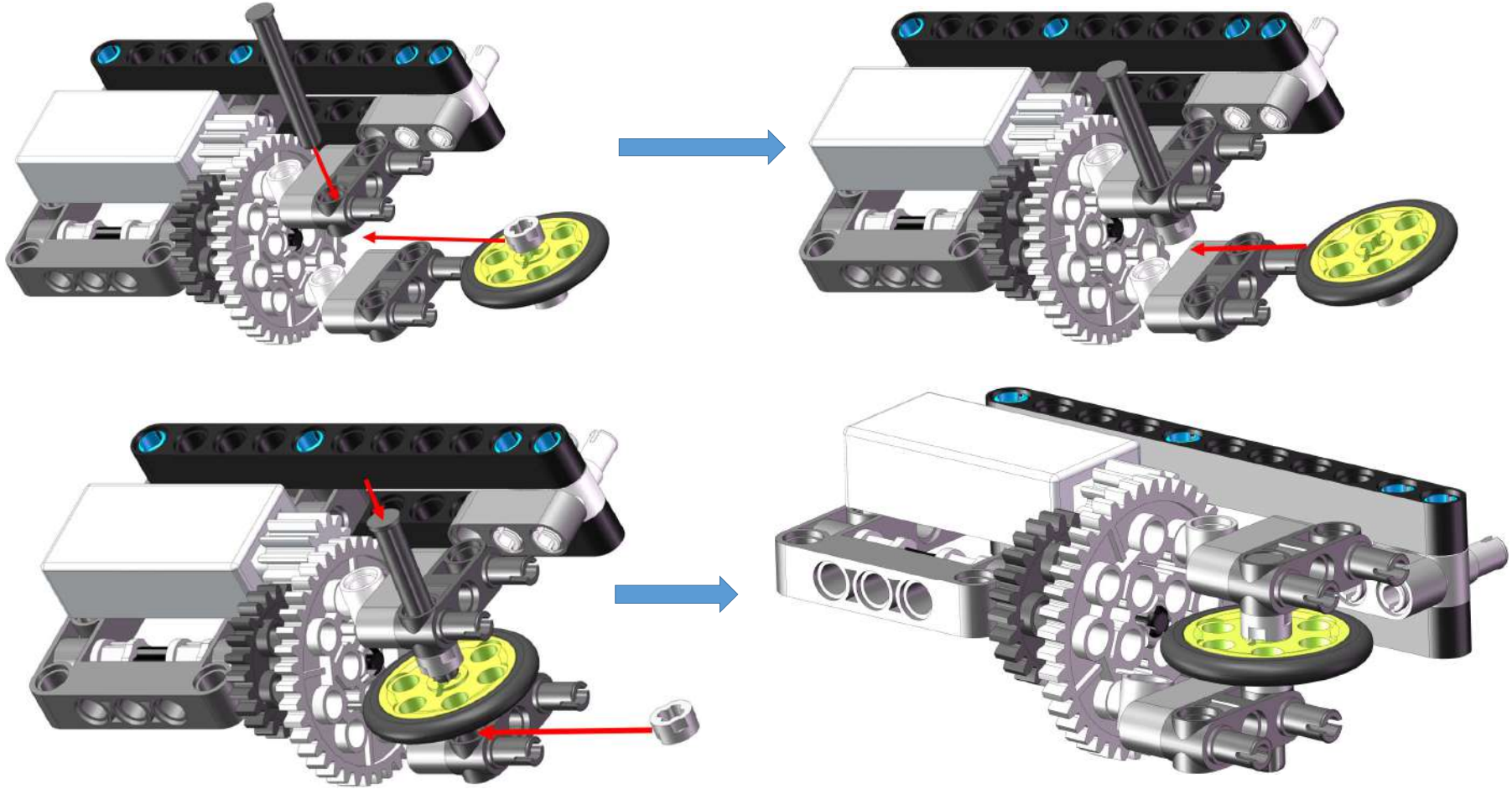
Step 15: Locate the two 1x3 hole arms and assemble them.



Step 16: Find the two 3x3 bolt connections and insert them into the two 1x3 hole arms.

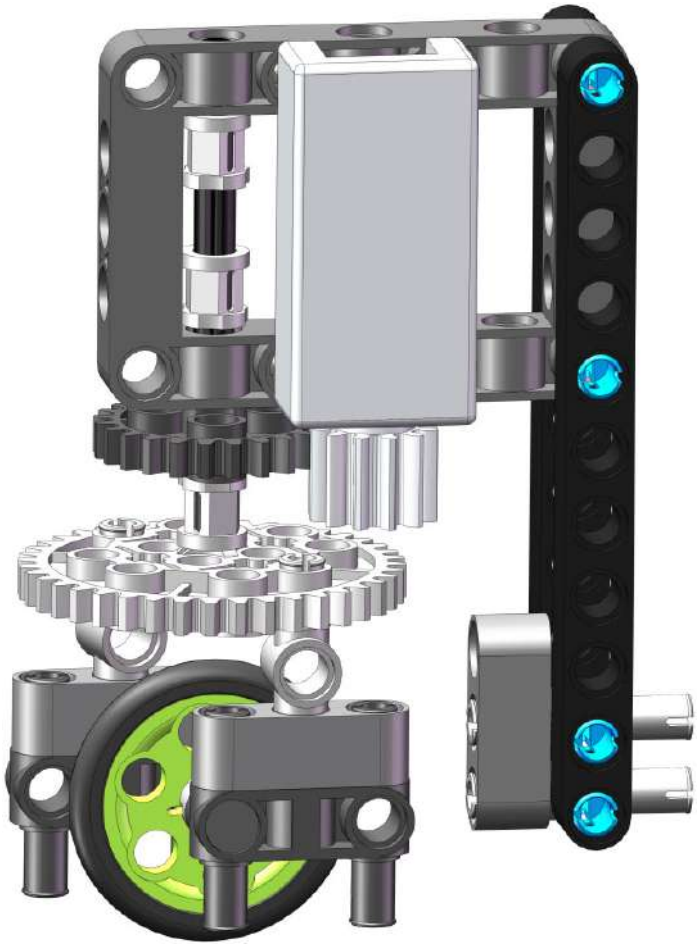


Step 17: Place the two 1/2 bushings on both sides of the rubber ring +24 pulley, then place them together between the two 3x3 bolt connections and insert the 1*4 shaft cutoff from the middle hole.



After the independent steering wheel of the car is installed, as shown in the figure below.

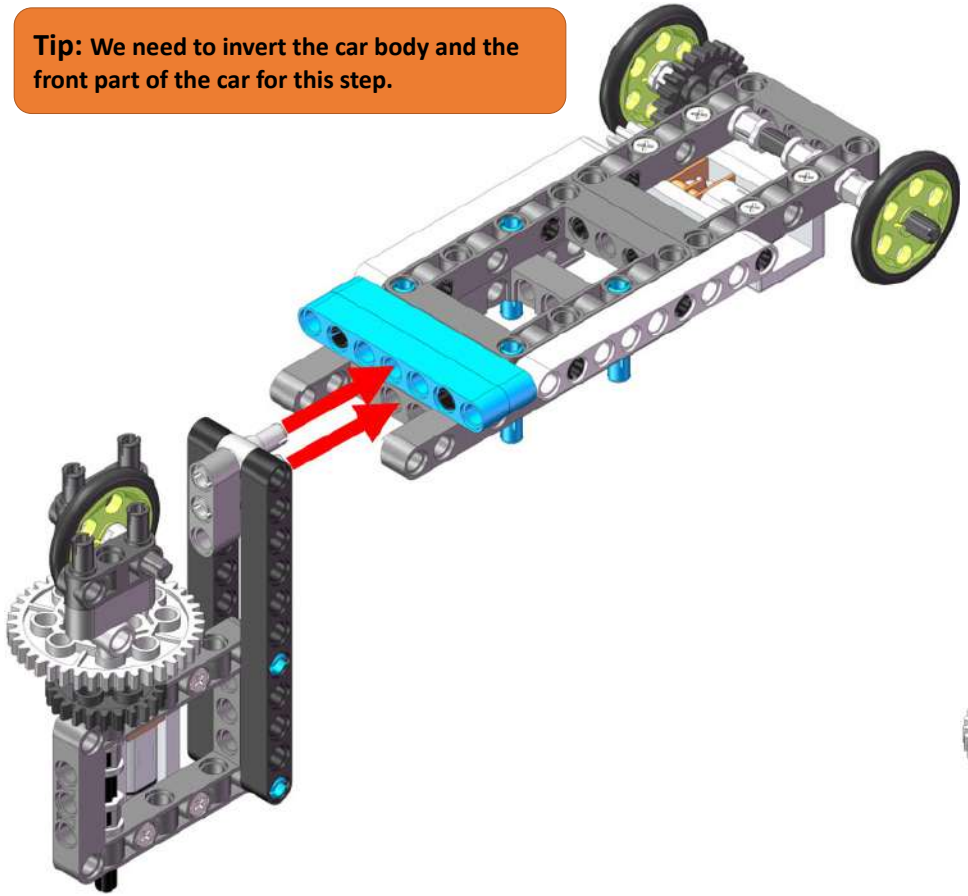
Tip: After the installation is complete, please take a closer look at whether your independent steering car is the same as the picture.

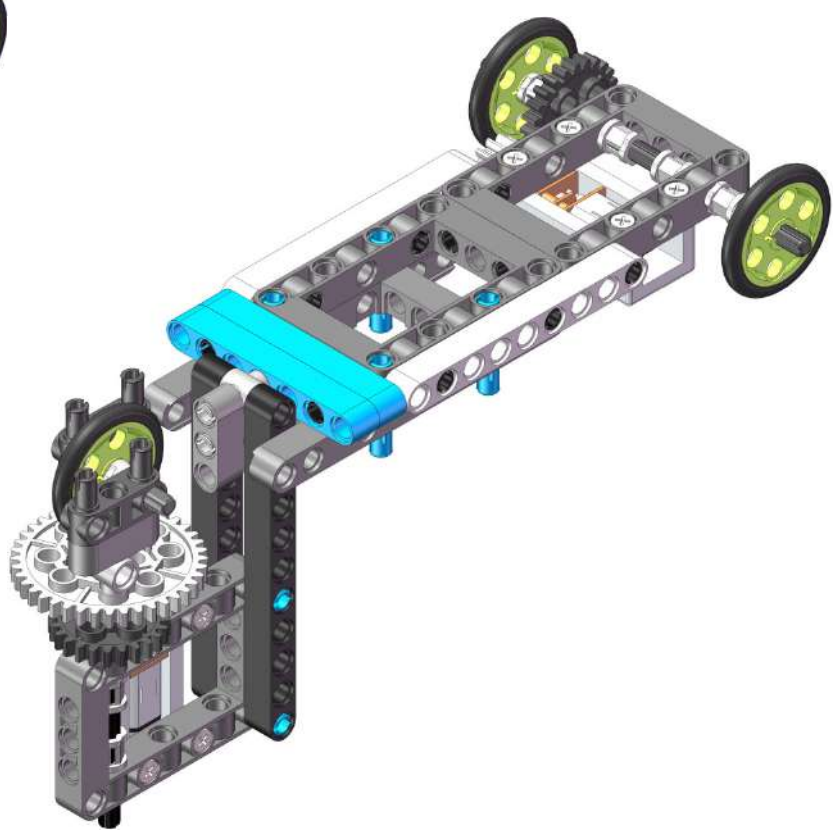


Tip: Note that the 1x4 shaft with the cut-off inserted on both sides of the two 3x3 bolts is asymmetrical.

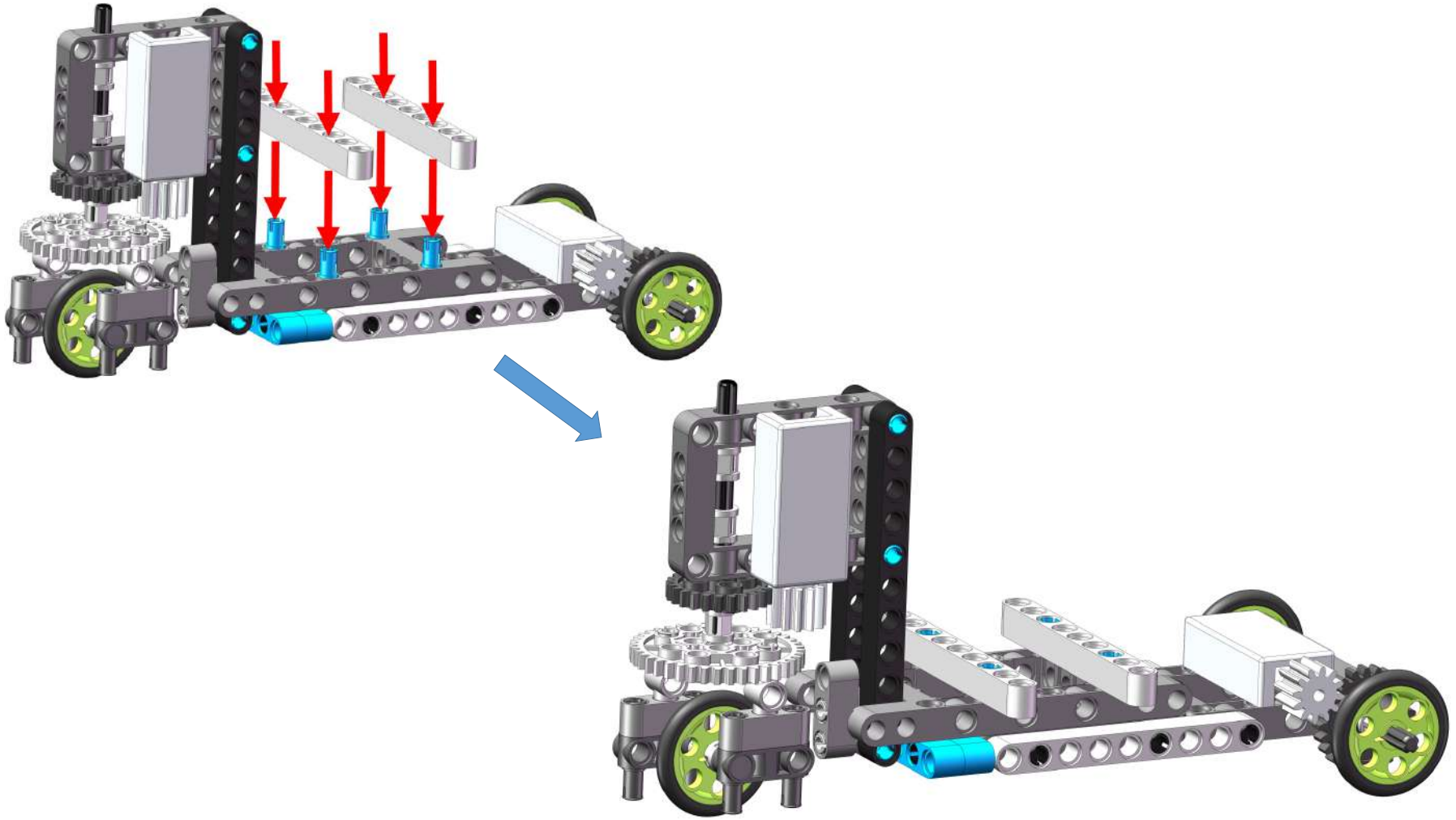
Step 18: Combine the part of the car that we assembled in step 18 with the part of the car that was assembled in step 17.

Tip: We need to invert the car body and the front part of the car for this step.

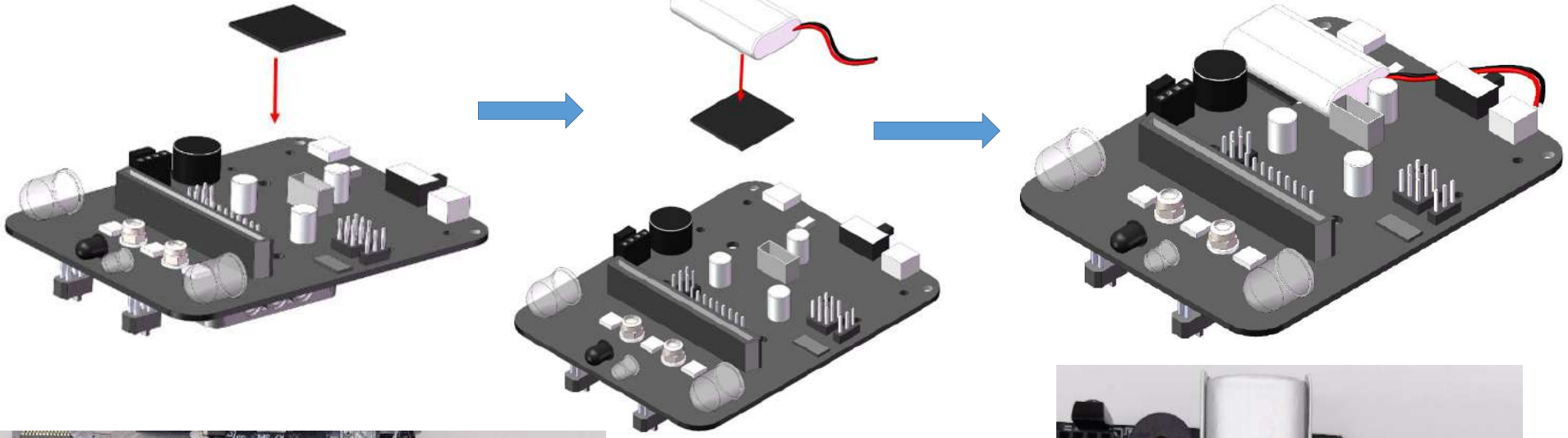


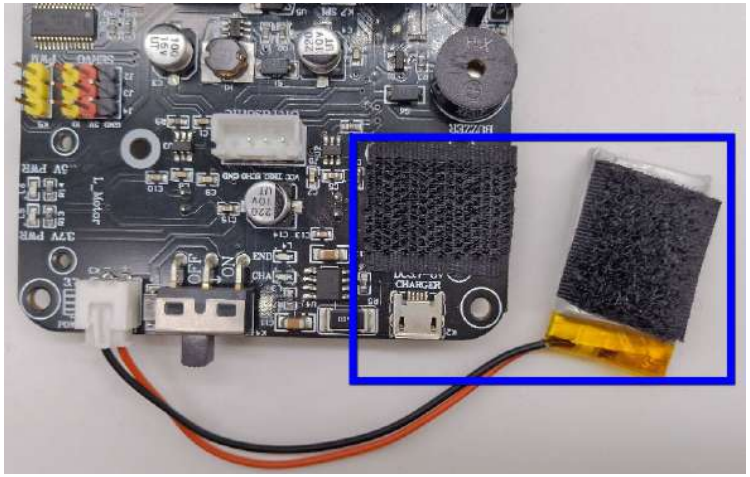


Step 19: We need to find two 1x9 hole arms and mount them on the four assembled 1x3 pins.

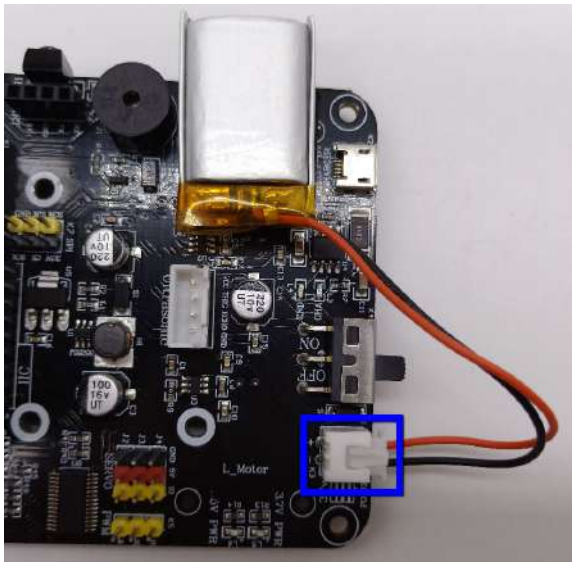


Step 20: Find the Velcro and micro:bit expansion board, remove the protective film on the back of the Velcro, and attach the two Velcro stickers to the lower right corner of the micro:bit expansion board and one side of the battery.

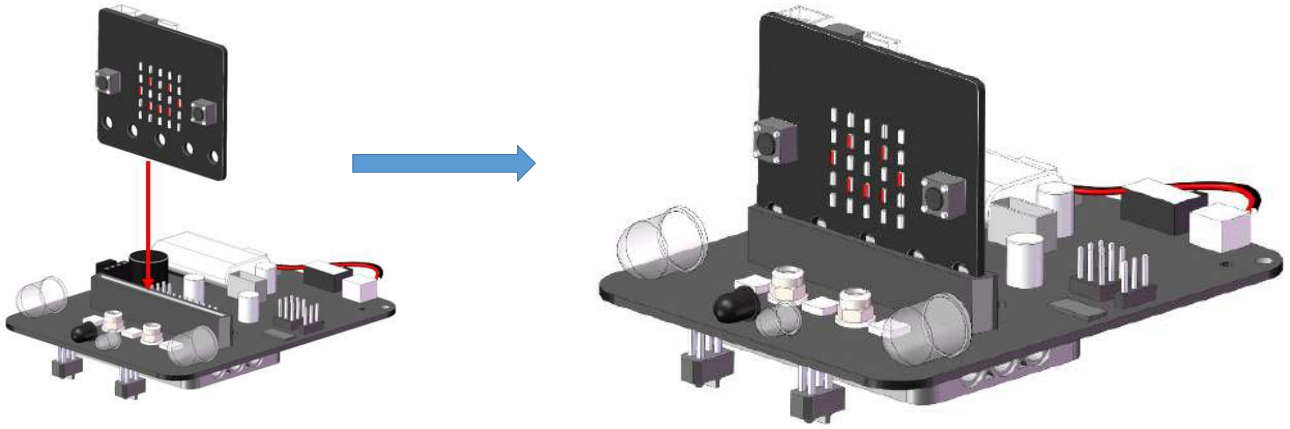




Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

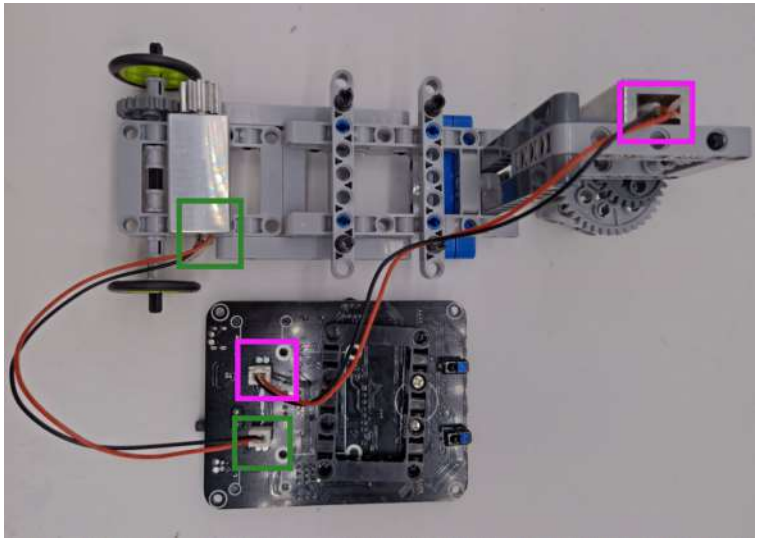


Step 21: Find the micro:bit and insert it correctly into the micro:bit expansion board.

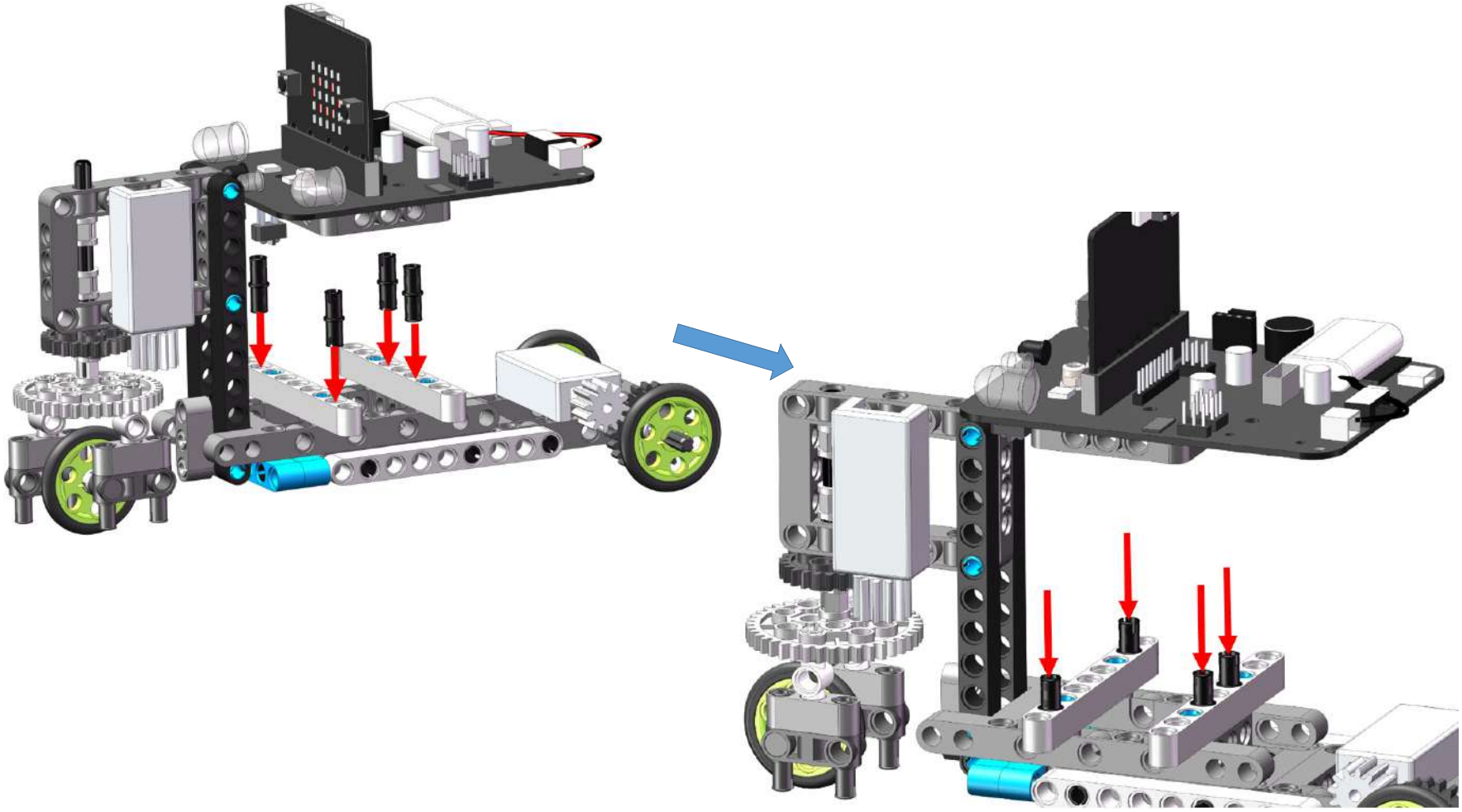


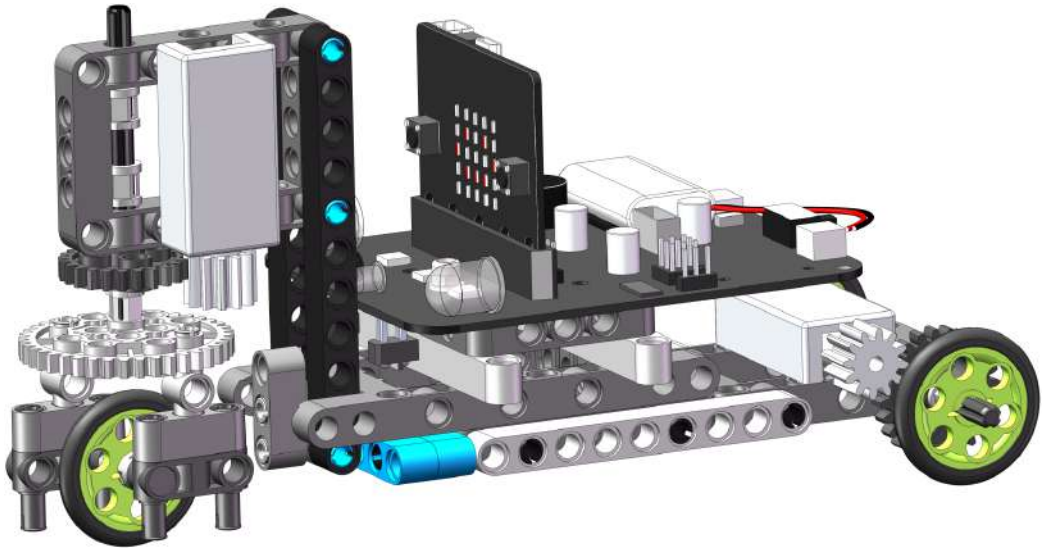
Tip: The micro:bit board is equivalent to the "brain" of the car, so be sure to remember to install it properly. In this case, the car can work normally.

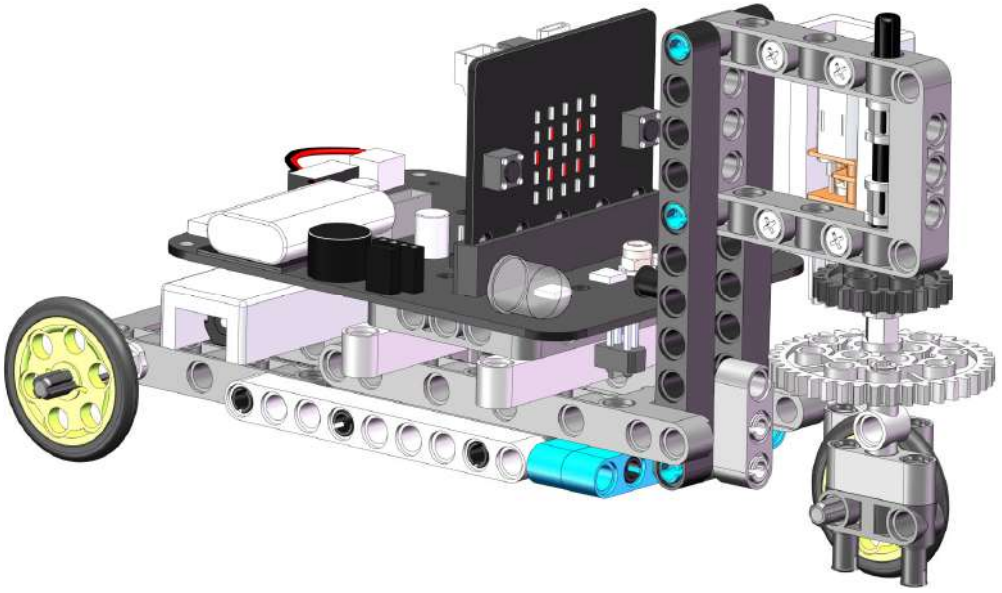
Step 22: Wire as shown.



Step 23: Combine the frame with the micro:bit expansion board with four 1x2 friction pins.







Tip: Our independent steering building blocks car is assembled.
Nex,t we will learn how to control it by programming.

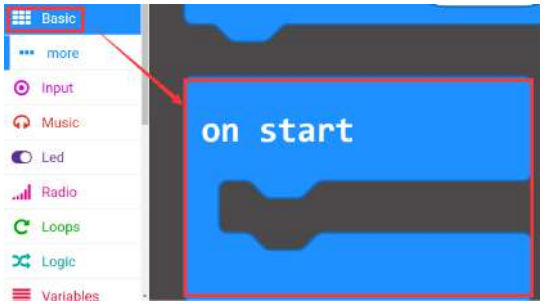
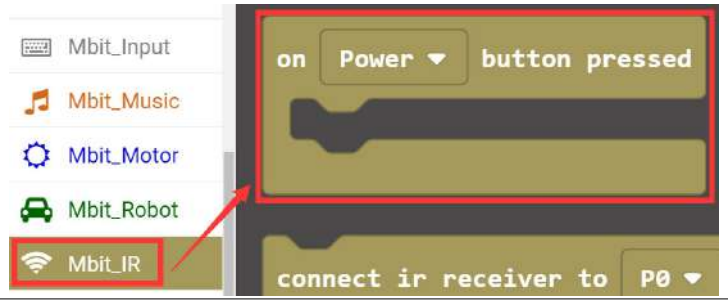
Thinking：This session is mainly to teach you how to use graphical programming to control the independent steering car.

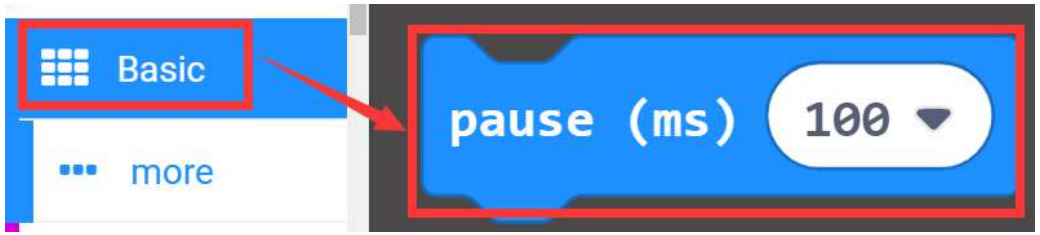
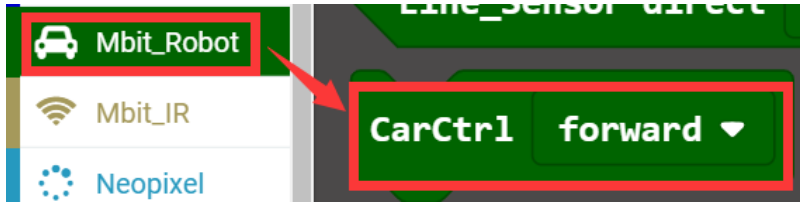
Preparation

- USB cable *1
- Independent steer car *1
- IR remote control*1

Blocks

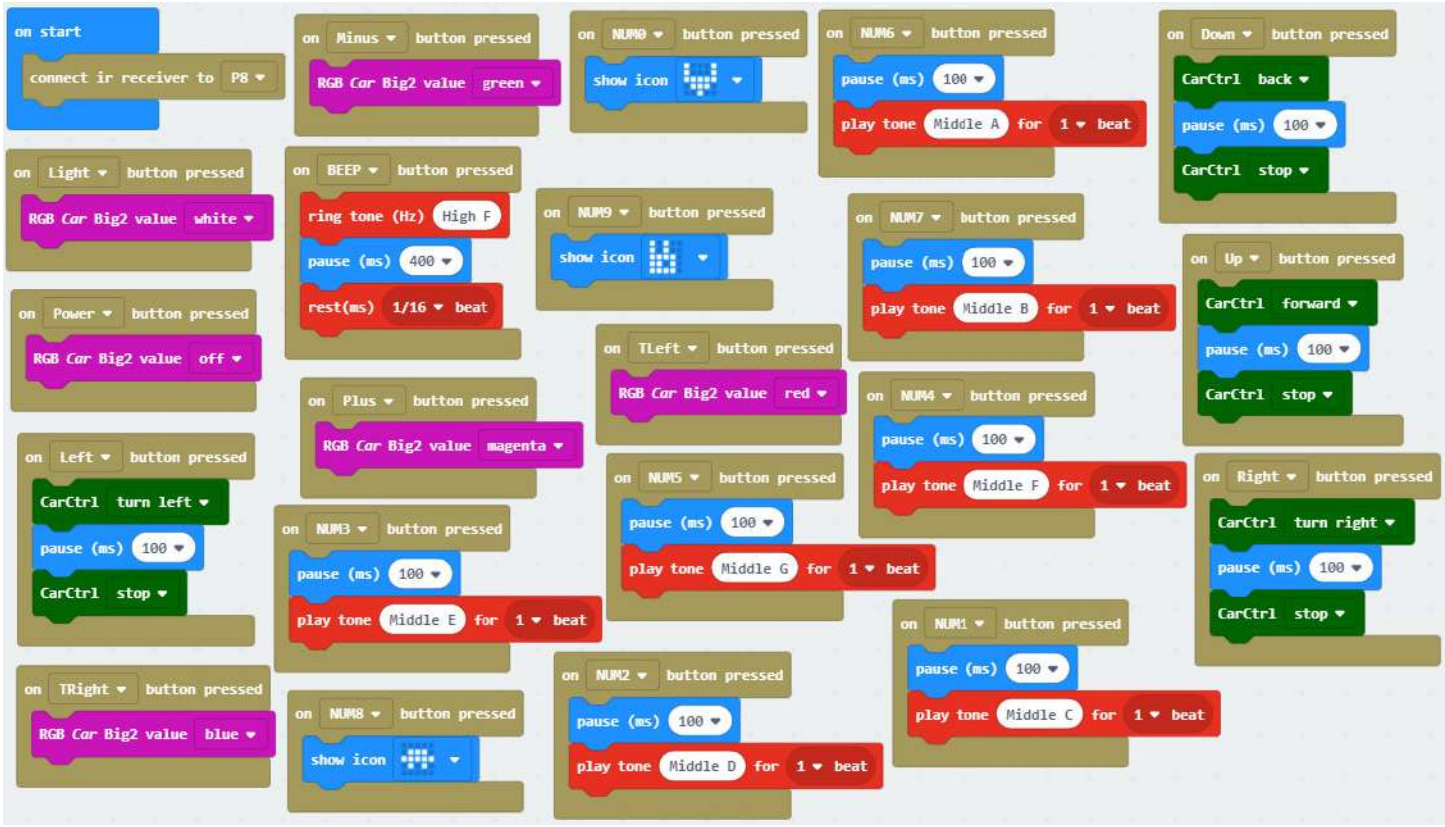
Block	Instruction
	Select the color that the lights are lit.
	Display the image on the micro:bit dot matrix screen.

Block	Instruction
	Executed at the moment of boot, the code is only executed once.
	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.
	When the power on the remote control is pressed, the code inside will be executed, and the button can be customized.
	The car's motion state selection and the control of the two motor speeds.

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 continus.
	The program pauses for 100 milliseconds and the time can be modified by itself.
	The Cartrl forward represents the forward rotation of the motor, and the Cartrl back represents the reverse rotation of the motor.

Programming

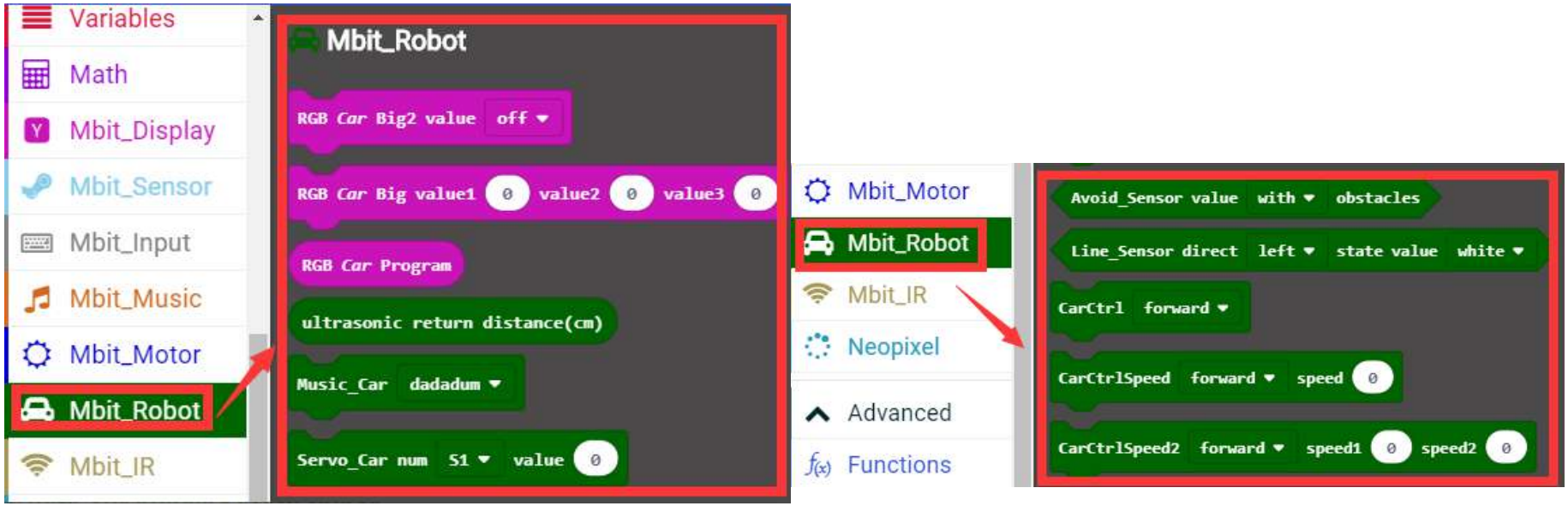
The program of this course is shown in the figure below. After downloading the program, turn on the power switch of the independent steering car, press the button of the infrared remote control, and the independent steering car will have corresponding action. The small light, plus, minus, rotate left , rotate right button of the infrared remote control is used to control the color of the colorful lights. The red power button is the close light button. 1~7 represents the music in the do, re, mi, fa, sol, la, si. The front, rear, left and right buttons are used to control the car. 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”.

Programming path: Building bit starter kit\2. Experimental course\E.Independent steer car\2.Independent steer car Infrared remote control\Independent-steer-car-Infrared-remote-control.hex

We have packaged the blocks as shown in the two figures below for this independent steer car.



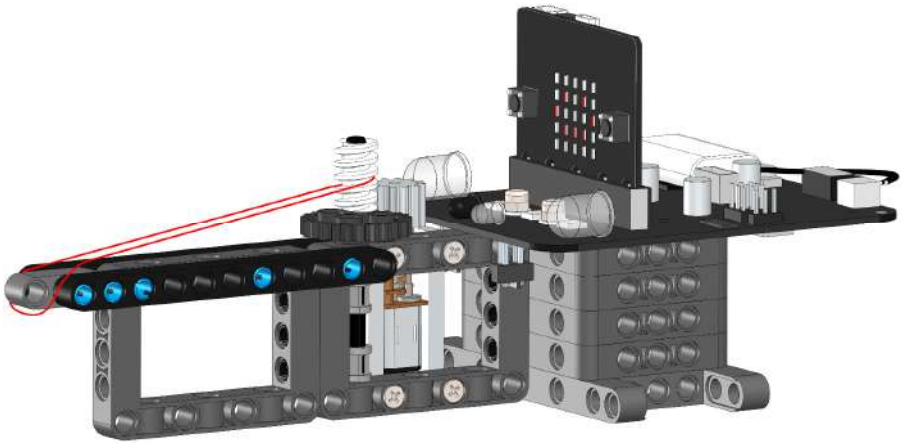
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely. Drag these blocks and play with our building block independent steer car.

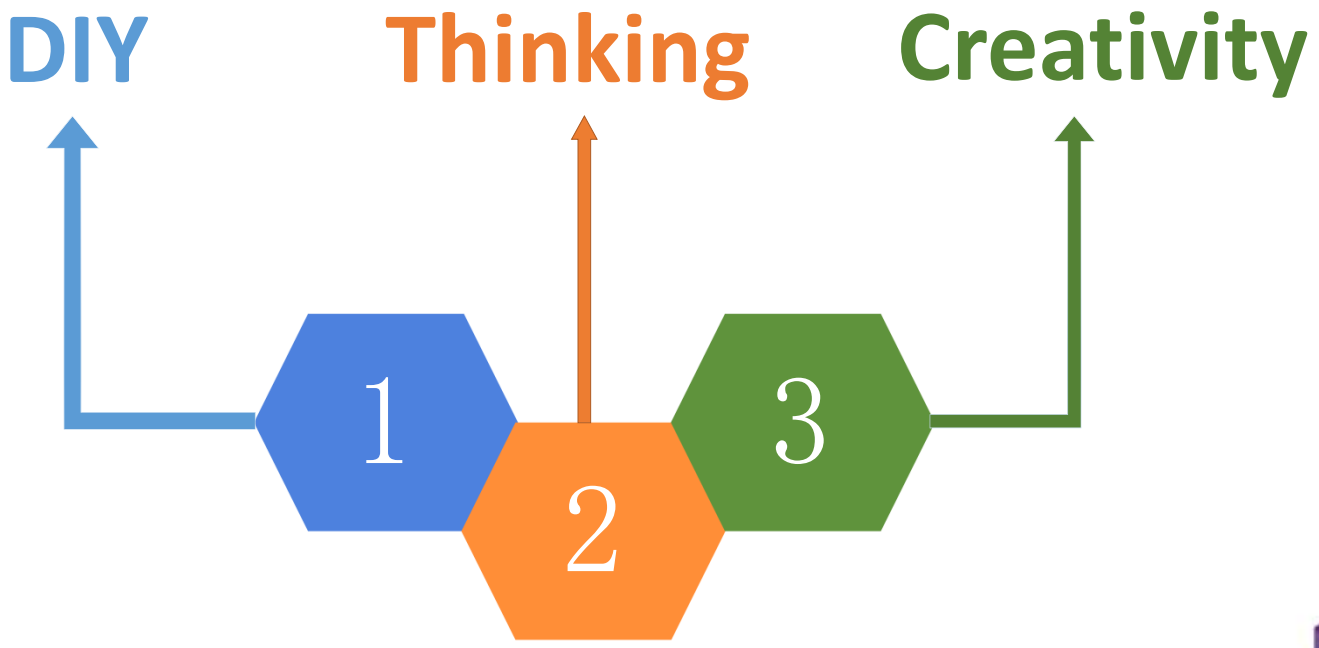


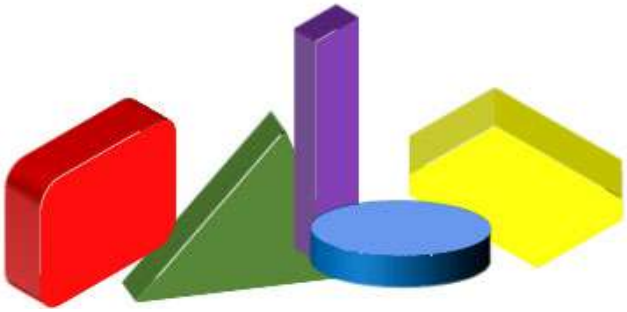
On our official website, we also provides other tutorial: Independent steer car bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.6 Sniper

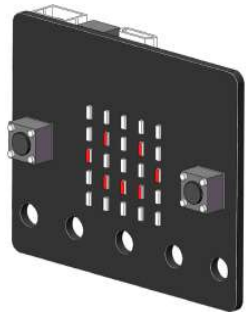
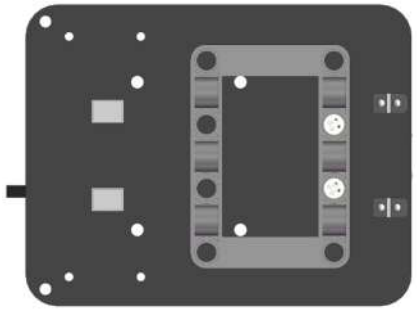
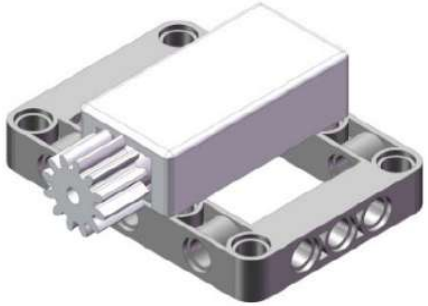
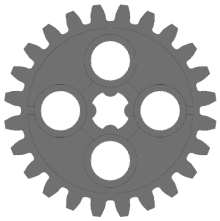
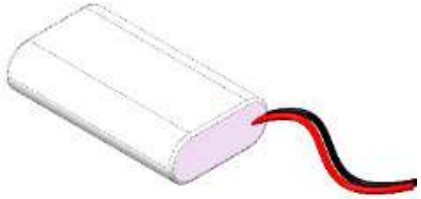
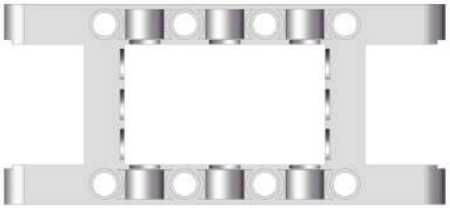



DIY
Thinking
Creativity
1
2
3

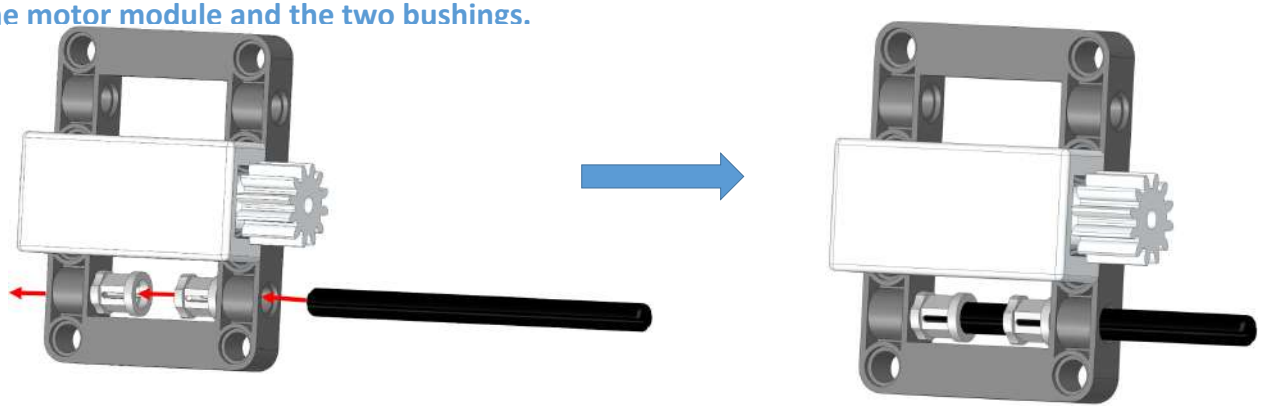


DIY: This section is mainly to teach you to assemble sniper with building blocks.

Prepare the following blocks and we will assemble a cute building block sniper.

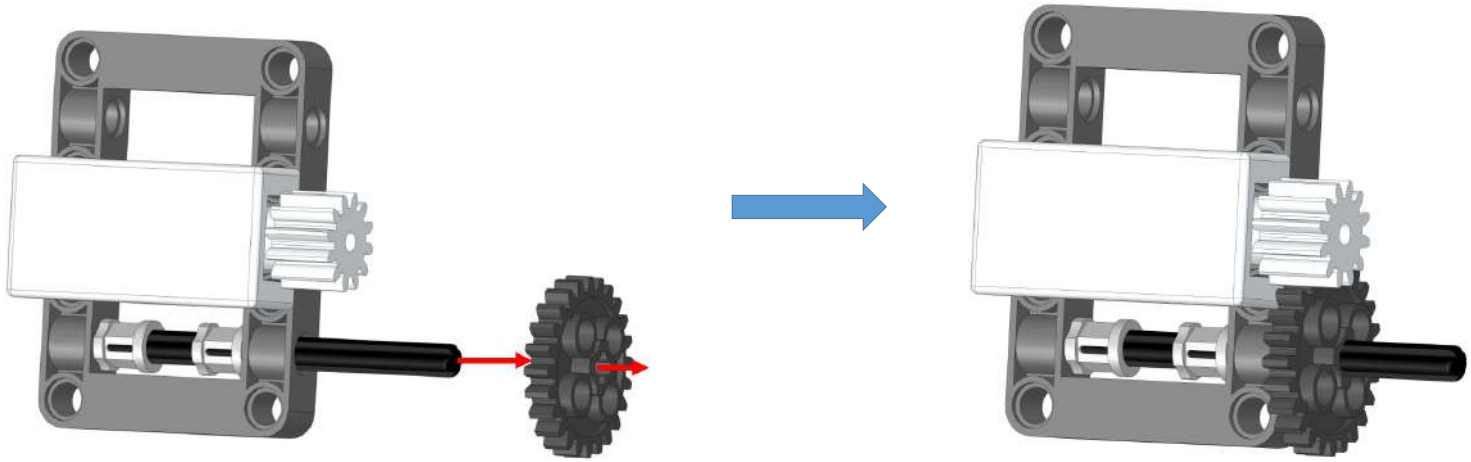
 Micro:bit*1	 Micro:bit expension board*1	 Motor module*1	 5x7 beam frame*4	 24 toothed wheel*1
 1x11 hole arm*2	 Battery*1	 5x11 beam frame*1	 1x8 Cross Axle*1	 1x3 shaft*5
 Bushing*2	 1x3 hole arm*1	 1x2 Frictional pin *14	 Spiral wheel*1	

Step 1: Find a motor module, two bushings and a 1x8 cross axle. Pass the cross axle through the corresponding hole position of the motor module and the two bushings.

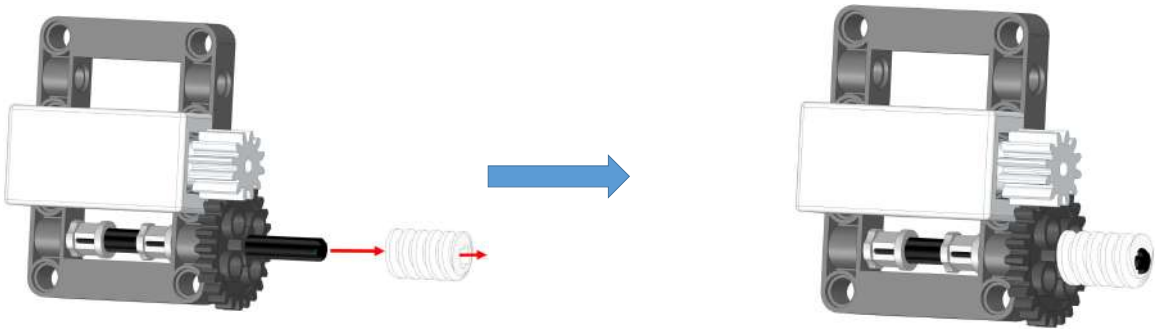


Tip: After the cross axle passes through the bushing and motor module, there is no need to reserve the length on the left side.

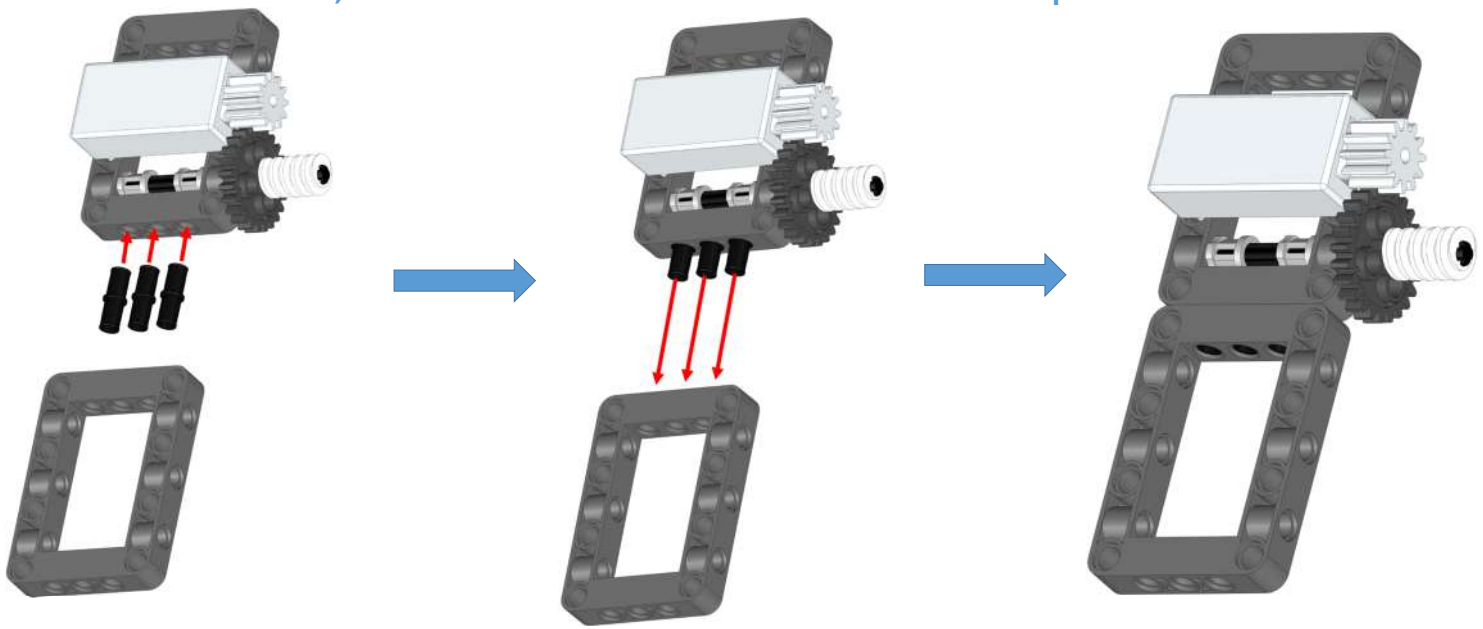
Step 2: Look for a 24-toothed wheel to install it.



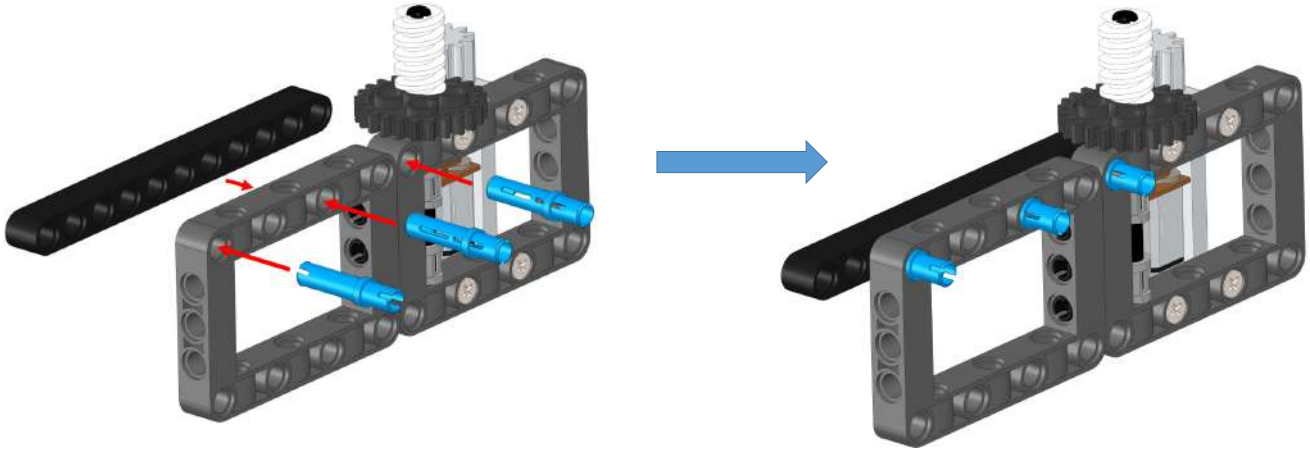
Step 3: Find a spiral wheel and install it on the already assembled cross axle.



Step 4: Locate three 1x2 friction pins and one 5X7 beam frame. First insert the three friction pins into the corresponding holes on the side of the motor module, and then install the 5x7 beam frame on the friction pin.

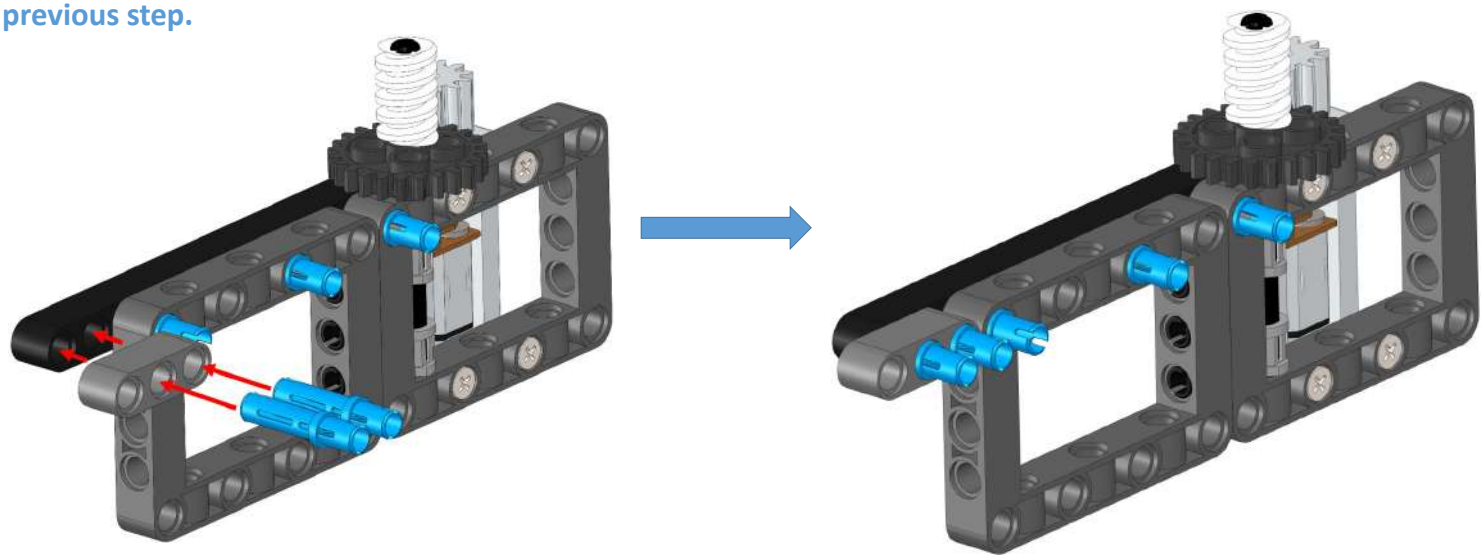


Step 5: Find three 1x3 bolts and a 1x11 hole arm for assembly.

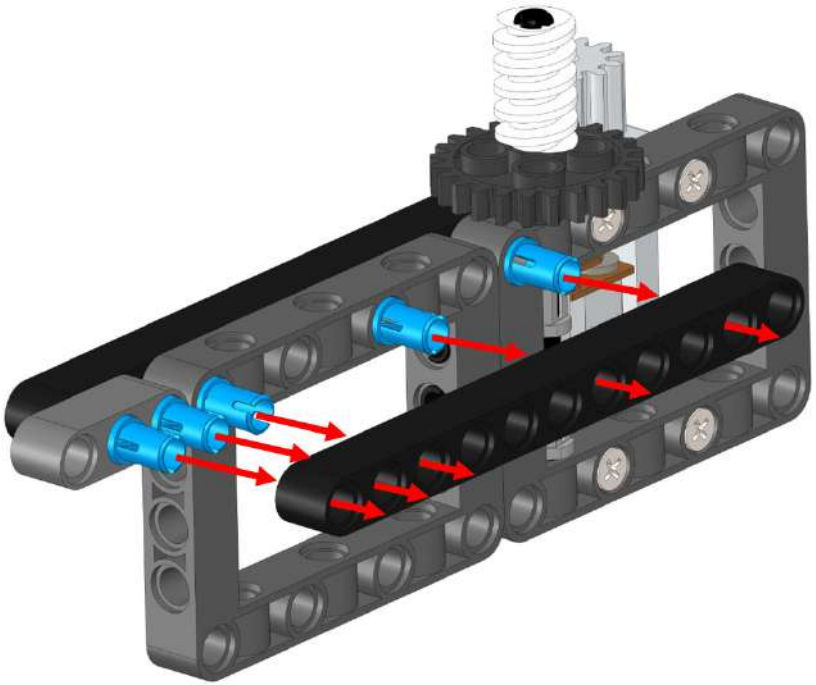


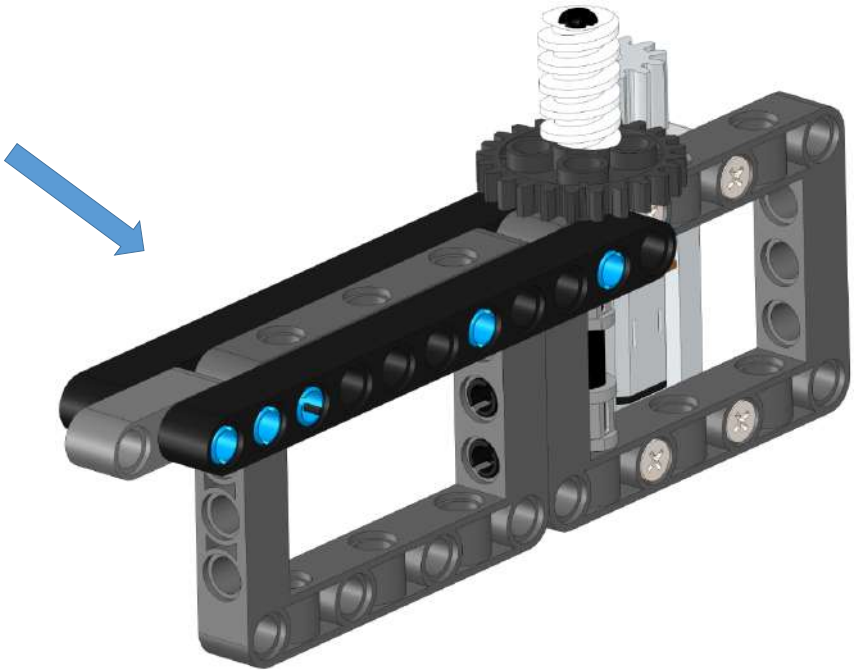
Tip: After the 1x11 hole arm is installed, the front end is reserved for the length of the two holes. These two holes will be used in the next assembly.

Step 6: Locate a 1x3 hole arm and two 1x3 pins. Install the 1x3 hole arm through the two 1x3 bolts to the two holes reserved in the previous step.

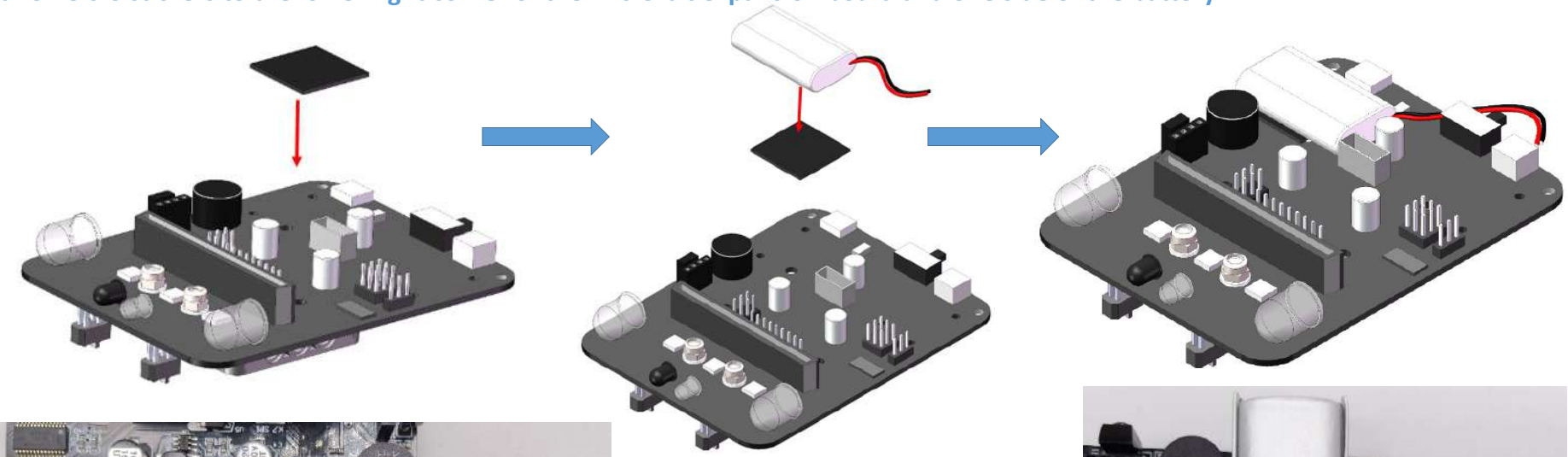


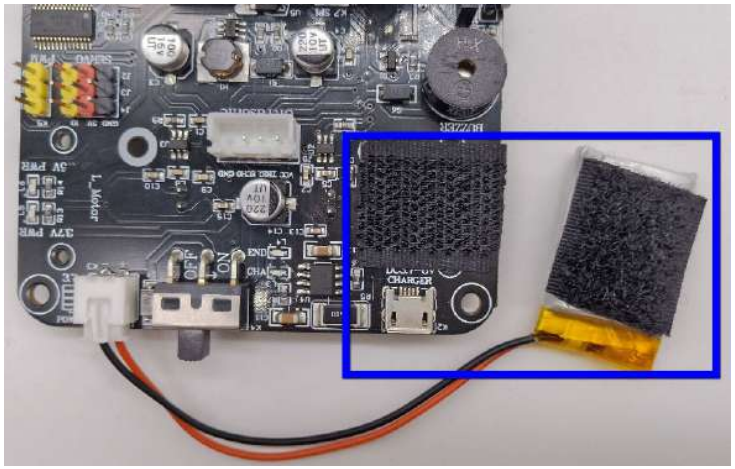
Step 7: Continue to find a 1x11 hole arm and mount it on the other side.



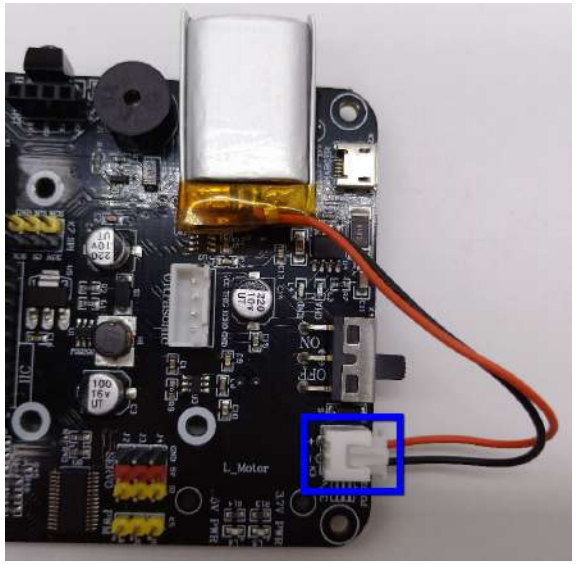


Step 8: Find the Velcro and micro:bit expansion board, remove the protective film on the back of the Velcro, and attach the two Velcro stickers to the lower right corner of the micro:bit expansion board and one side of the battery.

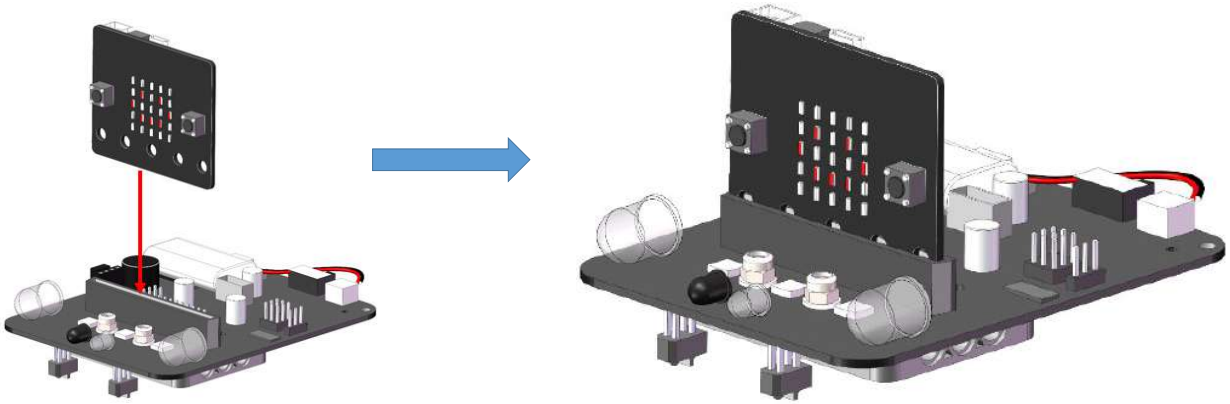




Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

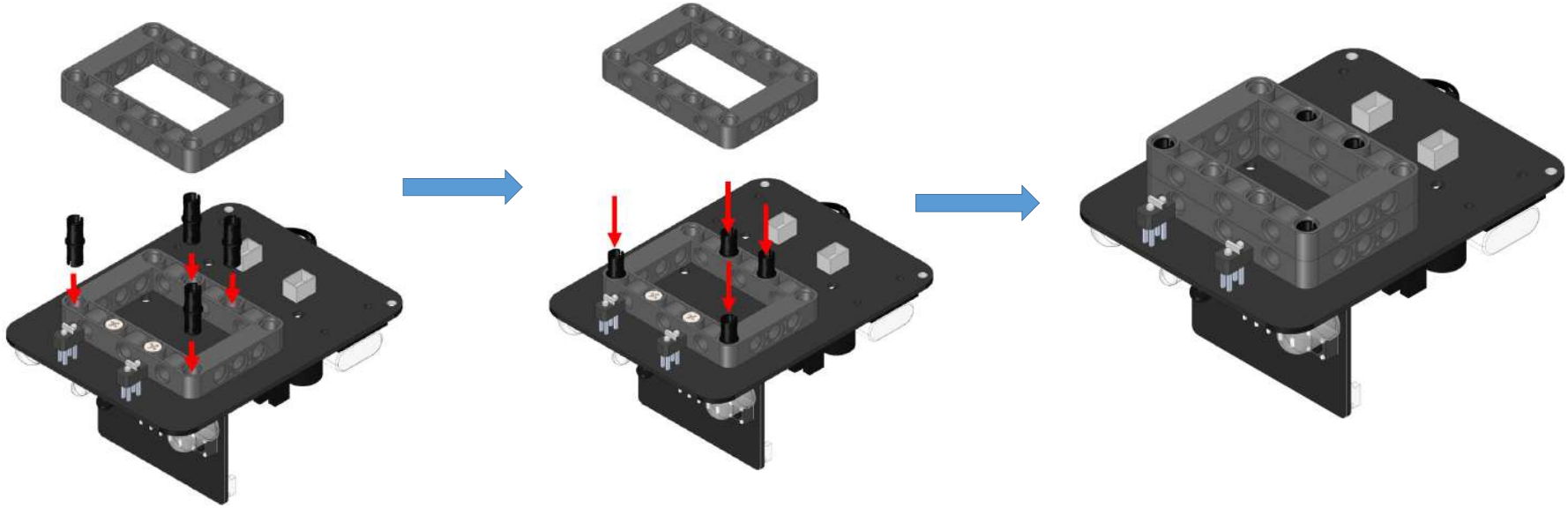


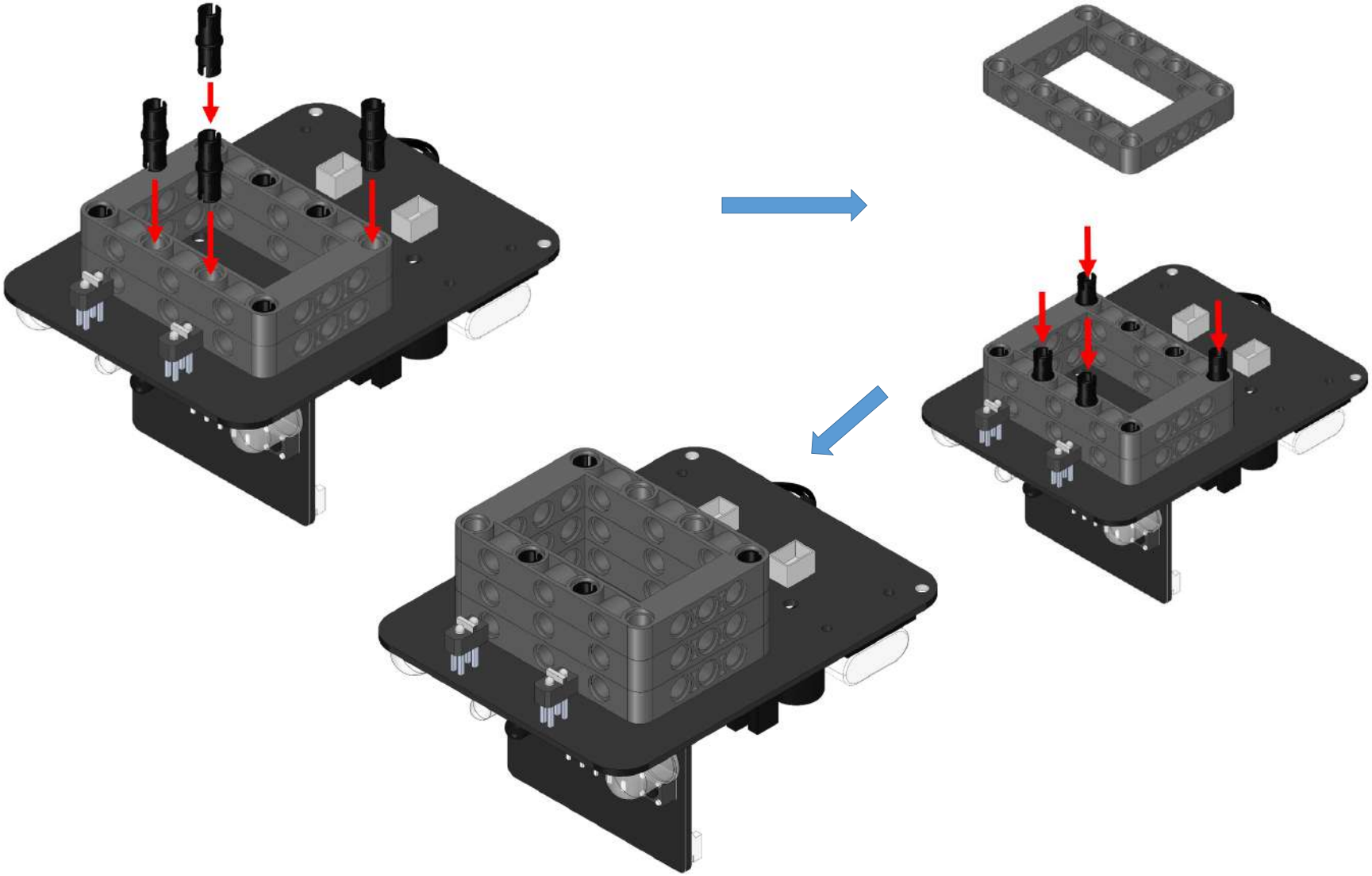
Step 9: Locate the micro:bit motherboard and insert it correctly into the micro:bit expansion board.

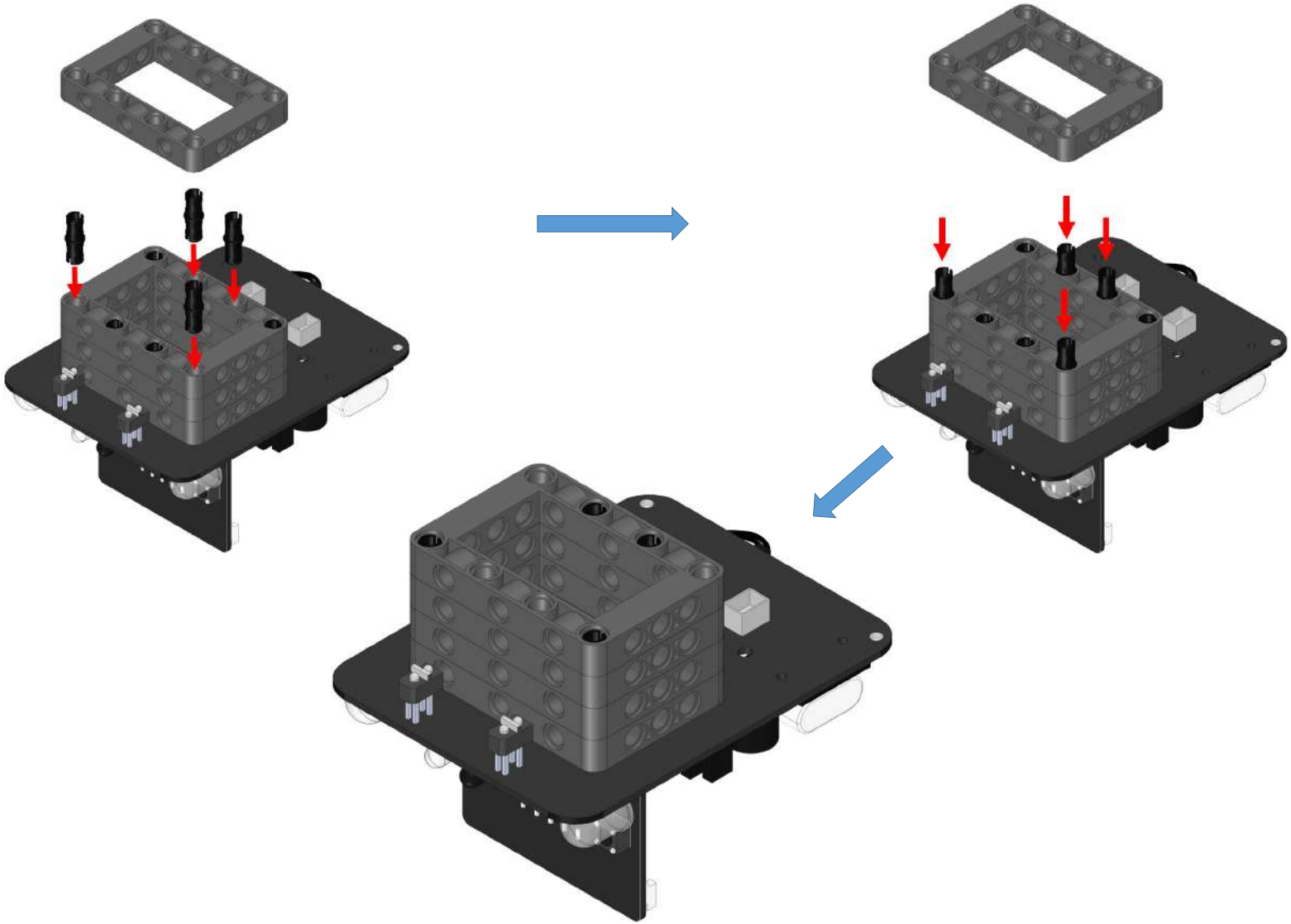


Tip: The micro:bit board is equivalent to the "brain" of the sniper, so please remember to install it correctly.

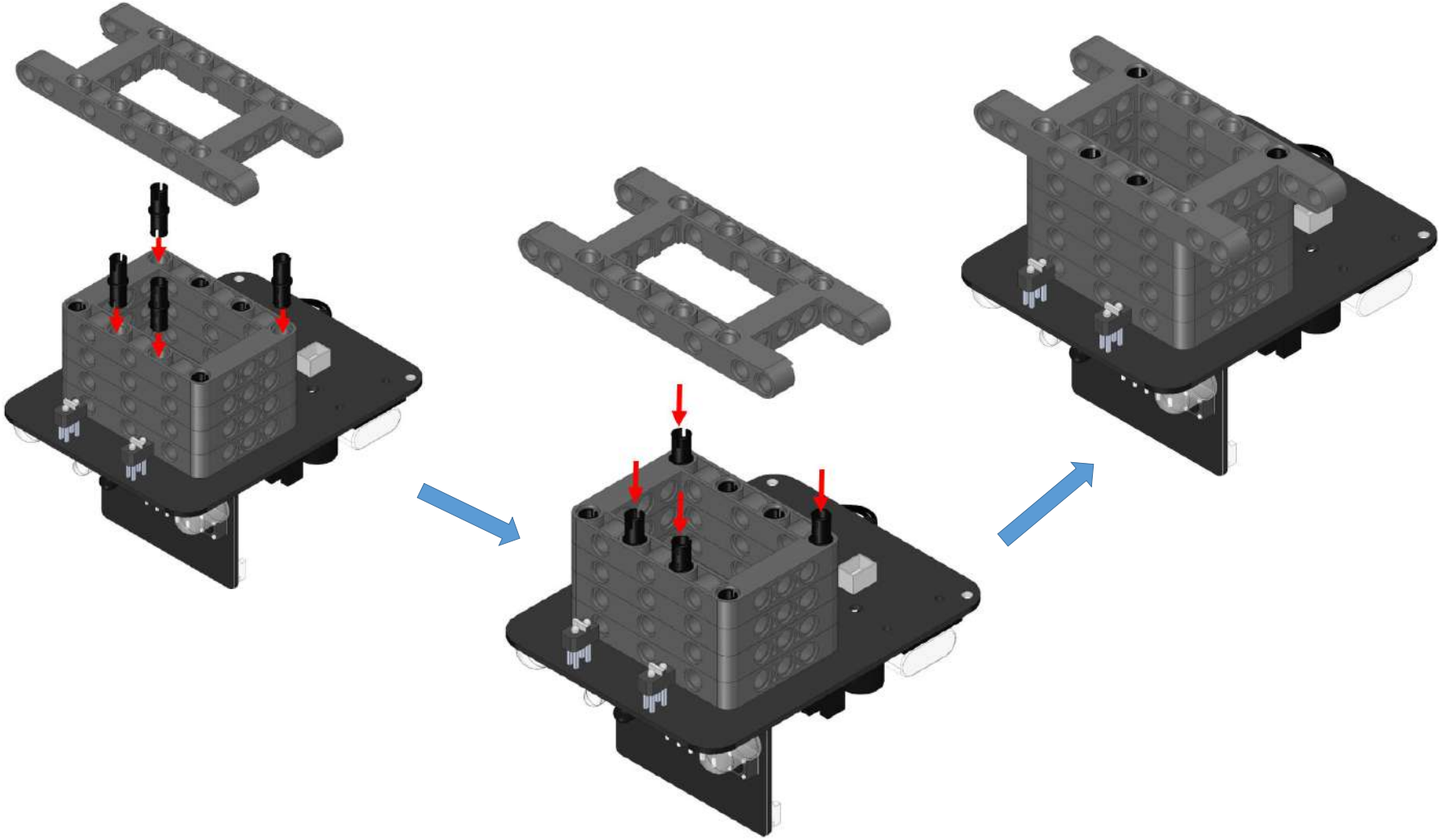
Step 10: Find the micro:bit expansion board, twelve 1x2 friction pins, three 5x7 beam frames, and assemble them.



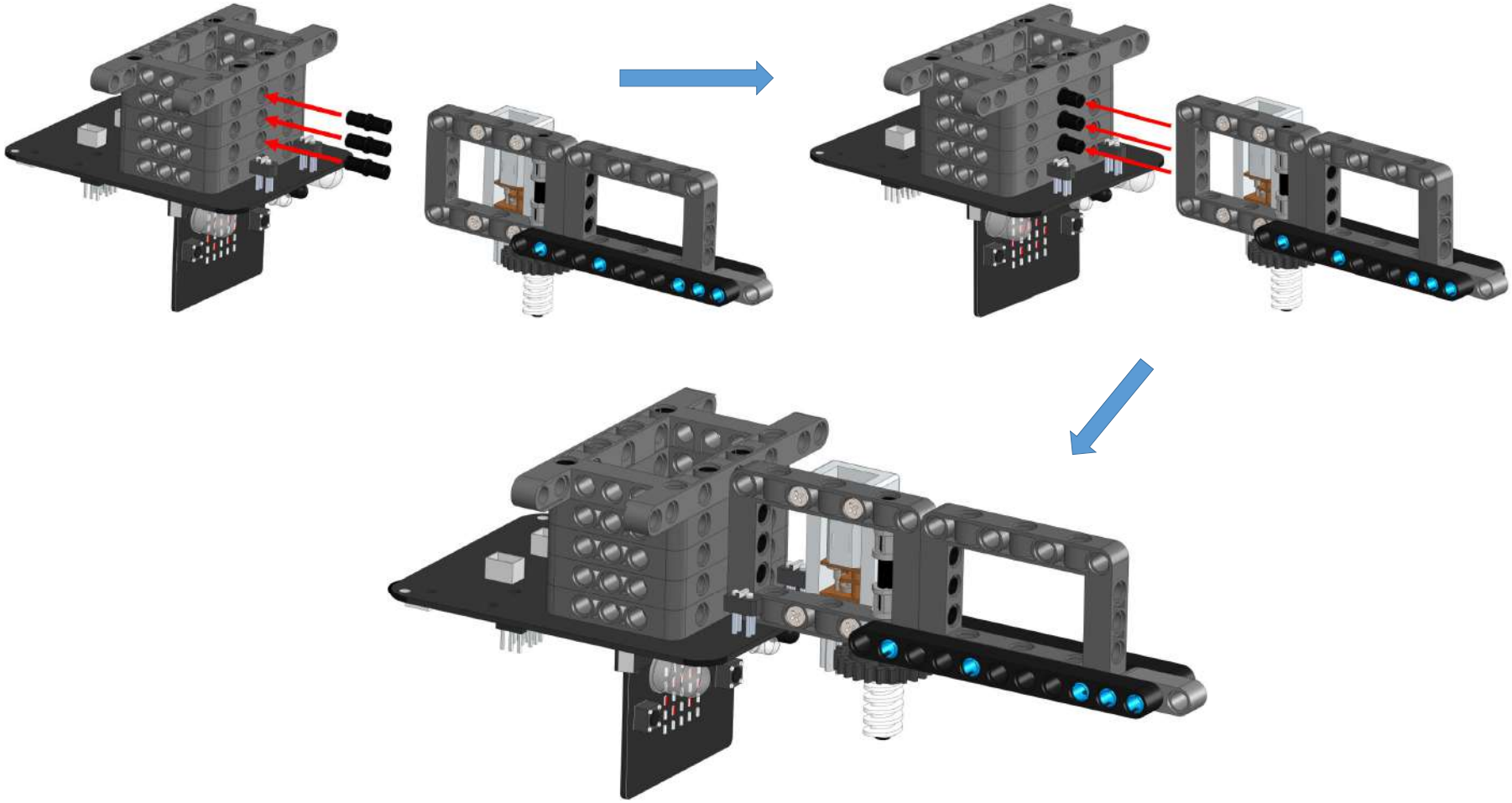




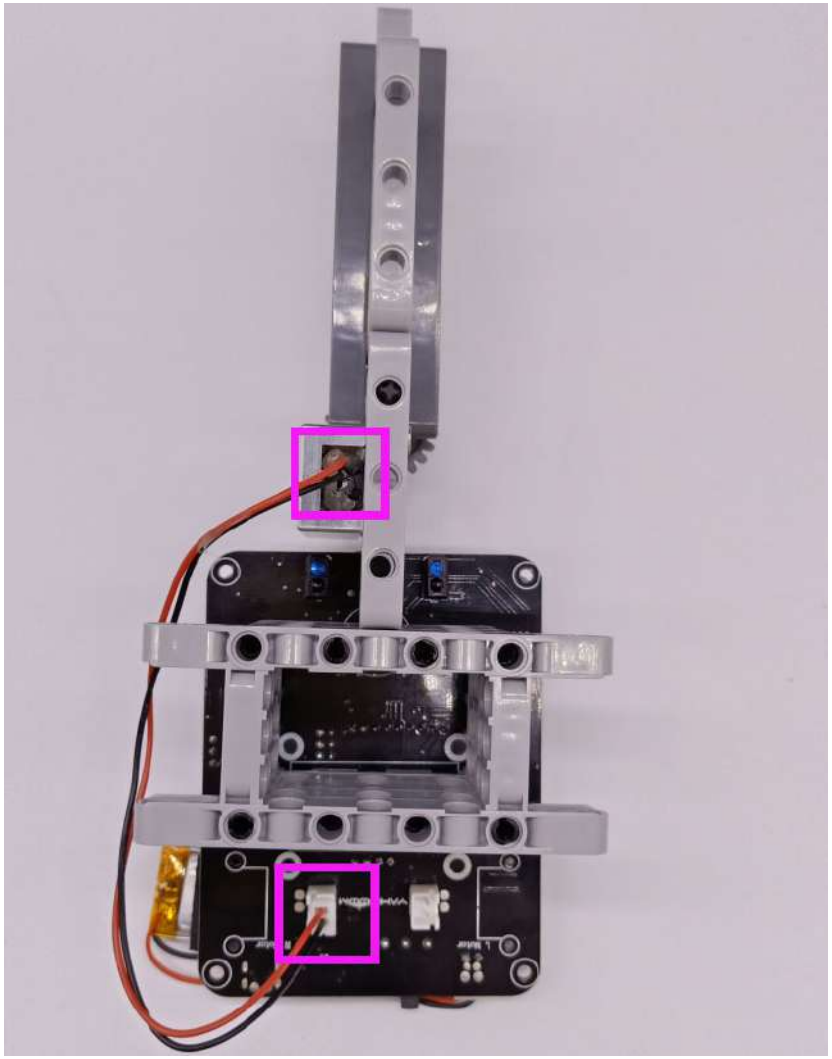
Step 11: Find four 1x2 friction pins, a 5x11 beam frame, and assemble them.



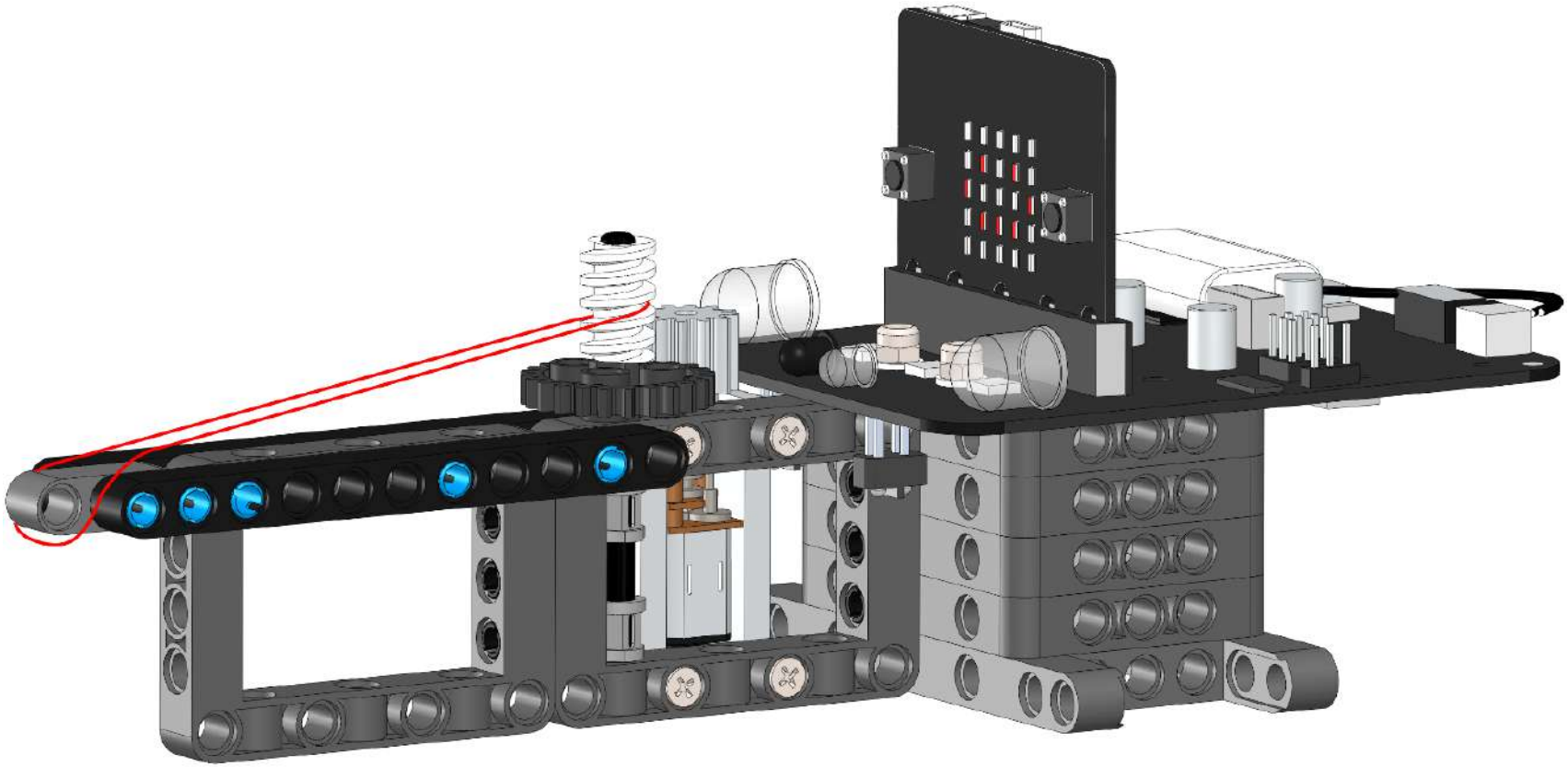
Step 12: Combine the two pieces of building blocks we have assembled in the seventh and eleventh steps with three 1x2 friction pins.



Step 13: Wire as shown below.



Please remember to put on the rubber band after the assembly is completed, as shown below.



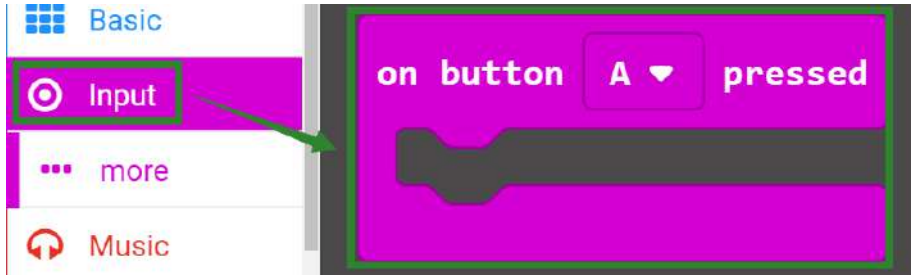
Tip: When playing with a sniper, you can't shoot at people. You can shoot at an empty place.

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

Preparation

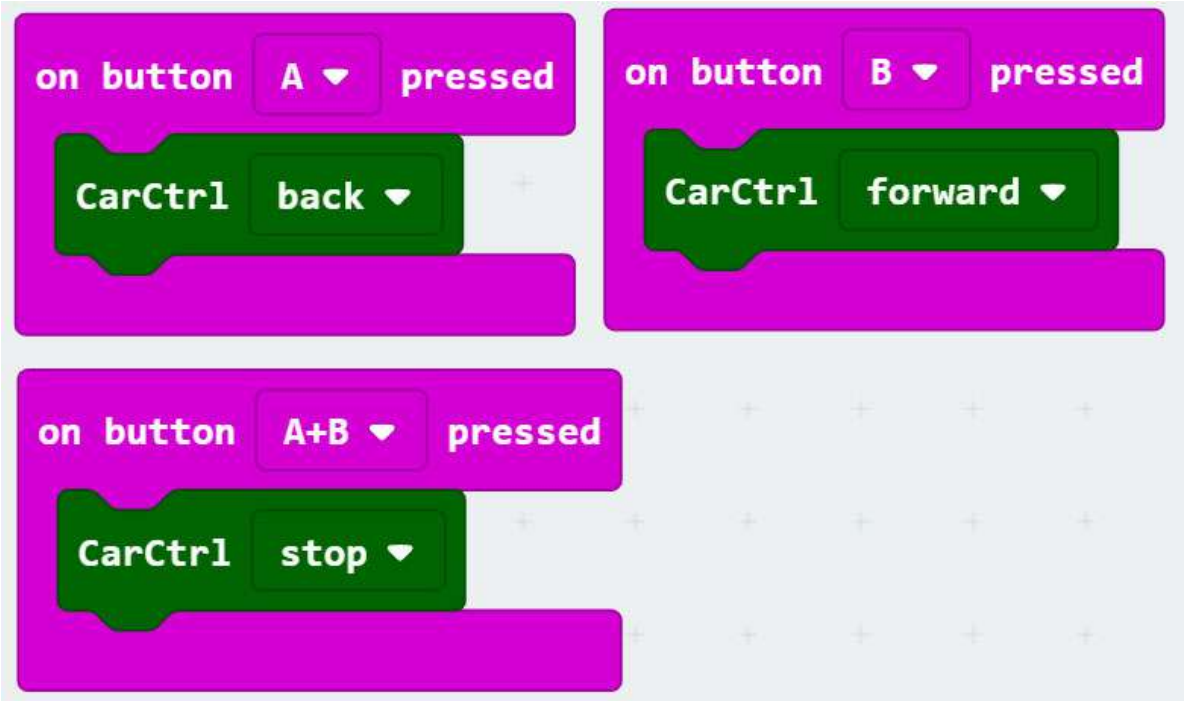
- USB cable *1
- Sniper *1

Blocks

Block	Instruction
	When the button on the micro:bit board is pressed, the corresponding content is executed.
	The Cartrl forward represents the forward rotation of the motor, and the Cartrl back represents the reverse rotation of the motor.

Programming

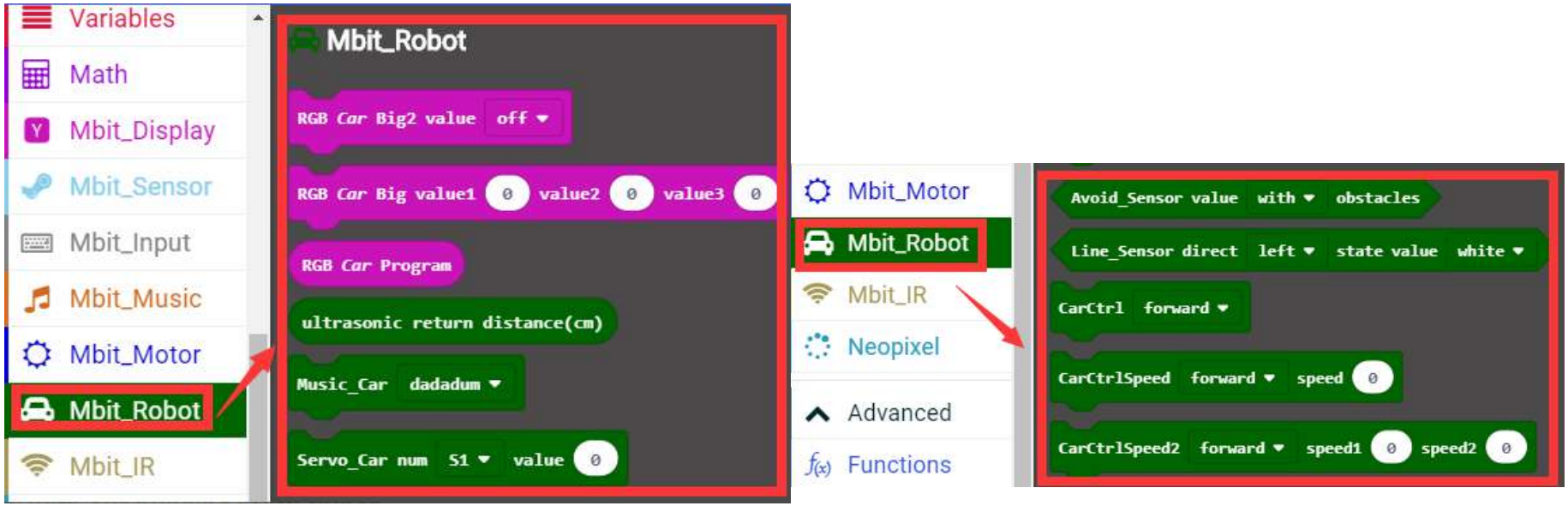
The program of this course is shown in the figure below. After downloading the program, open the sniper's power switch, install the rubber band on the helical gear. Press the A button on the micro:bit board, the motor will start until the rubber band is ejected. Press the B button on the micro:bit , the motor is reversed. Press the A and B button on the micro:bit board, the motors stop rotation.



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\F.Sniper\2.Sniper\Sniper.hex

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



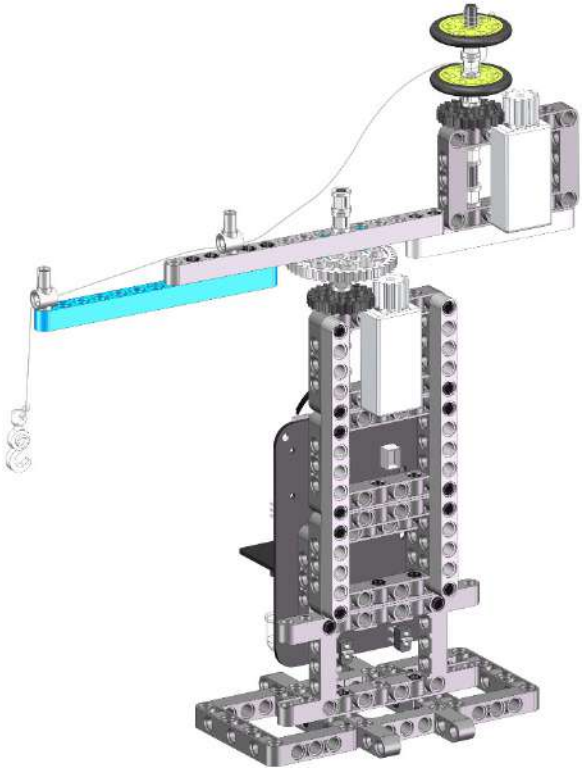
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely.
Drag these blocks and play with our building block sniper.

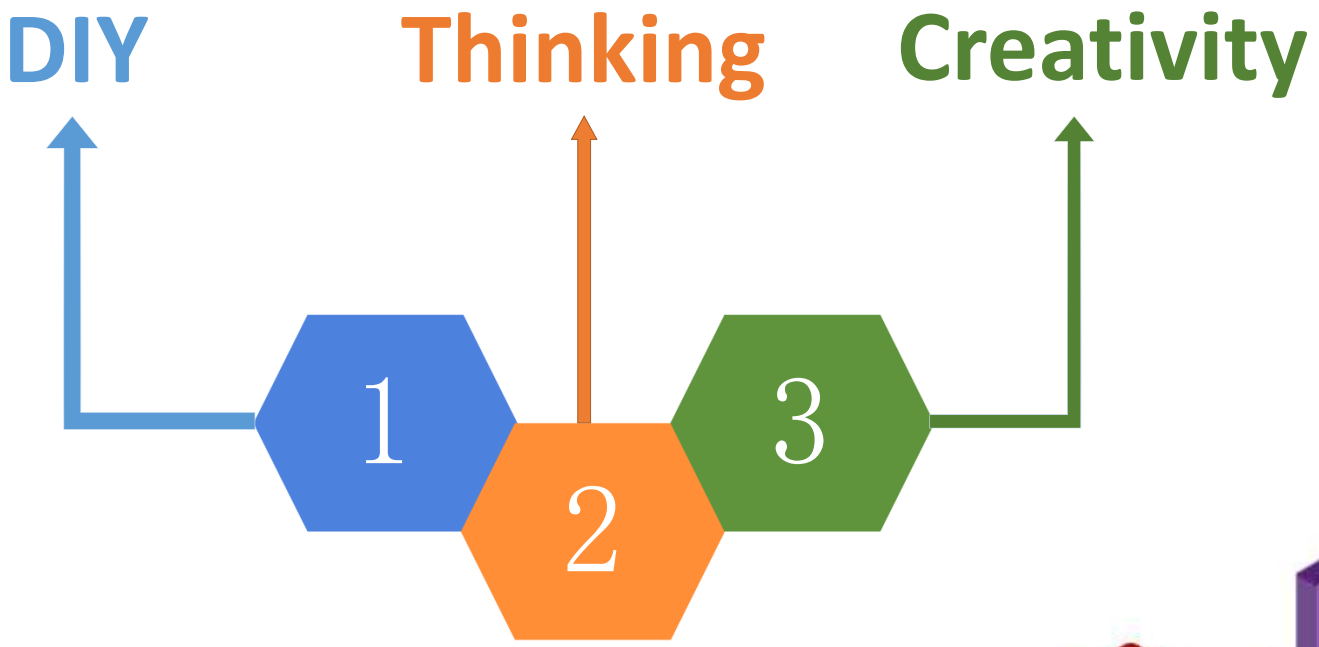


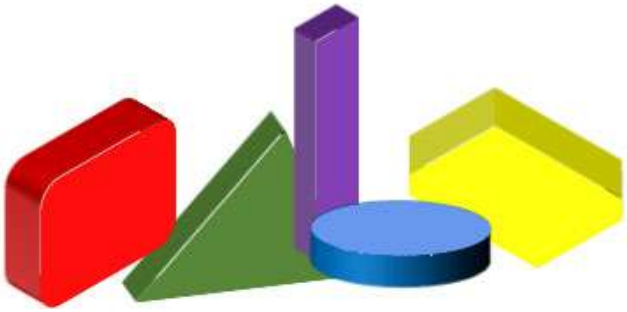
On our official website, we also provides other tutorial: Sniper Infrared remote control, Sniper bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.7 Tower Crane

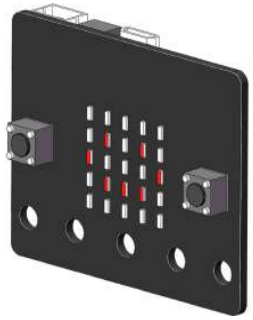
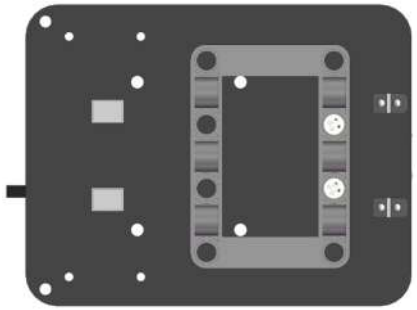
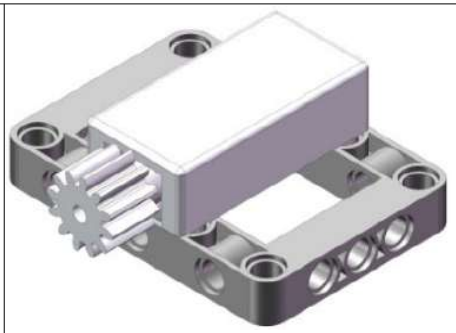
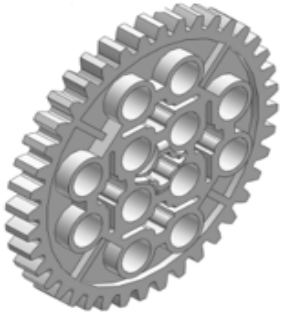
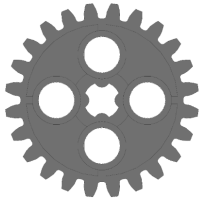
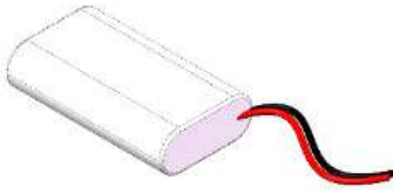
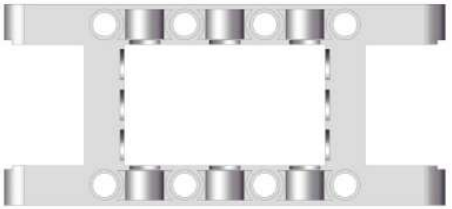
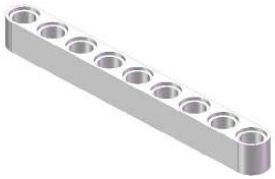
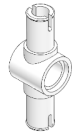


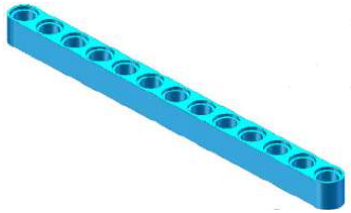
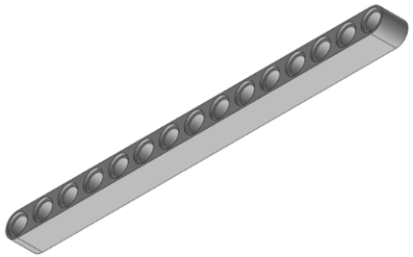
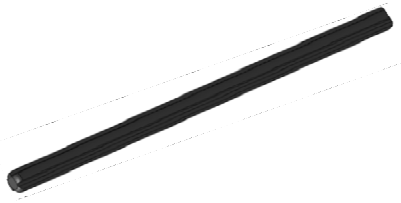

DIY
Thinking
Creativity
1
2
3



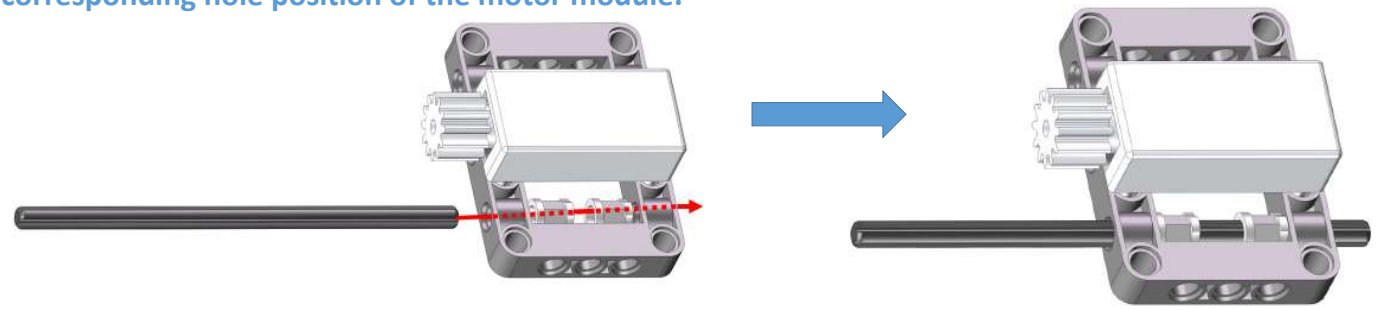
DIY: This section is mainly to teach you to assemble the tower crane with building blocks.

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

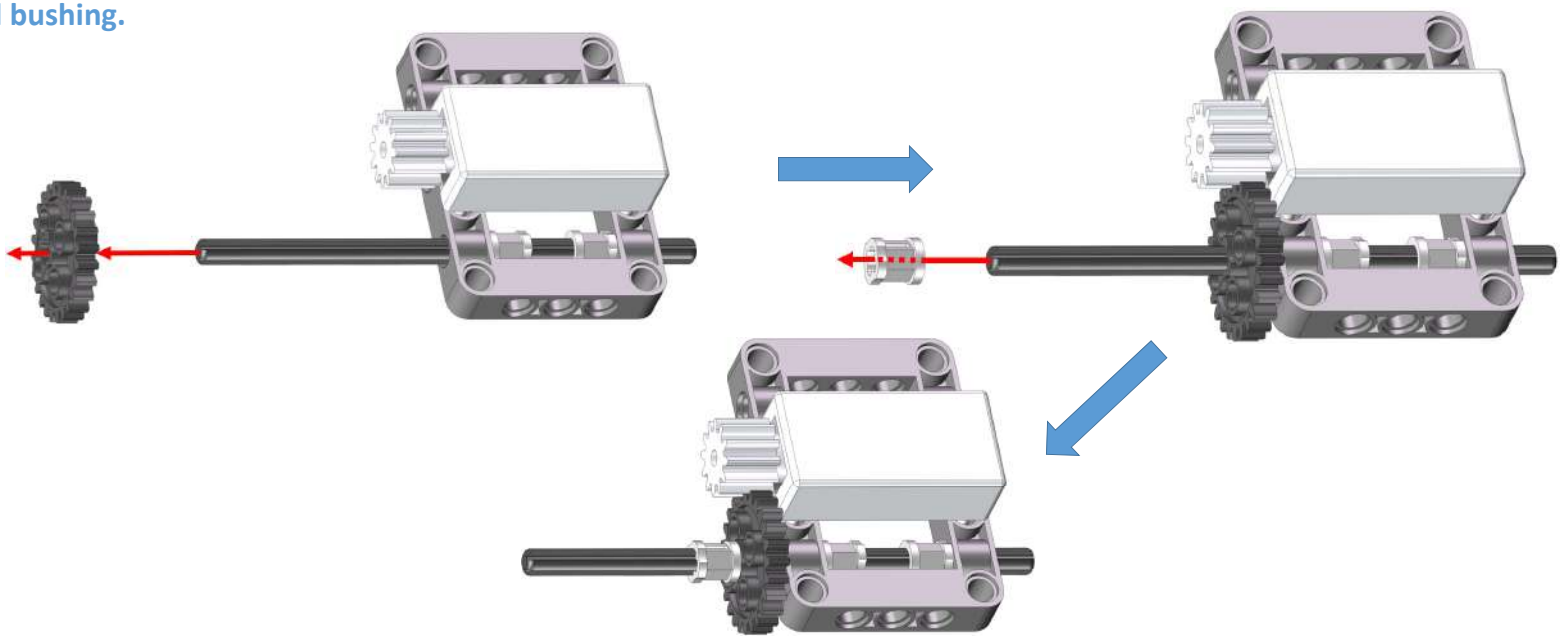
 1x13 hole arm*1	 1x15 hole arm*3	 1x12 Cross Axle*2		

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.

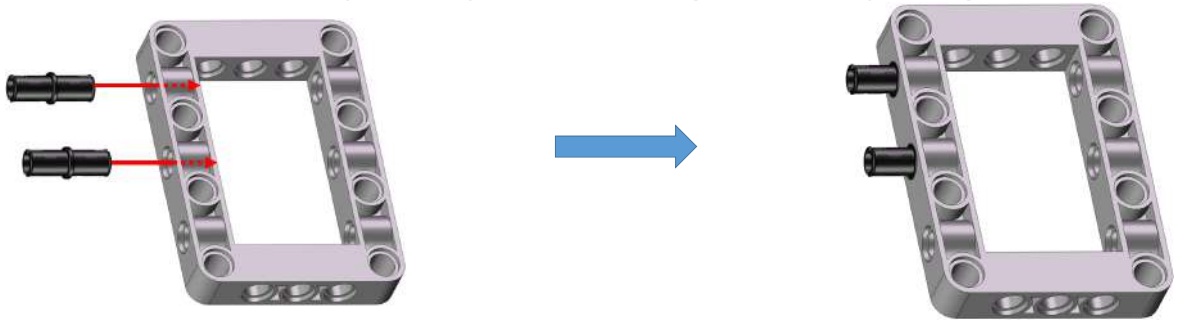


Tip: After the 1x12 cross axle is installed, the length of the hole is reserved on the right side. In the next step of assembly will use the length of this hole.

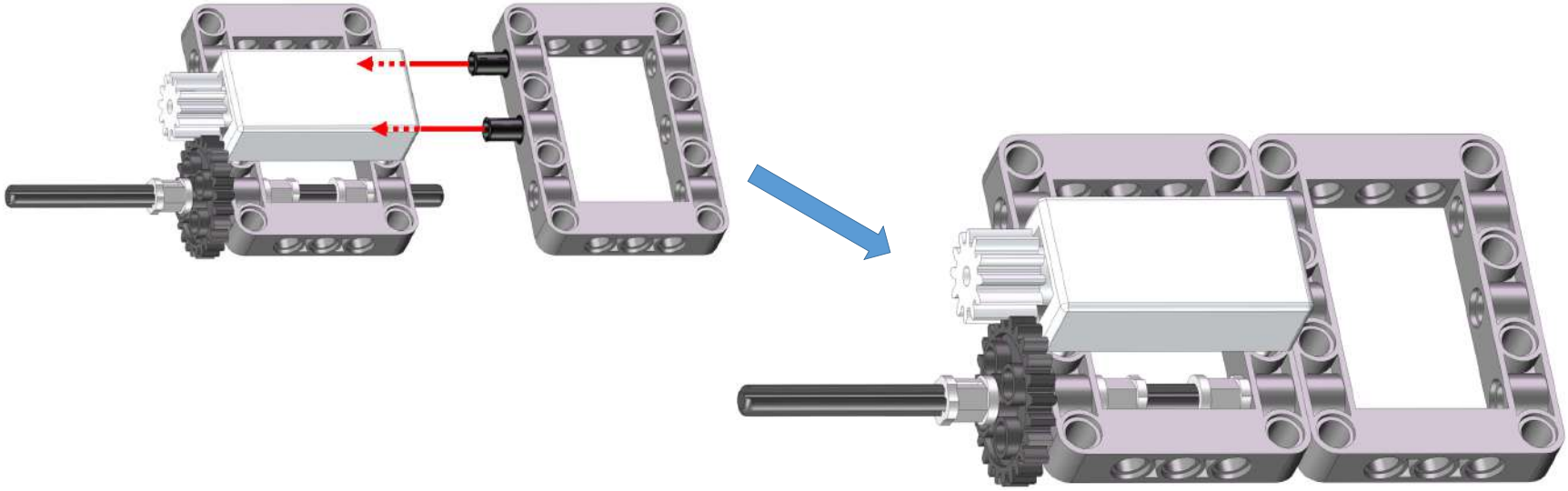
Step 2: Locate a 24-toothed wheel and a bushing that passes the assembled 1x12 cross axle through the 24-toothed wheel and bushing.



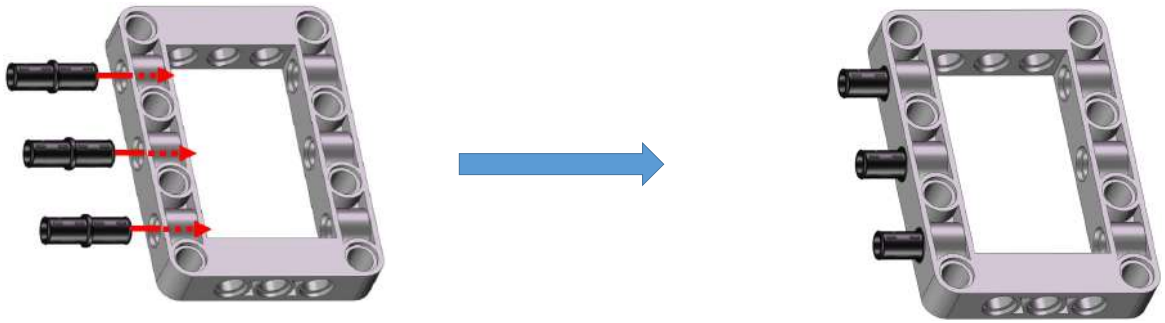
Step 3: Locate the two 1x2 friction pins and pass them through the corresponding holes in the 5x7 beam frame.



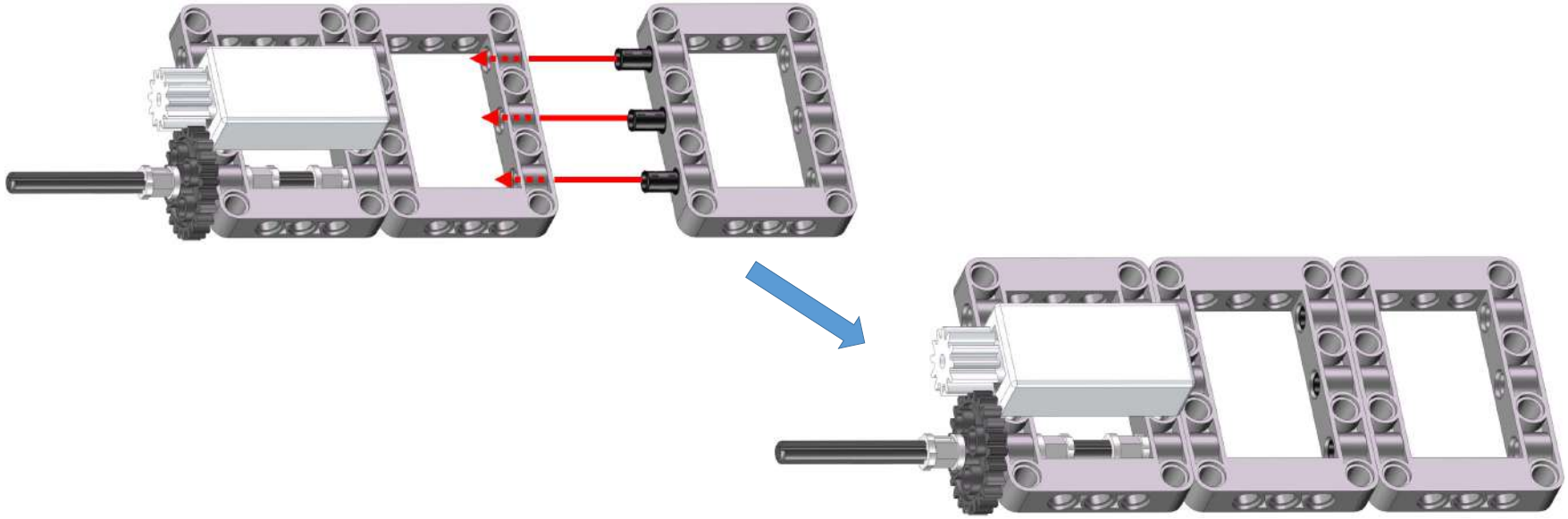
Step 4: Combine the two parts of the assembled blocks in the step 2 and step 3.



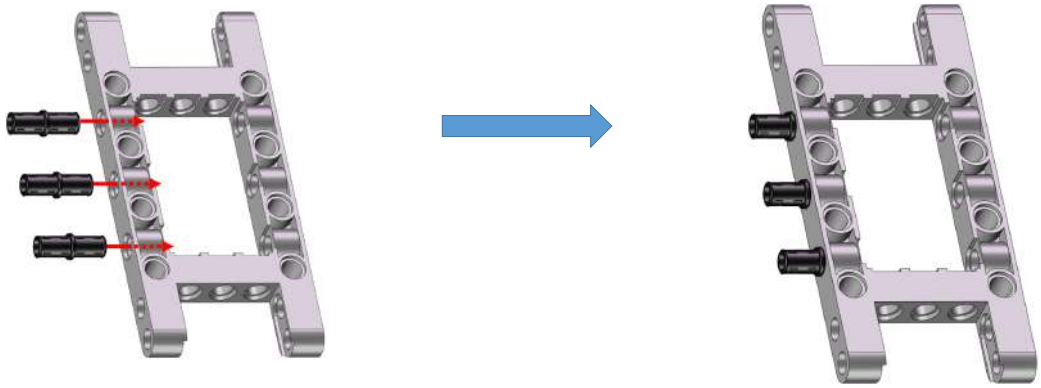
Step 5: Locate the three 1x3 bolts and a 5x7 beam frame and insert the 1x3 bolts from the side into the corresponding holes in the 5x7 beam frame.



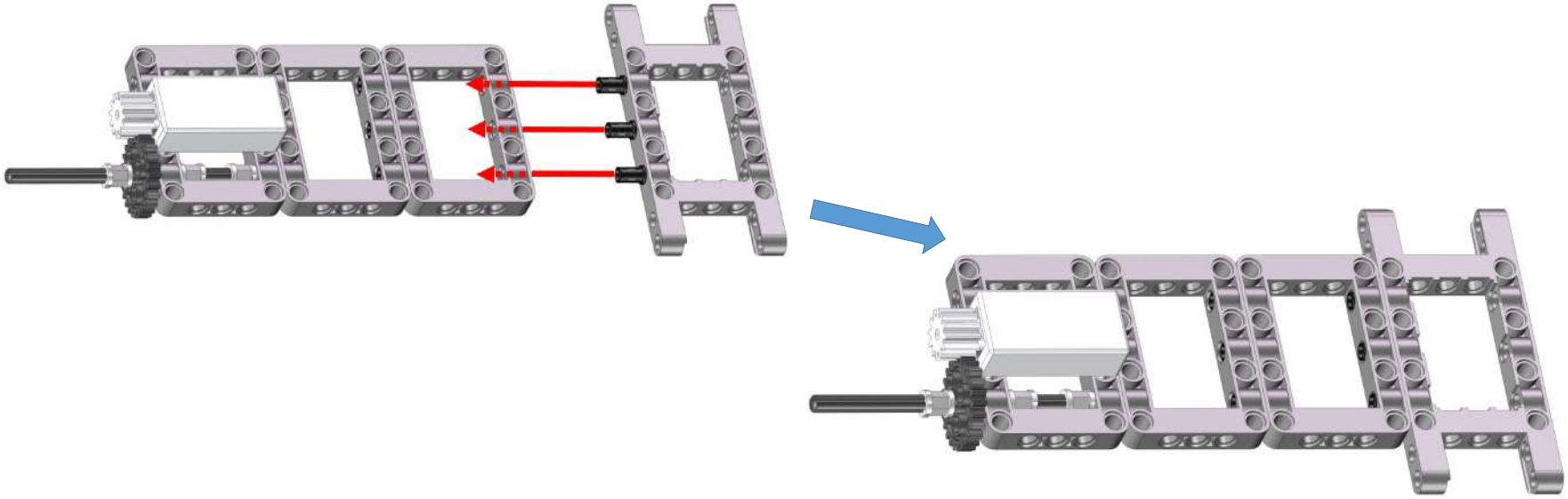
Step 6: Combine the assembled blocks of the step 4 and step 5.



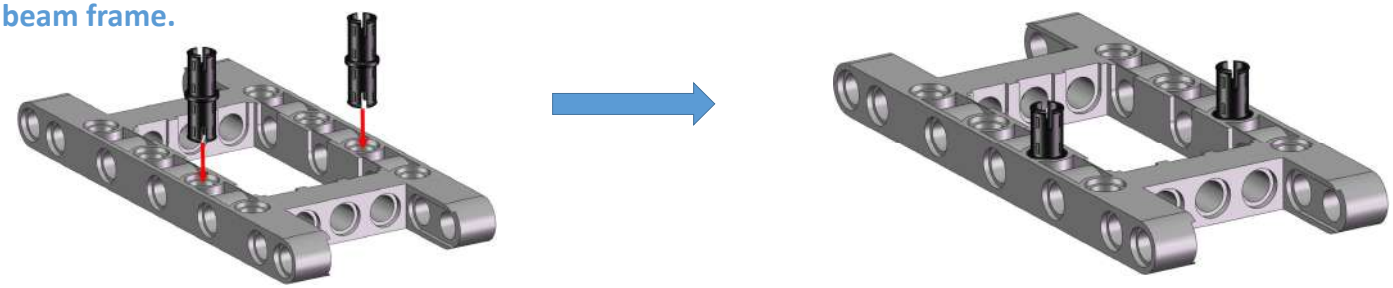
Step 7: Locate the three 1x2 friction pins and a 5x11 beam frame and insert the friction pins into the holes on the side of the 5x11 beam frame.



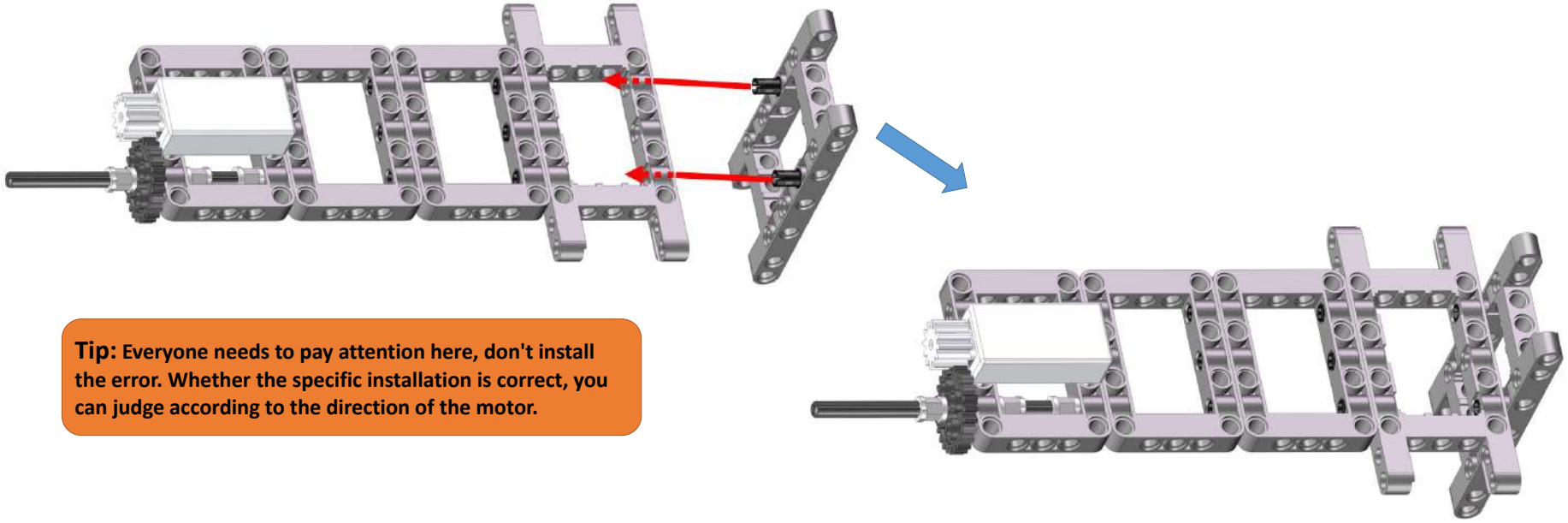
Step 8: Combine the assembled blocks of the step 6 and step 7.



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.

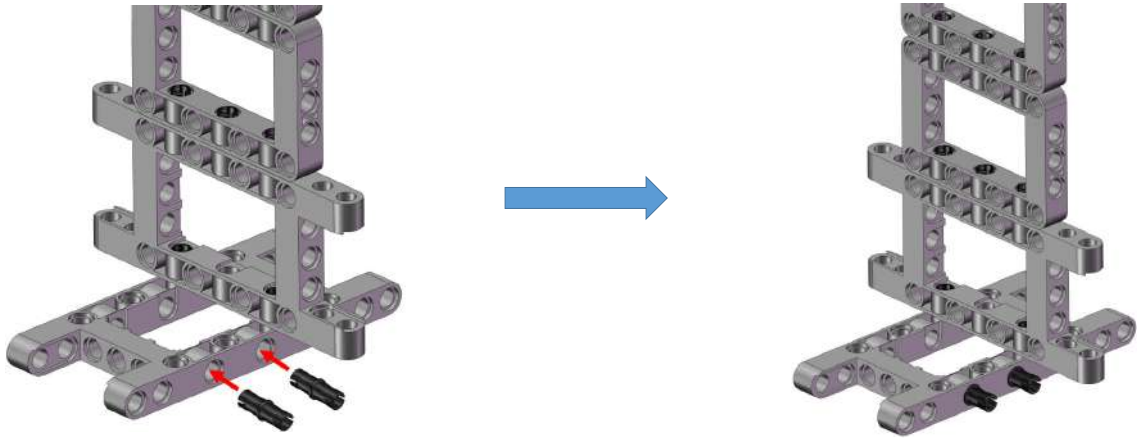


Step 10: Combine the two parts of the assembled blocks in the step 8 and step 9.

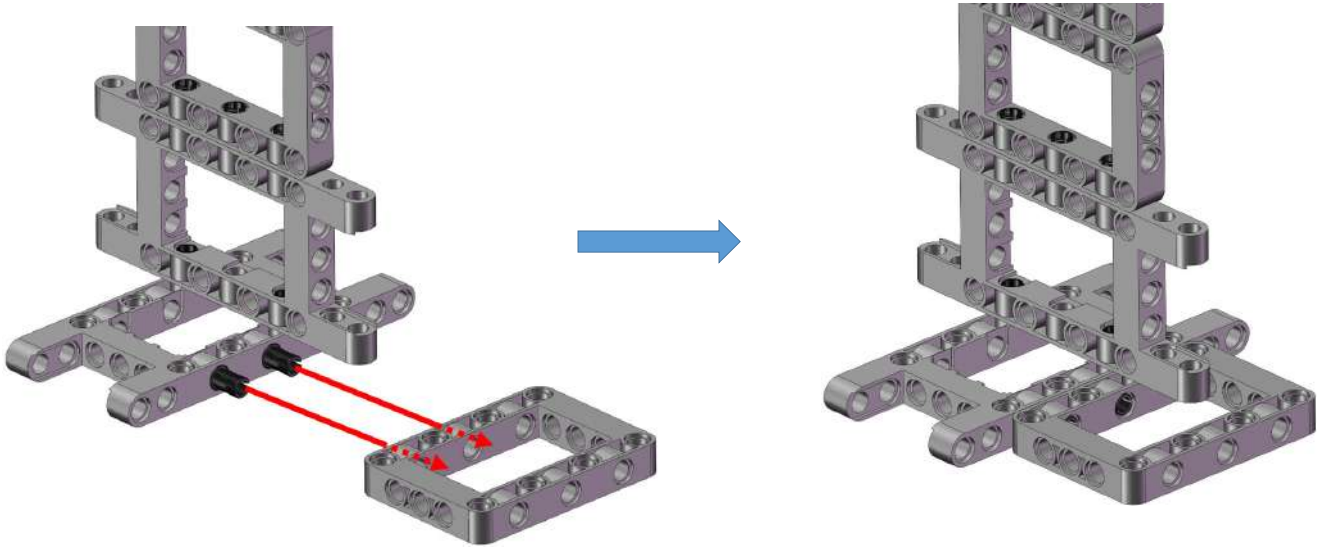


Tip: Everyone needs to pay attention here, don't install the error. Whether the specific installation is correct, you can judge according to the direction of the motor.

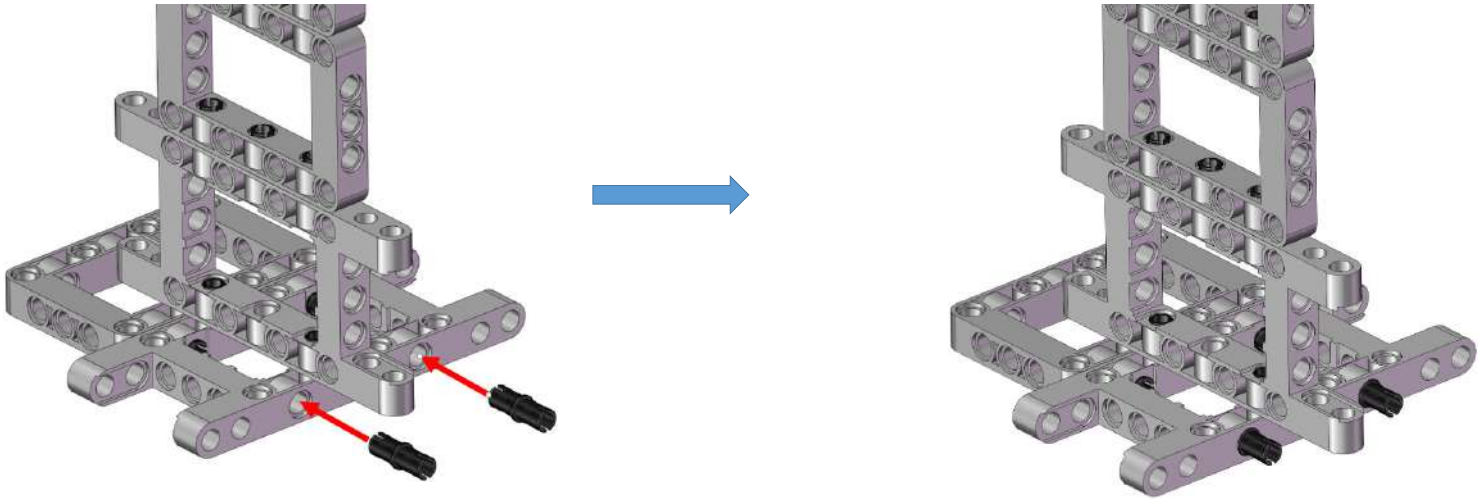
Step 11: Look for two 1X2 friction pins and insert them into the corresponding holes on the side of the bottom 5x11 beam frame.



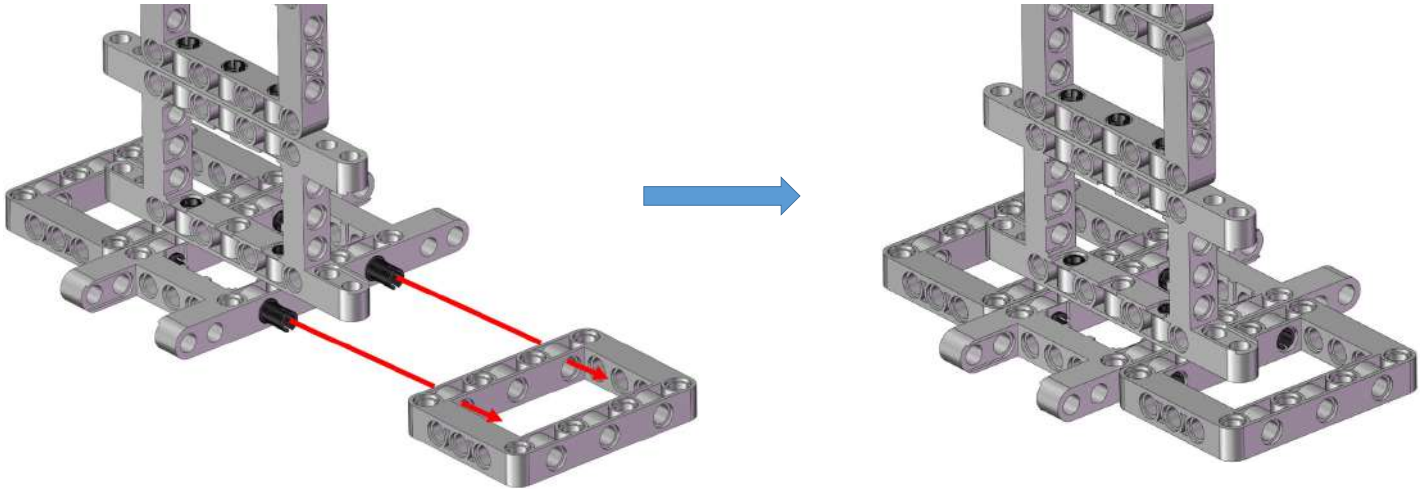
Step 12: Look for a 5x7 beam frame and insert it into the 1x2 friction pin on the side.



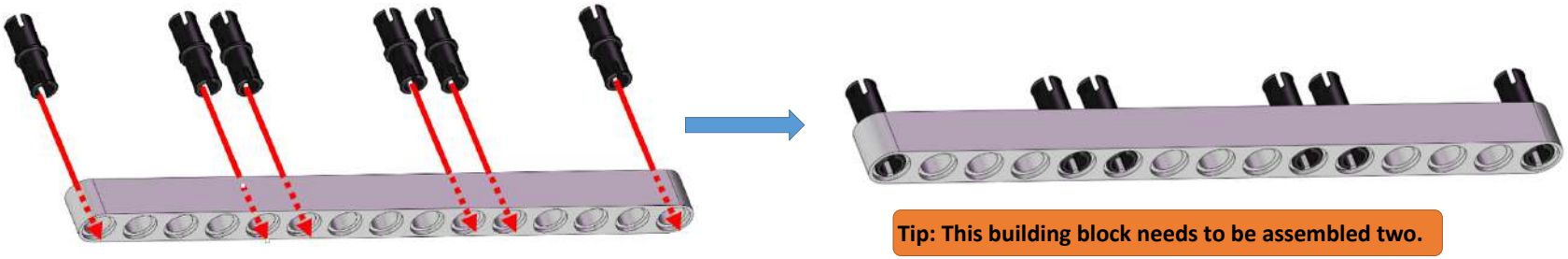
Step 13: Look for two 1x2 friction pins and insert them into the corresponding holes on the other side of the bottom 5x11 beam frame.



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

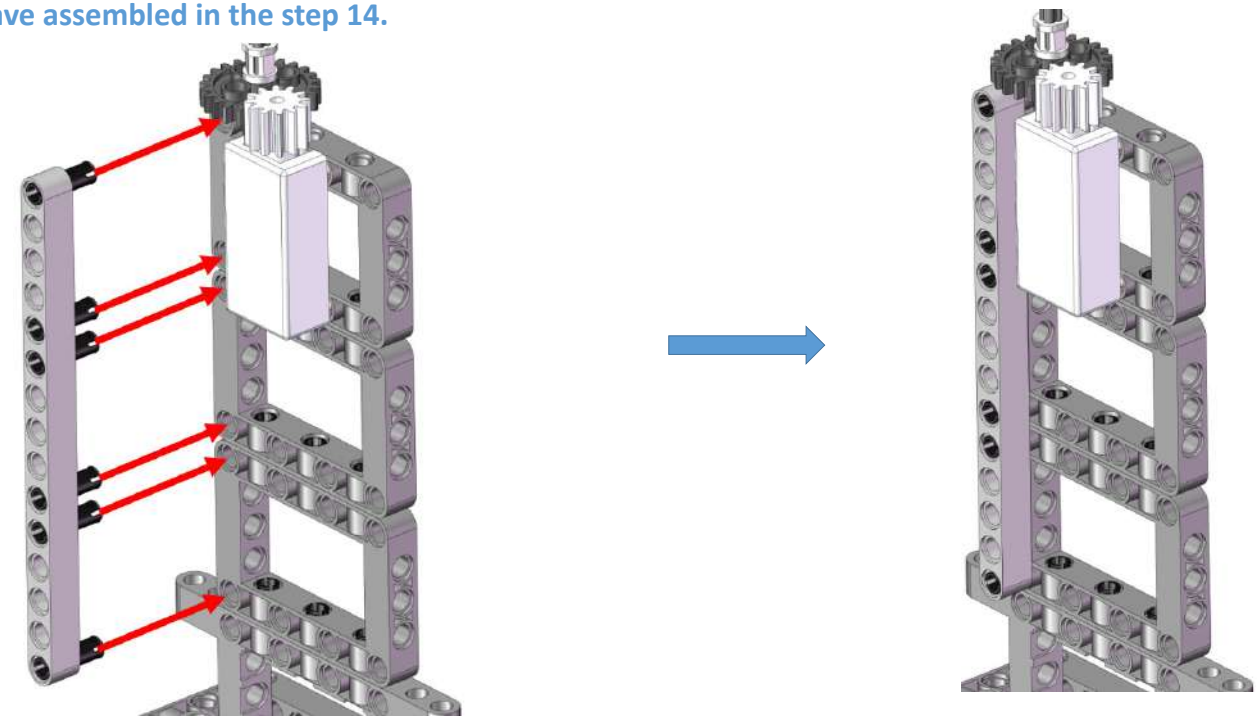


Step 15: Look for six 1x2 friction pins and 1x15 hole arms, and insert the friction pins into the holes 1st, 5th, 6th, 8th, 10th, 11th, and 15th of the hole arm.

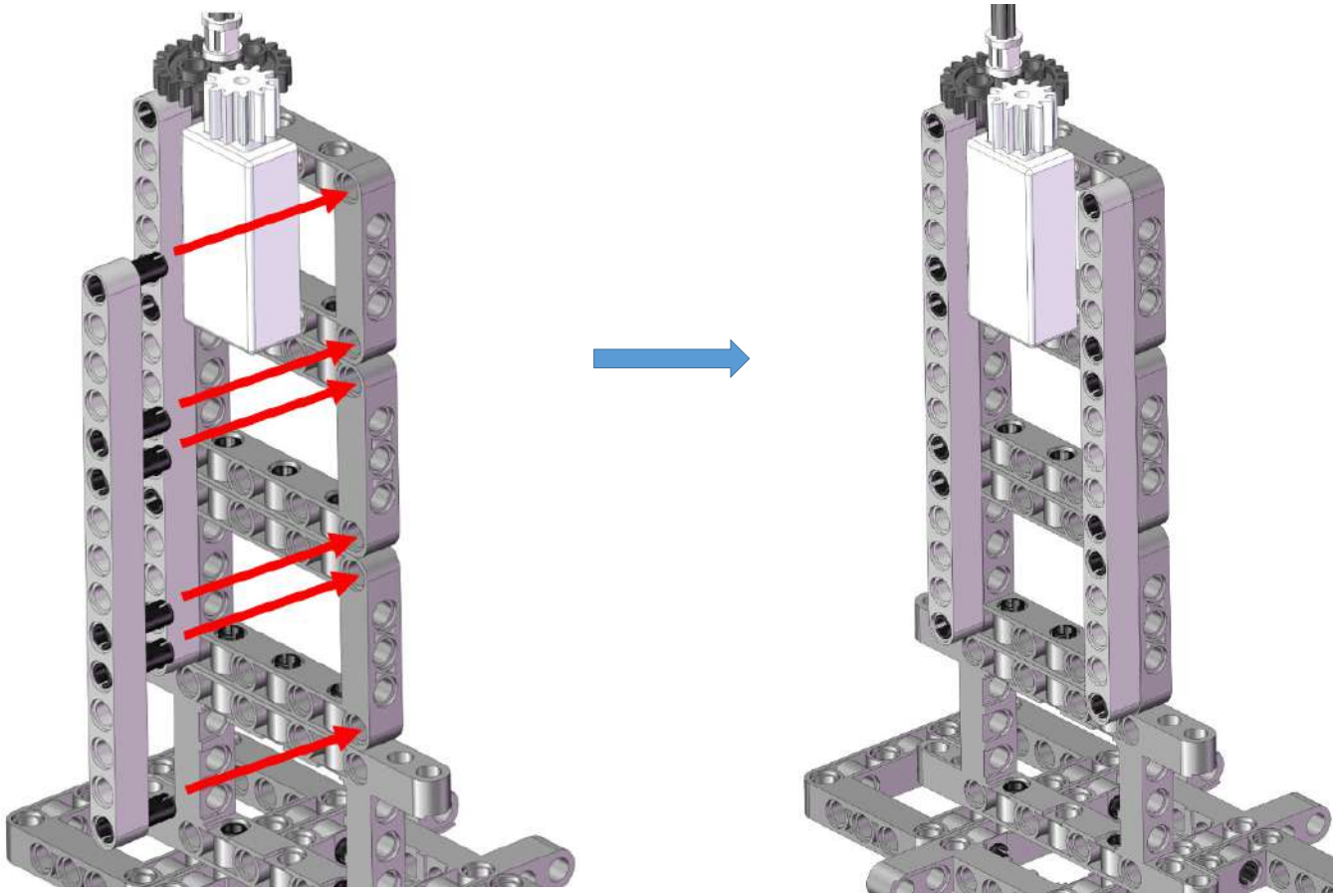


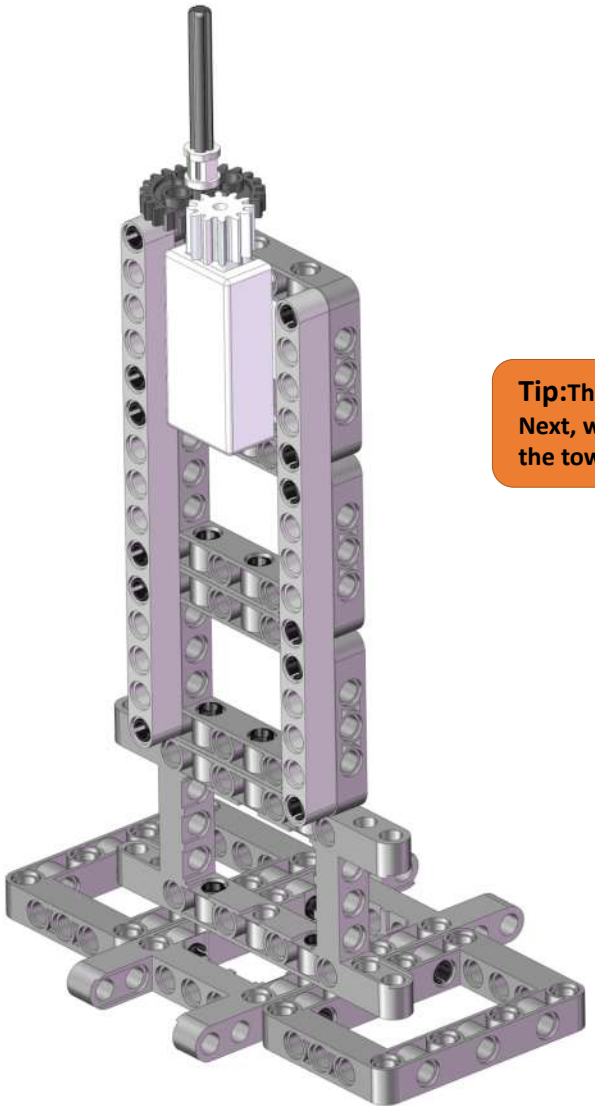
Tip: This building block needs to be assembled two.

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.



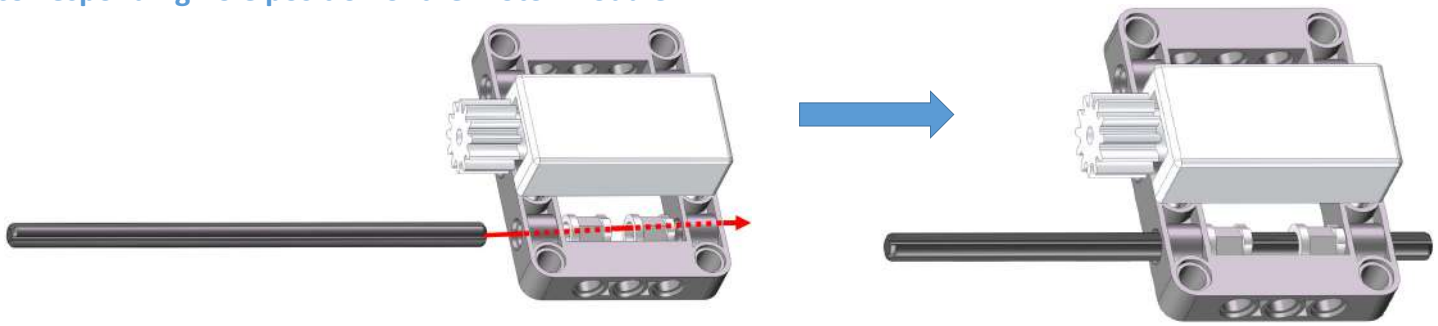
Step 17: Insert the assembled building block in the step 15 into the corresponding position on the right side of the building block that we have assembled in the step 14.





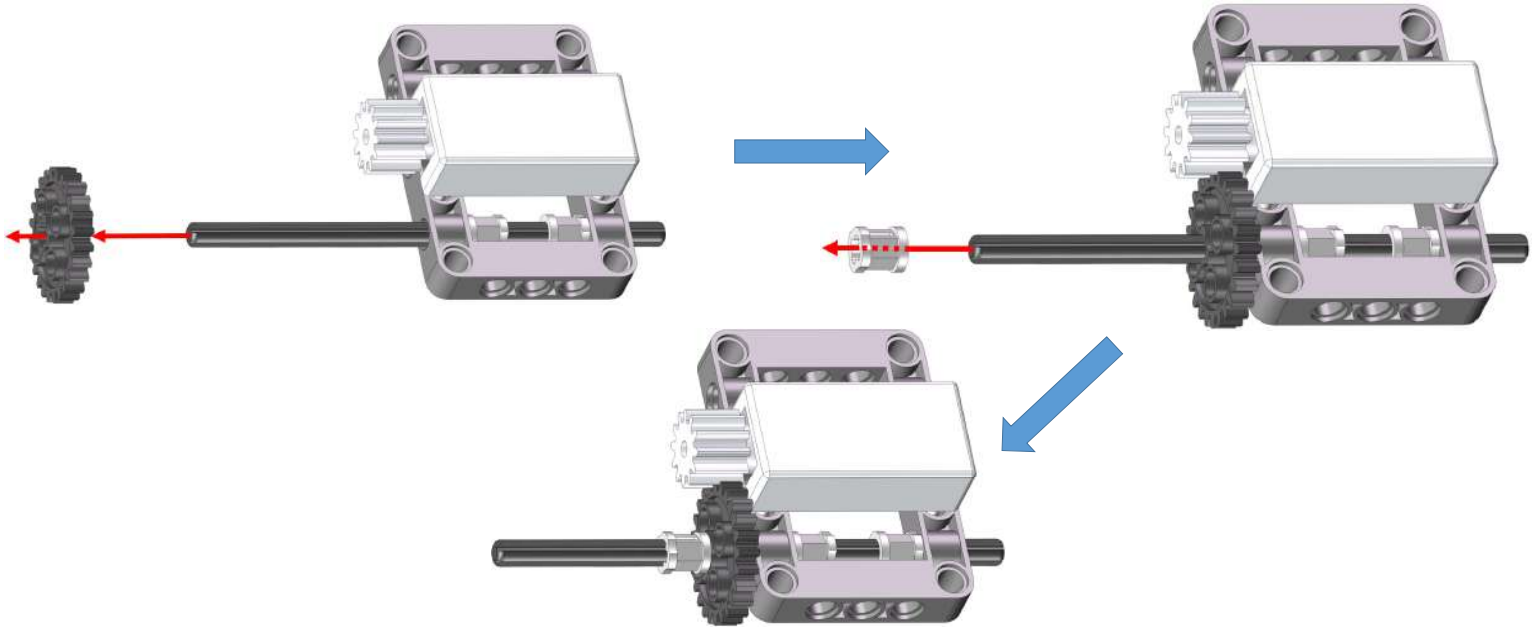
Tip:This is the chassis part of our assembled tower.
Next, we will continue to assemble the upper body part of the tower.

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.

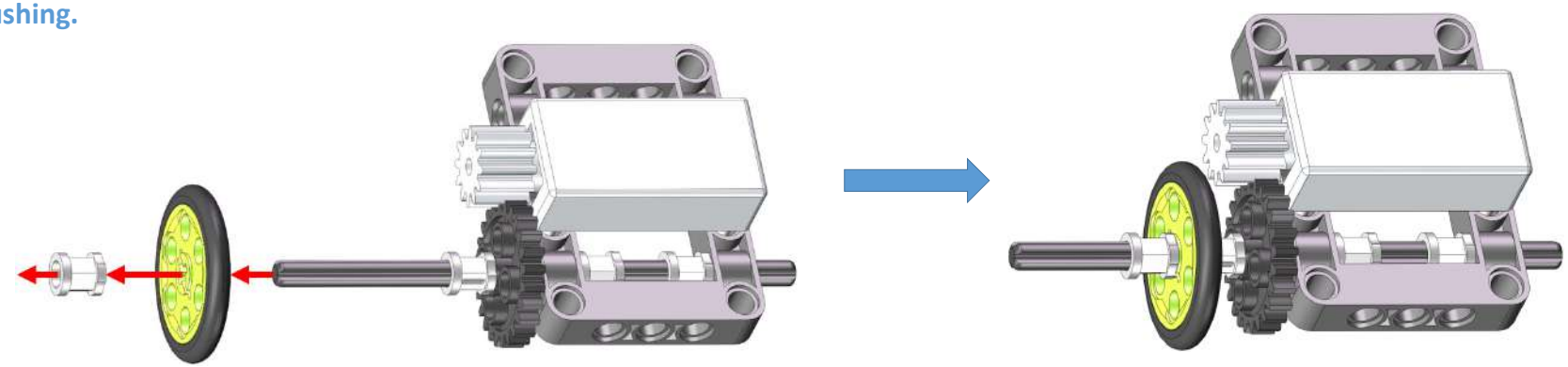


Tip: After the 1x12 cross shaft is installed, we need to leave a hole length of the 1x12 cross shaft . The length of this hole will be used in the next assembly.

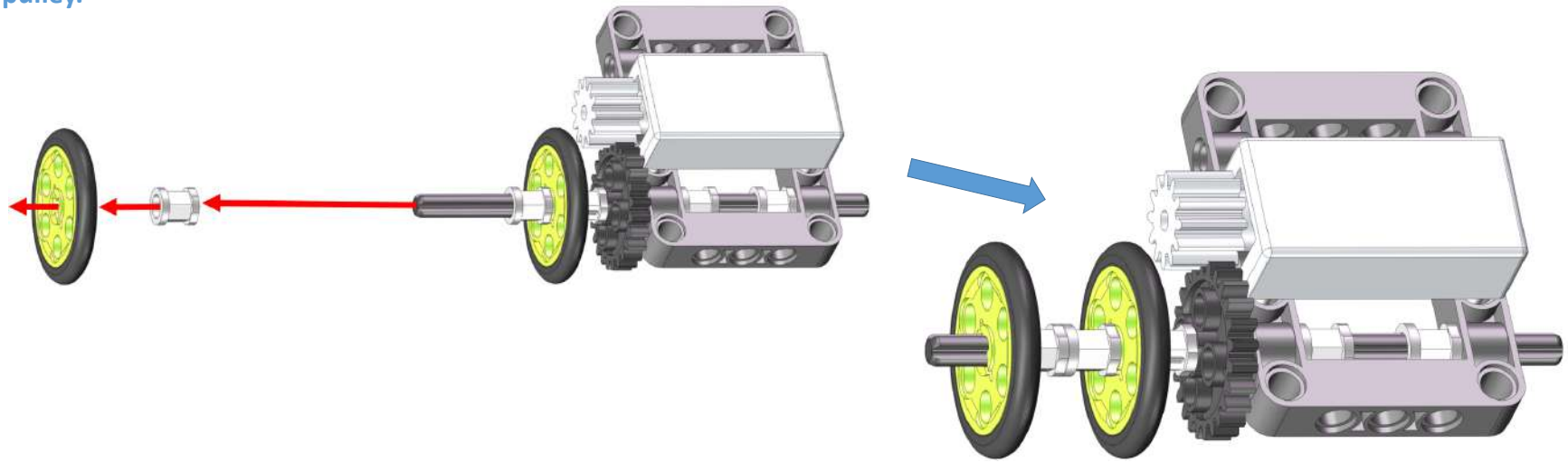
Step 19: Find a 24-toothed wheel and a bushing, and pass the assembled 1x12 cross axle through the 24-toothed wheel bushing.



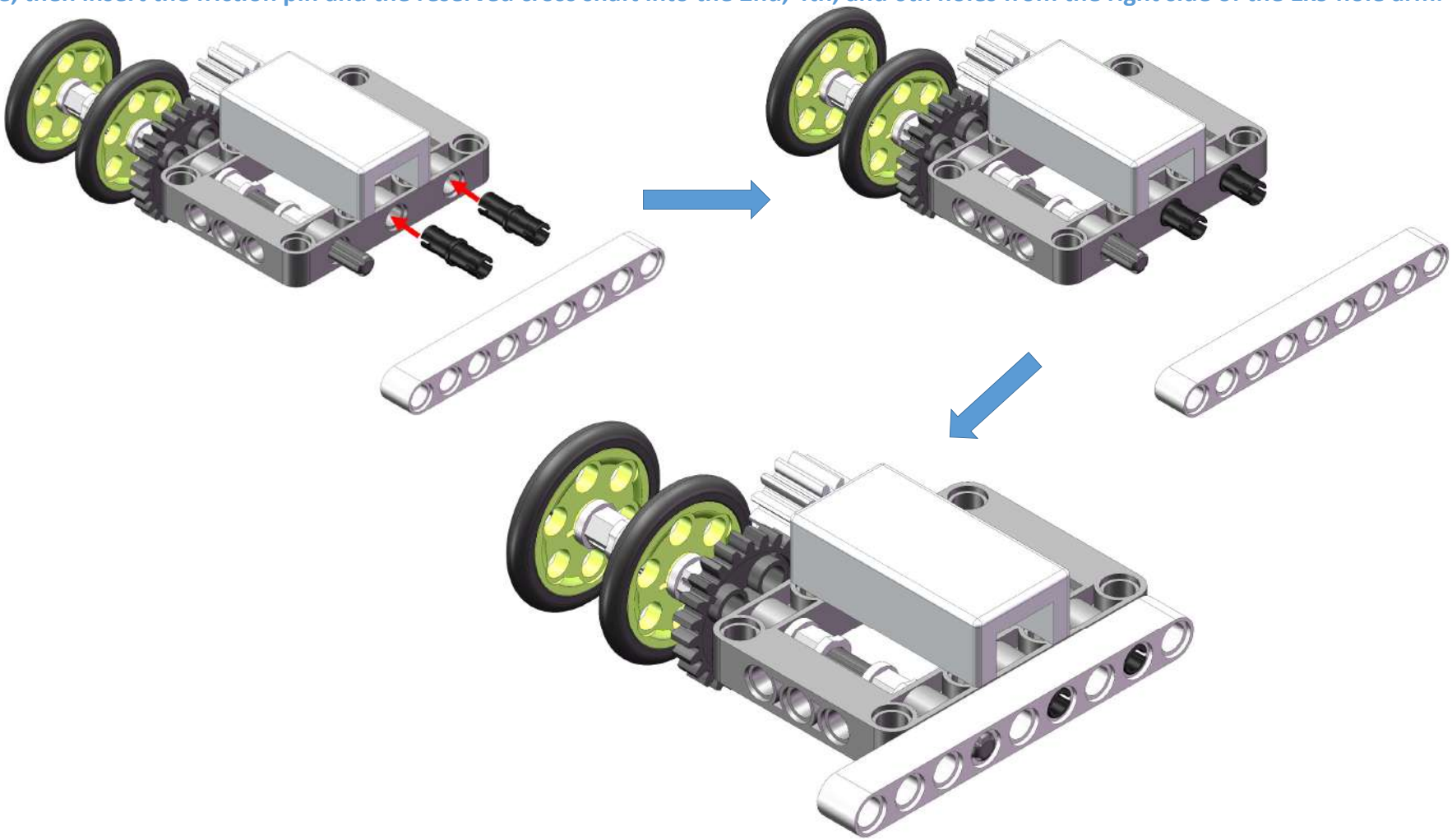
Step 20: Find a rubber ring +24 pulley and a bushing, and pass the assembled 1x12 cross axle through the rubber ring +24 pulley and bushing.



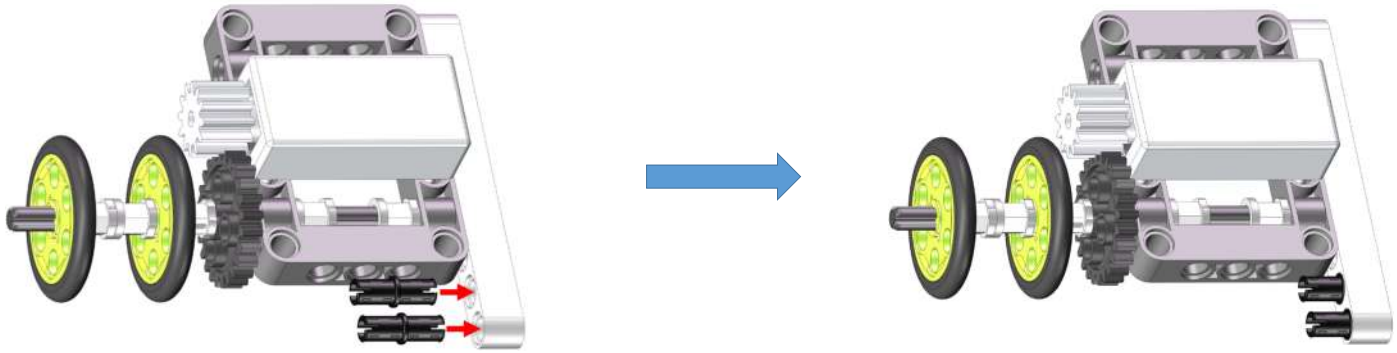
Step 21: Find a rubber ring +24 pulley and a bushing, and pass the assembled 1x12 cross axle through the bushing and rubber ring +24 pulley.



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.

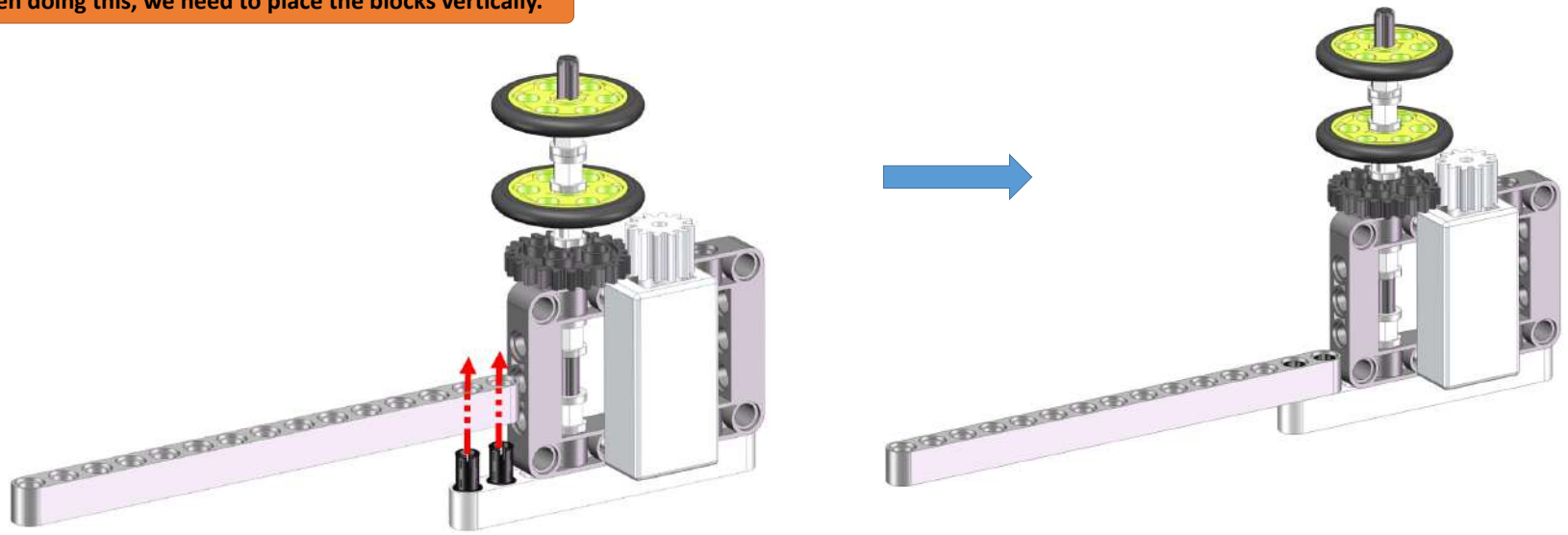


Step 23: Locate the two 1x2 friction pins and insert them into the corresponding holes in the 1x9 hole arm.

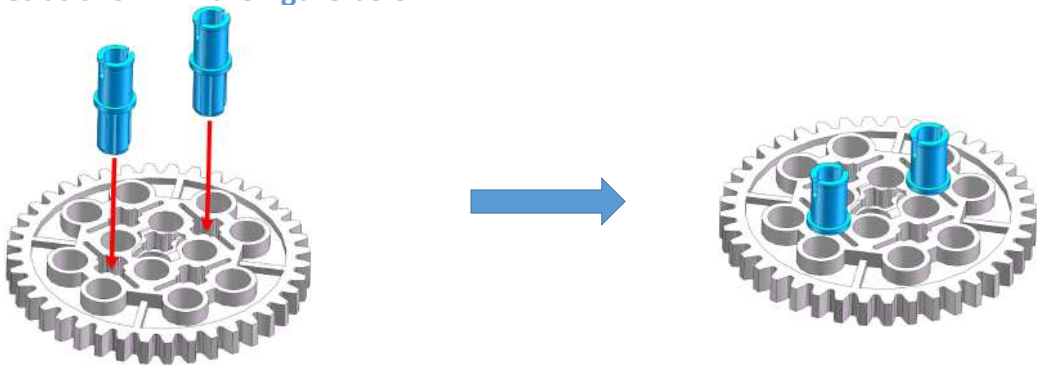


Step 24: Locate a 1x15 hole arm and insert the 1x2 friction pin installed in the previous step into the two holes at the far right end of the hole arm.

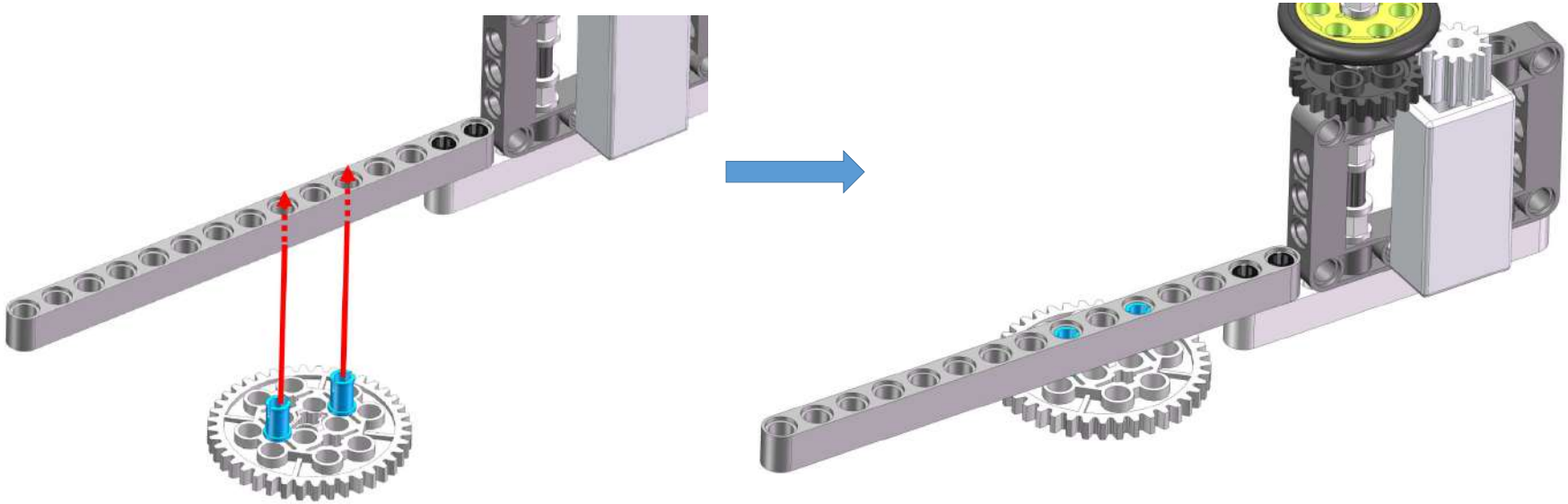
Tip: When doing this, we need to place the blocks vertically.



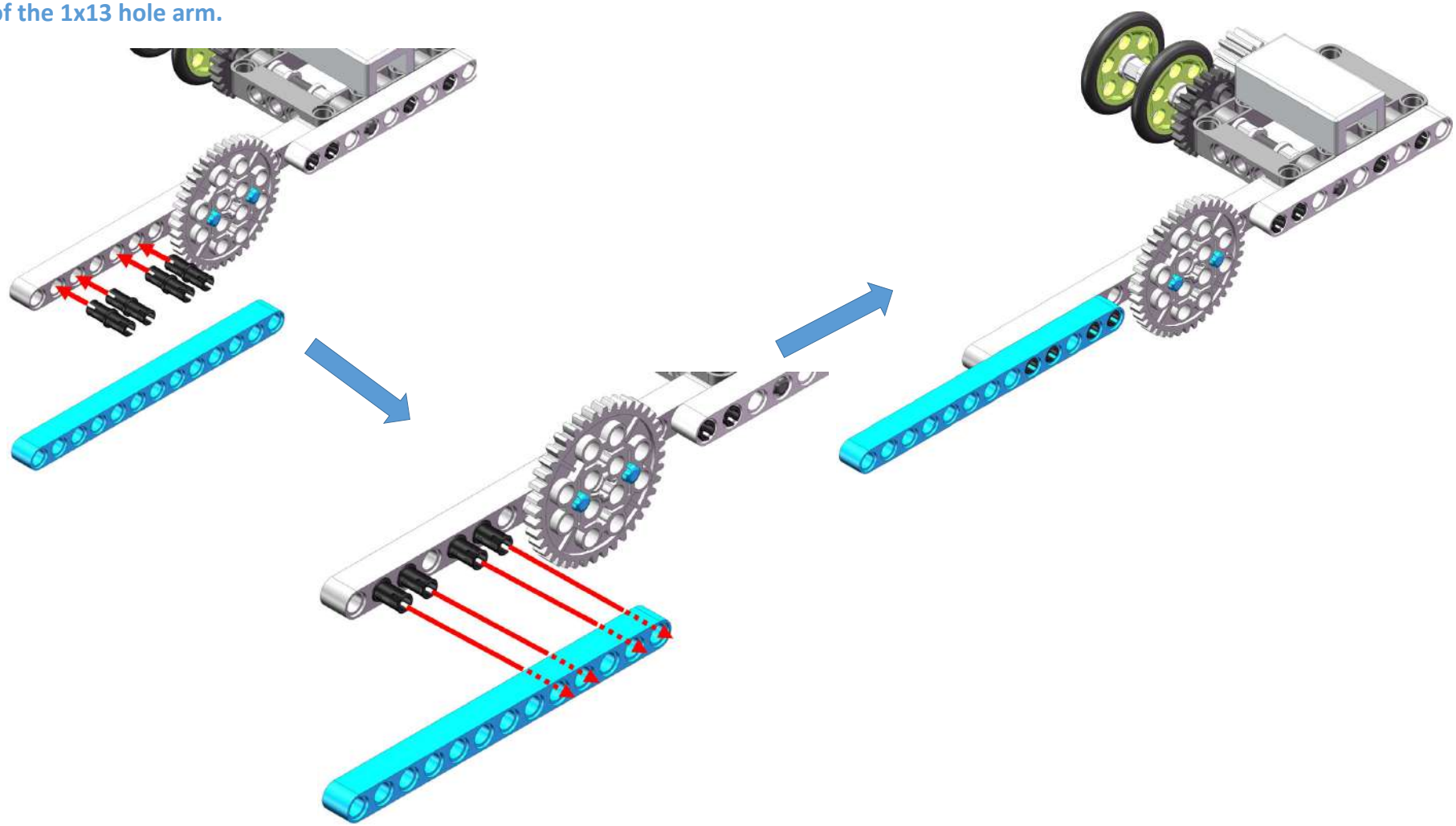
Step 25: Locate a 40-toothed wheel and two 1x2 shaft and bolt connector. Insert the two 1x2 shaft and bolt connector into the corresponding holes as shown in the figure below.



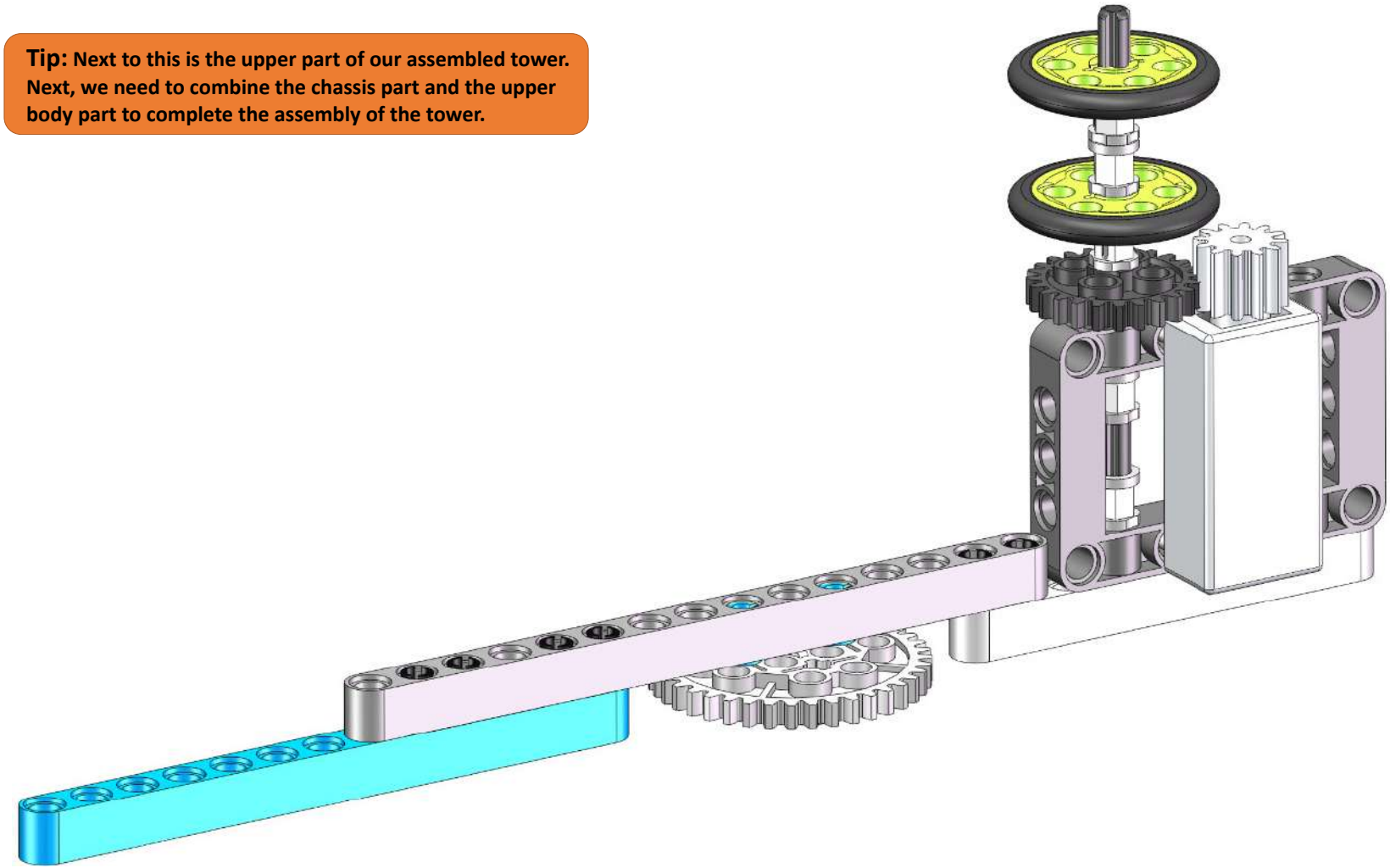
Step 26: Combine the building blocks assembled in the previous step with the building blocks that we have assembled in the step 24.



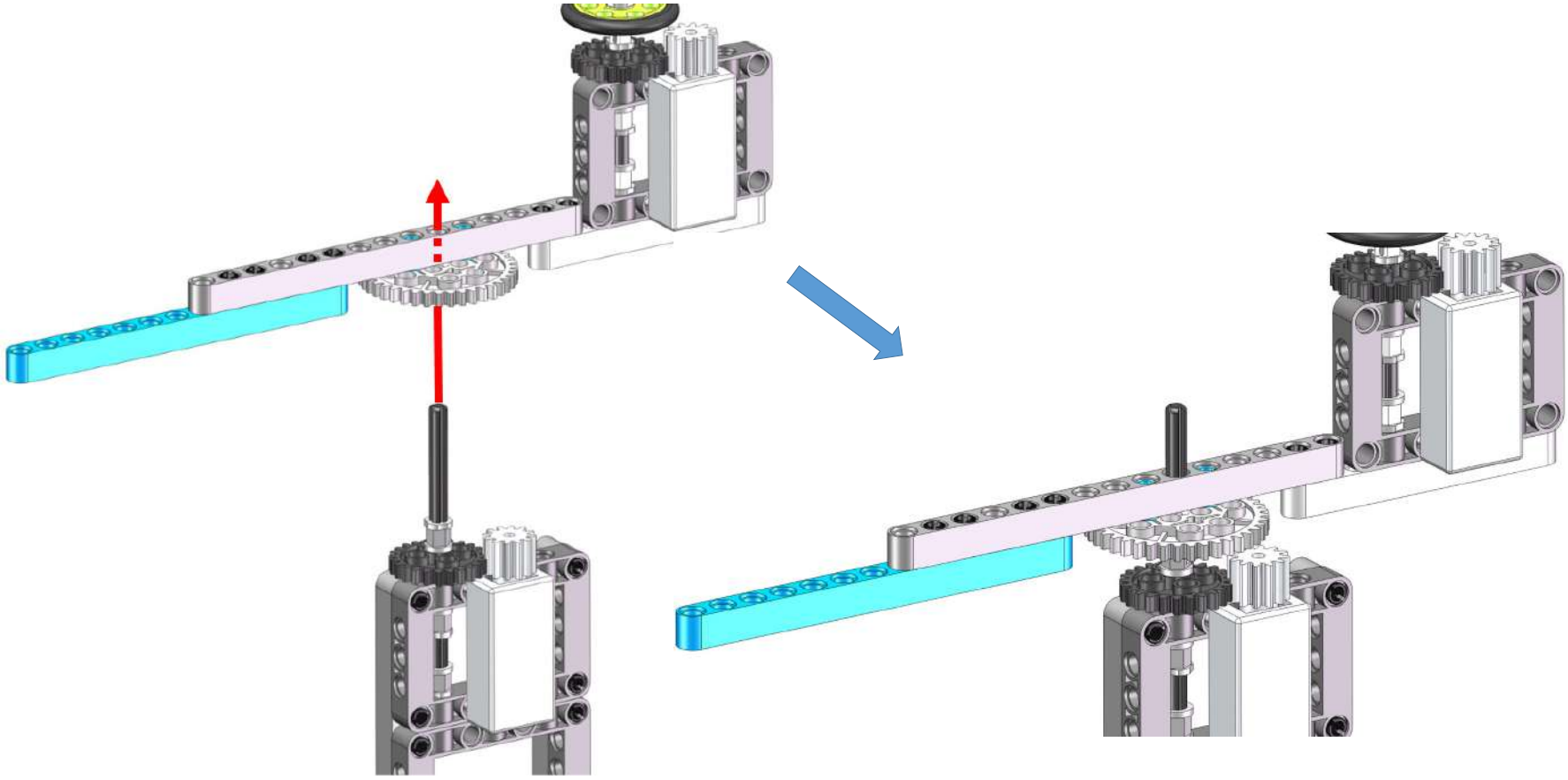
Step 27: Look for four 1x2 friction pins and a 1x13 hole arm. First insert the four 1x2 friction pins into the 2nd, 3rd, 5th, and 6th holes from the left of our assembled 1x15 hole arm. Then insert the four 1x2 friction pins into the 1st, 2nd, 4th, and 5th holes from the right side of the 1x13 hole arm.



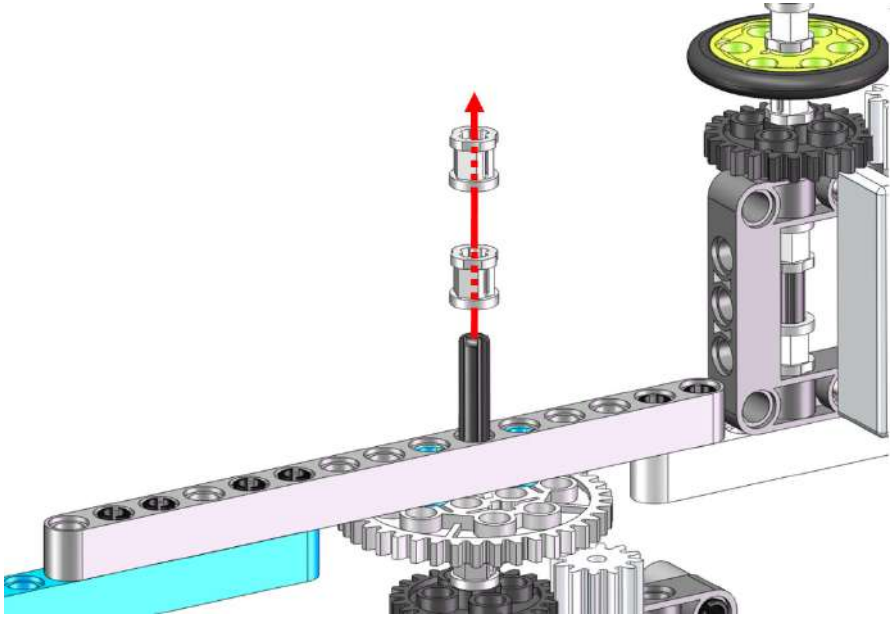
Tip: Next to this is the upper part of our assembled tower. Next, we need to combine the chassis part and the upper body part to complete the assembly of the tower.

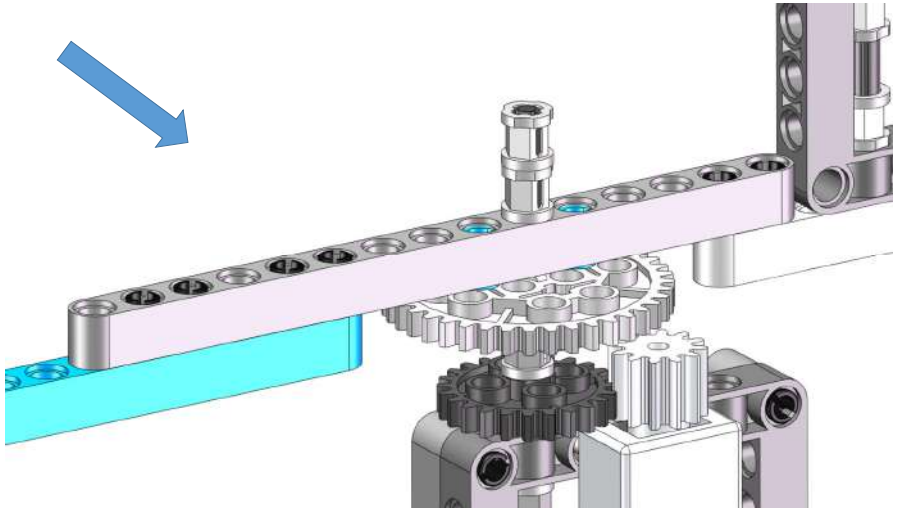


Step 28: Combine the chassis part and the upper body part of the assembled tower that we have assembled in steps 17 and 27. The 1x12 cross axle at the top of the chassis section passes through the center hole of the 40-toothed wheel of the upper body section and then passes through the 1x15 hole arm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

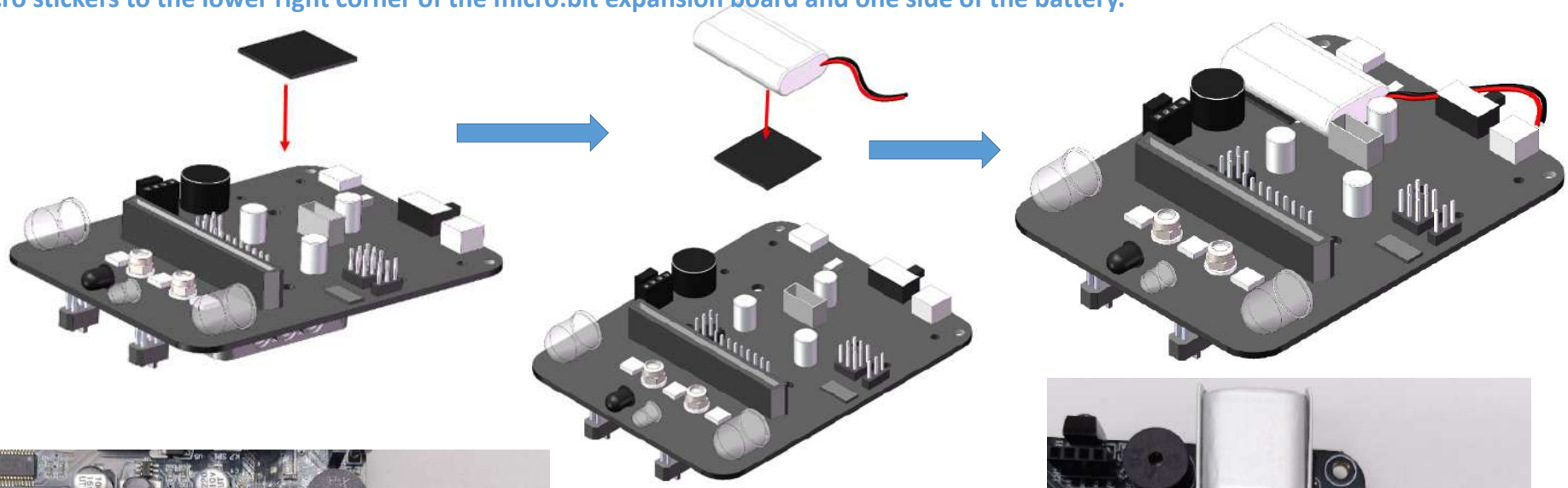


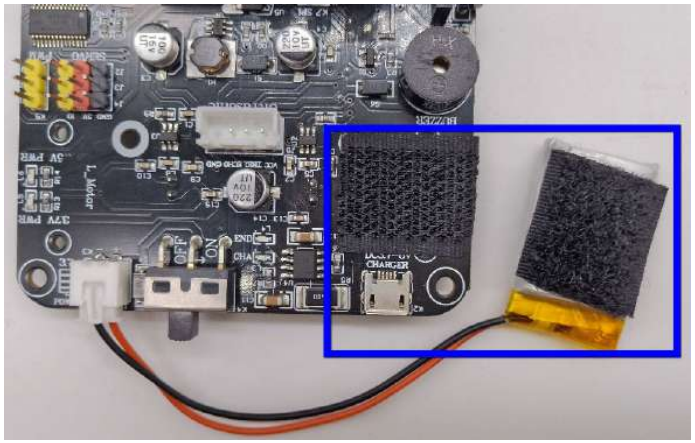
Step 29: Find the two bushings and mount them on the assembled 1x12 cross axle.



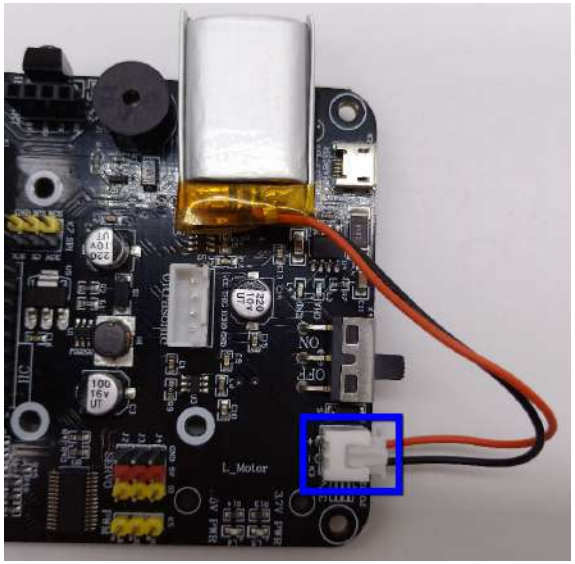


Step 30: Find the Velcro and micro:bit expansion board, remove the protective film on the back of the Velcro, and attach the two Velcro stickers to the lower right corner of the micro:bit expansion board and one side of the battery.

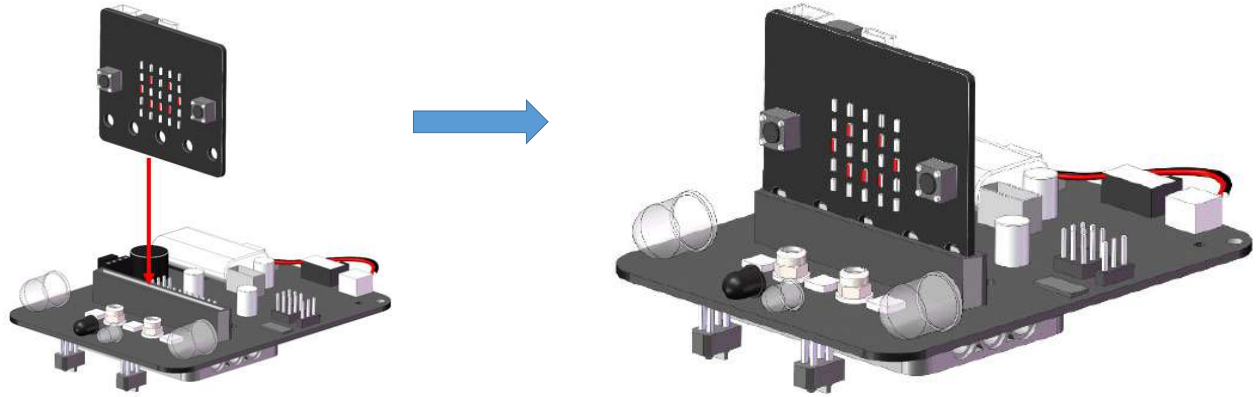




Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

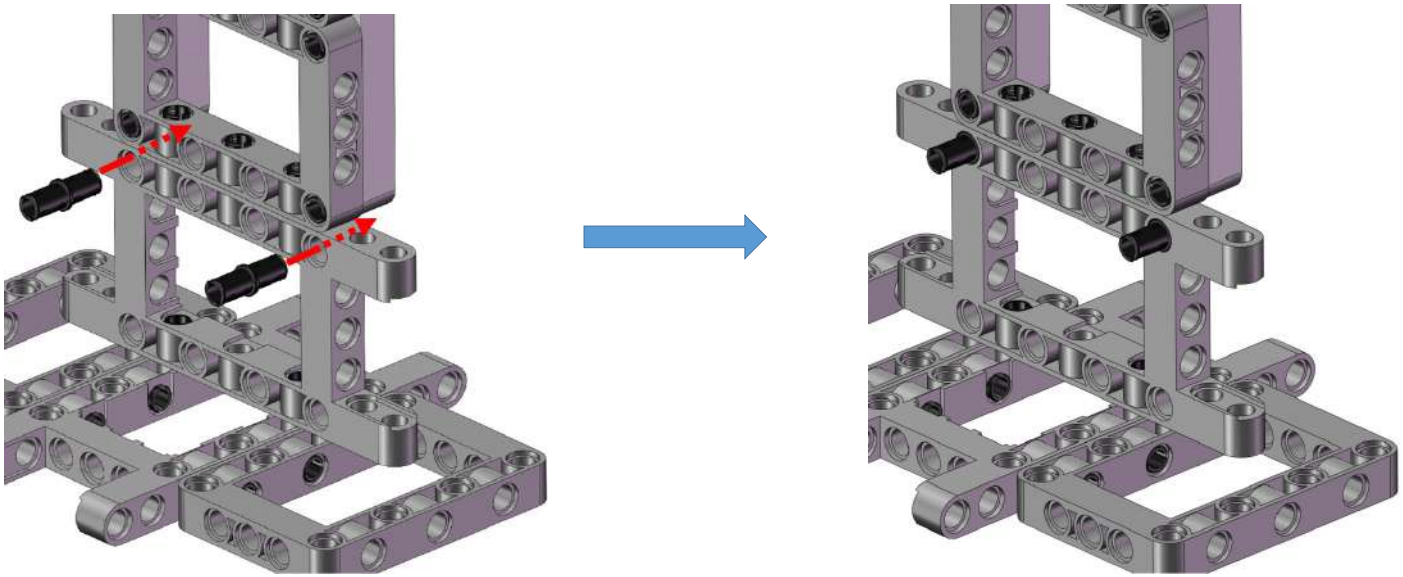


Step 31: Find the micro:bit motherboard and insert it correctly into the micro:bit expansion board.

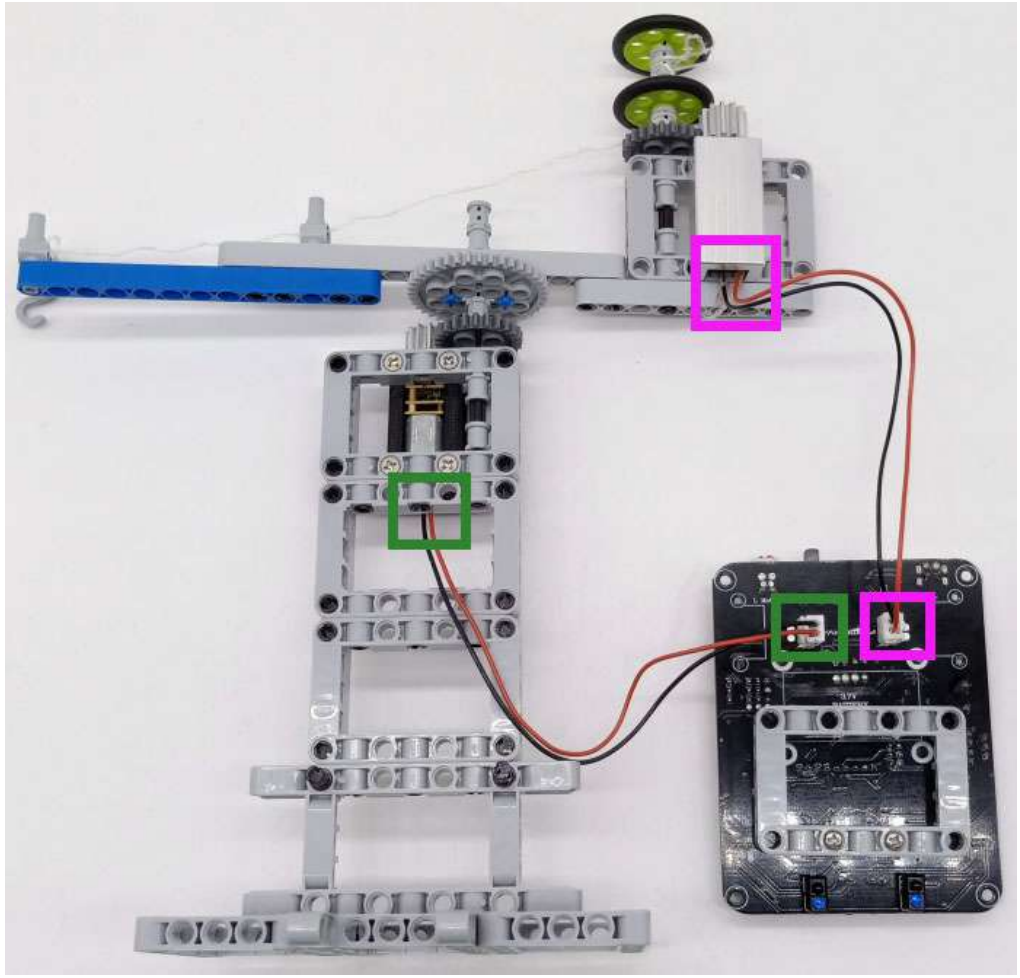


Tip: The micro:bit board is equivalent to the "brain" of the tower, so be sure to remember to install it properly.

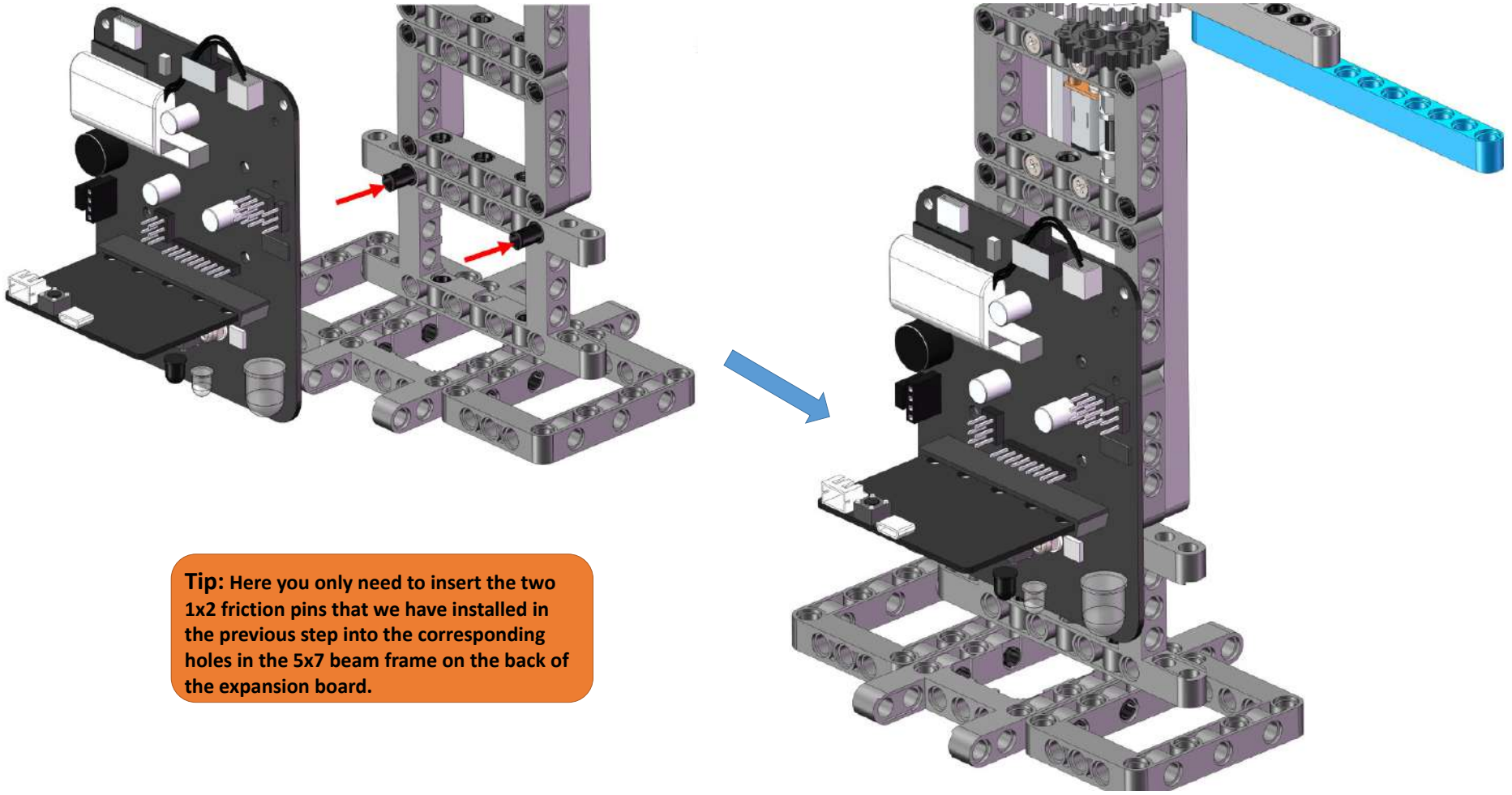
Step 32: Locate the two 1x2 friction pins and insert them into the corresponding holes in the chassis section of the tower.



Step 33: Wire as shown in the figure below.

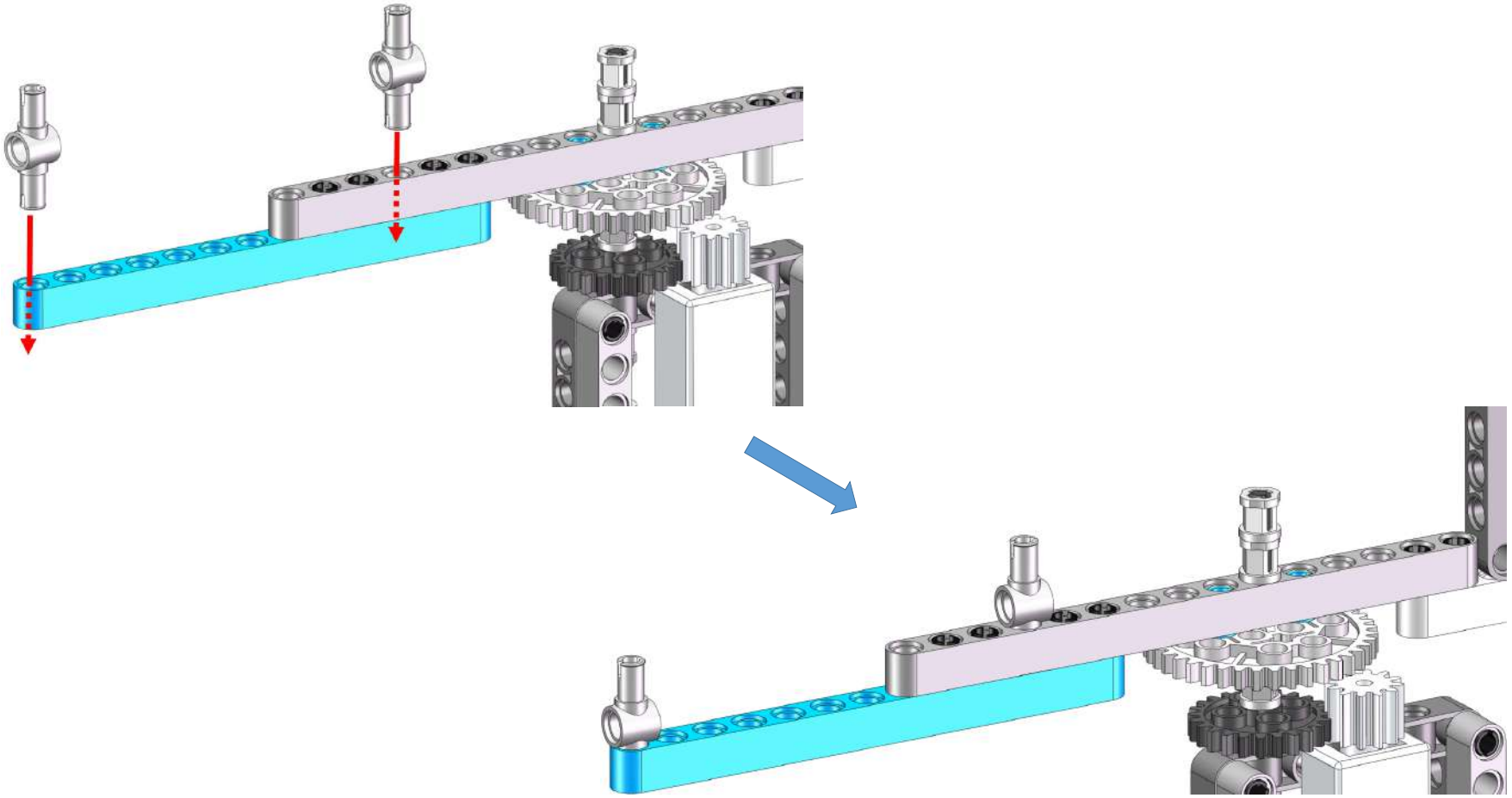


Step 34: Insert the micro:bit expansion board into the two 1x2 friction pins assembled in the previous step.

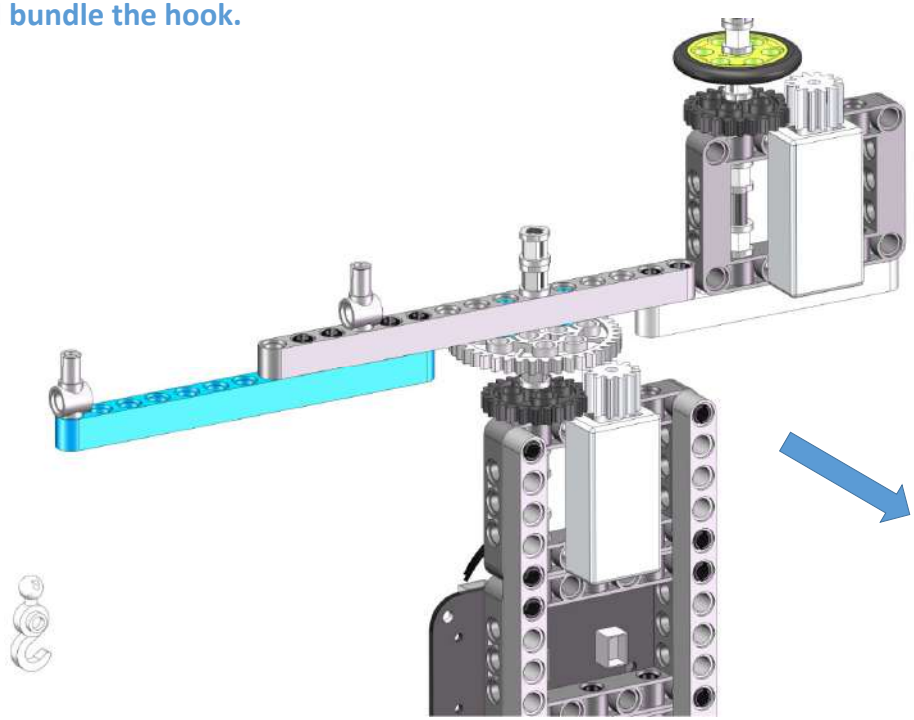


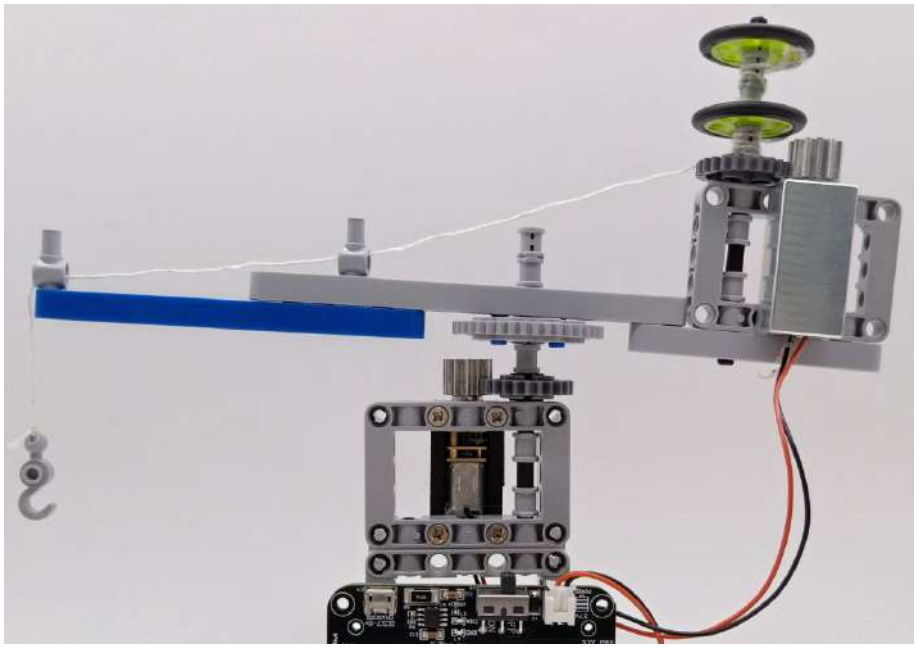
Tip: Here you only need to insert the two 1x2 friction pins that we have installed in the previous step into the corresponding holes in the 5x7 beam frame on the back of the expansion board.

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

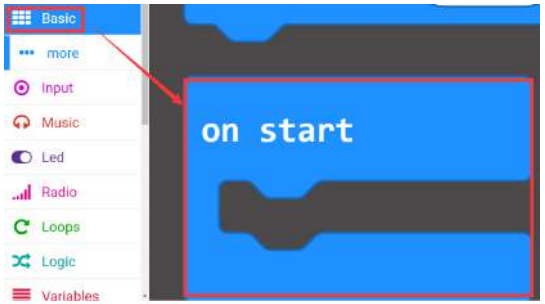
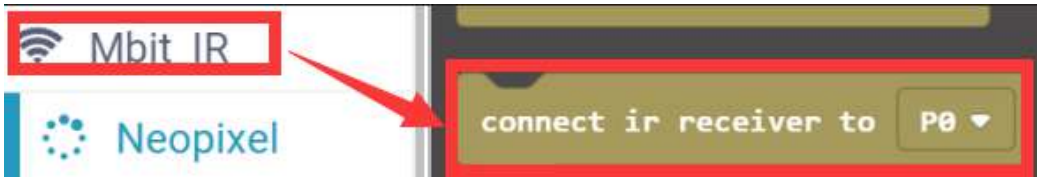
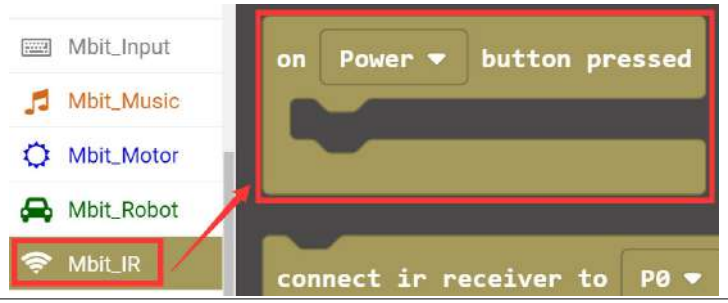
Thinking：This session is mainly to teach you how to use graphical programming to control the tower.

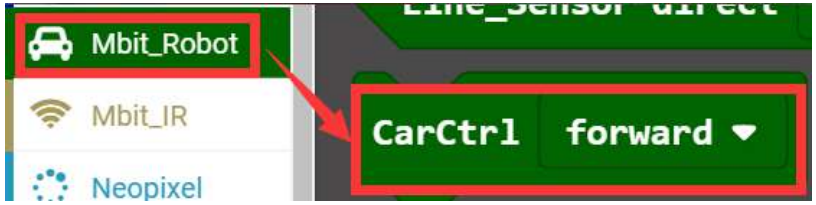
Preparation

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

Blocks

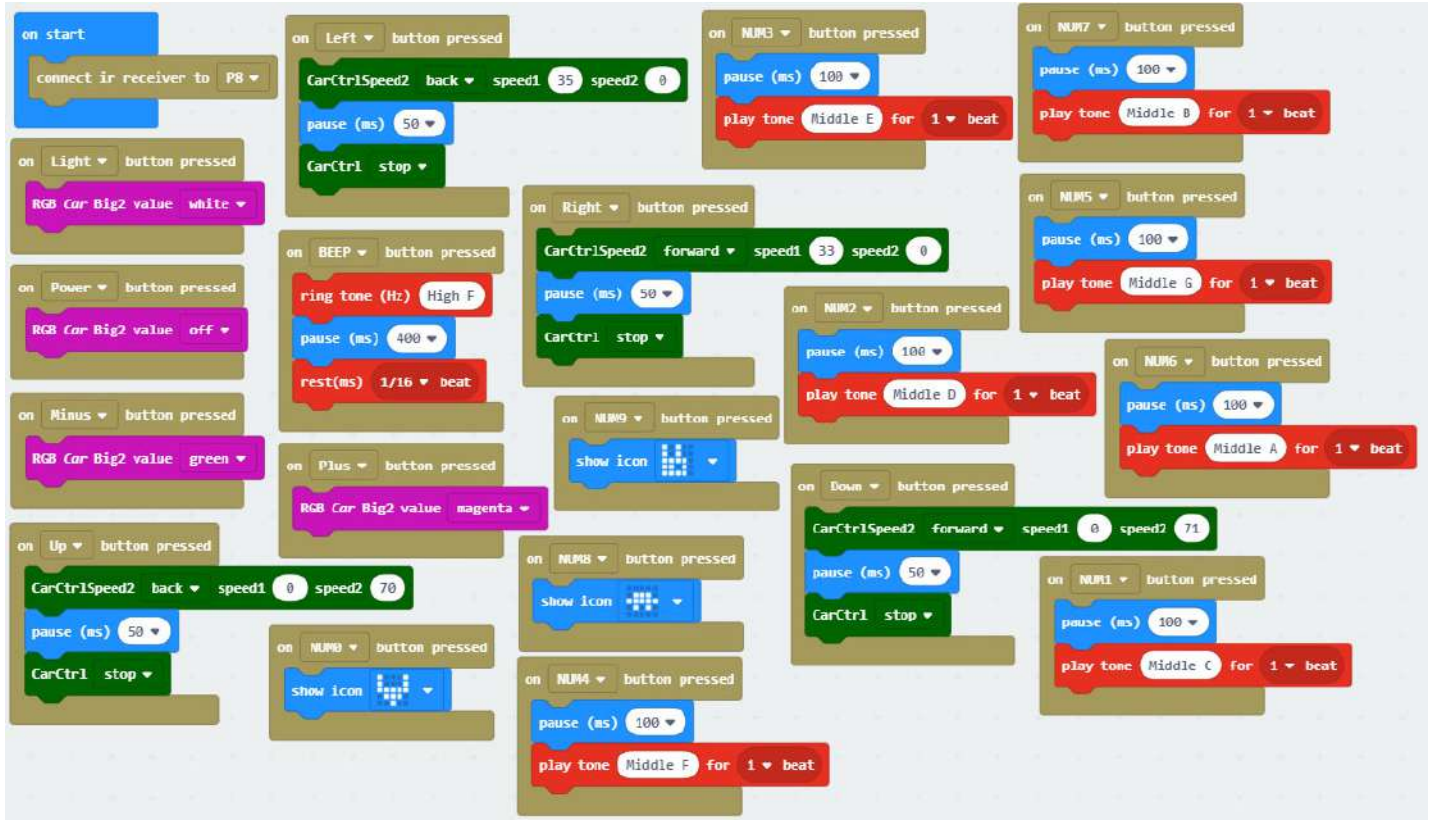
Block	Instruction
	Select the color that the lights are lit.
	Display the image on the micro:bit dot matrix screen.

Block	Instruction
	Executed at the moment of boot, the code is only executed once.
	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.
	When the power on the remote control is pressed, the code inside will be executed, and the button can be customized.
	The Cartrl forward represents the forward rotation of the motor, and the Cartrl back represents the reverse rotation of the motor and control the speed of two motors.

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 continus.
	The program pauses for 100 milliseconds and the time can be modified by itself.
	The Cartrl forward represents the forward rotation of the motor, and the Cartrl back represents the reverse rotation of the motor.

Programming

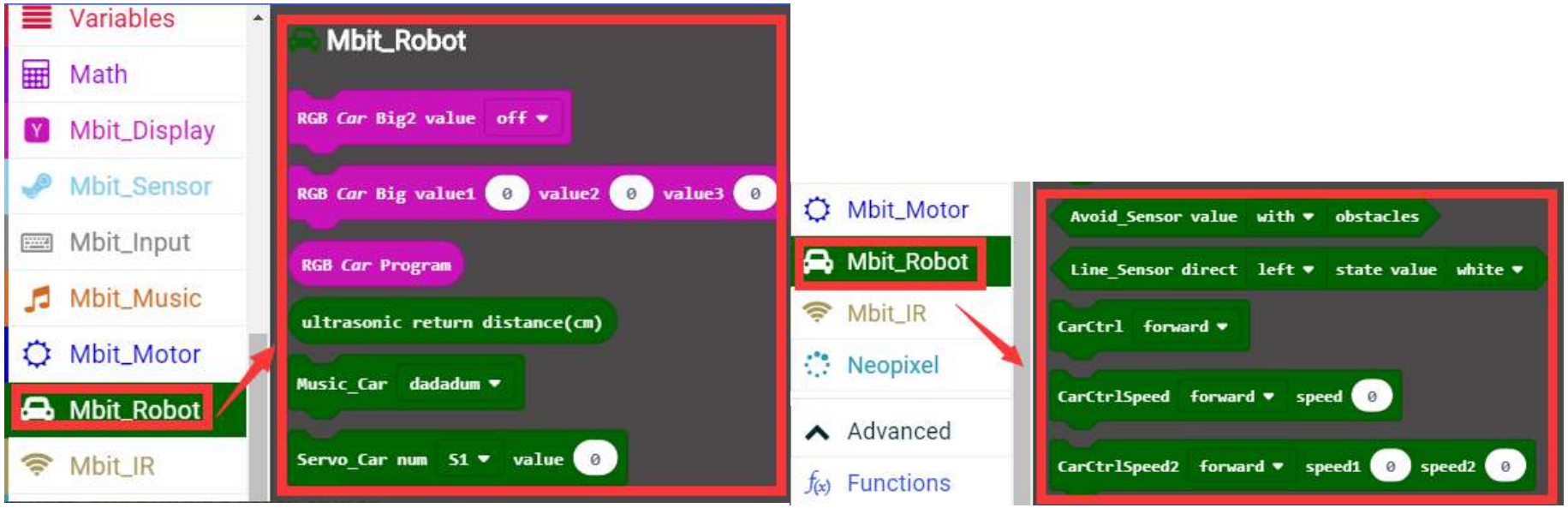
The program of this course is shown in the figure below. After downloading the program, open the power switch of the tower and press the button of the infrared remote control. The tower will have corresponding action. The ismall light, the plus and minus buttons of the infrared remote control are used 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.



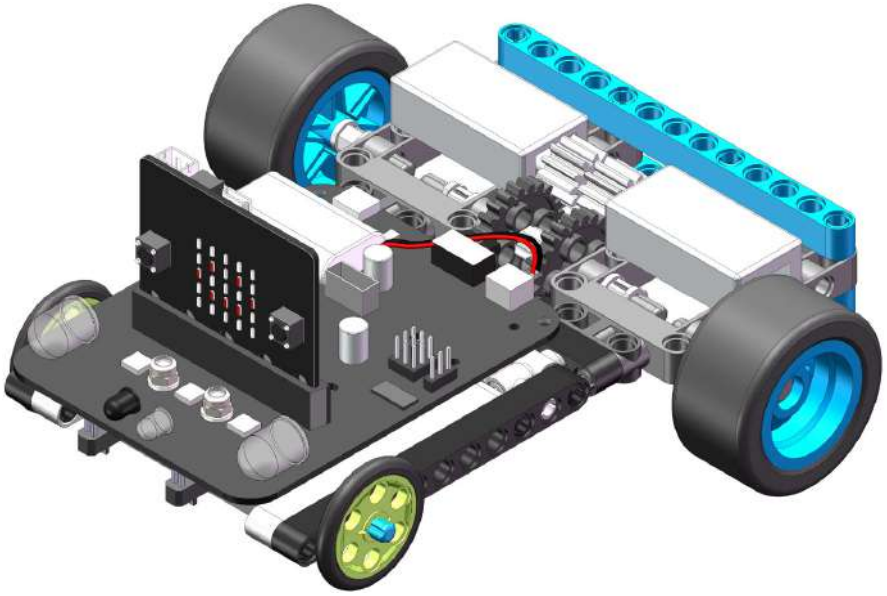
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely.
Drag these blocks and play with our building block tower crane!!!

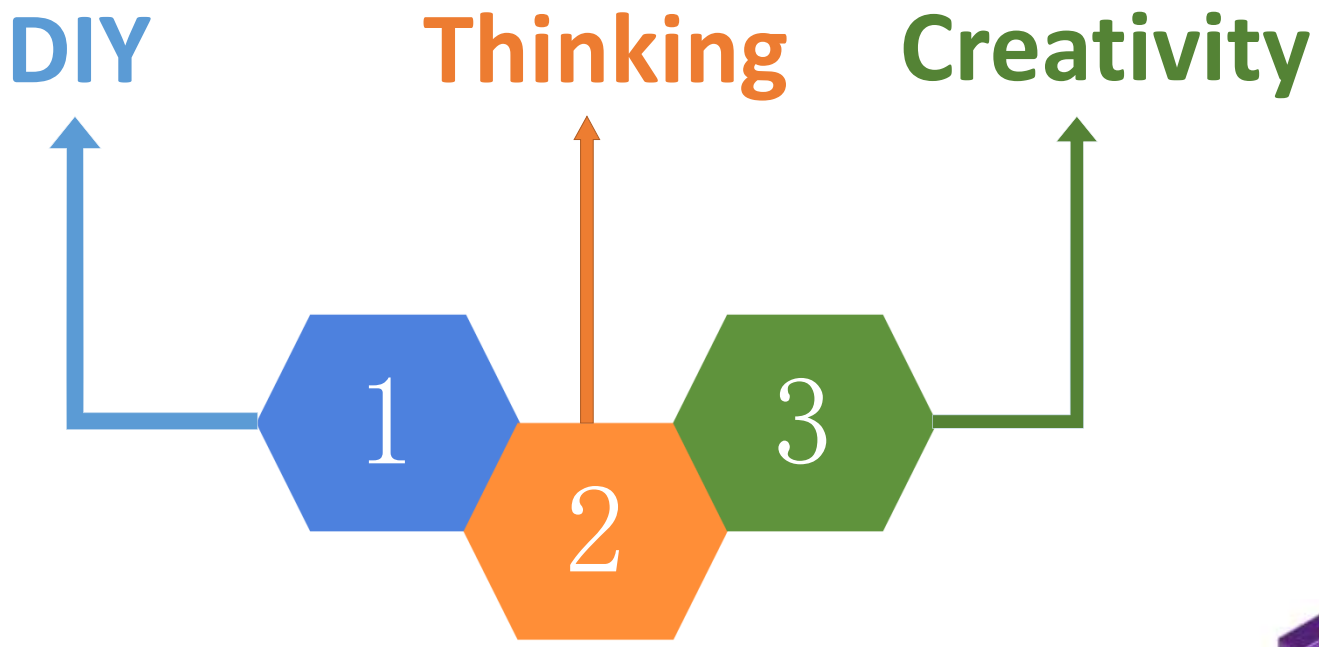


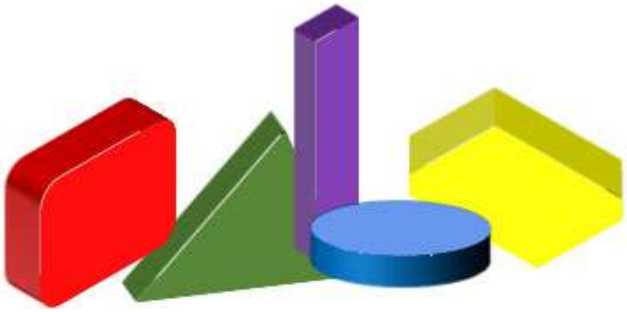
On our official website, we also provides other tutorial: Tower crane bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.8 Following car

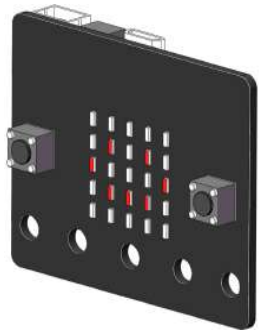
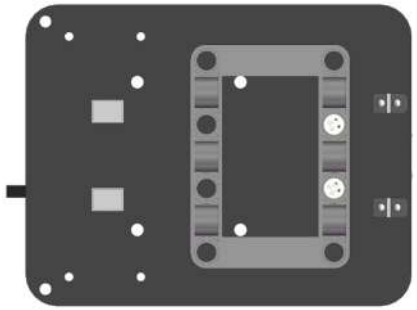
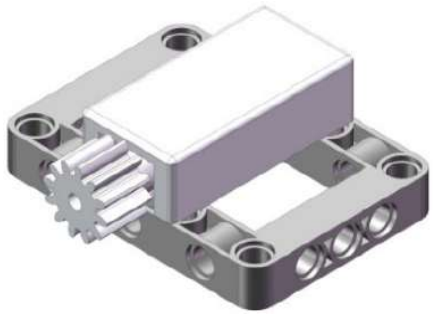
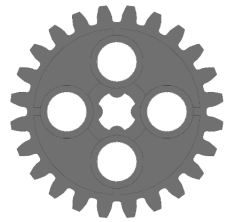
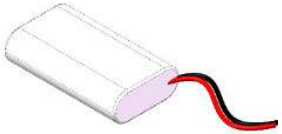
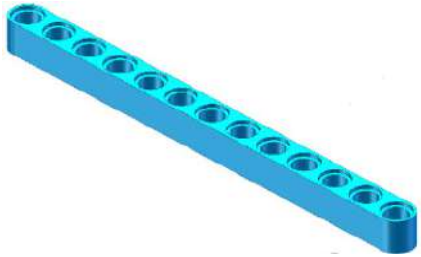
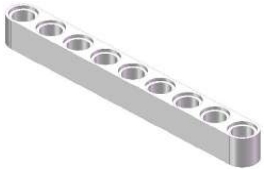


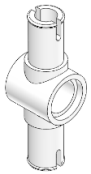

DIY
Thinking
Creativity
1
2
3



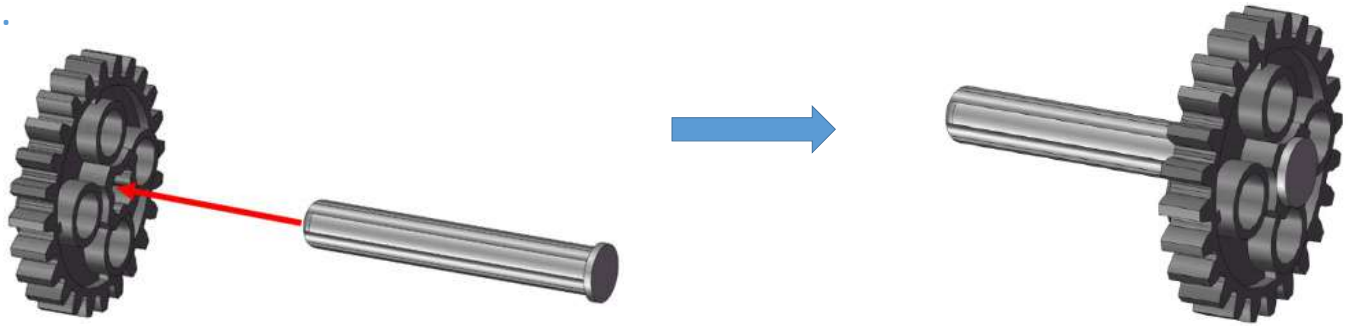
DIY: This part is mainly to teach you to assemble the tracing car with building blocks.

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

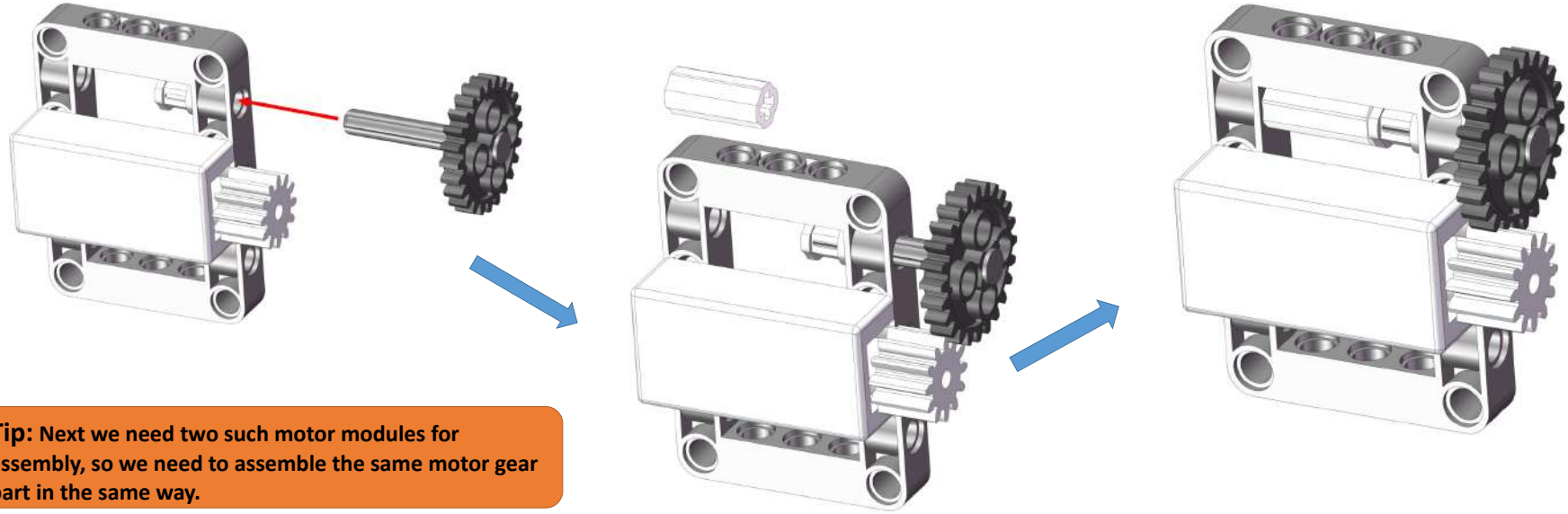
 Micro:bit*1	 Micro:bit expansion board*1	 Motor module*2	 5x7 beam frame*1	 24 toothed wheel*2
 Battery*1	 1*2 Shaft and bolt connector*2	 1x13 hole arm*2	 1x11 hole arm*3	 1x9 hole arm*2
 Bushing*4	 1x2 bolt connector*2	 1x2 Frictional pin*16	 1x3 shaft*4	 3x3 bolt connector*2

				
1*4 shaft cutoff*4	1x3 bolt connector*4	43*22mm wheel*2	Rubber ring+24 pulley*2	

Step 1: Find a 24-toothed wheel and a 1x4 shaft cut off. Pass the 1x4 shaft cutoff through the center hole of the 24-toothed wheel.

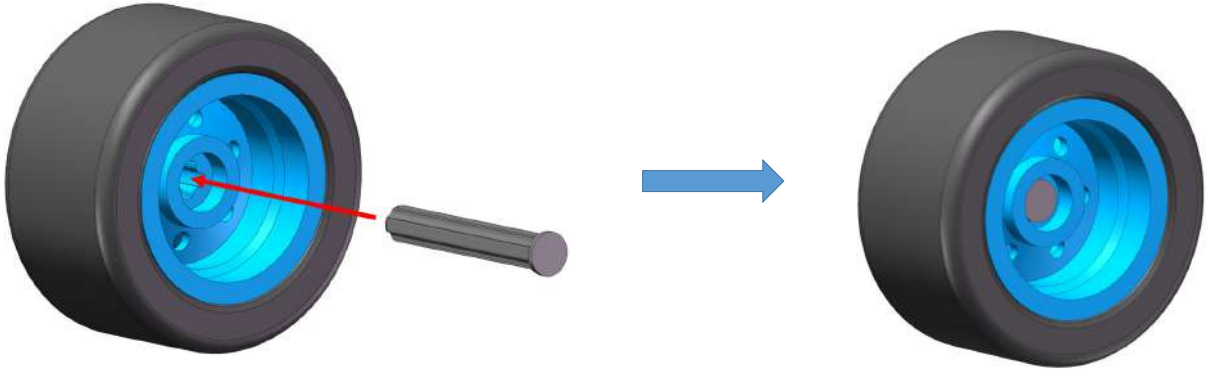


Step 2: Find a motor module, a 1x2 shaft connector and a bushing to complete the motor gear section installation.



Tip: Next we need two such motor modules for assembly, so we need to assemble the same motor gear part in the same way.

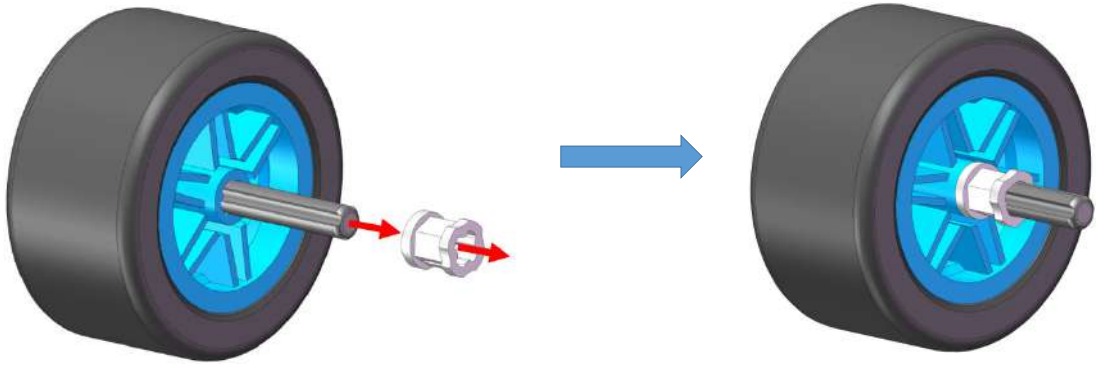
Step 3: Find a 43*22mm wheel and a 1*4 shaft cutoff, and pass the 1*4 shaft cutoff through the middle of the wheel.



Tip: We need to pay attention to the direction of the wheel.

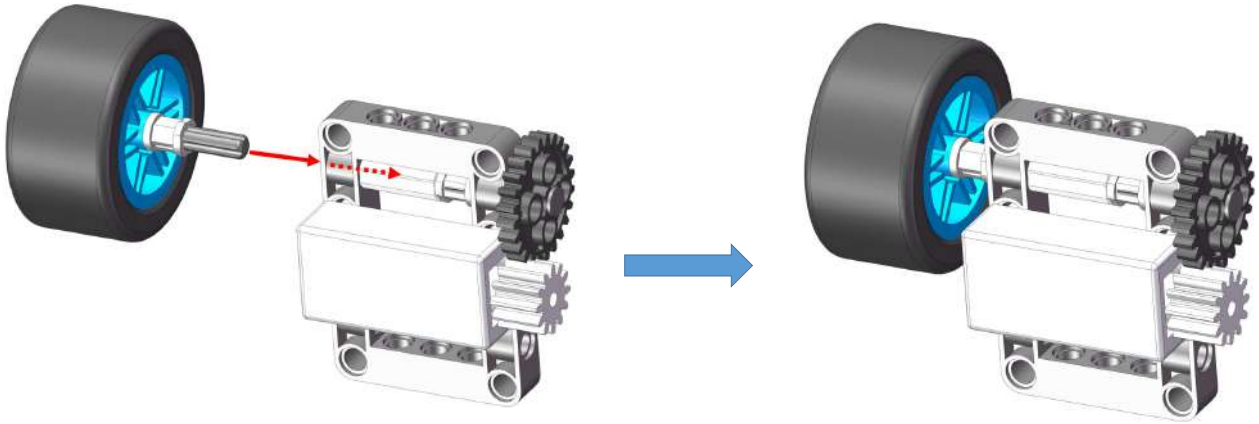
Step 4: Find a bushing and pass the assembled 1*4 shaft cutoff from the middle of the bushing to complete the assembly of the wheel.

Tip: You need to turn the wheel to the other side when doing this step.



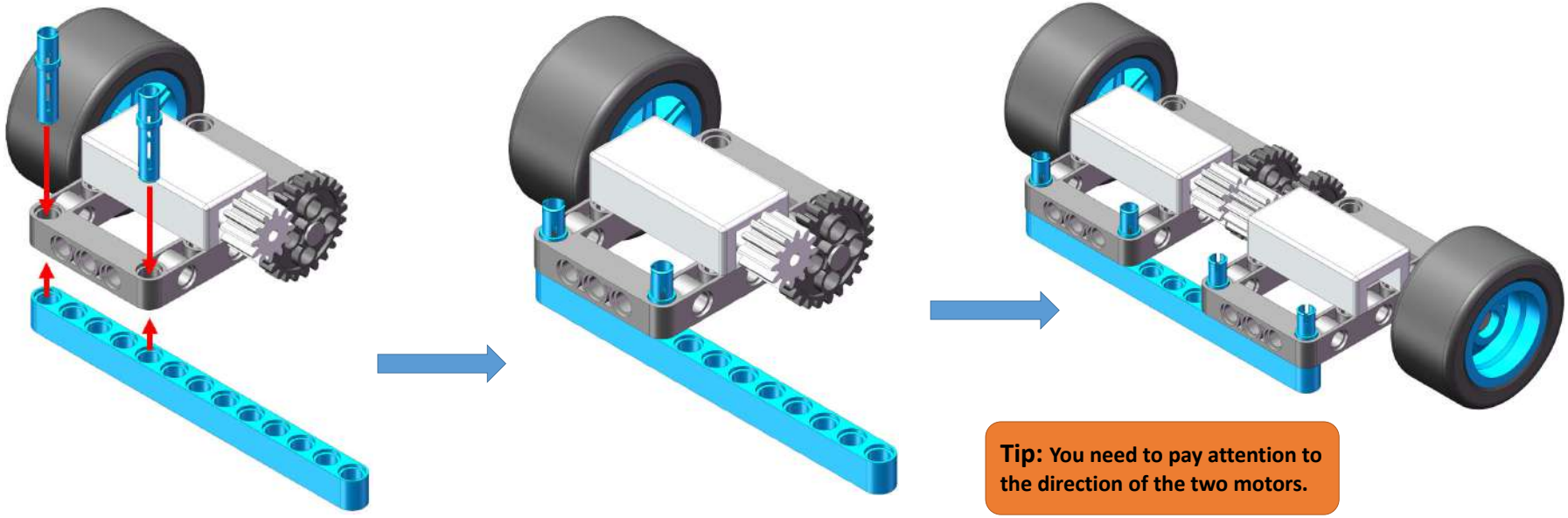
Tip: We need two such wheels to assemble, so we need to use the same method to assemble a identical wheel.

Step 5: Combine the building blocks that we assembled in the steps 2 and 4.



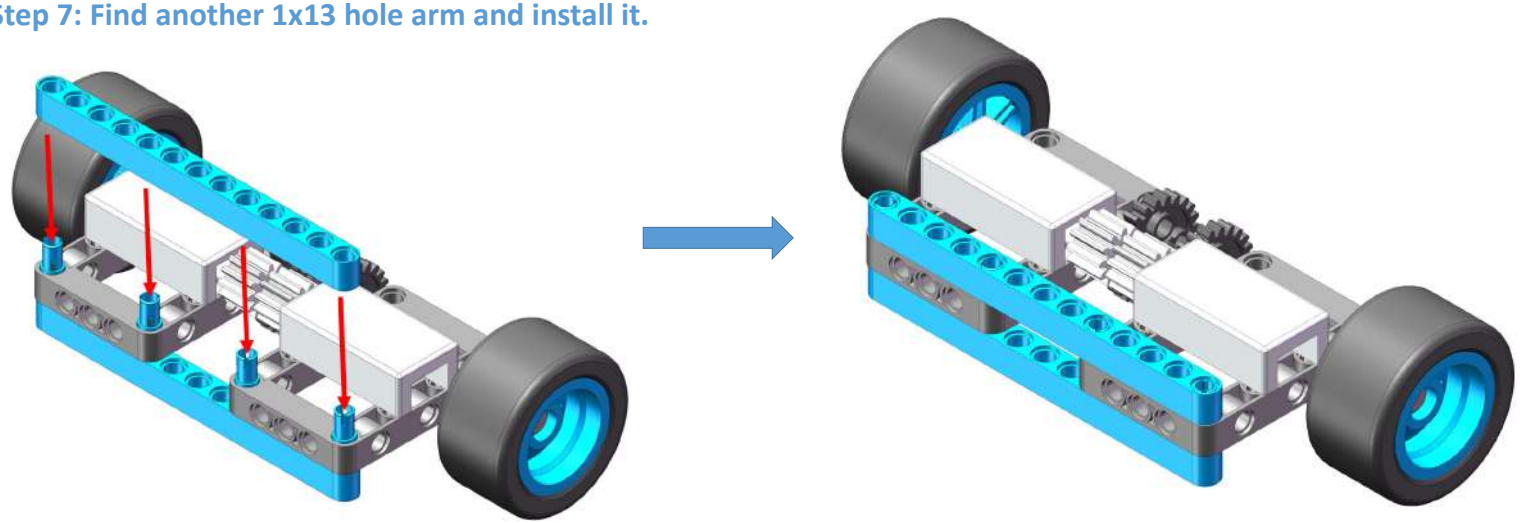
Tip: You will need two such parts, don't forget to combine the other one. It is also the same combination method.

Step 6: Find a 1x13 hole arm and four 1x3 bolts for assembly.

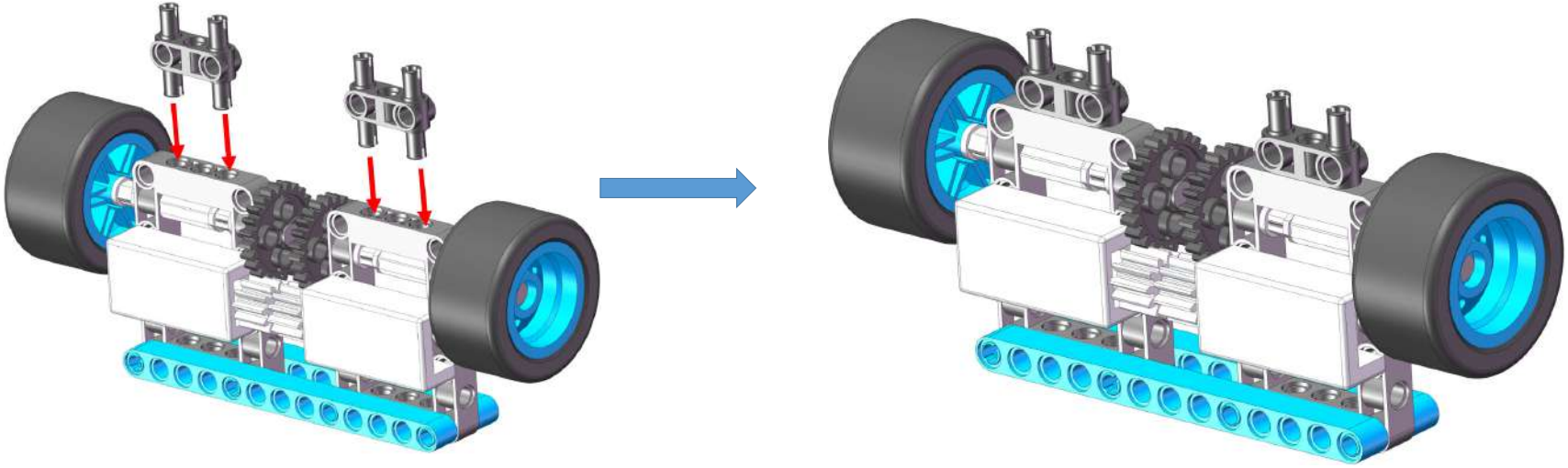


Tip: You need to pay attention to the direction of the two motors.

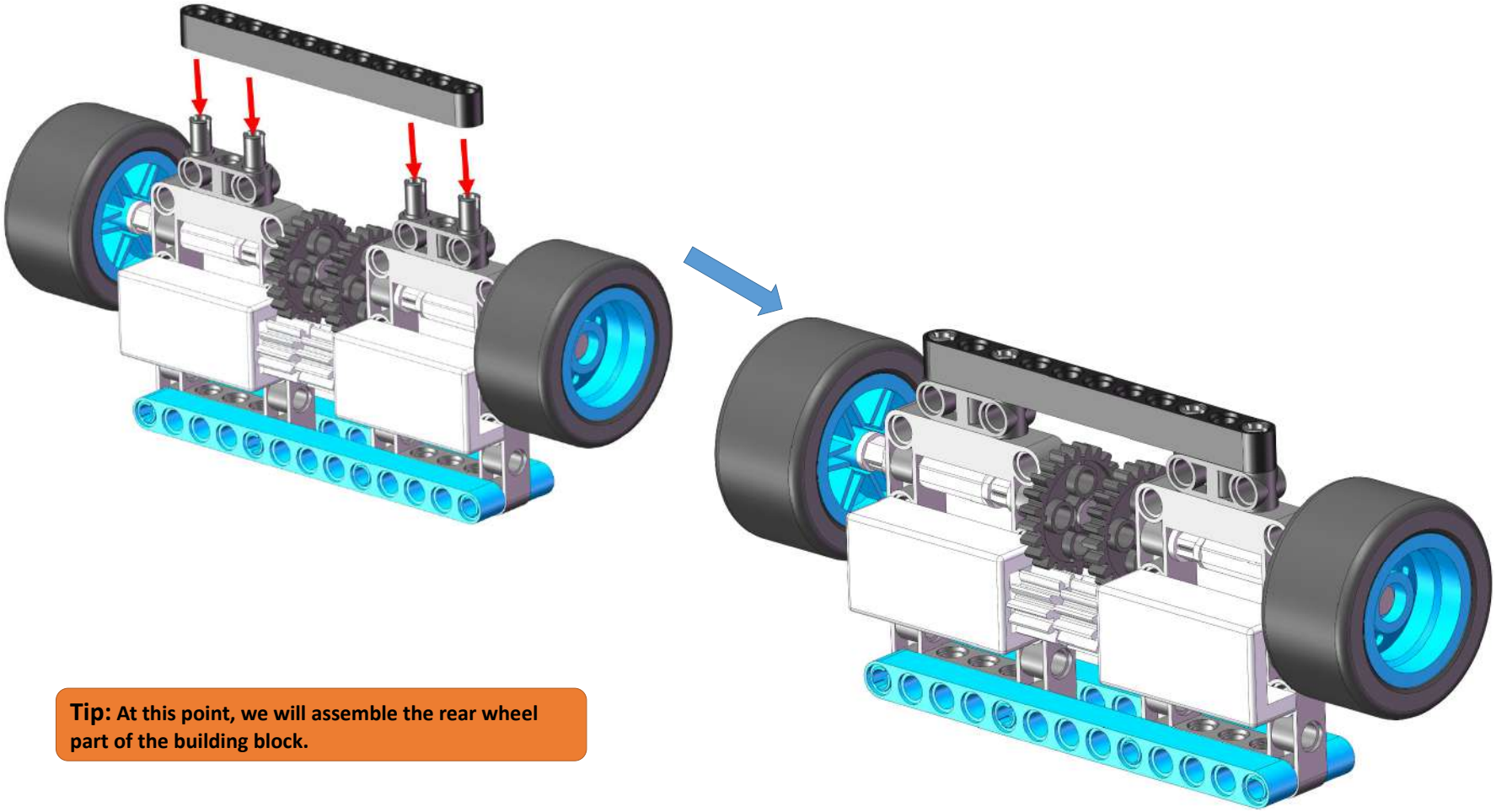
Step 7: Find another 1x13 hole arm and install it.



Step 8: Look for two 3x3 bolt connections and install them to the corresponding position on the side of the motor module.

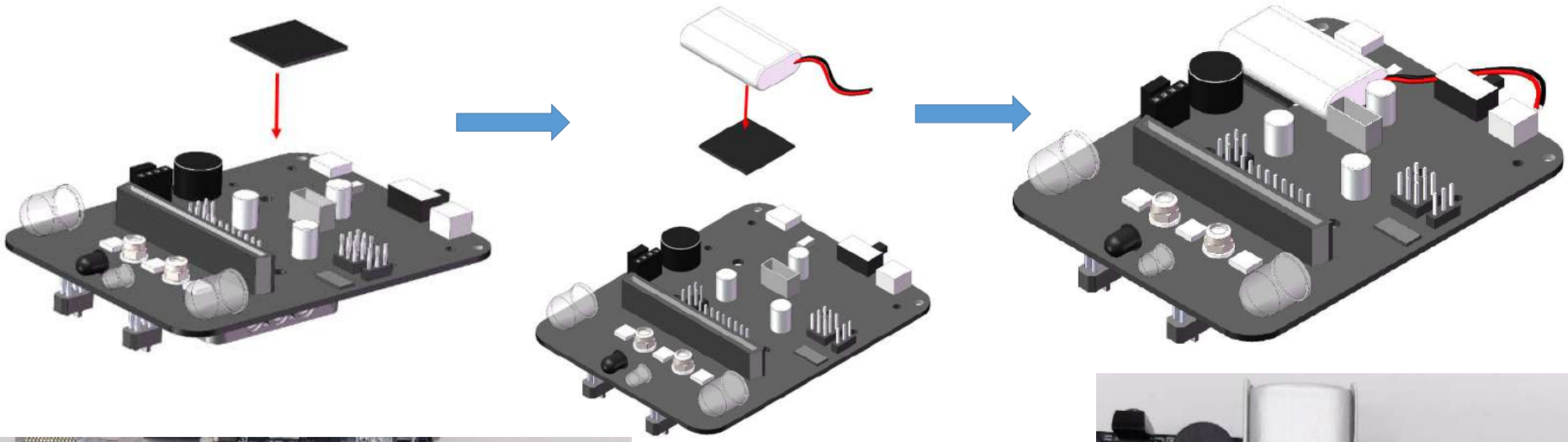


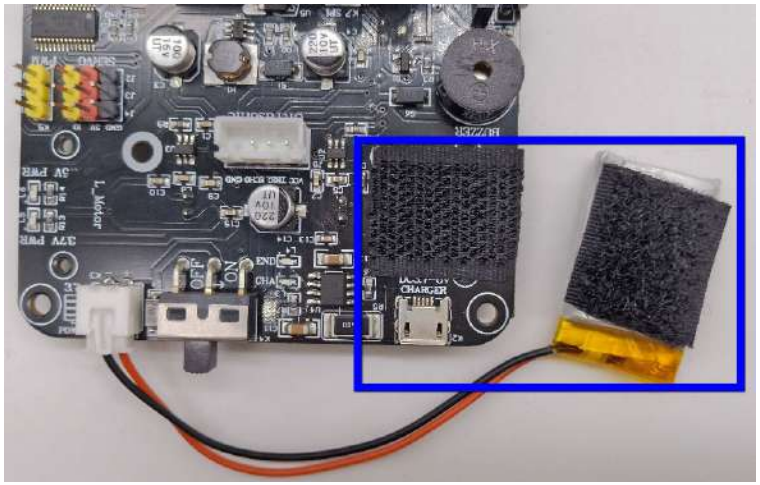
Step 9: Locate a 1x11 hole arm and attach it to the two 3x3 bolt connections.



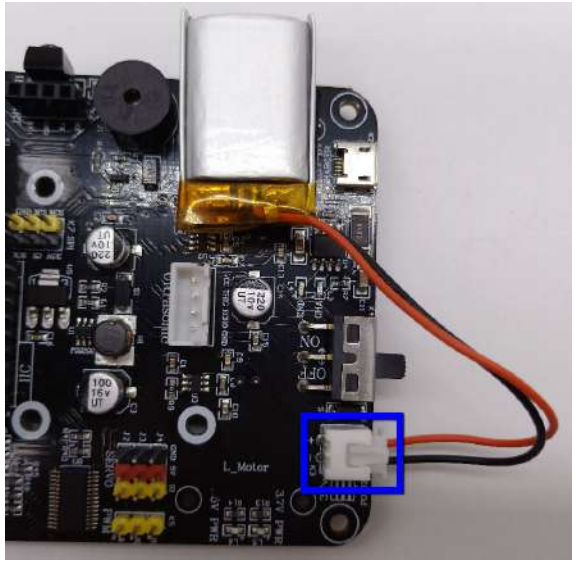
Tip: At this point, we will assemble the rear wheel part of the building block.

Step 10: 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.

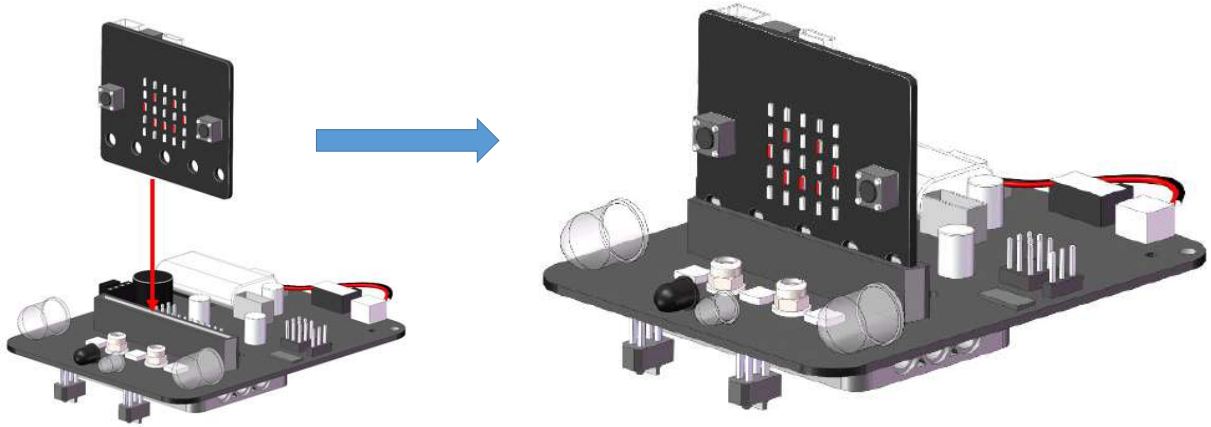




Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

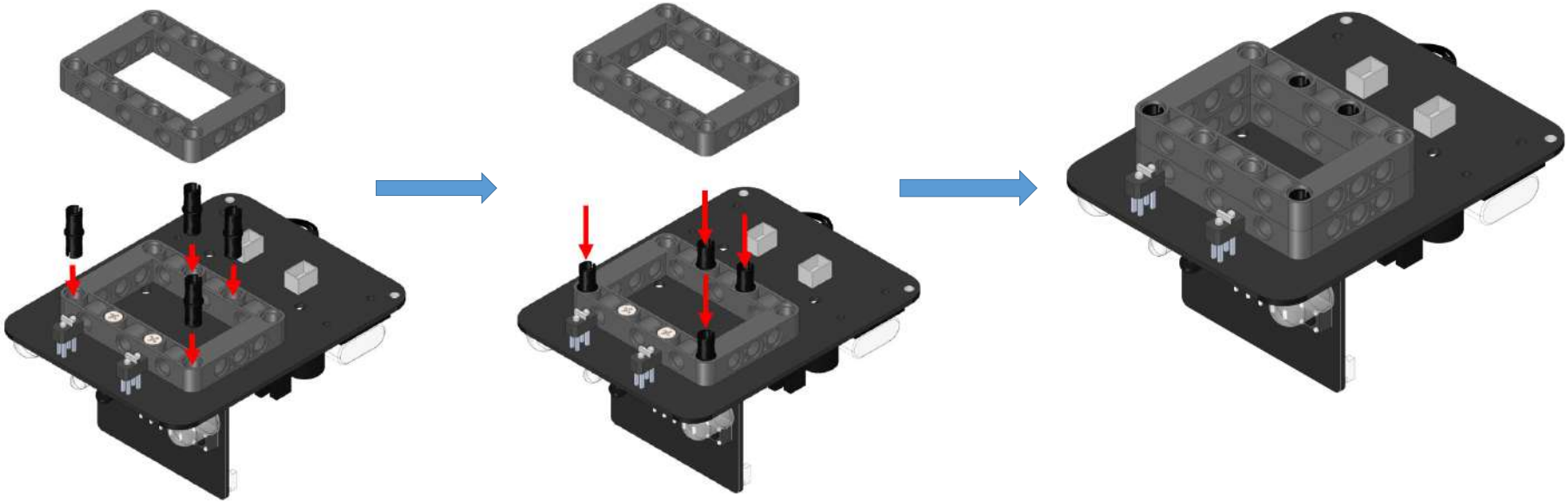


Step 11: Find the micro:bit board and insert it correctly into the micro:bit expansion board.

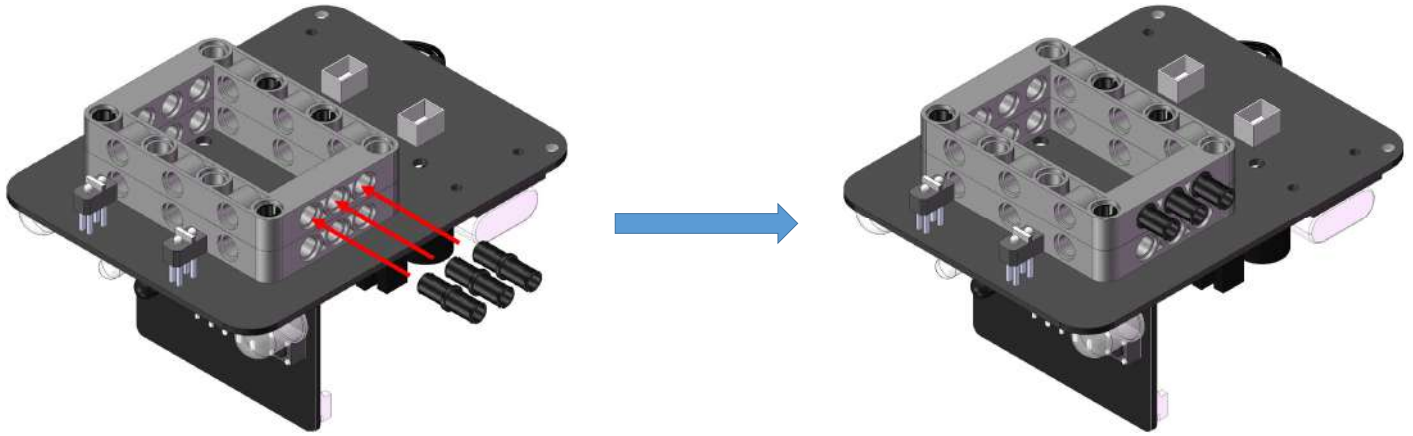


Tip: The micro:bit board is equivalent to the "brain" of the car, so please remember to install it correctly.

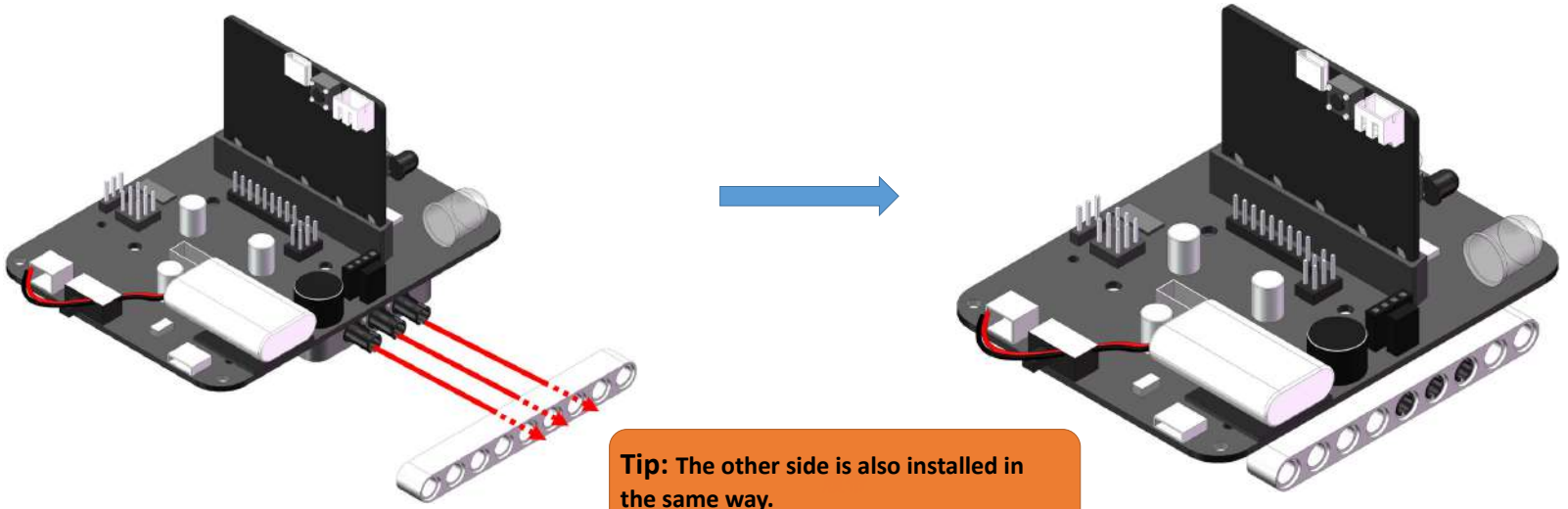
Step 12: Locate the four 1x2 friction pins, a 5x7 beam frame, and assemble them to the back of the micro:bit expansion board.



Step 13: Locate the three 1x2 friction pins and insert them into the holes in the side of the 5x7 beam frame we installed in the previous step.

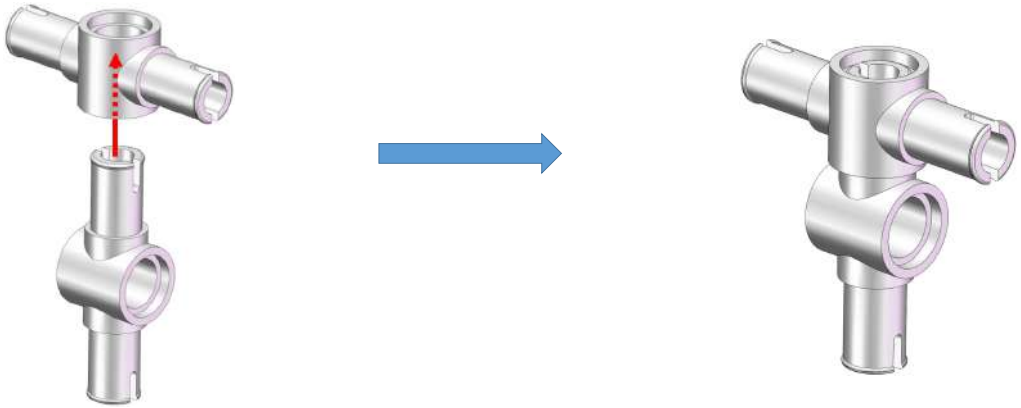


Step 14: Locate a 1x9 hole arm and install it on the 1x2 friction pin we have installed in the previous step. The three friction pins are respectively inserted into the holes 3nd, 4th, and 5th of the hole arm starting from the right side.

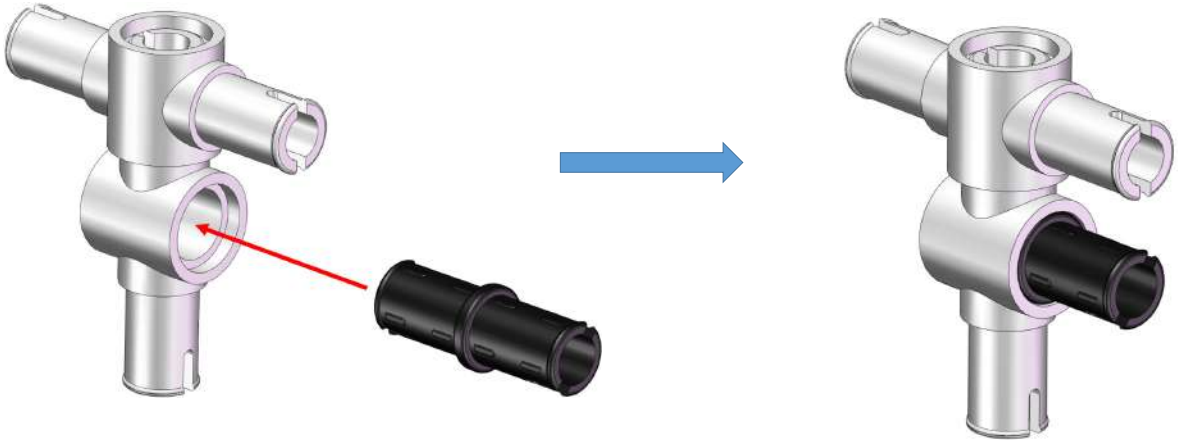


Tip: The other side is also installed in the same way.

Step 15: Find two 1x3 bolt connectors and combine them.

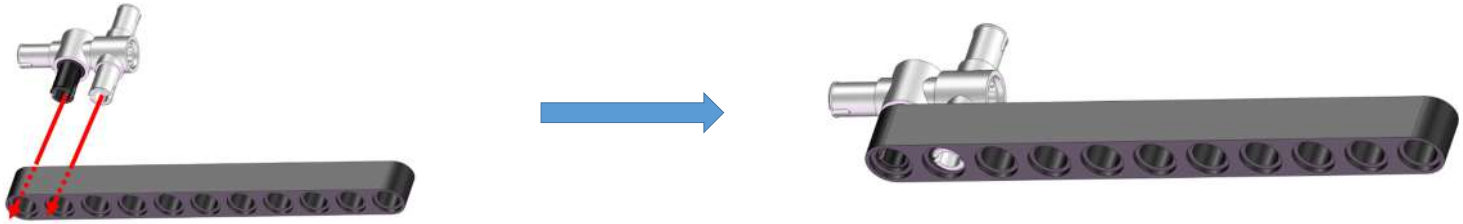


Step 16: Find a 1x2 friction pin and insert it into the corresponding hole of the 1x3 bolt connector.



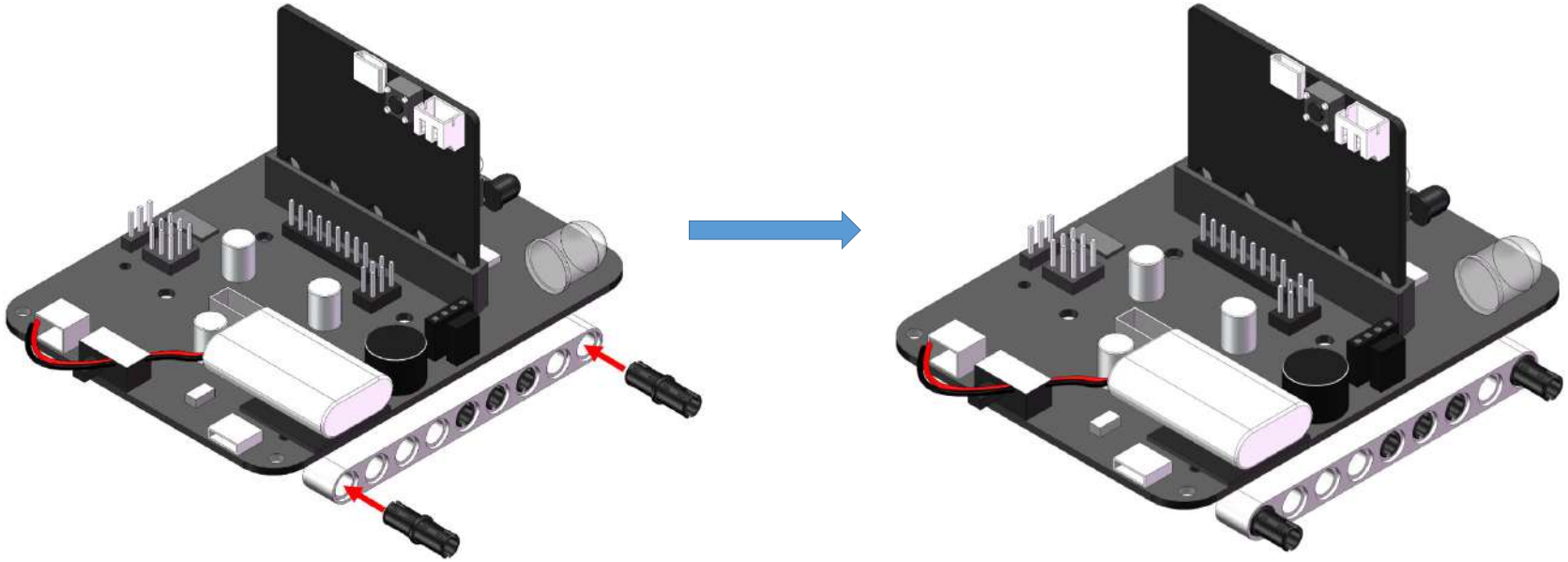
Tip: Two such bricks are needed in the rear installation, so here we have to assemble two pieces of bricks.

Step 17: Locate a 1x11 hole arm and insert the assembled block from the previous step into the 1st and 2nd holes on the left side of the 1x11 hole arm.



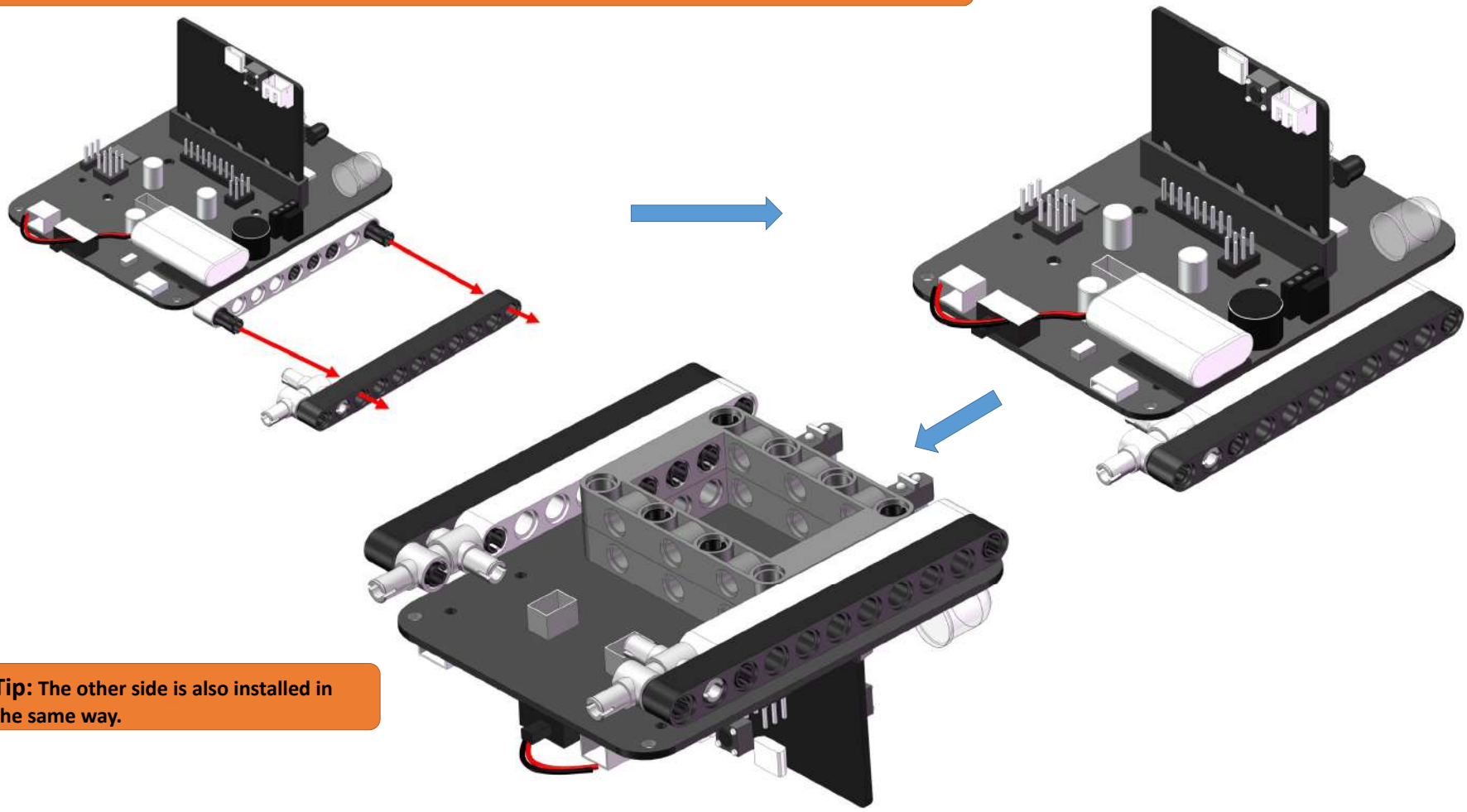
Tip: Two such bricks are needed in the rear installation, so here we have to assemble two pieces of bricks.

Step 18: Locate the two 1x2 friction pins and insert them into the hole at the ends of the 1x9 hole arm.



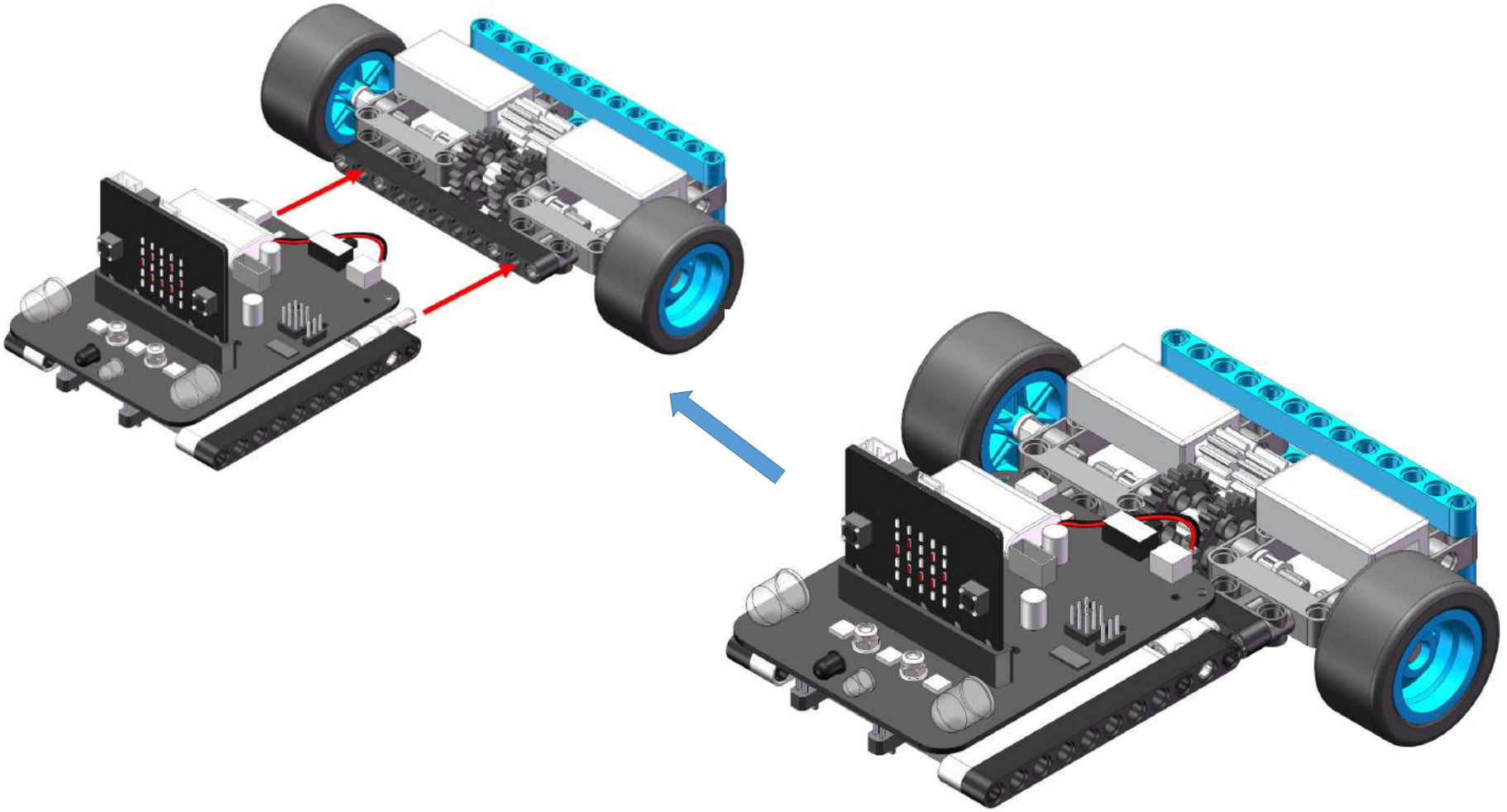
Step 19: Combine the two parts that we have assembled in steps 17 and 18 to complete the installation of the front body part of the following car.

Tip: Two 1x2 friction pins on the side of the expansion board are inserted into the 1st hole on the right side of the 1x11 hole arm and the 3rd hole on the left side.

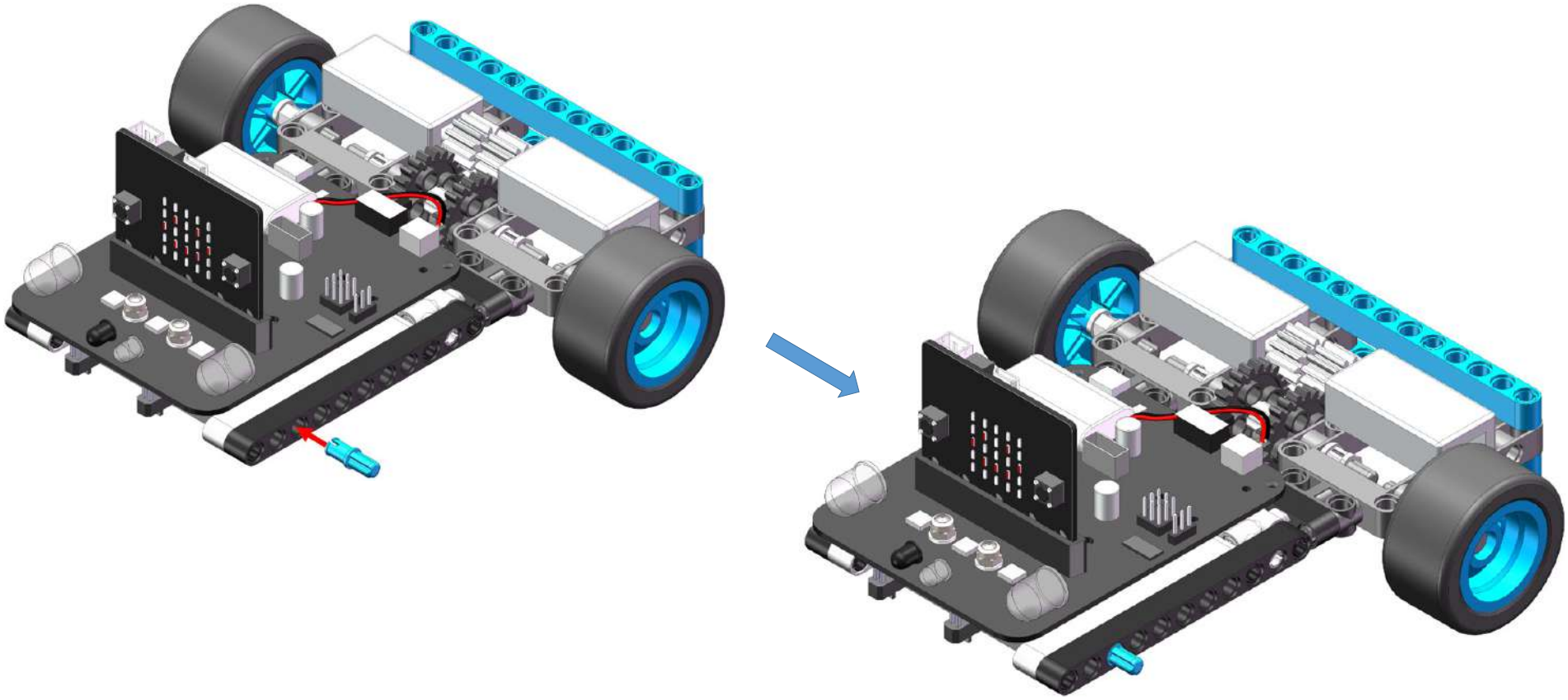


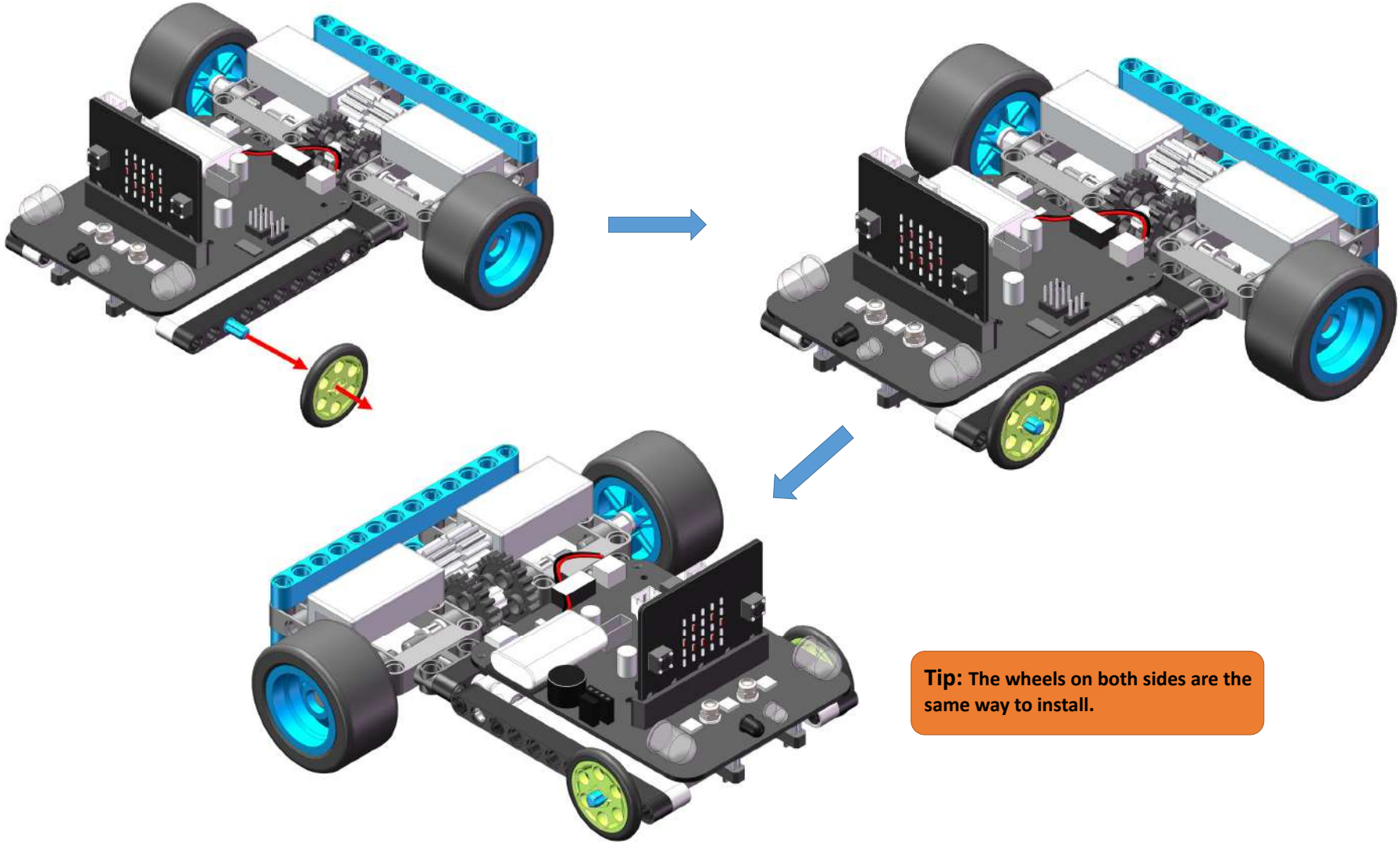
Tip: The other side is also installed in the same way.

Step 20: Combine the assembled rear wheel part and the front body part.
Combination method: insert two 1x3 bolt connectors on the front body into the No. 2nd and 10th holes of the rear wheel part 1x11 hole arm.



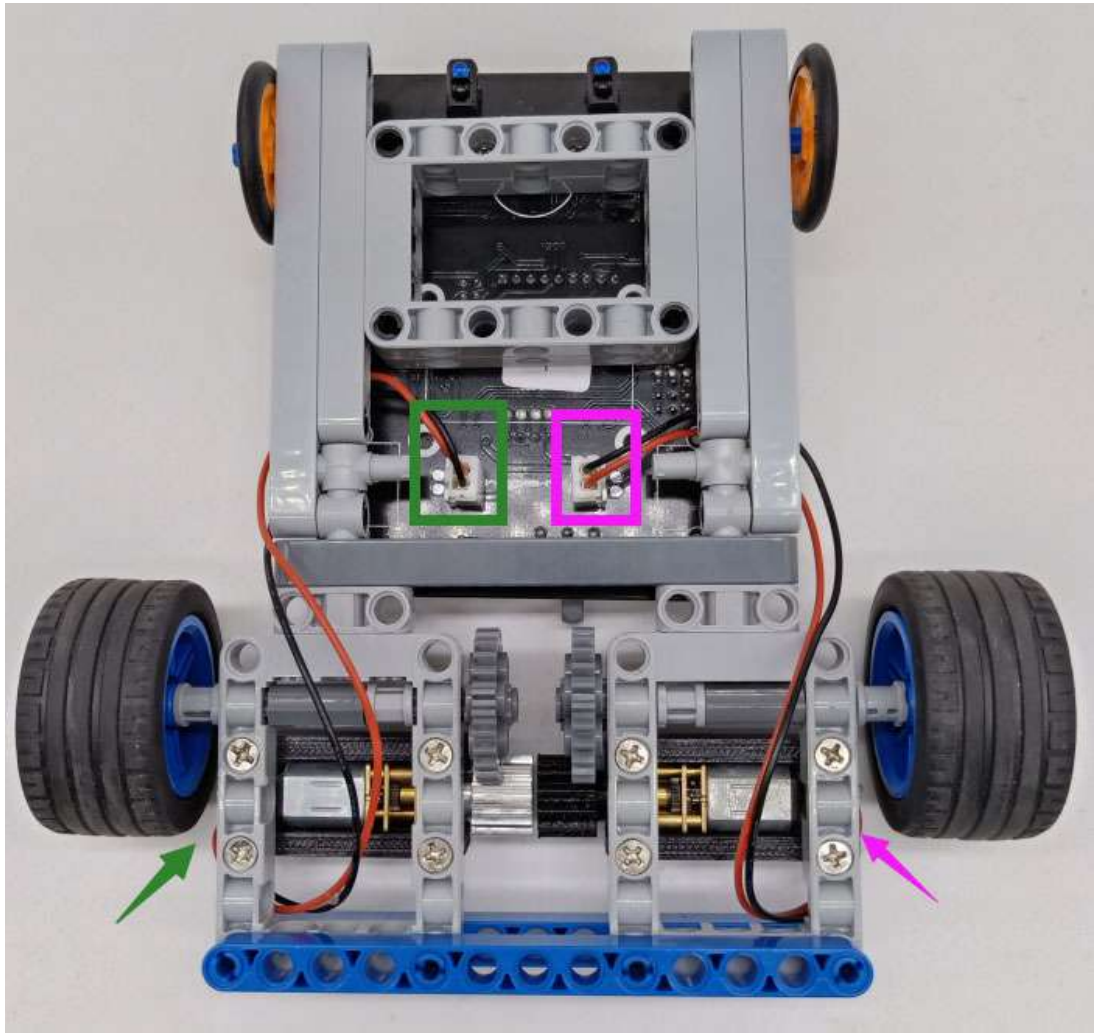
Step 21: Find two 1x2 shaft and bolt connector and two rubber rings +24 pulleys. First insert the two 1x2 shaft bolts into the 3nd hole on the left side of the 1x11 hole arm on both sides of the trolley. Rubber ring + 24 pulleys are mounted to the two 1x2 shaft and bolt connector on each side.



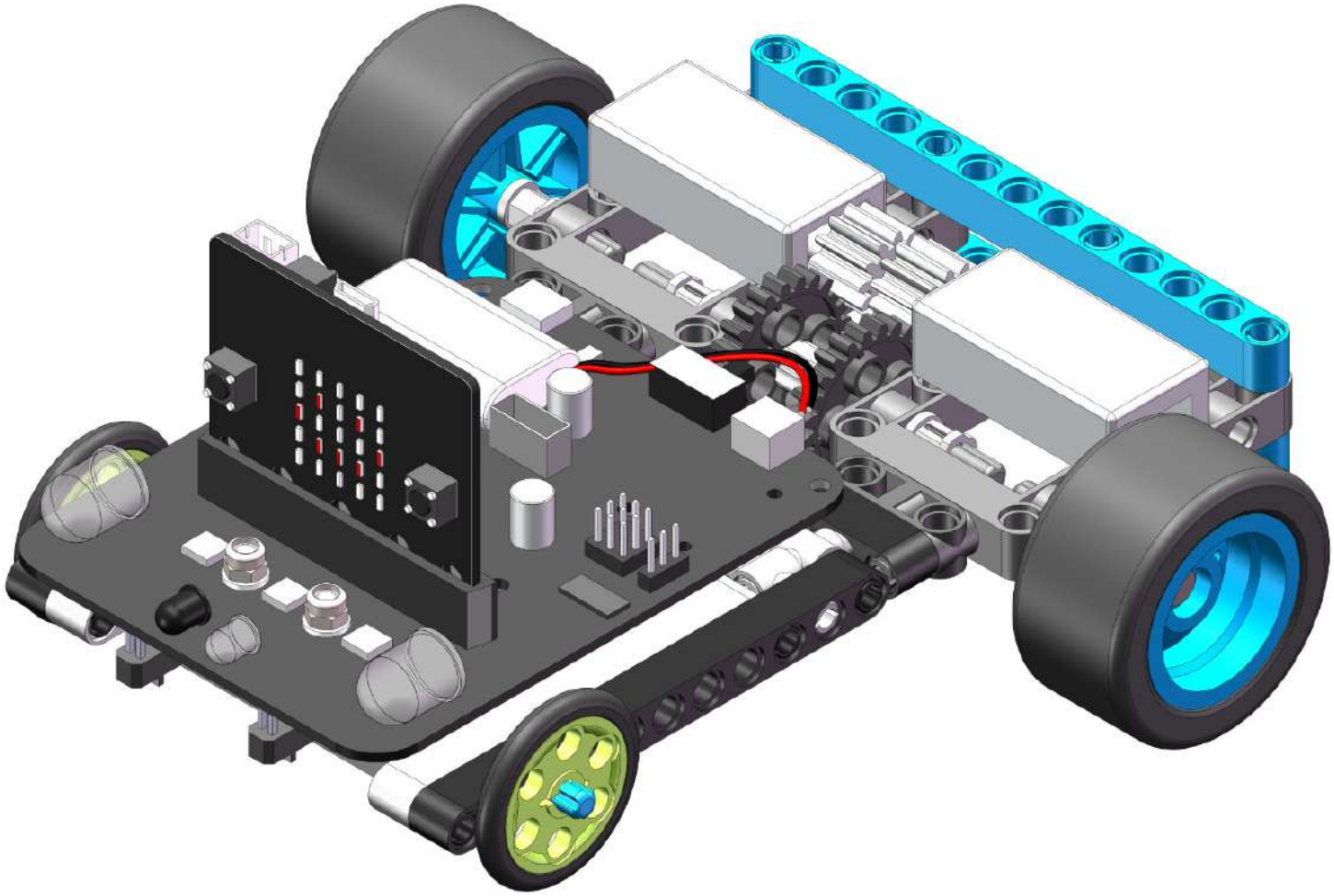


Tip: The wheels on both sides are the same way to install.

Step 22: Wire the wiring as shown below.



The micro:bit building block following car after assembly is as shown below:

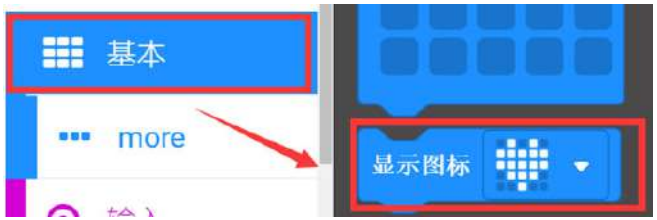
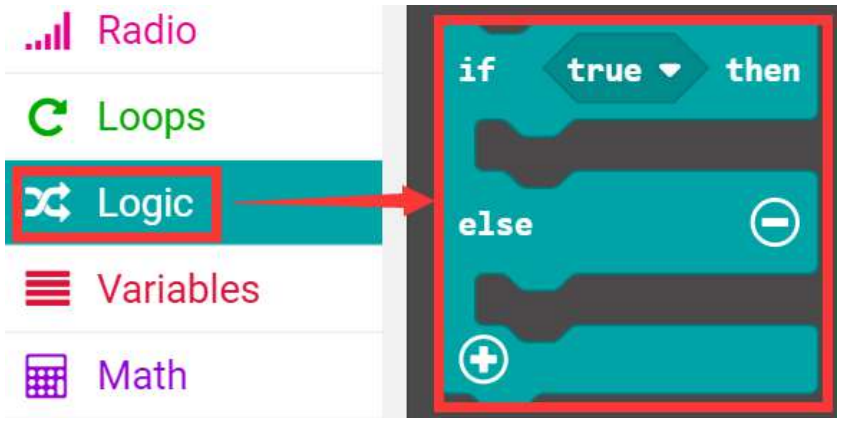


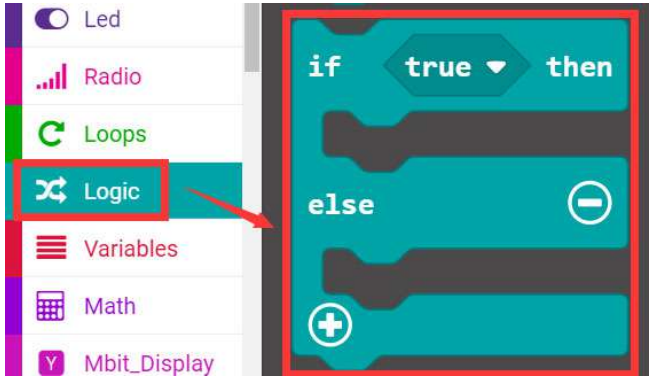
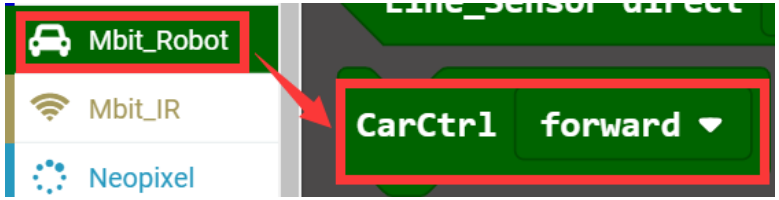
Thinking： This session is mainly to teach you how to use graphical programming to control the following car.

Preparation

- USB cable *1
- Following car *1
- Tracking map *1

Blocks

Block	Instruction
	Display the image on the micro:bit dot matrix screen.
	The two compare, returning 0 if they are the same, and returning 1 if they are different.

Block	Instruction
	The line sensor detects the color of the ground track.
	If it is true then, If it is false, it will not be executed.
	The car's motion state selection: forward, back, turn left , turn right , rotate left, rotate right and stop.
	The program pauses for 100 milliseconds and the time can be modified by itself.

Programming

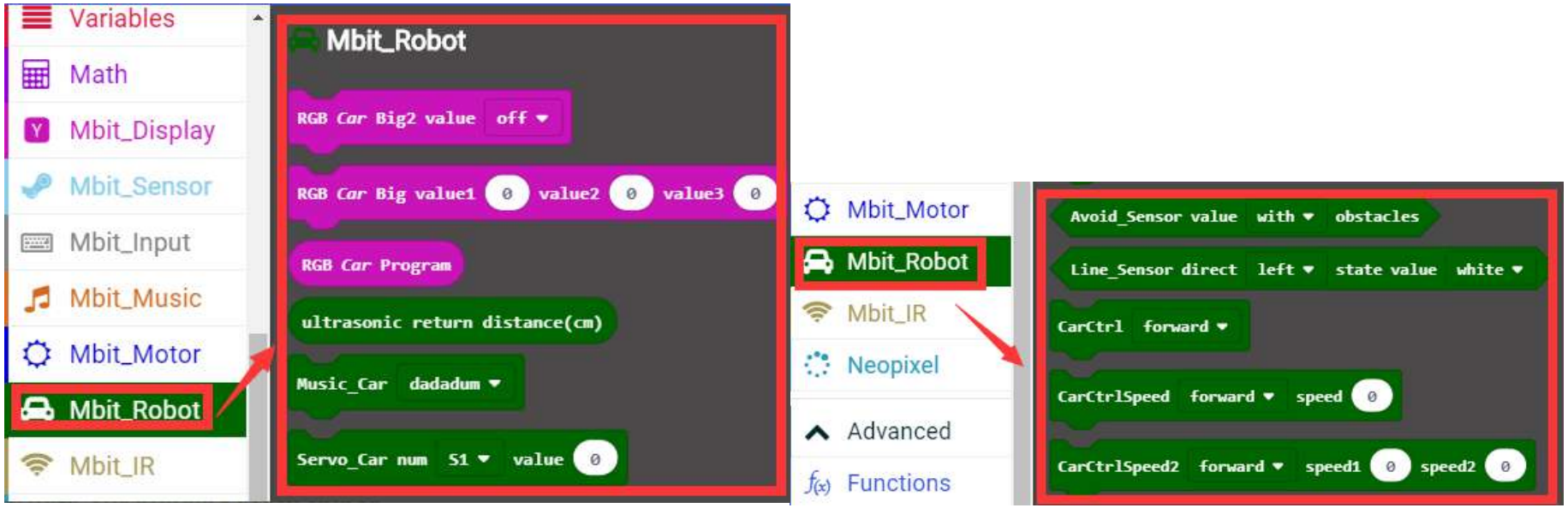
The program of this course is shown in the figure below. After downloading the program, open the power switch of the following car and place the car on the black line on the white tracking background. The car will follow the line of the track.



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\H.Following car\2.Tracking\Tracking.hex

We packaged the blocks as shown in the two figures below for this following car.



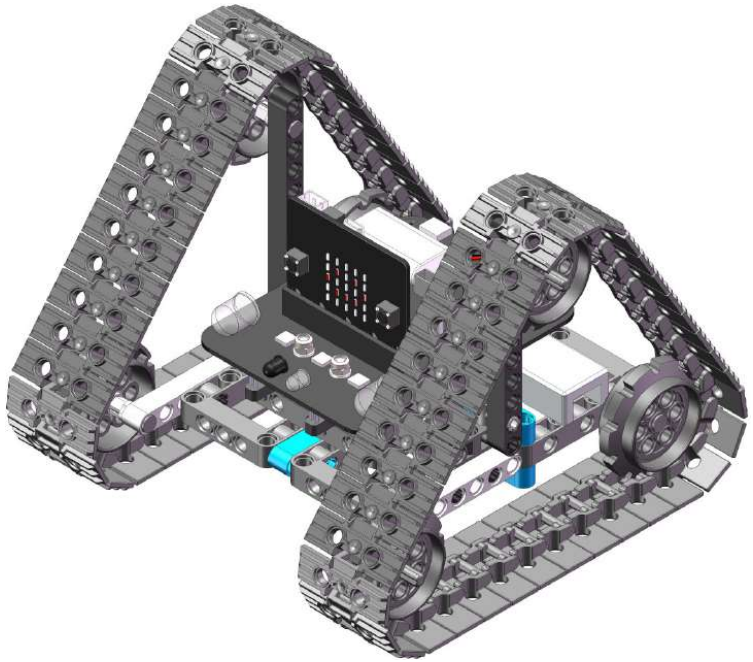
If you see these blocks, you can definitely think of more gameplay, so don't hesitate to try it bravely.
Drag these blocks and play with our building block following car.

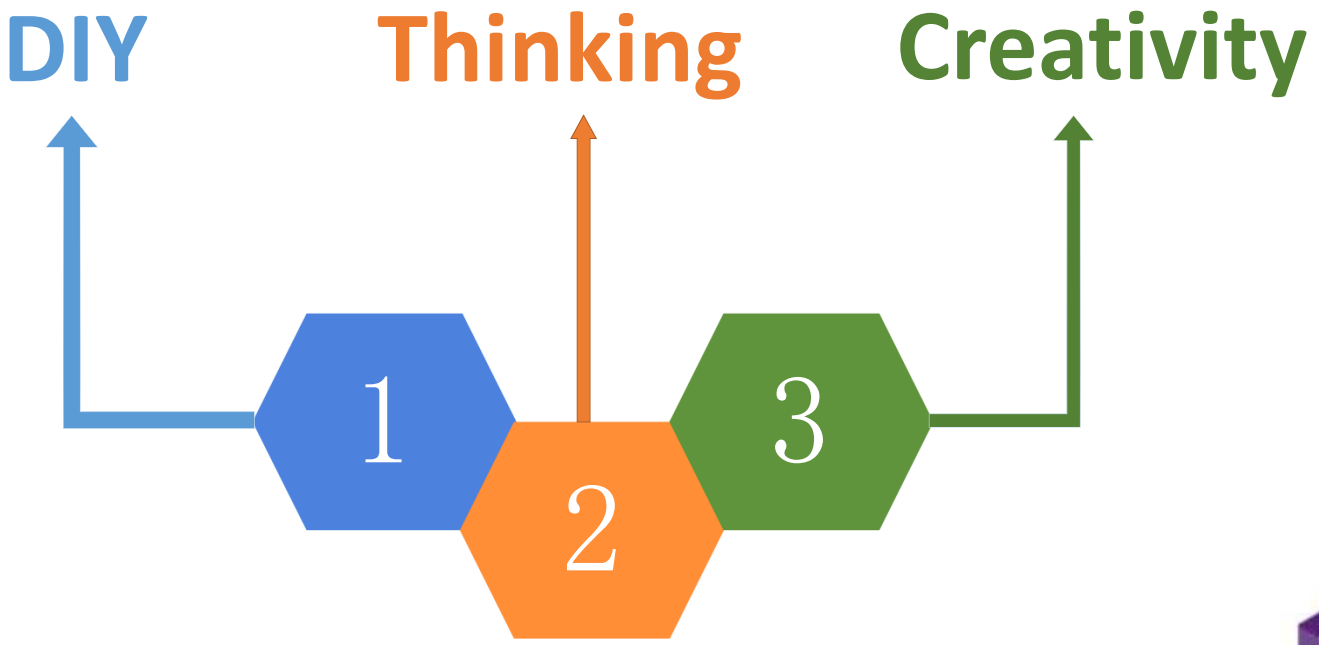


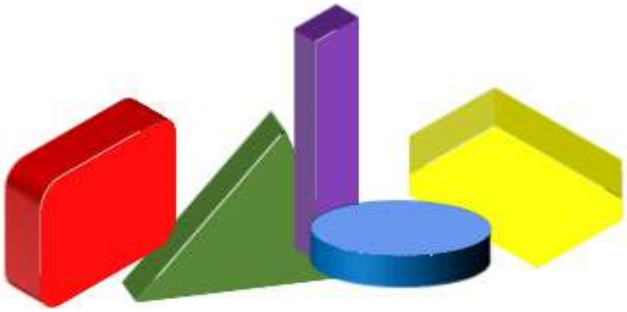
On our official website, we also provides other tutorial: Following car Infrared obstacle avoidance, Following car Infrared remote control, Following car bit handle remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Yahboom Building:bit blocks

No.9 Caterpillar tripod

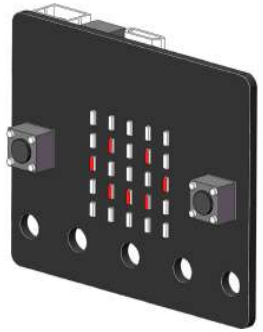
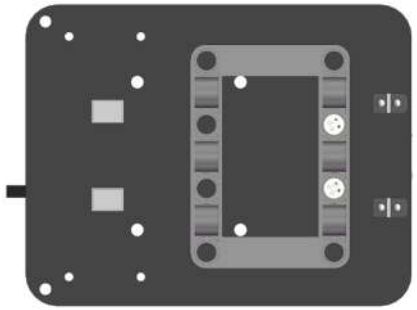
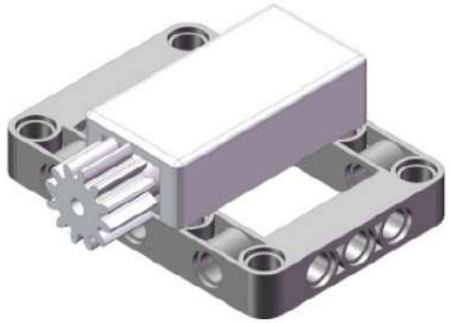
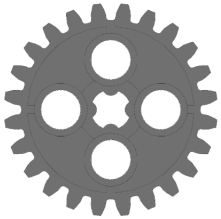
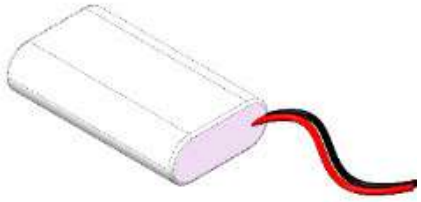
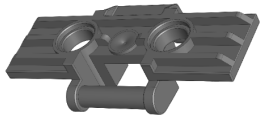
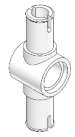


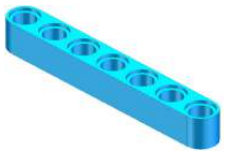
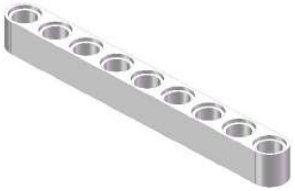
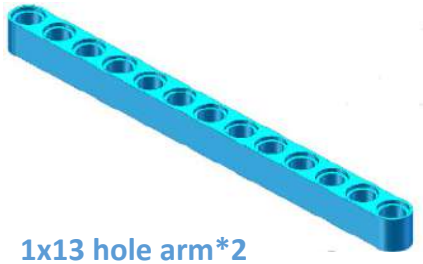

DIY
Thinking
Creativity
1
2
3



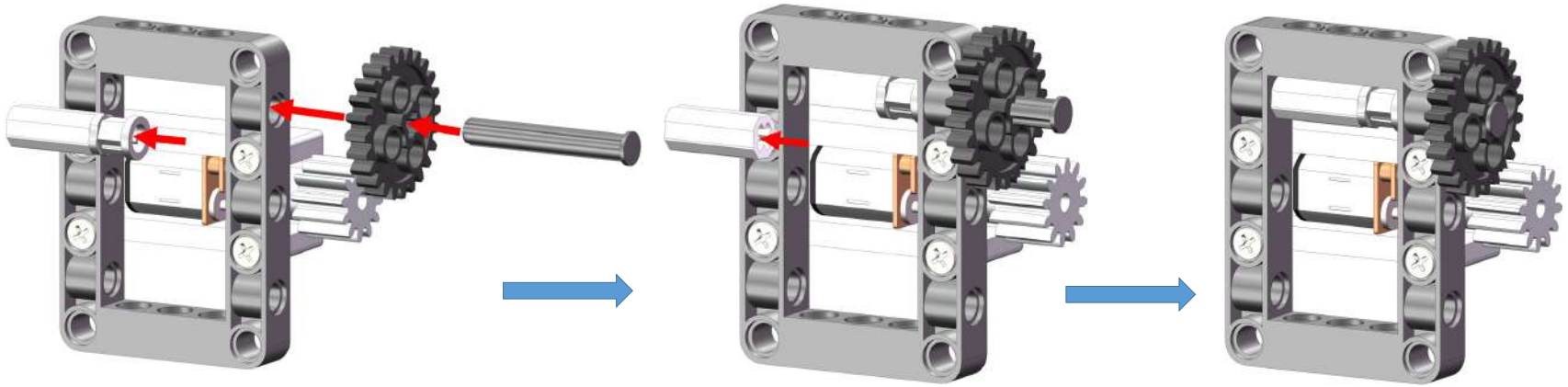
DIY: This section is mainly to teach you to assemble the caterpillar tripod with building blocks.

Prepare the following blocks and we will assemble a building block caterpillar tripod.

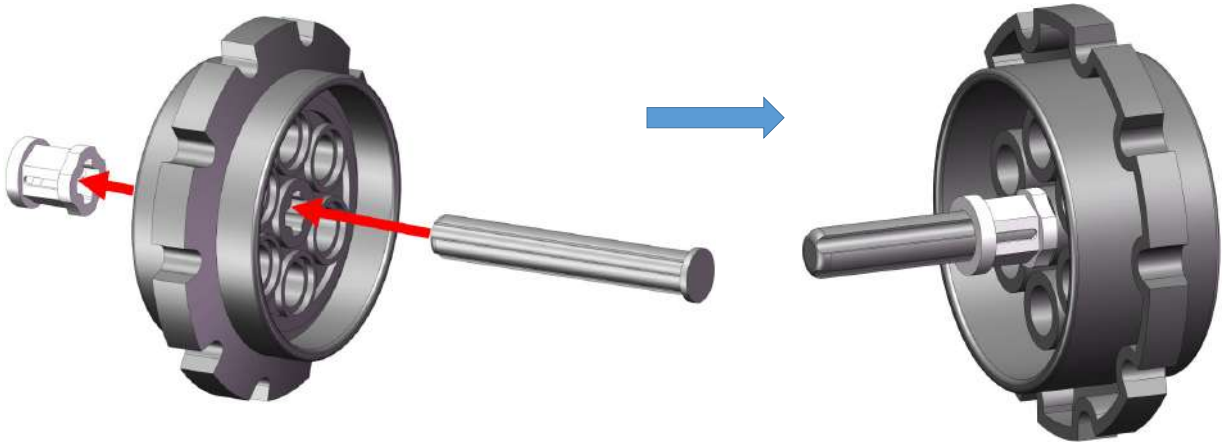
 Micro:bit*1	 Micro:bit expansion board*1	 Motor module*2	 5x7 Beam frame*4	 3x3 Bolt connector*2
 24 toothed wheel*2	 Battery*1	 Crawler wheel*6	1x2 shaft connector*2	 1x4 shaft cutoff*6
 Bushing*14	 Plastic crawler*68	 1x2 Frictional pin*22	 1x3 Bolt connector *2	 1x3 shaft*9

 1x7 hole arm*1	 1x9 hole arm*2	 1x11 hole arm*2	 1x13 hole arm*2	

Step 1: Find a motor module, a 1x4 shaft cut-off, a bushing, a 1x2 shaft connection and a 24-toothed wheel. Pass the shaft cutoff through the 24-toothed wheel, the corresponding hole position of the motor module, and the bushing. And one end of the 1x2 shaft connection.

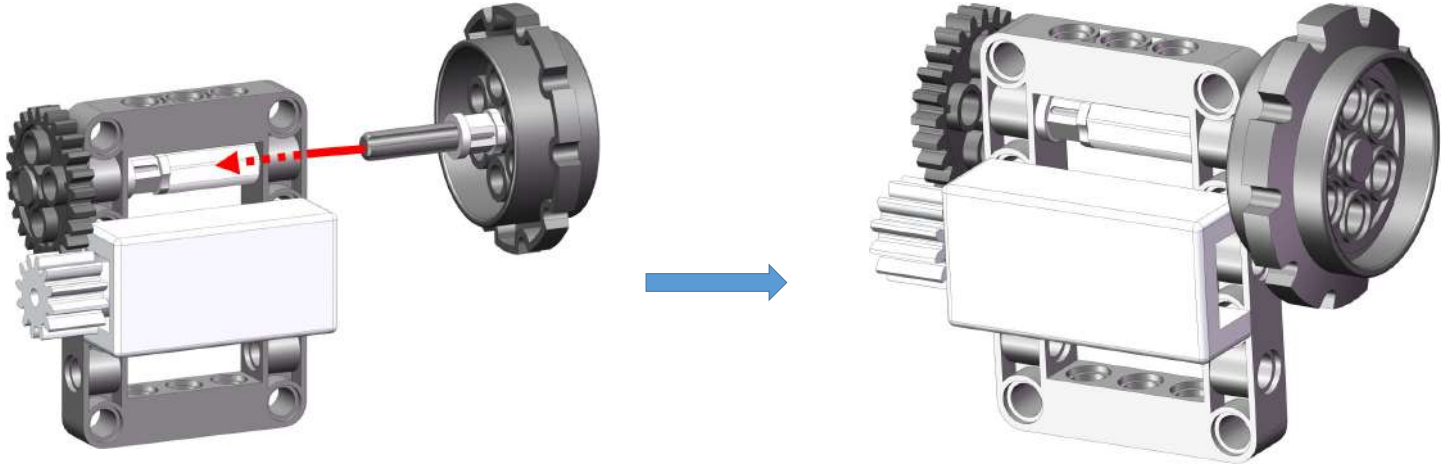


Step 2: Find a 1*4 shaft cutoff, a bushing and a crawler wheel. Pass the 1*4 shaft cutoff through the middle hole of the crawler wheel and bushing.

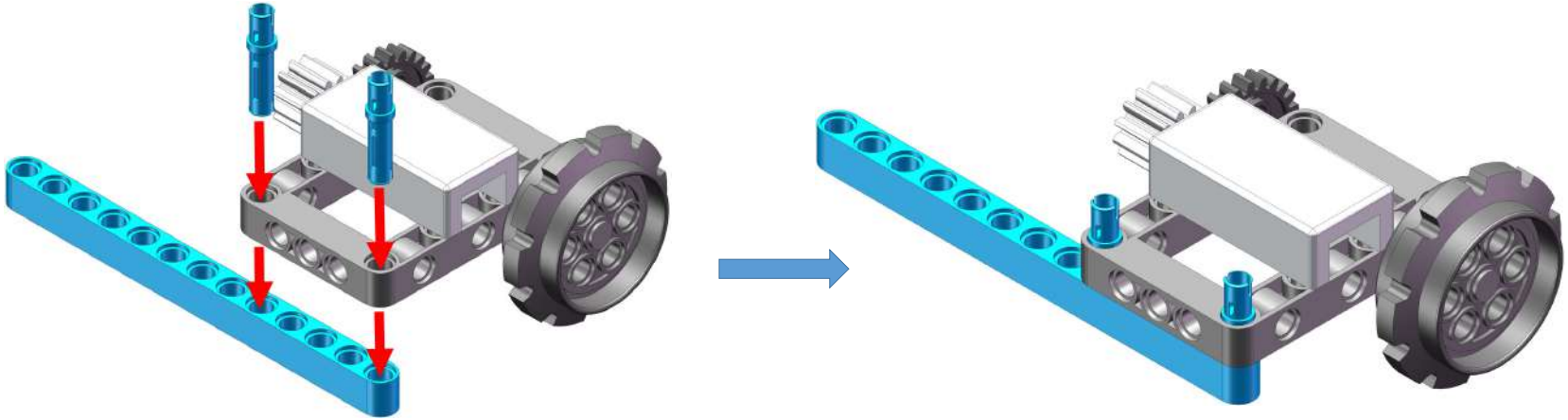


Tip: Two such blocks are needed in the later installation, so we need to repeat the first and second steps to assemble two such blocks again.

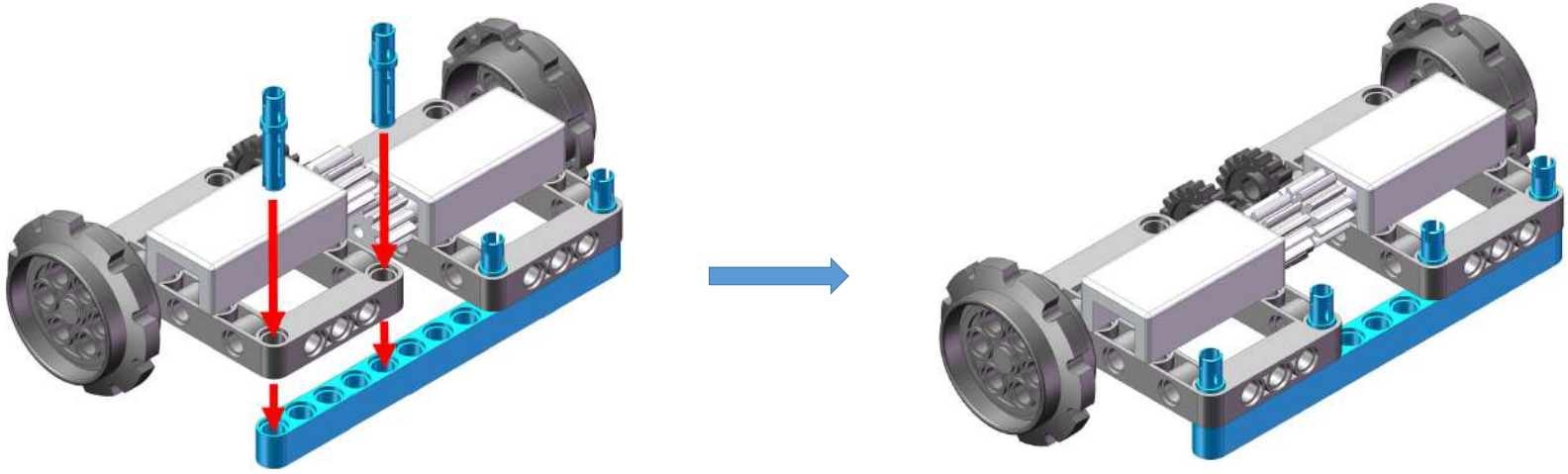
Step 3: Combine the two pieces of building blocks we have assembled in the step1 and step 2.



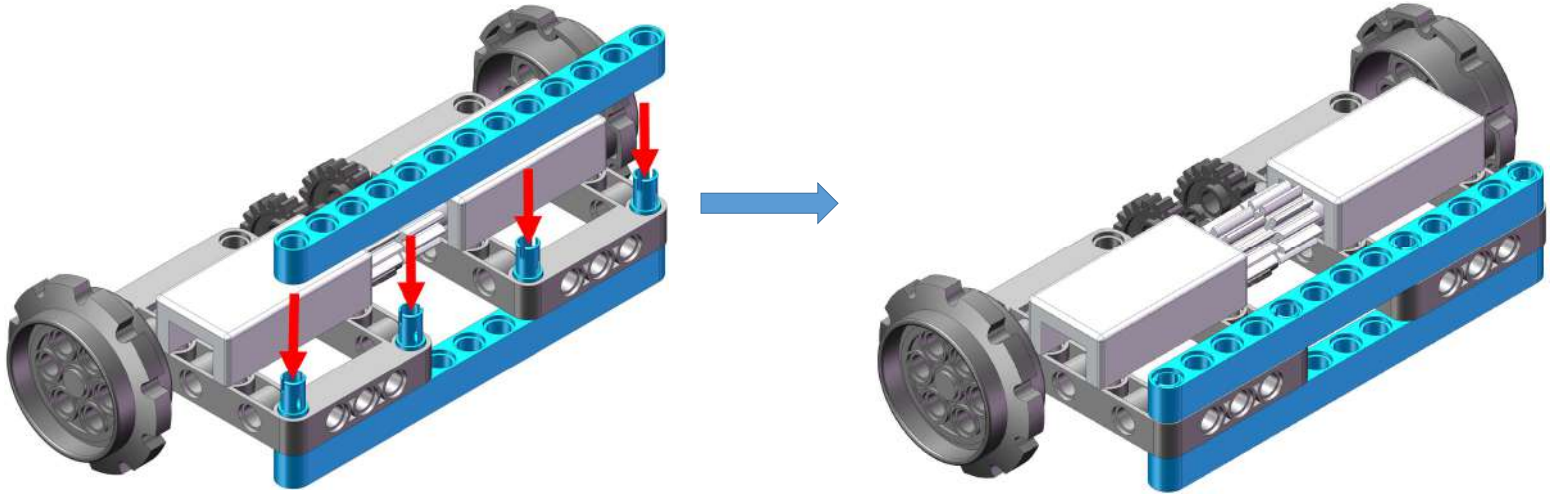
Step 4: Locate the two 1x3 bolts and the 1x13 hole arm. Insert the two 1x3 bolts into the corresponding hole positions of the motor module and the 1st and 5th holes from the right side of the 1x13 hole arm.



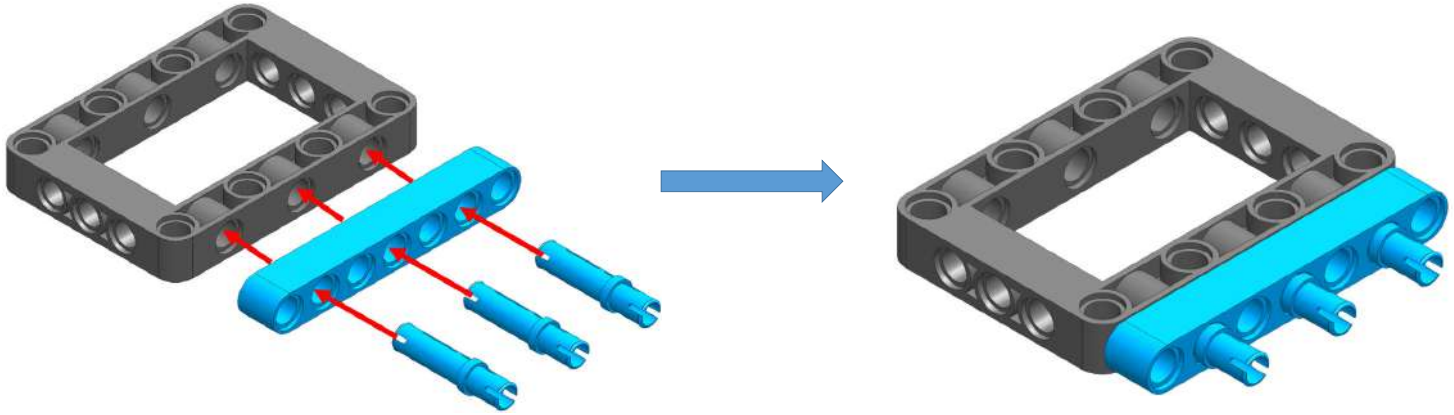
Step 5: Find two 1x3 bolts, insert the two 1x3 bolts into the corresponding hole positions of the motor module and the holes 1st and No. 5th from the left side of the hole arm.



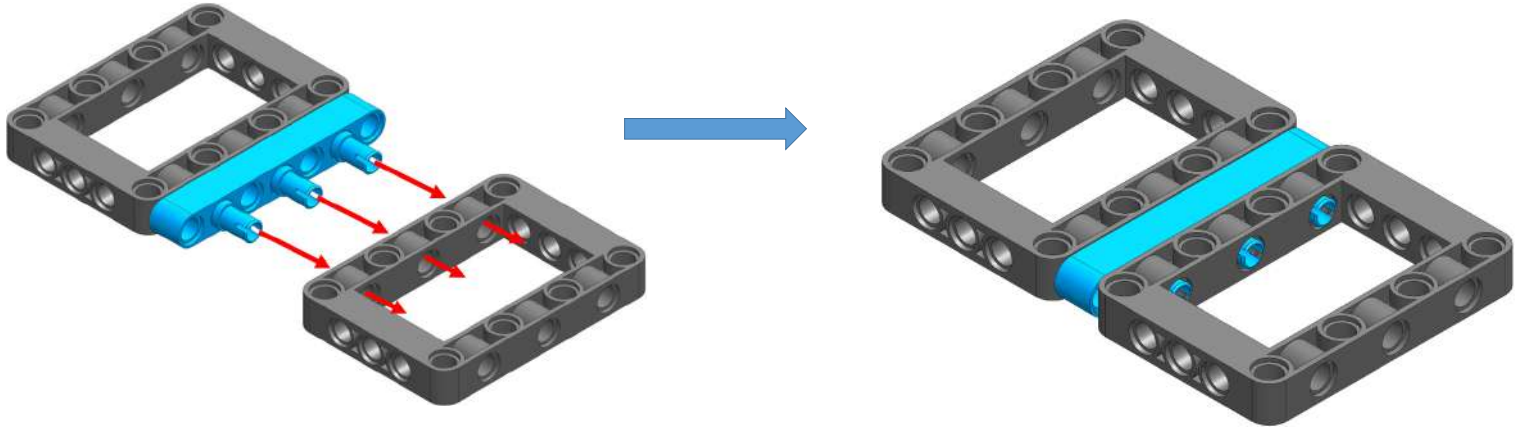
Step 6: Locate a 1x13 hole arm and insert the four 1x3 pins into the holes 1st, 5th, 9th, and 13th of the hole arm.



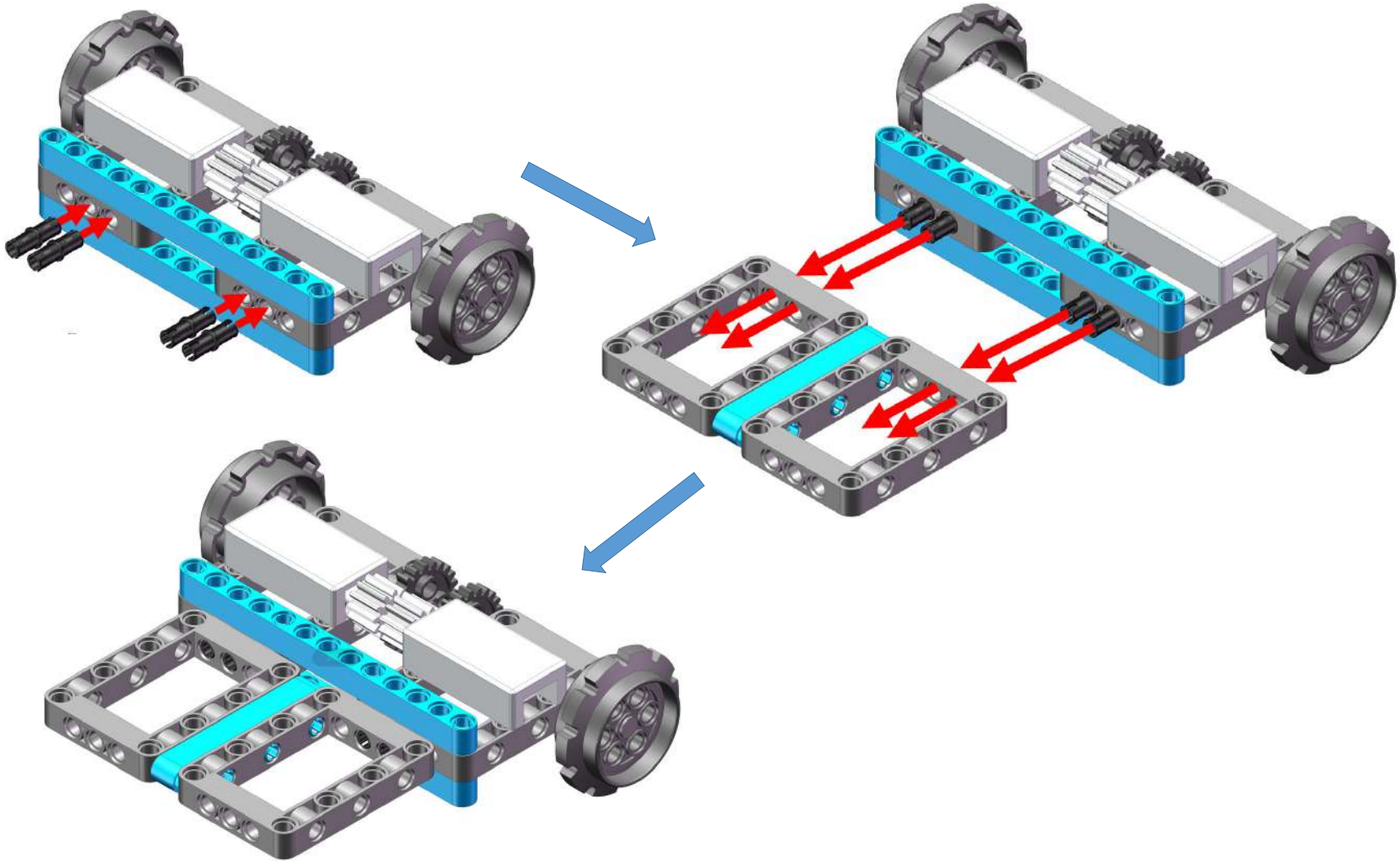
Step 7: Find a 5x7 beam frame, a 1x7 hole arm and three 1x3 bolts. Three 1x3 bolts were passed through holes 2, 4, and 6 of the 1x7 hole arm and passed through the corresponding holes on the side of the beam frame.



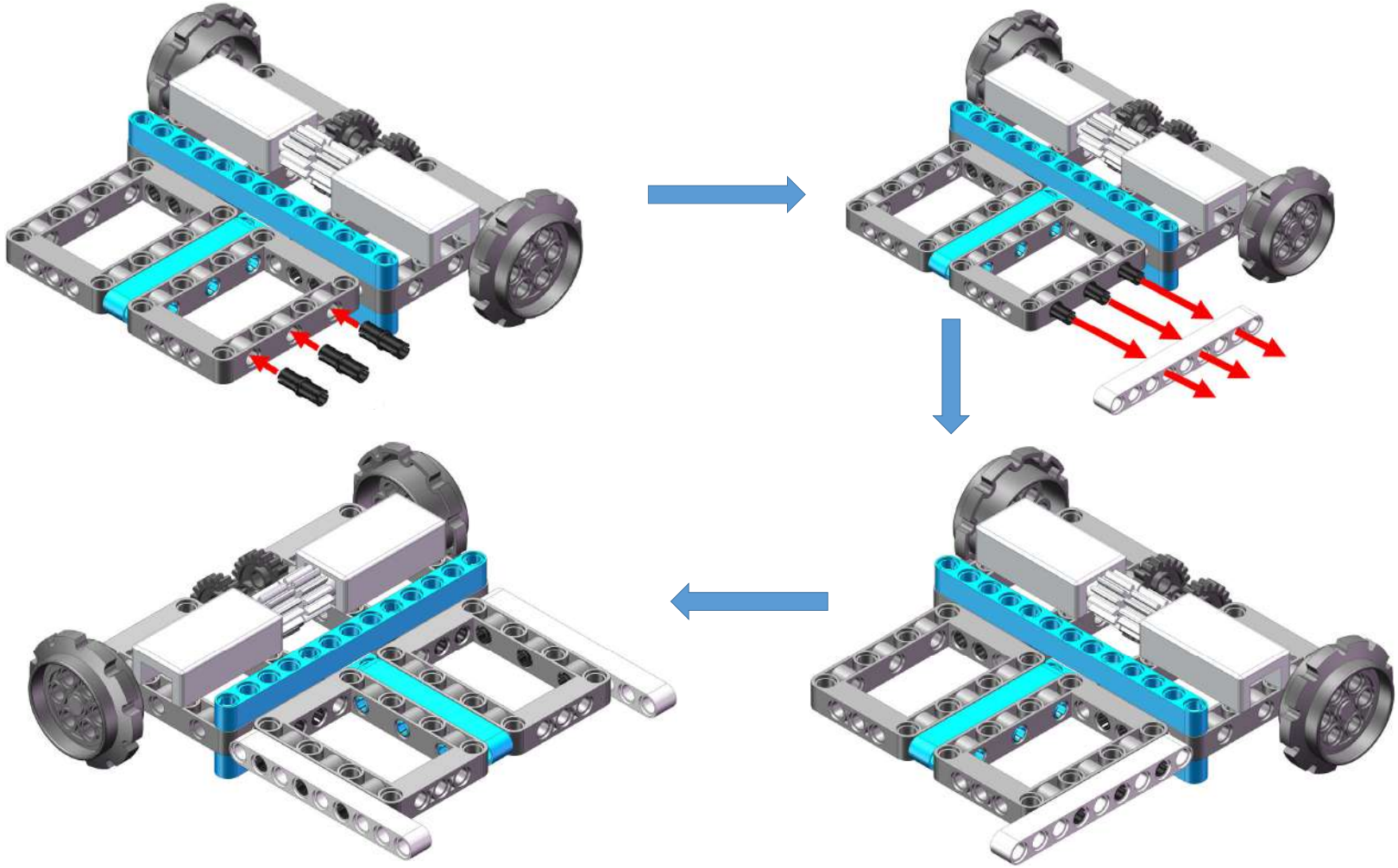
Step 8: Locate a 5x7 beam frame and insert the 1x3 bolt from the side into the corresponding hole of the 5x7 beam frame.



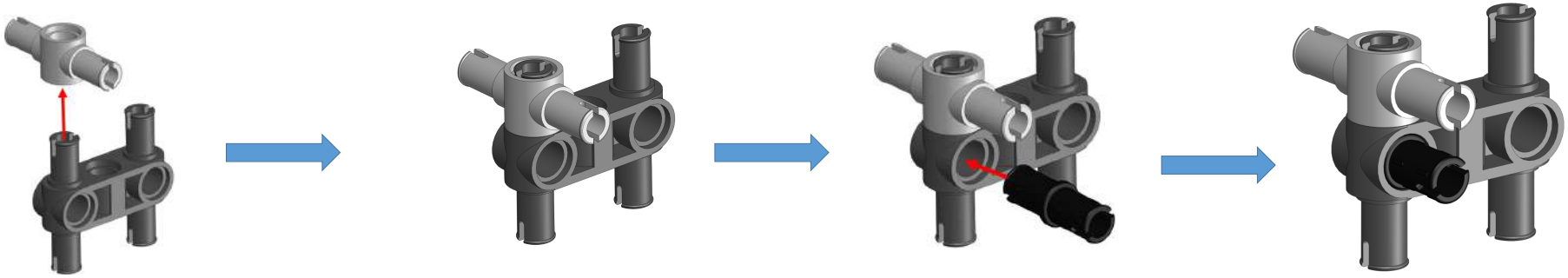
Step 9: Locate the four 1x2 friction pins and insert them into the corresponding holes in the motor module.



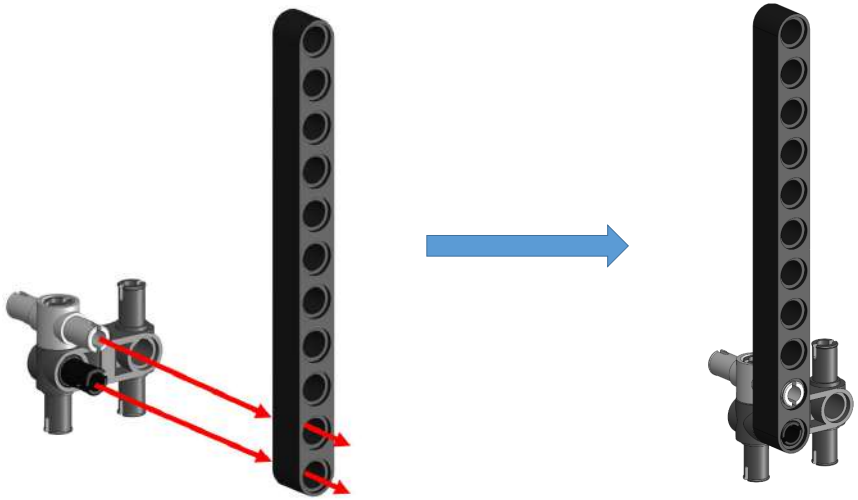
Step 10: Find three 1x2 friction pins and one 1x9 hole arm. First insert the 1x2 friction pin from the side into the corresponding hole of the 5x7 beam frame, then install the 1x9 hole arm onto the three 1x2 friction pins. At the same time, the same method is required for the other side, and the same building blocks are used for installation.



Step 11: Find a 3x3 bolt, a 1x3 bolt connector and a 1x2 friction pin. First insert one of the 3x3 bolt into the 1x3 bolt connector and insert the 1x2 friction pin into the corresponding hole on the side of the 3x3 bolt.

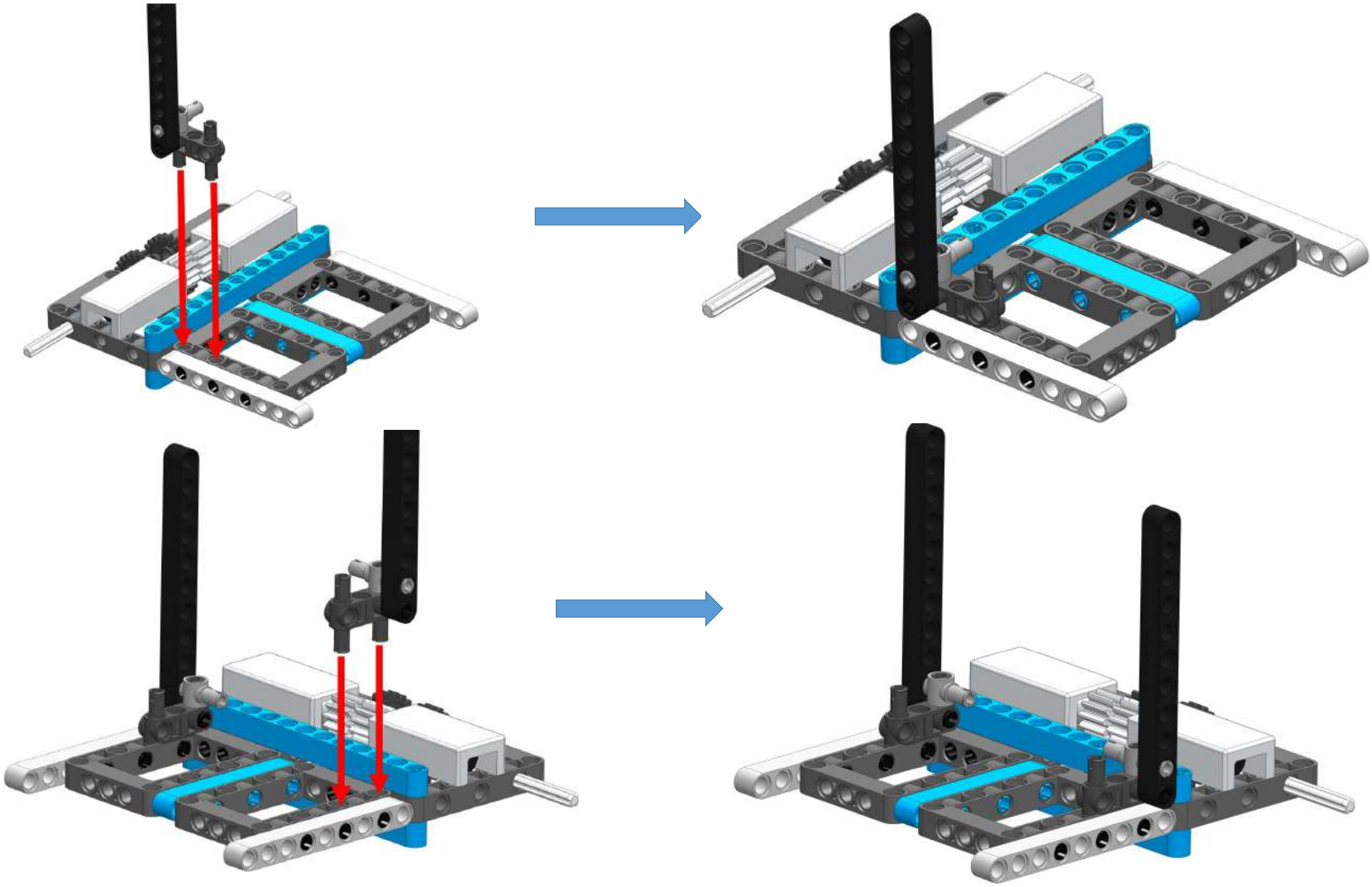


Step 12: Find a 1x11 hole arm. Insert the 1x2 friction pin and 1x3 bolt connector that we assembled in the previous step into the No. 1 and No. 2 holes at the lower end of the 1x11 hole arm.

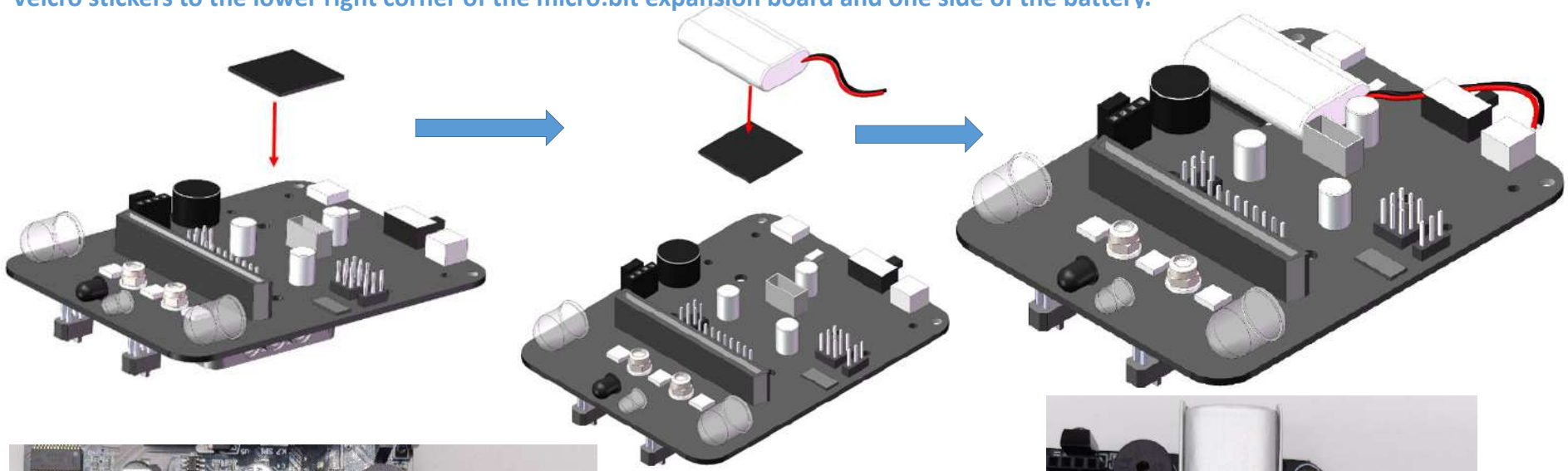


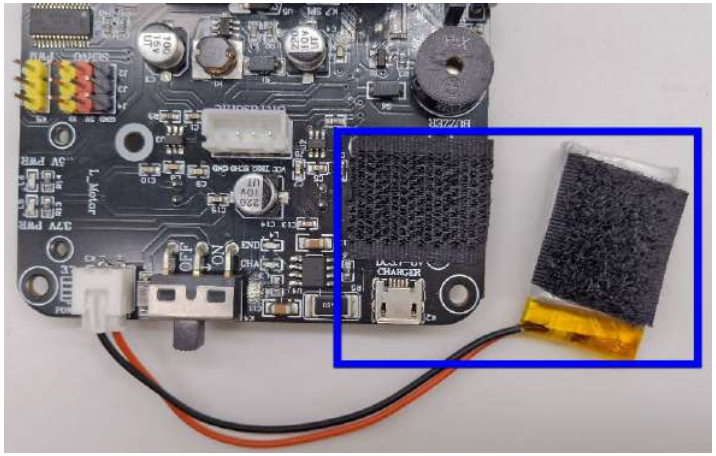
Tip: Two such blocks are needed in the later installation, so here we have to assemble two such blocks.

Step 13: Combine the two pieces of building blocks that we have assembled in step 9 and step 12.

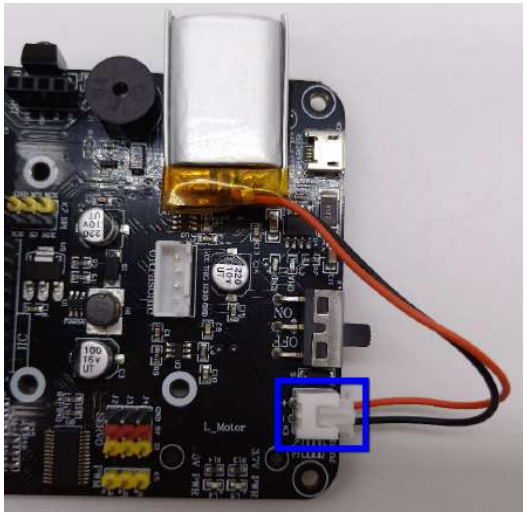


Step 14： Find the Velcro and micro:bit expansion board, remove the protective film on the back of the Velcro, and attach the two Velcro stickers to the lower right corner of the micro:bit expansion board and one side of the battery.

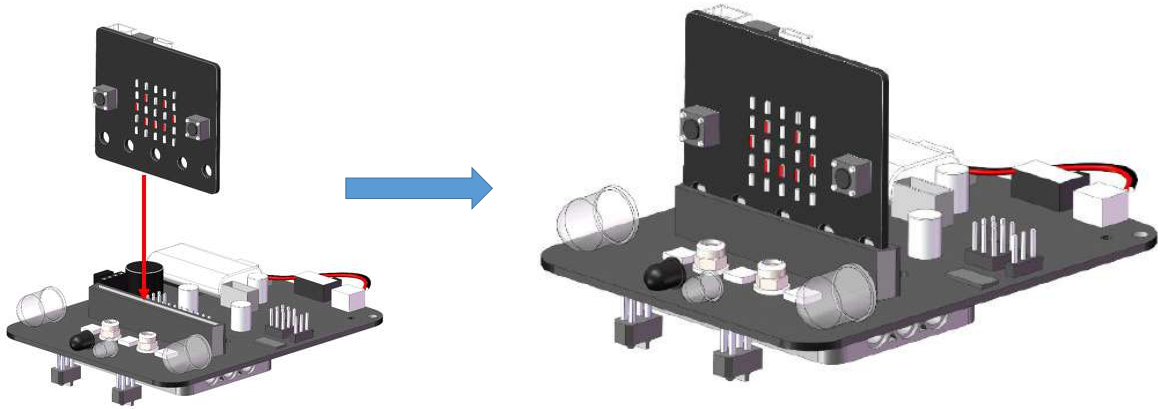




Tip: The socket for battery wiring, we use anti-reverse design. Just plug the battery cable into the socket.

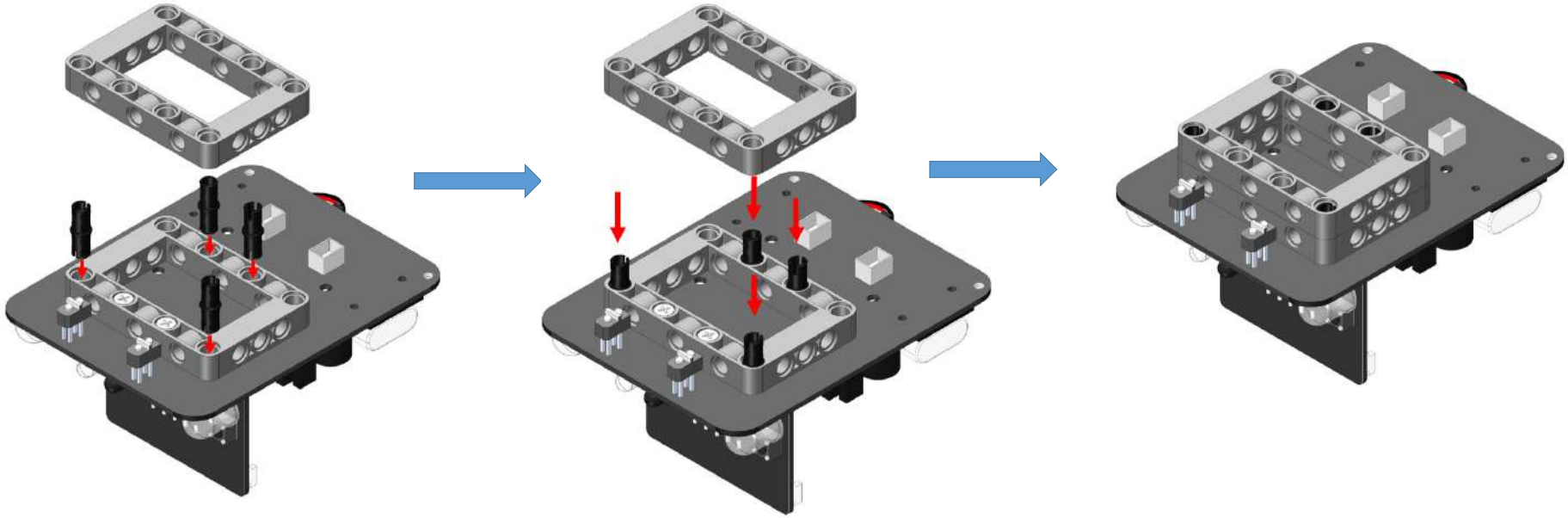


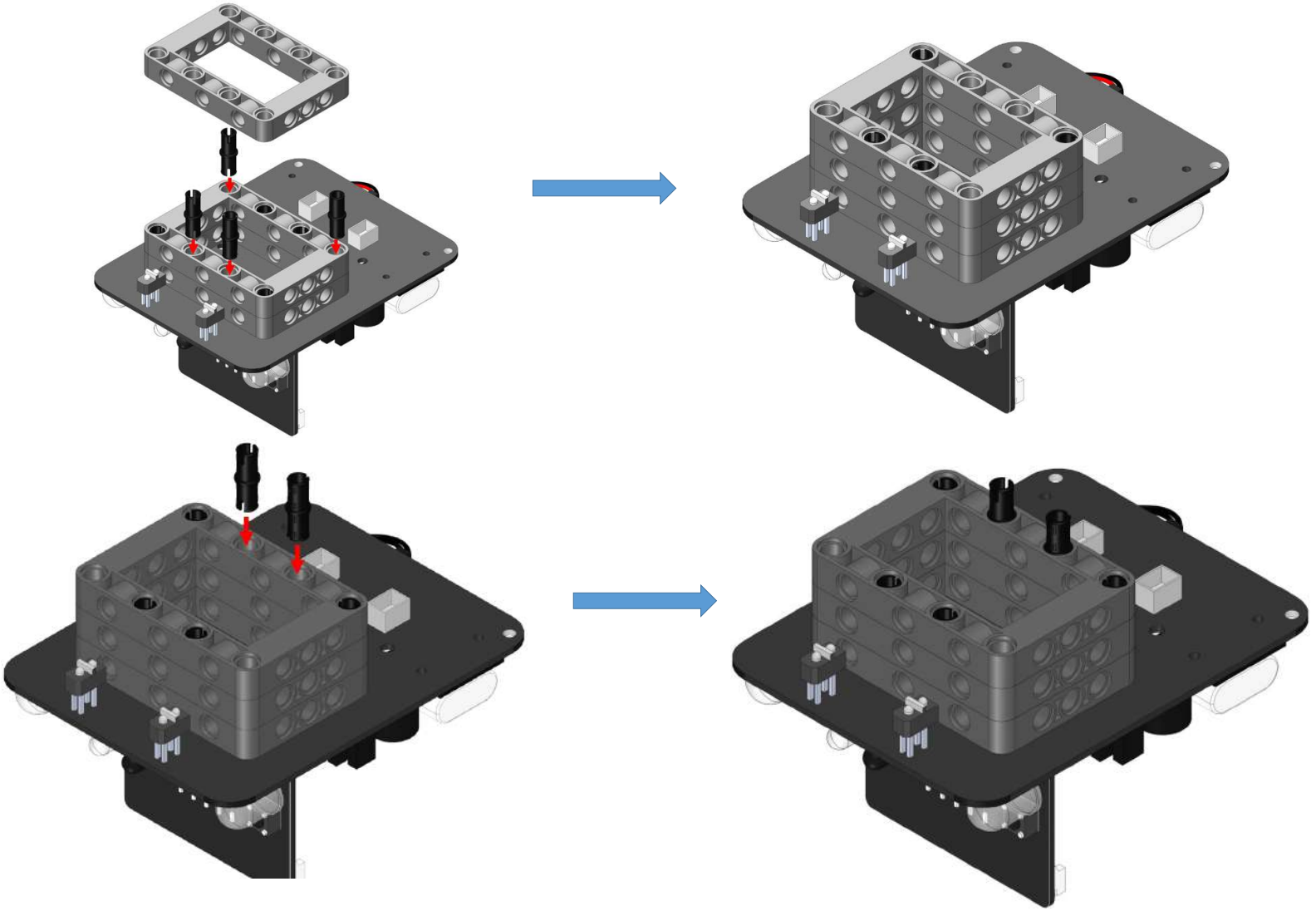
Step 15: Locate the micro:bit motherboard and insert the motherboard into the expansion board correctly.



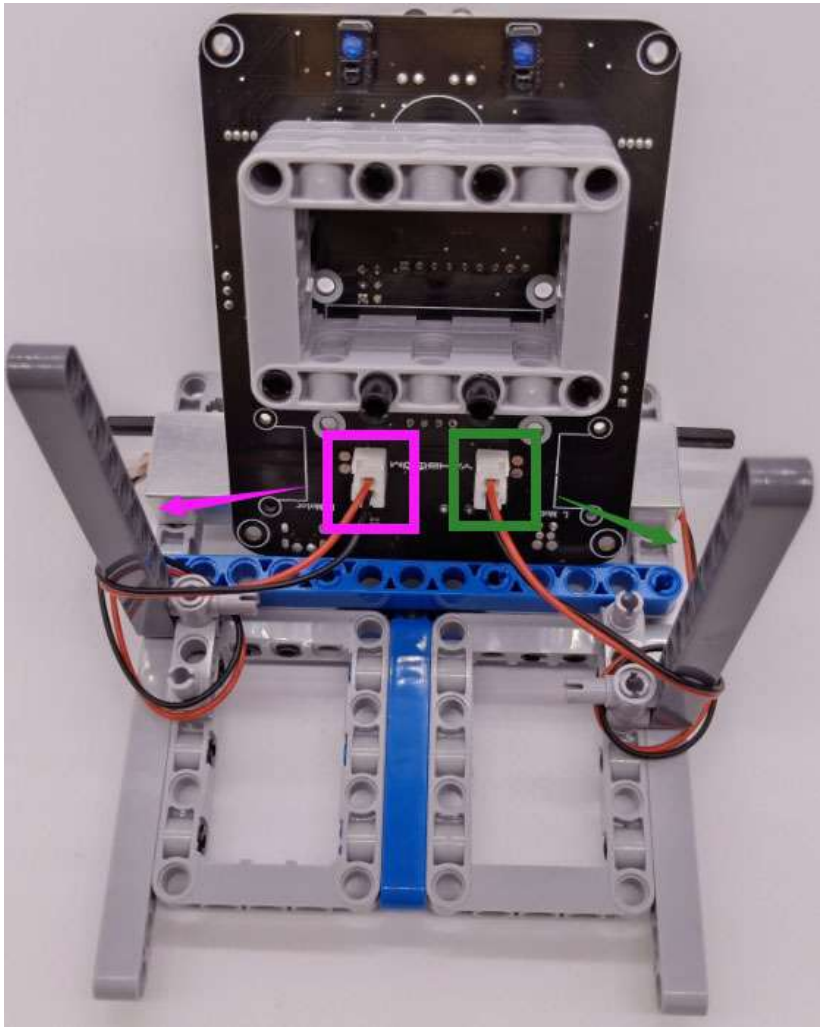
Tip: The micro:bit board is equivalent to the "brain" of the car, so be sure to remember to install it properly.

Step 16: Find ten 1x2 friction pins and two 5x7 beam frames and assemble them with the micro:bit expansion board.



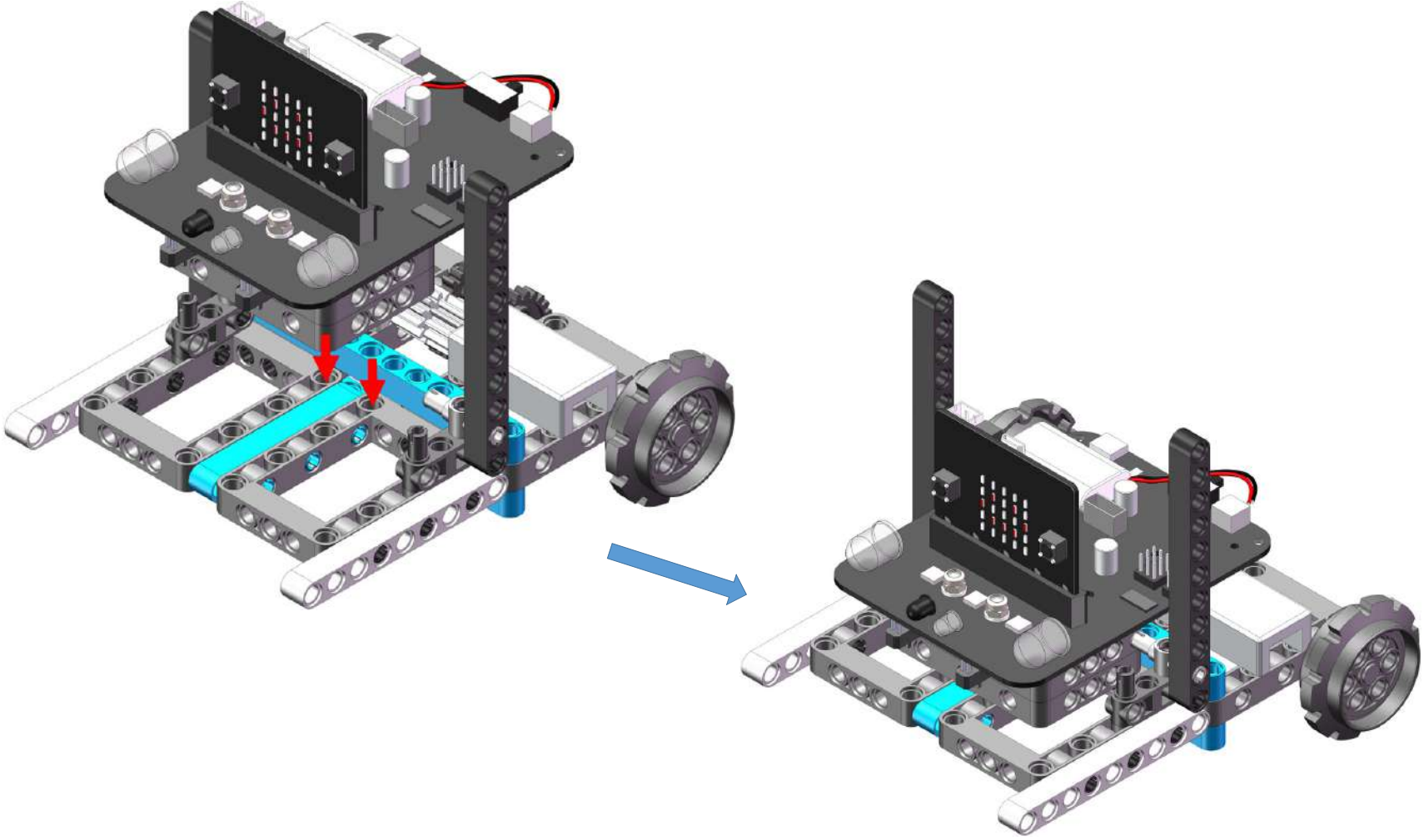


Step 17: Wire the motor as shown below.

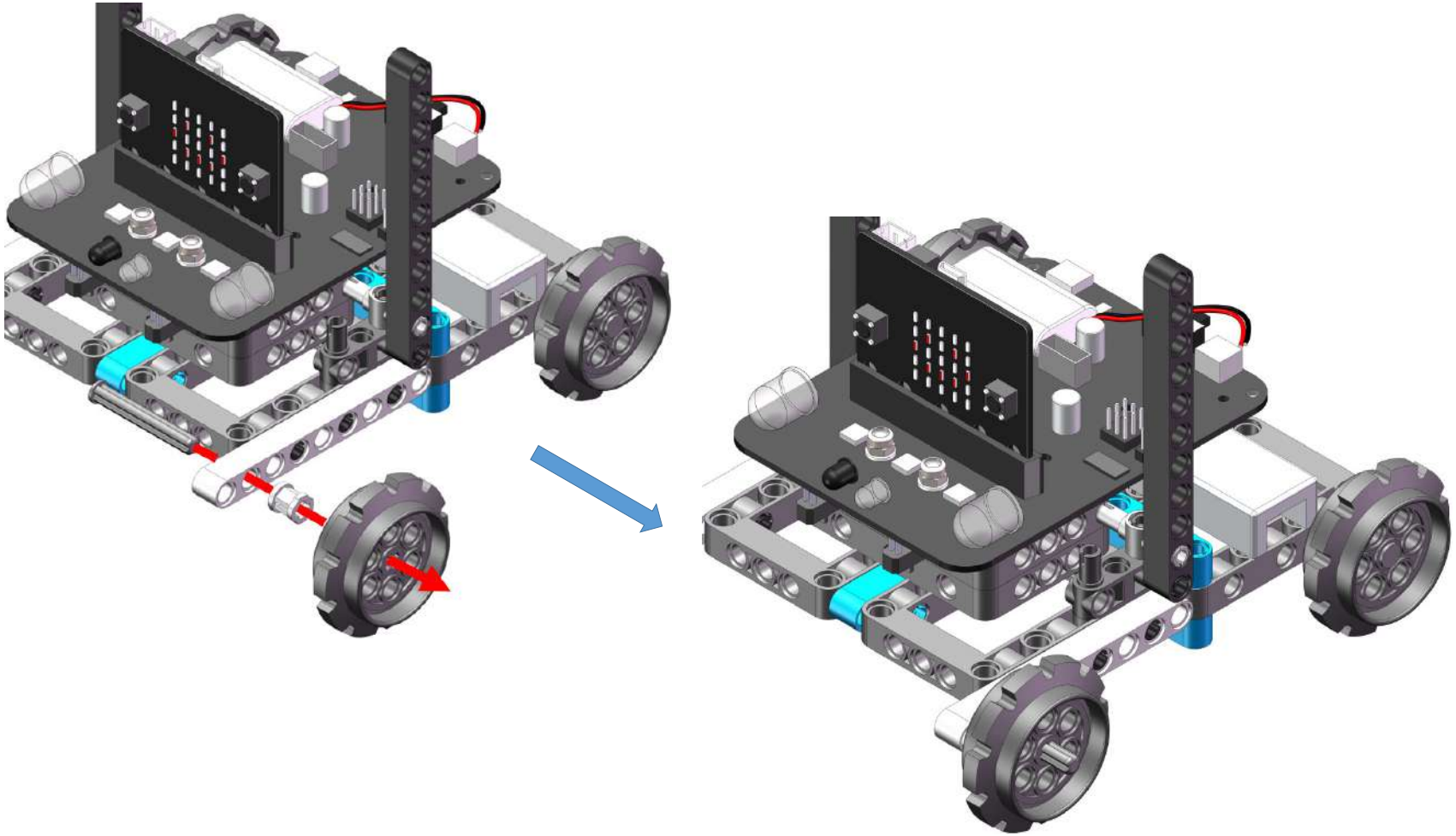


Tip: In order to prevent the motor wire from winding around the wheel, the car can't drive normally. We can wind the motor wire around the 1x11 hole arm.

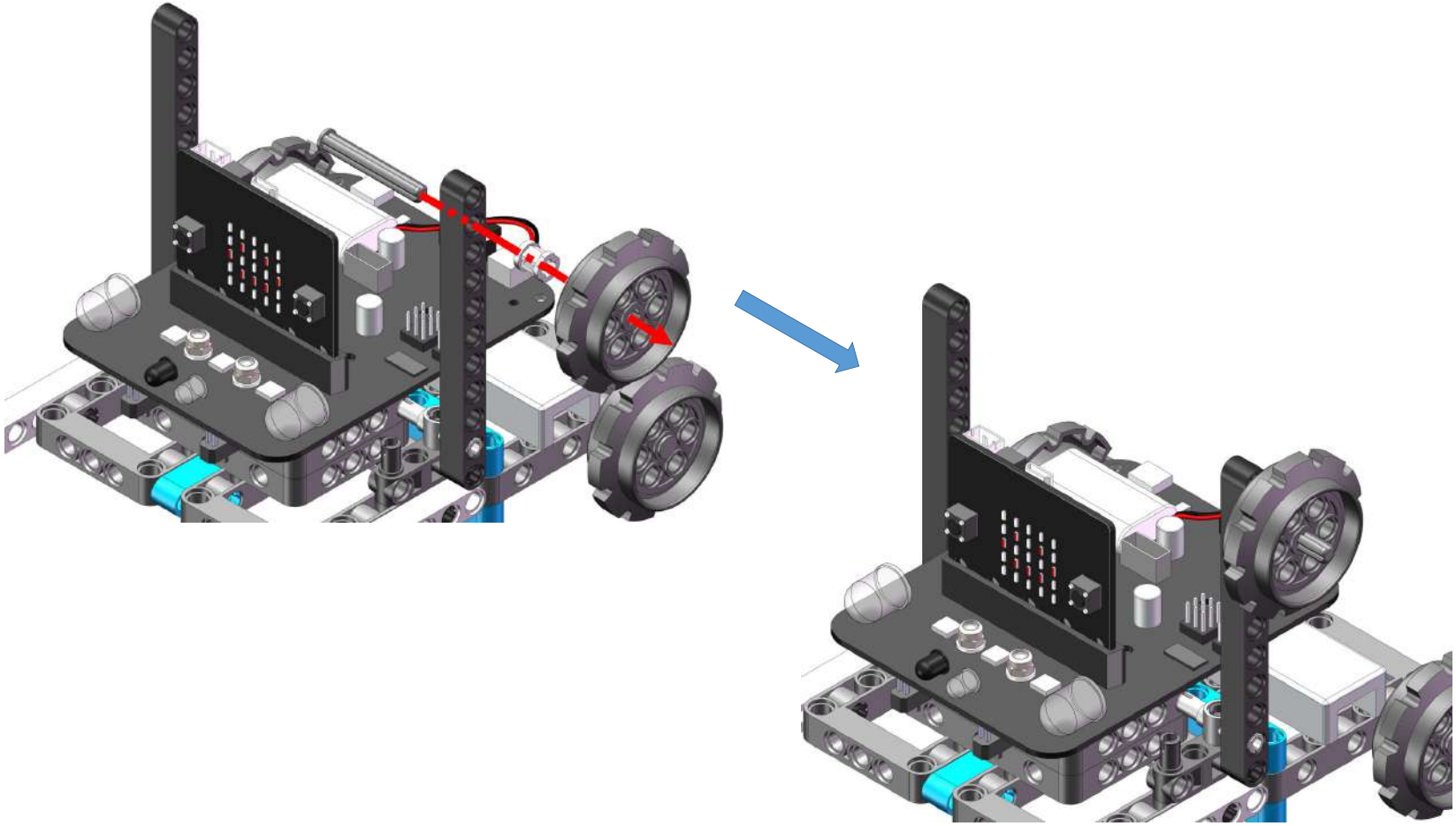
Step 18: Combine the two pieces of building blocks that we have assembled in step 13 and step 16.



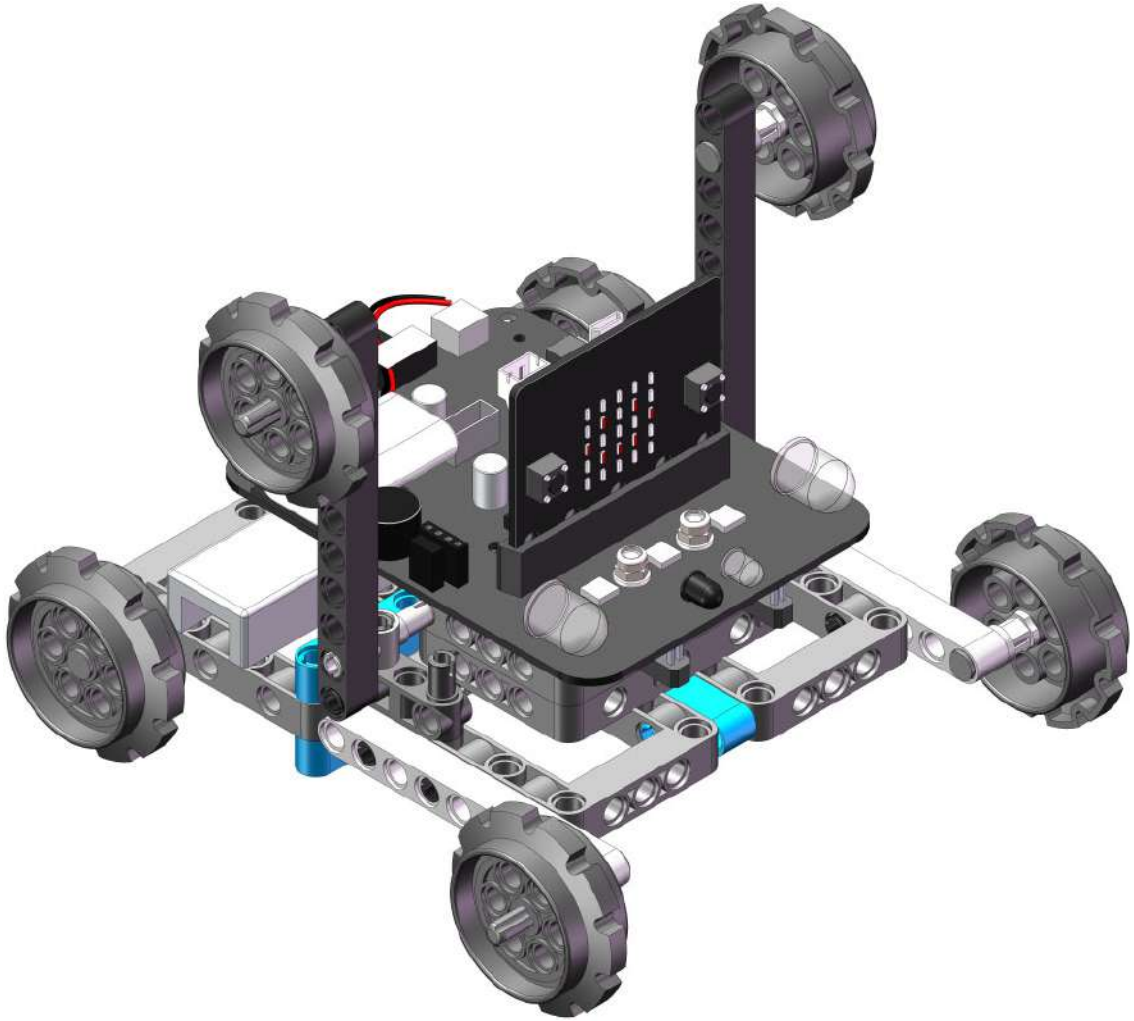
Step 19: Find a bushing, a crawler wheel and a 1x4 shaft cutoff. Pass the 1x4 shaft cutoff through the 2nd hole on the left side of the 1x9 hole arm on the side of the car, the bushing and the center of the crawler wheel.



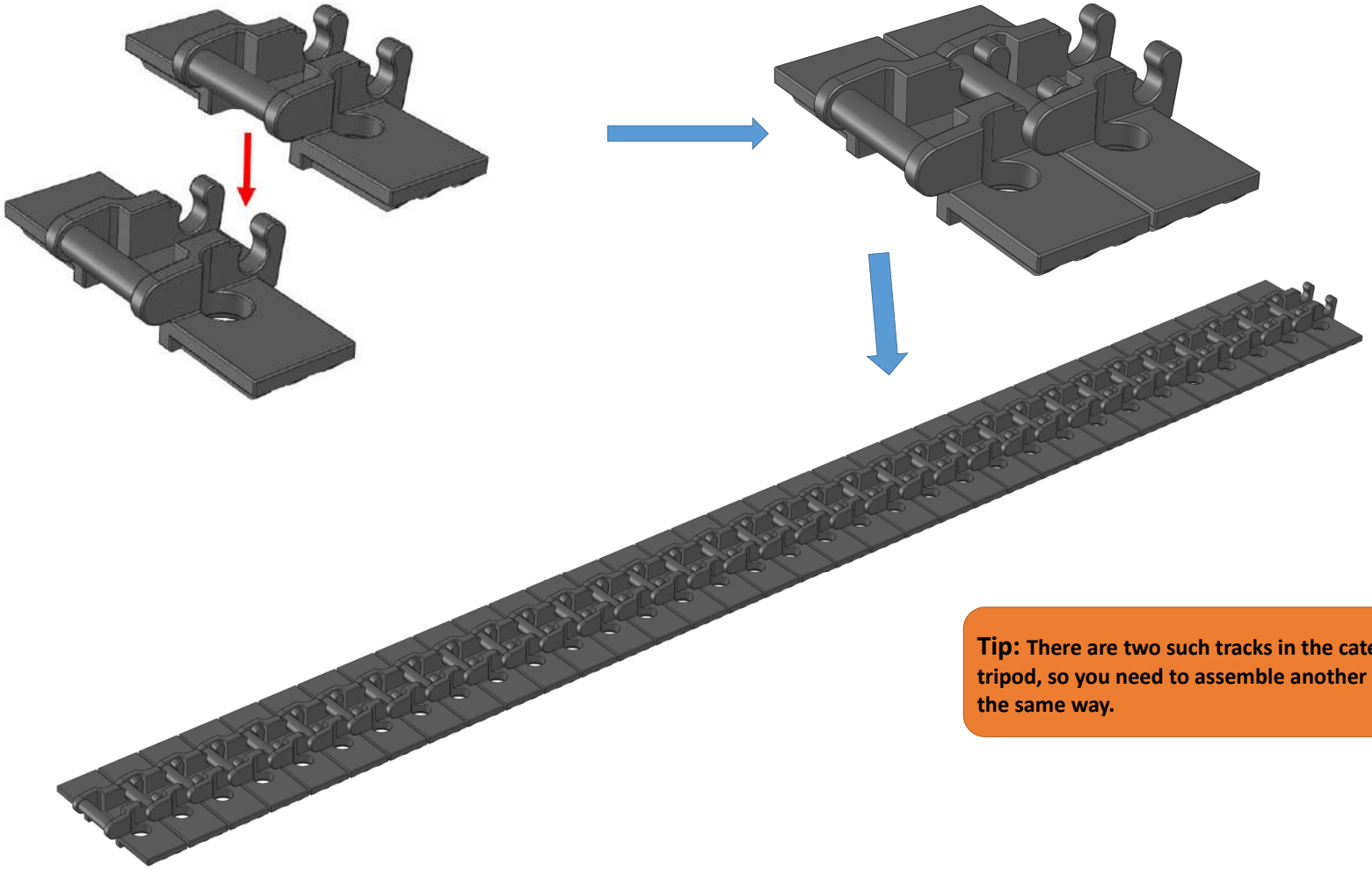
Step 20: Find a bushing, a crawler wheel and a 1x4 shaft cutoff. Pass the 1x4 shaft cutoff through the 1x11 hole arm on the car from the 2nd hole above, the bushing and the center of the crawler wheel.



Step 21: Install the two track rollers on the other side of the frame with the same steps and the same blocks as the previous two steps. After the installation is completed, the following figure is shown.

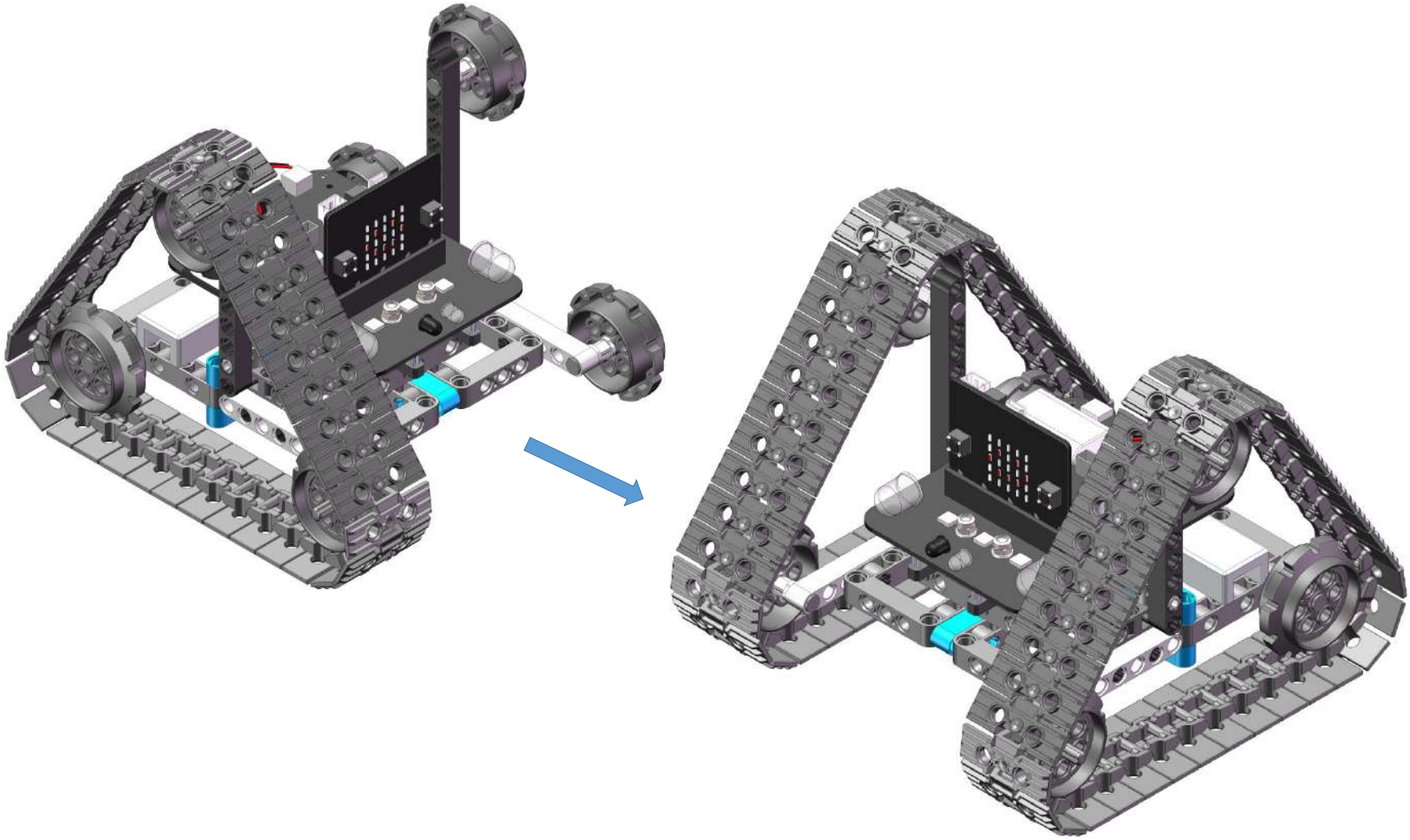


Step 22: Find the plastic track. Each is spliced together in sequence to form a track. Each track requires 34 plastic tracks to be spliced together.



Tip: There are two such tracks in the caterpillar tripod, so you need to assemble another track in the same way.

Step 23: Install the tracks on both sides.

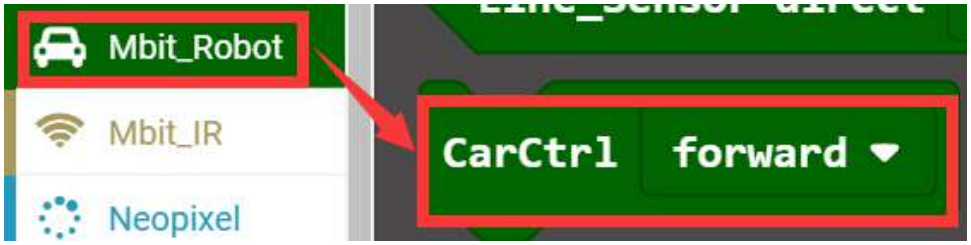


Thinking： This session is mainly to teach you how to use graphical programming to control the building block caterpillar tripod.

Preparation

- USB cable *1
- Caterpillar tripod *1

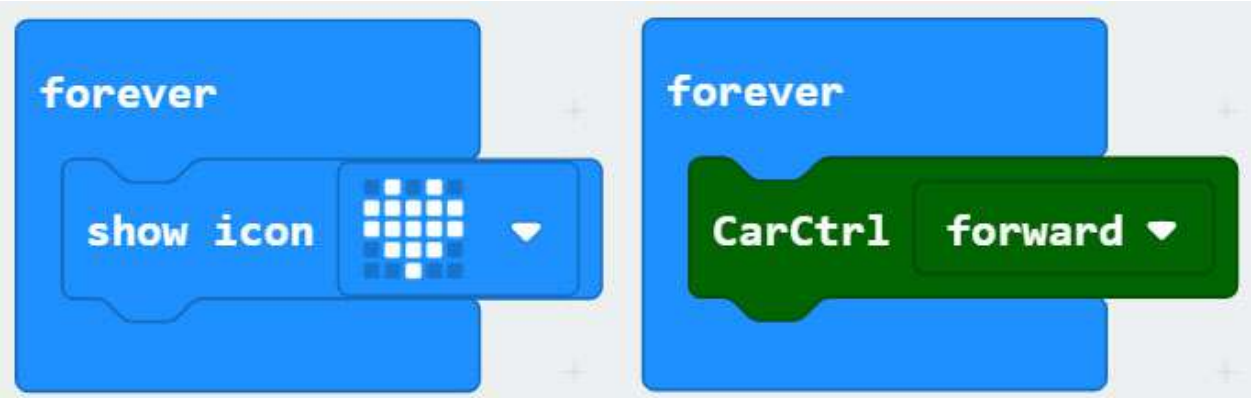
Blocks

Block	Instruction
	The code inside is executed after booting.
	The car's motion state selection: forward, back, turn left , turn right , rotate left, rotate right and stop.

Block	Instruction
	Display the pattern on the micro:bit dot matrix.

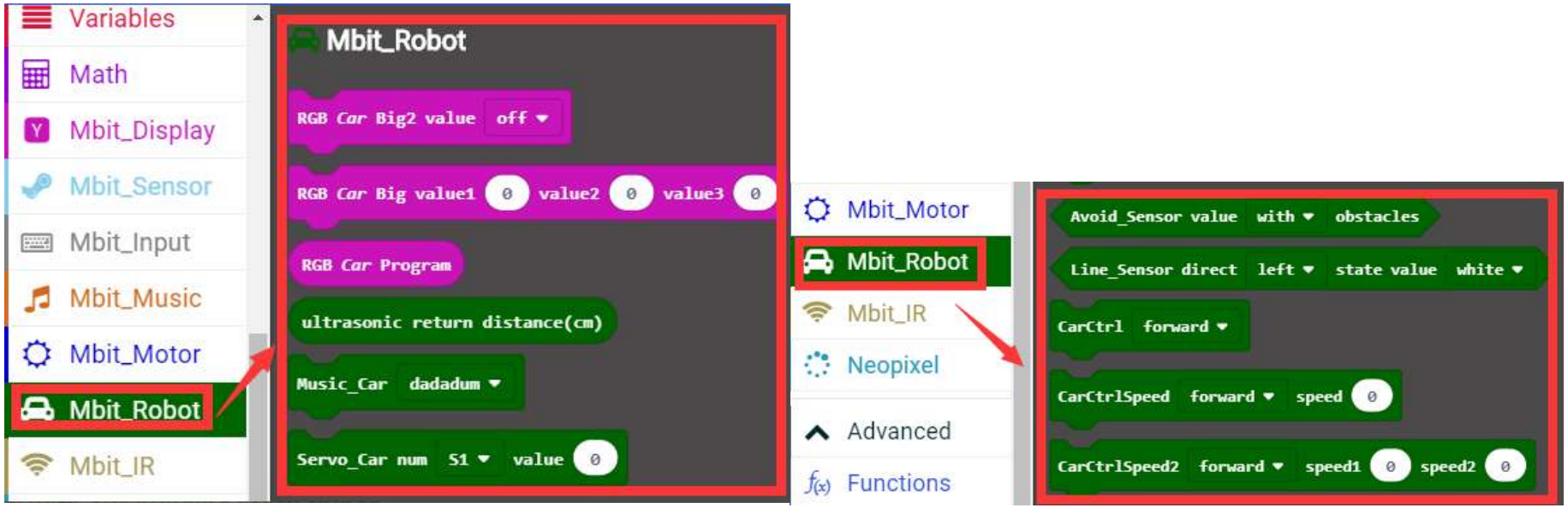
Programming

The program for this course is shown below. After downloading the program, open the power switch of the caterpillar tripod, it will automatically keep moving forward and display a smile on the dot matrix.



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\I.Caterpillar tripod\2.Caterpillar tripod advance\Caterpillar-tripod-advance.hex

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



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 caterpillar tripod!!!



On our official website, we also provides other tutorial: Caterpillar tripod Infrared obstacle avoidance, Caterpillar tripod bit handle remote control, Caterpillar tripod Infrared remote control.
Official website learning website: www.yahboom.net/study/Building_bit

Lithium-ion battery safety specification

1.The battery is charged directly, plug the charger directly into the charging interface of the expansion board.
2.Don't use the battery while charging to prevent the charger or battery from exploding.
3.Please charge the battery when the voltage is about 3.7V. The battery voltage is about 4.2V after fully charged.
4.Unplug the battery when the device is not used for a long time and keep the battery voltage between 3.7V-3.9V.When storing the battery, do not mix it with metal objects. Do not remove the insulation film on the outside of the battery.
5.When the battery is charging, the charger indicator lights up red and full green light. After charging is completed, the charger and power supply should be unplugged in time to avoid overcharging and damaging the battery. Someone needs to be present when charging.
6.Please use the official battery, power adapter and battery box provided by Yahboom.
7.Keep away from heat, fire, any liquid. Don't use it in wet or rain. Humid environment may cause the battery to ignite or even explode.
8.Don't use the battery when it is leaking, damaged, heated, deformed, discolored, smelly or any other abnormal phenomenon, and contact Yahboom or other agents in time.
9.Please use the battery at 0 ° C ~35 ° C environment. The battery will be damaged or the discharge performance will be extremely reduced at other temperatures.
10.Intentional puncture, short circuit, reverse connection, unauthorized welding, impact, crushing, and throwing of batteries are strictly prohibited. Do not use the battery in a strong static and magnetic field environment, otherwise the battery may leak fluid, catch fire or even explode.
11.It is strictly forbidden to modify the hardware circuit board without permission.
12.Do not allow children to replace batteries without adult supervision. Keep batteries out of the reach of children.
13.Do not mix new and old batteries or different types of batteries, especially dry batteries and rechargeable batteries.
14.If the charger smokes, the battery hot (the outer packaging will crack in severe cases) or the battery leaks: please disconnect the power strip or the main gate, then quickly pull out the charger, remove the battery and put it in an open area.

Solemnly declare: Users must read this specification carefully, especially the parameter indicators, precautions, etc., understand the use method and application range of the product.Any economic loss and safety accident caused by failure to comply with the above-mentioned lithium ion battery use specifications or operating errors shall be borne by the user.