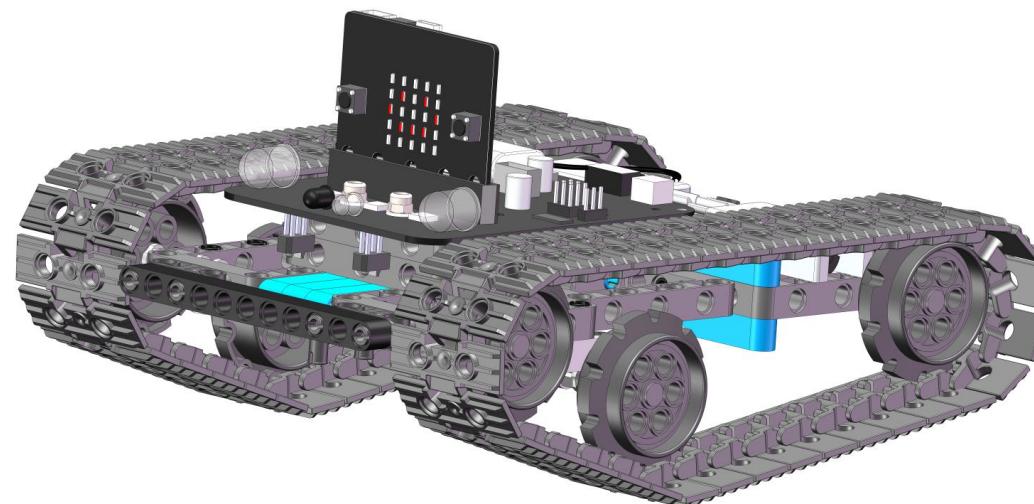
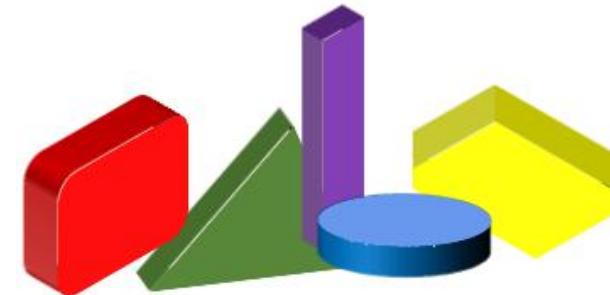
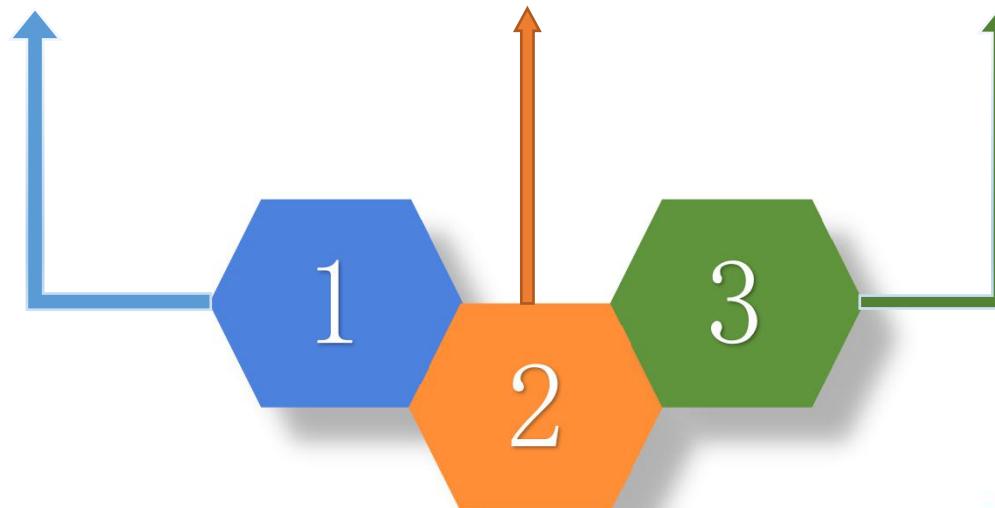


Yahboom Building:bit blocks

No.2 Tank car

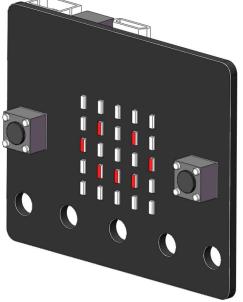
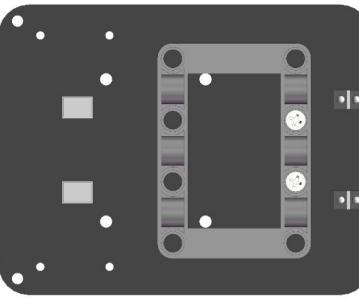
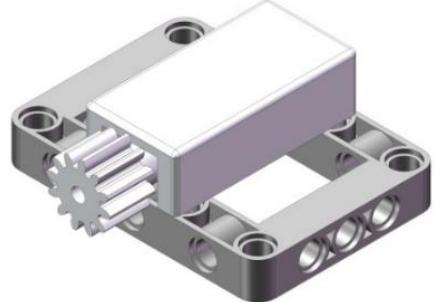
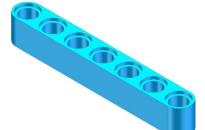
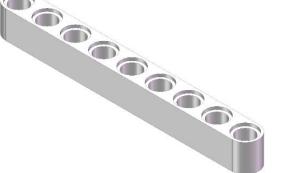
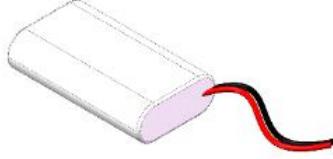
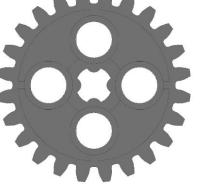
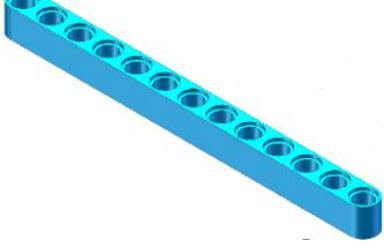


DIY Thinking Creativity



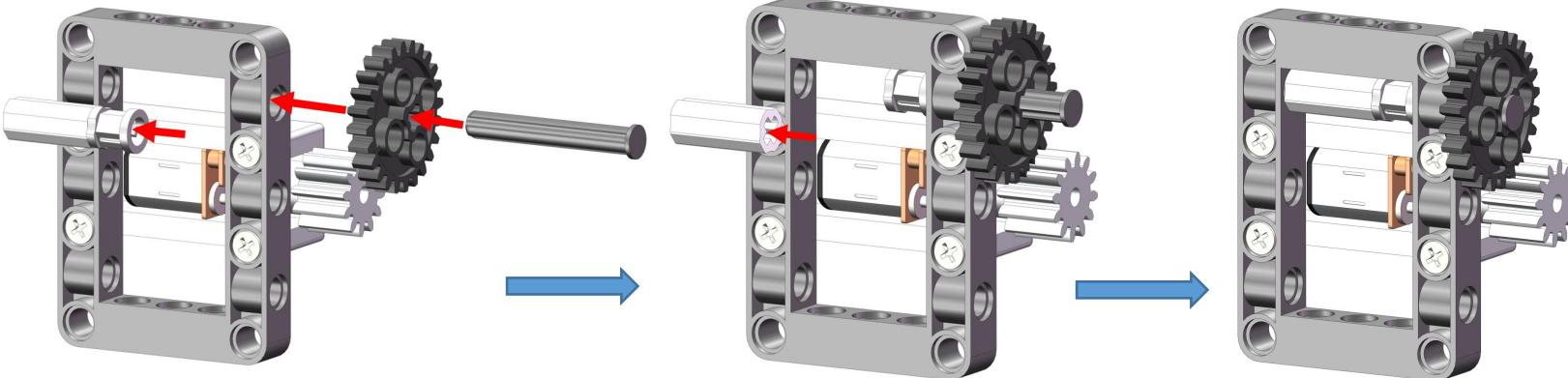
DIY: This section is mainly to teach you to assemble tank car with building blocks.

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

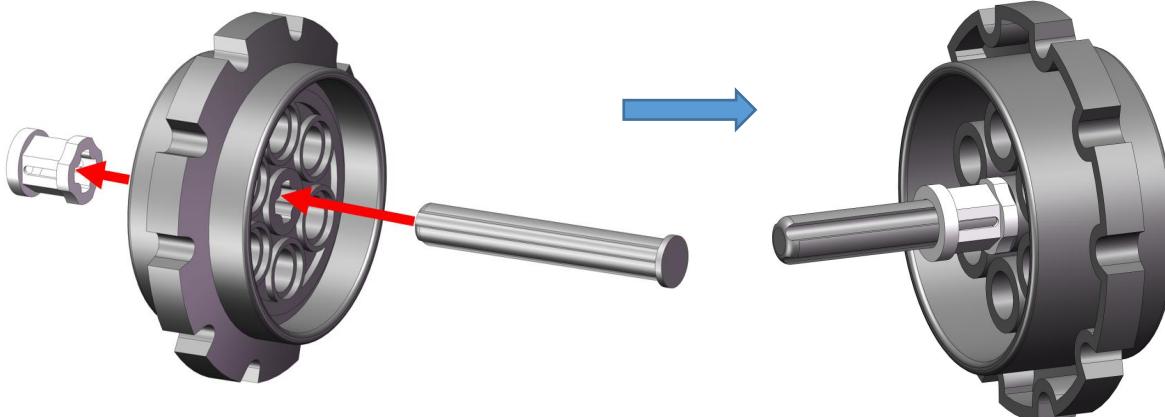
| | | | | |
|--|---|---|---|--|
|  Micro:bit *1 |  Micro:bit expansion board*1 |  Motor |  1x7 hole arm*2 |  3x3 Bolt connector *6 |
|  3x3 Bolt connector *2 |  1x9 hole arm*2 |  Battery*1 |  Plastic crawler*68 |  1x3 Shaft*8 |
|  24 toothed wheel*2 |  1x11 hole arm*2 |  1x13 hole arm*3 |  1x1 Bushing*16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



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.

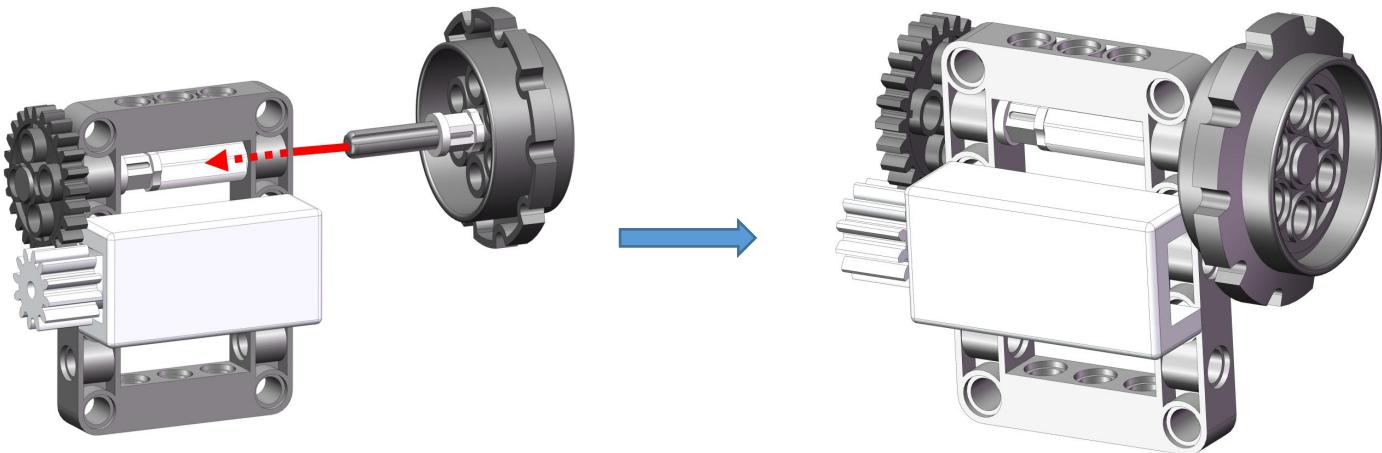


Step 2: Find a 1*4 shaft cutoff, a bushing and a crawler wheel. Pass the 1*4 shaft cutoff through the middle hole of the crawler wheel and bushing.

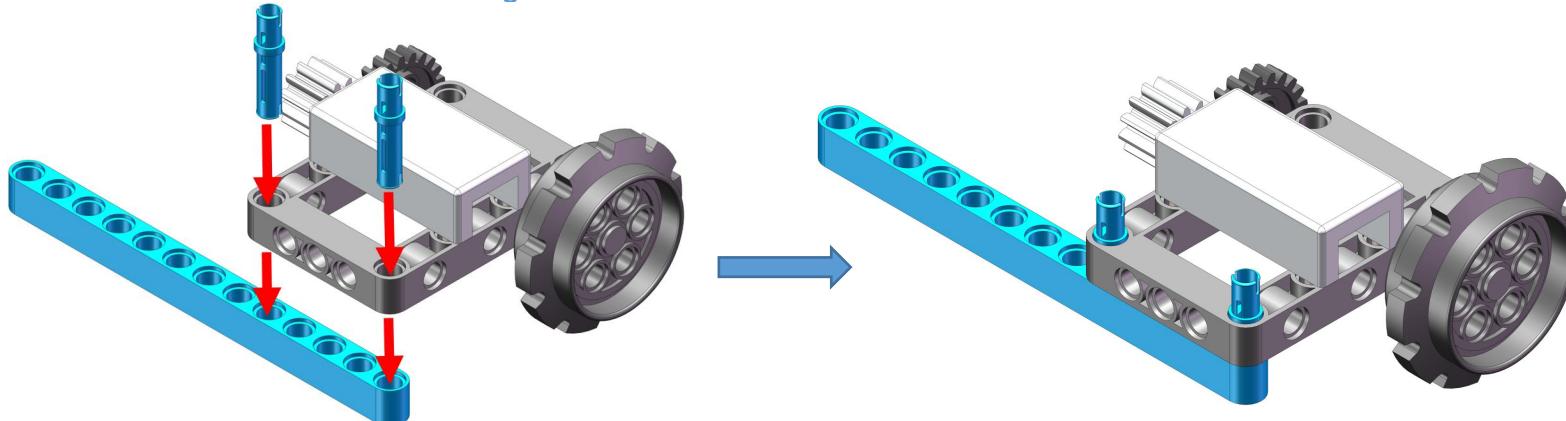


Tip: We need to use two such bricks in the later installation, so we need to repeat the first and second steps to assemble two such bricks again.

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.

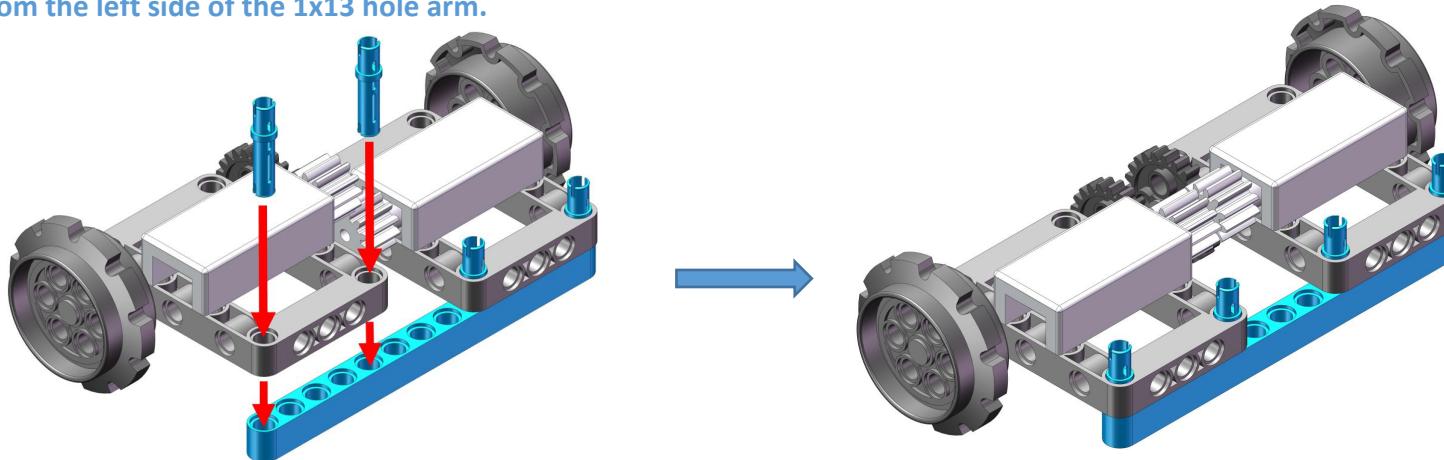


Step 4: Locate the two 1x3 bolts and the 1x13 hole arm. Insert the two 1x3 bolts into the corresponding hole positions of the motor module and the 1st and 5th holes from the right side of the 1x13 hole arm.

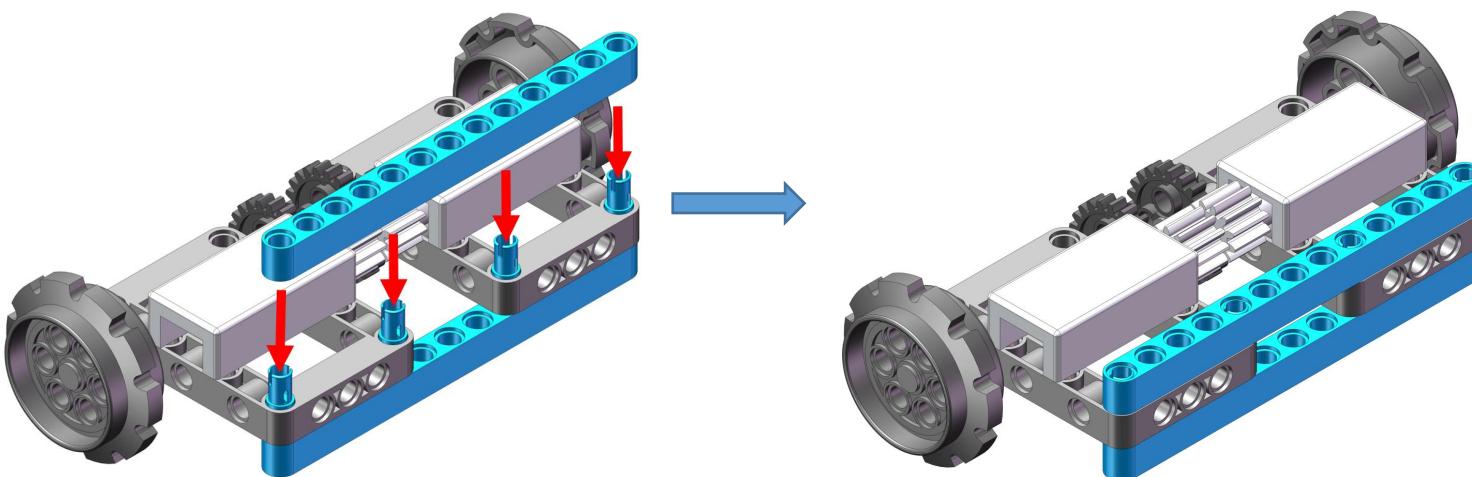




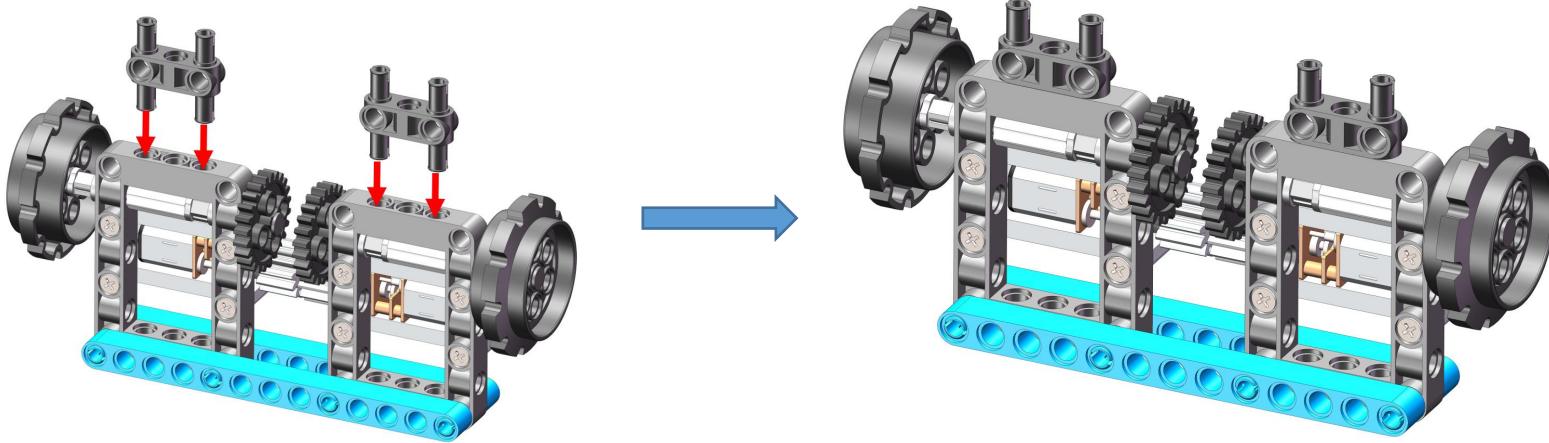
Step 5: Find two 1x3 bolts, insert the two 1x3 bolts into the corresponding hole positions of the motor module and the 1st and 5th holes from the left side of the 1x13 hole arm.



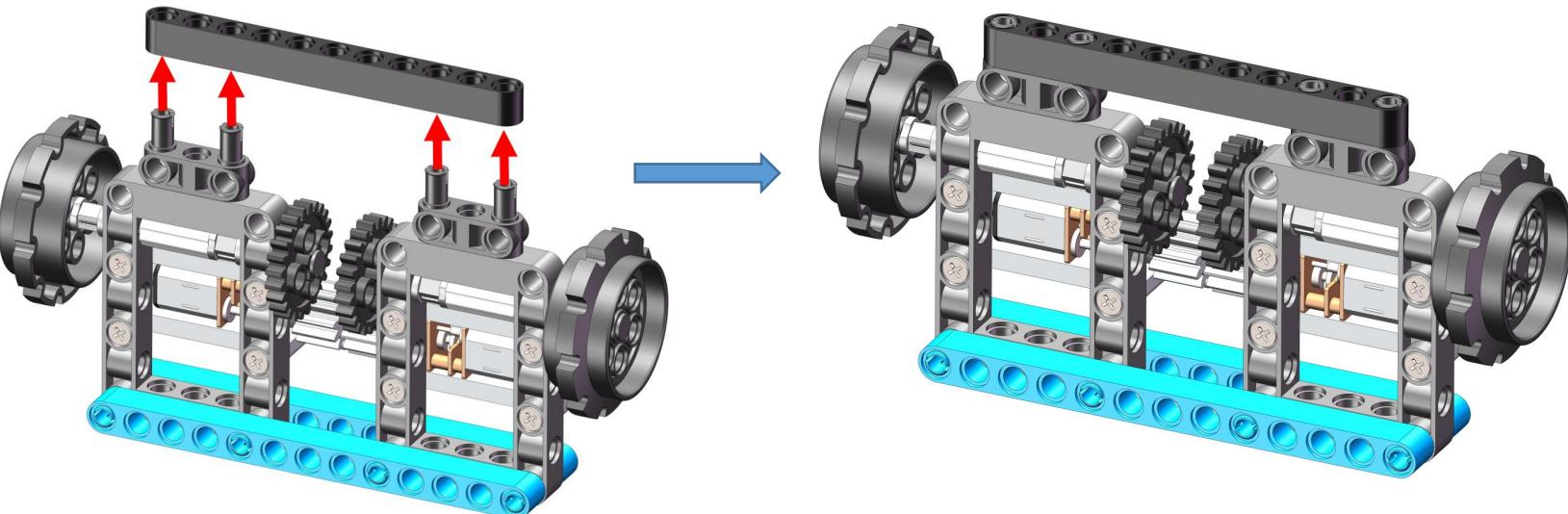
Step 6: Locate a 1x13 hole arm and insert the four 1x3 pins into the holes 1, 5, 9, and 13 of the hole arm.



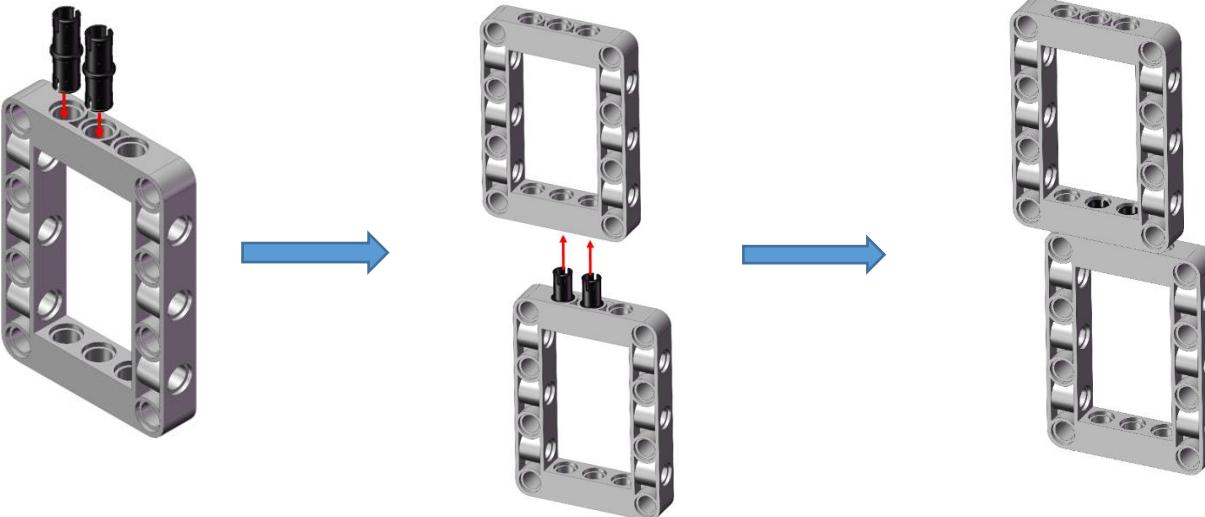
Step 7: Locate the two 3x3 pins and insert them into the corresponding holes on the side of the assembled motor module.



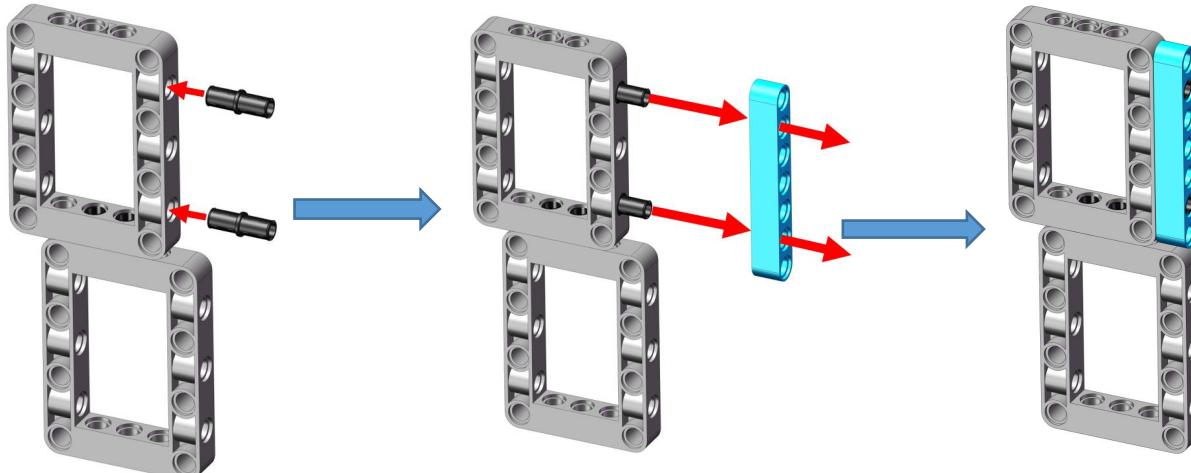
Step 8: Find a 1x11 hole arm and assemble it. When we got here, we completed the assembly of the gear part of the car.



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

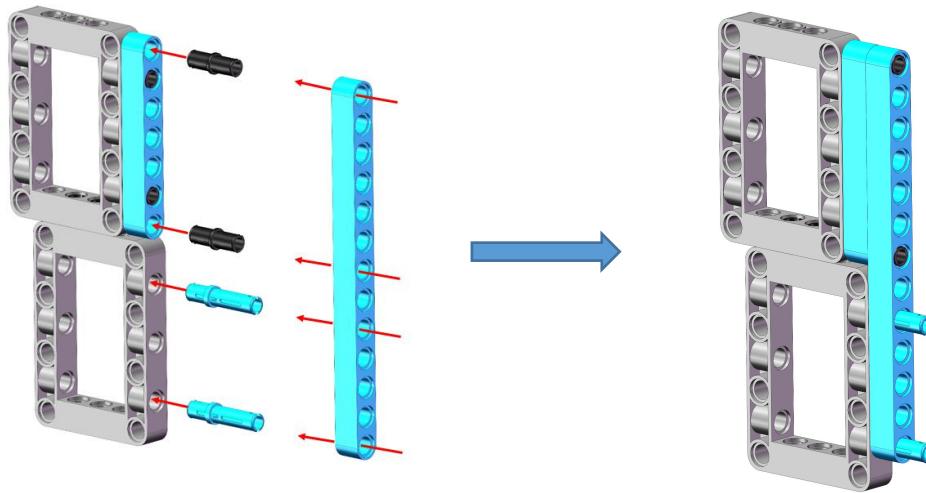


Step 10: Locate the two 1x2 friction pins and a 1x7 hole arm and assemble them.

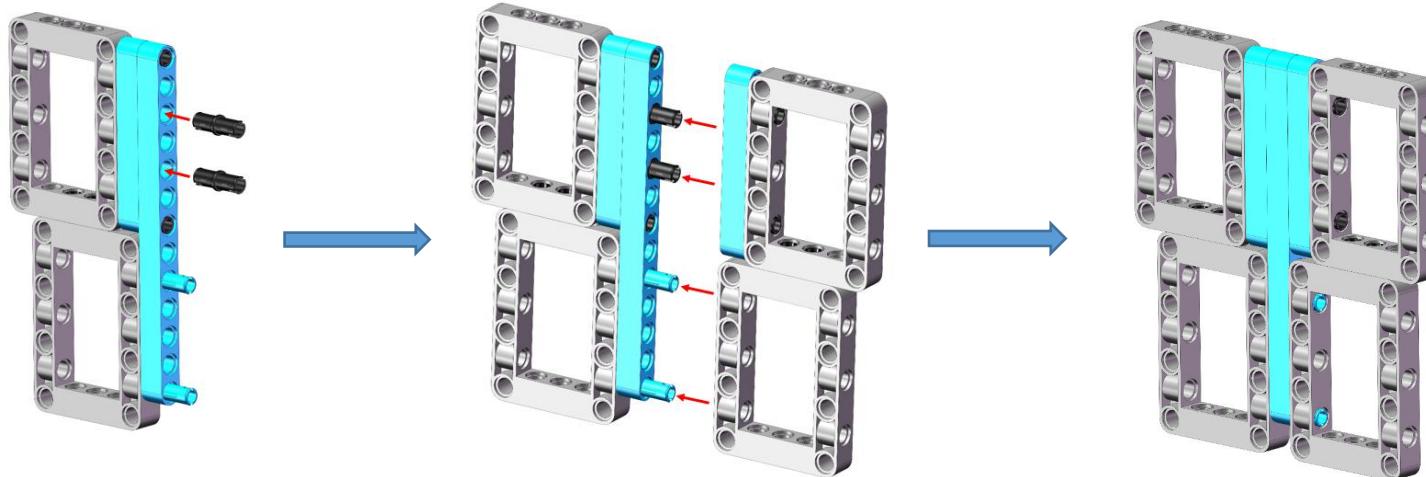


Tip: We need two such parts, so we need to repeat steps 6 and 7 to assemble the same part and proceed to the next step.

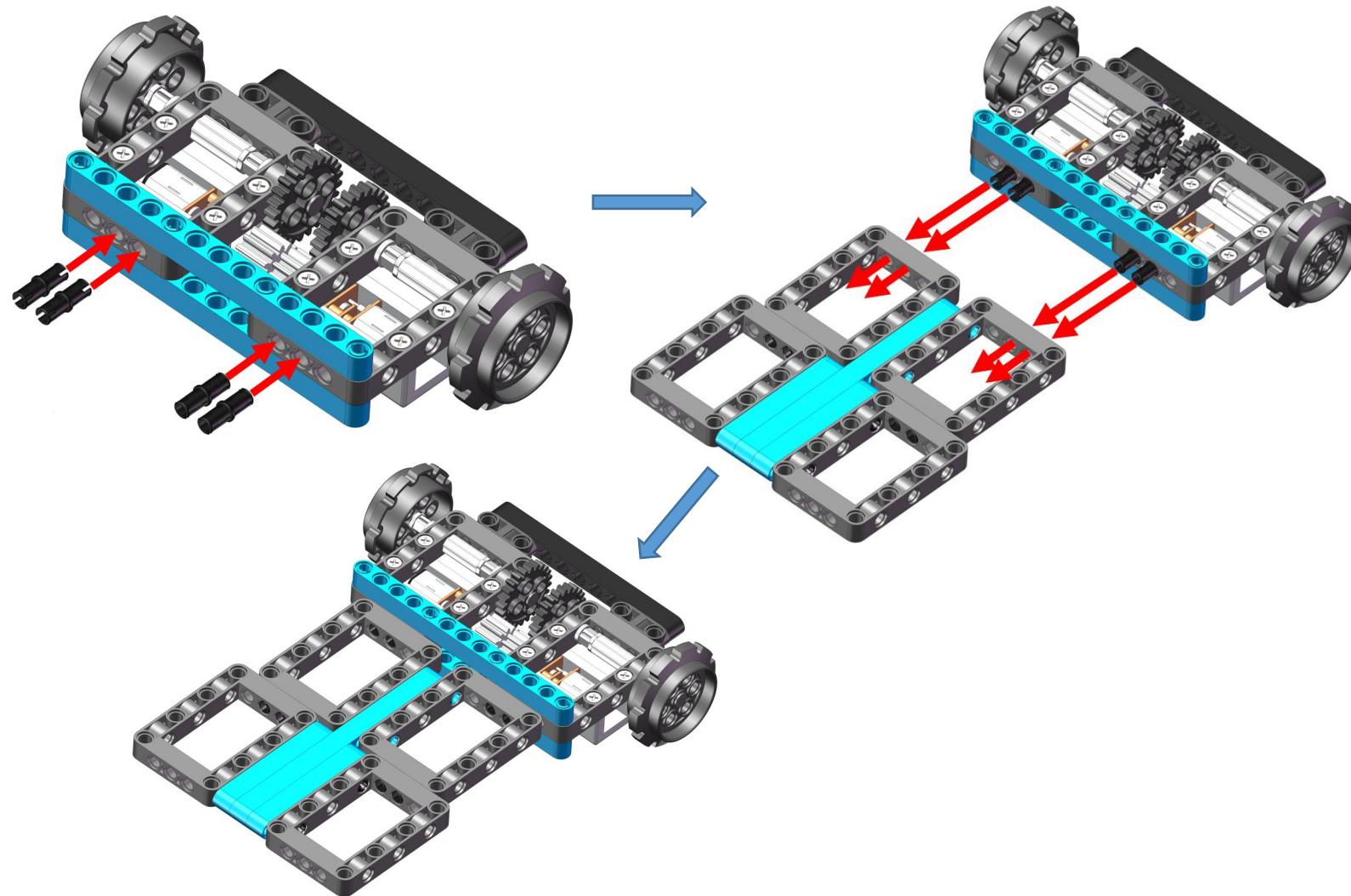
Step 11: Find two 1x2 friction pins, two 1x3 bolts and 1x13 hole arms and assemble them.



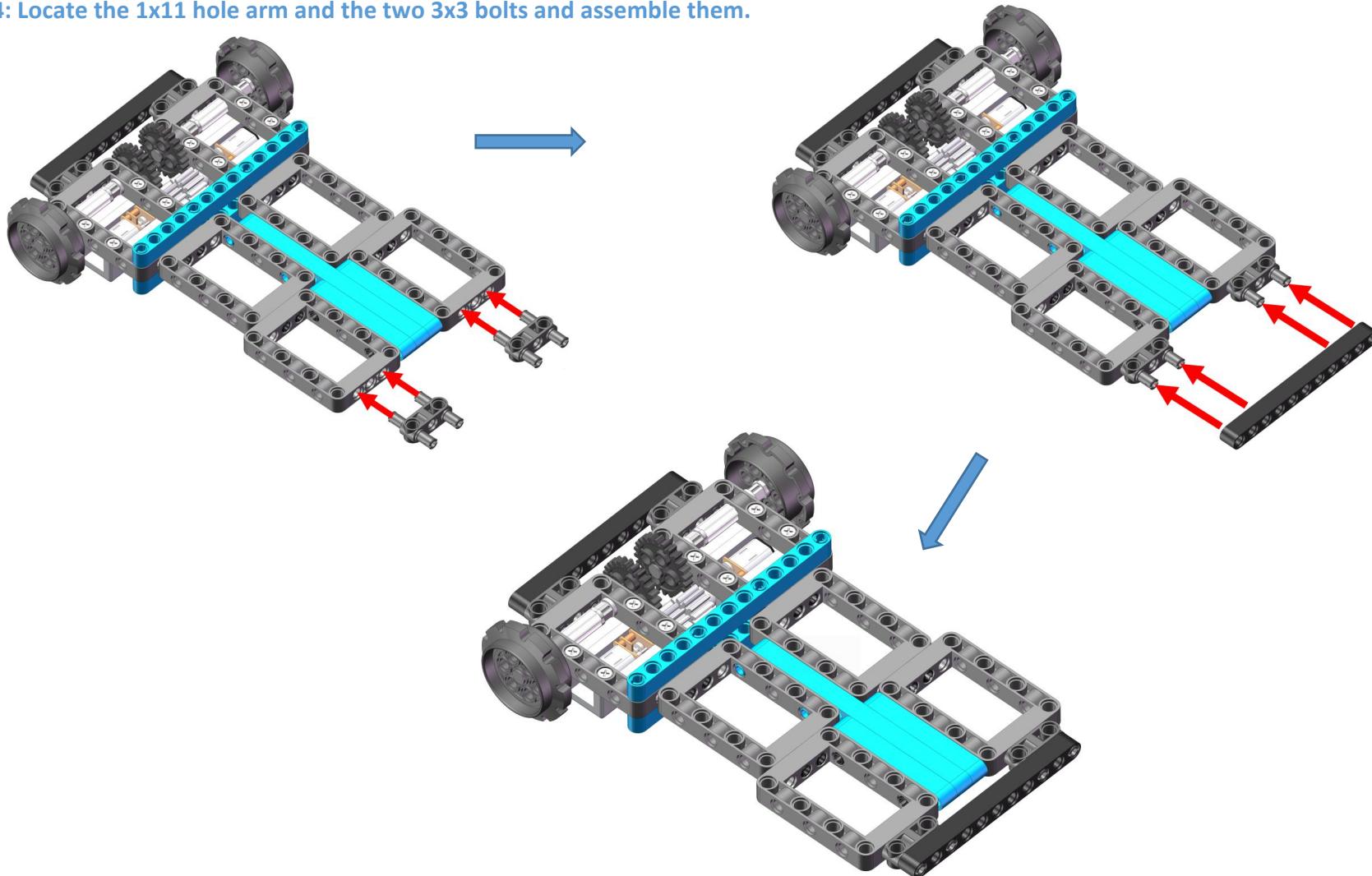
Step 12: Locate two 1x2 friction pins through which the two previously assembled bracket sections are combined.



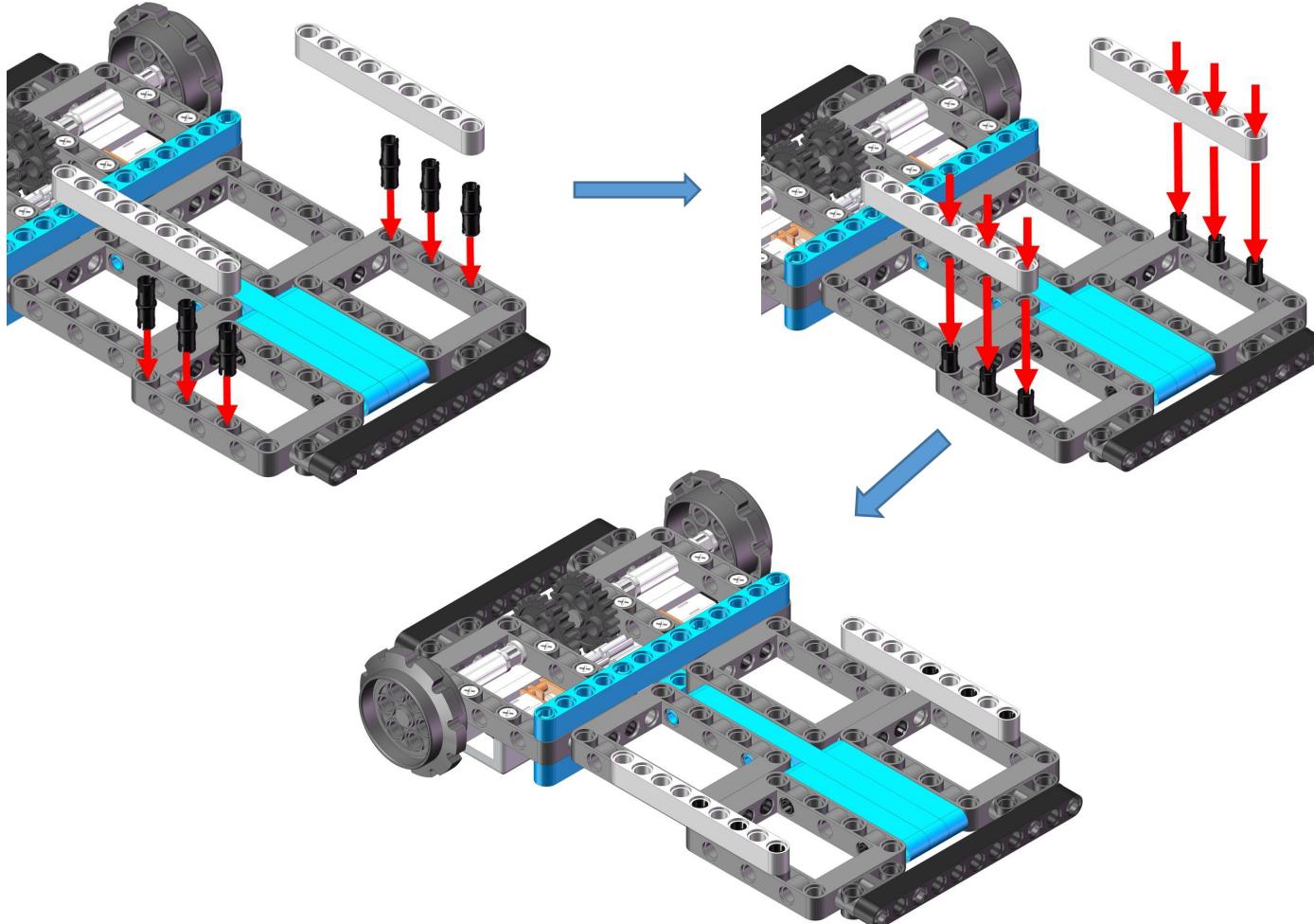
Step 13: Find four 1x2 friction pins and connect the assembled motor gear sections of step 8 and the assembled blocks in step 12.



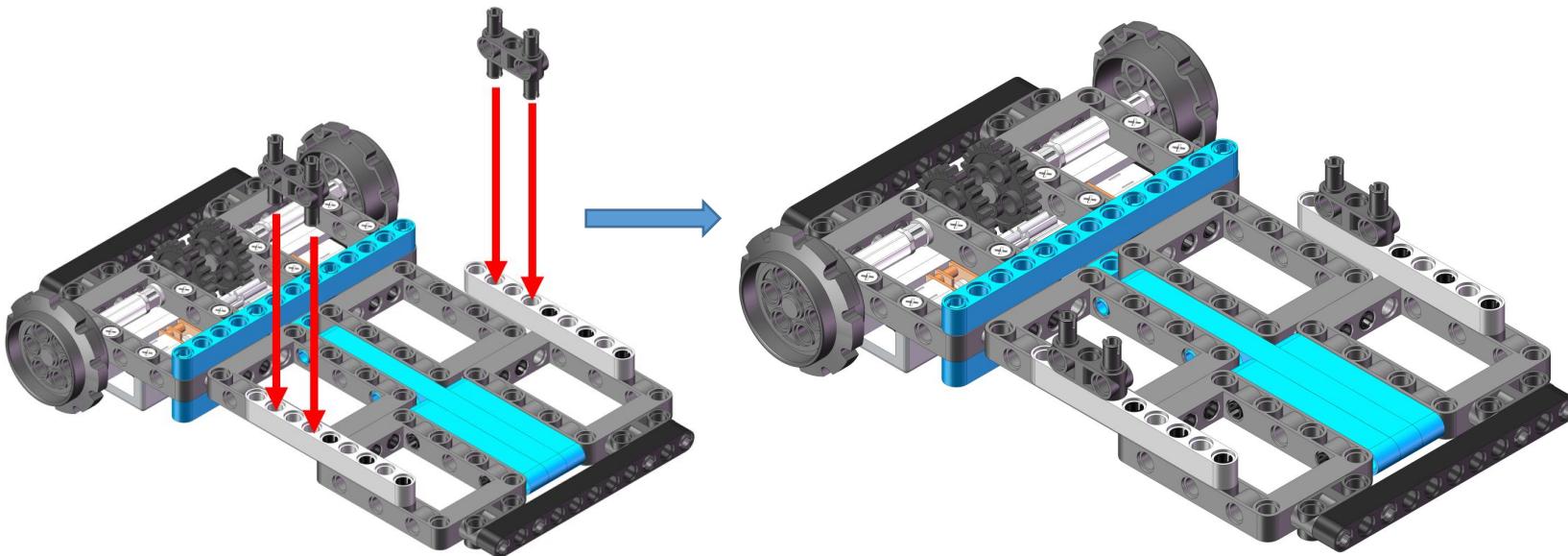
Step 14: Locate the 1x11 hole arm and the two 3x3 bolts and assemble them.



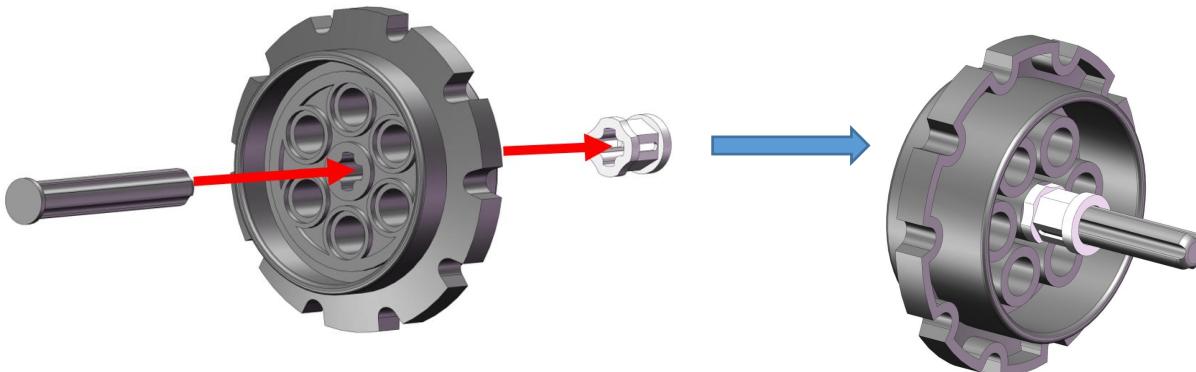
Step 15: Locate the six 1x2 friction pins and the two 1x9 hole arms and assemble them. The friction pins are inserted into the holes No. 1, 3, and 5 of the hole arms.



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



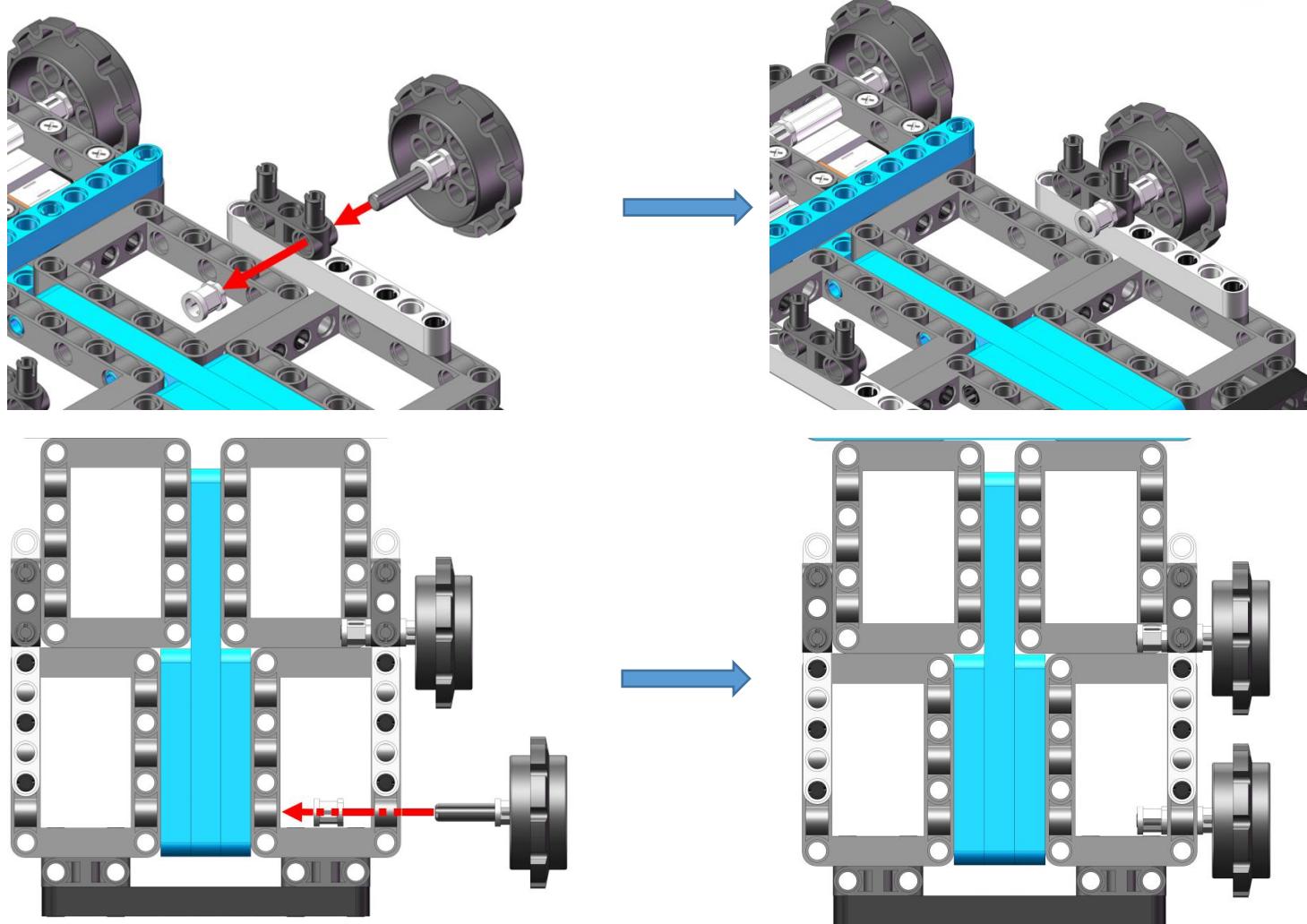
Step 17: Find a crawler wheel, a bushing, and a 1*4 shaft cutoff for assembly.



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

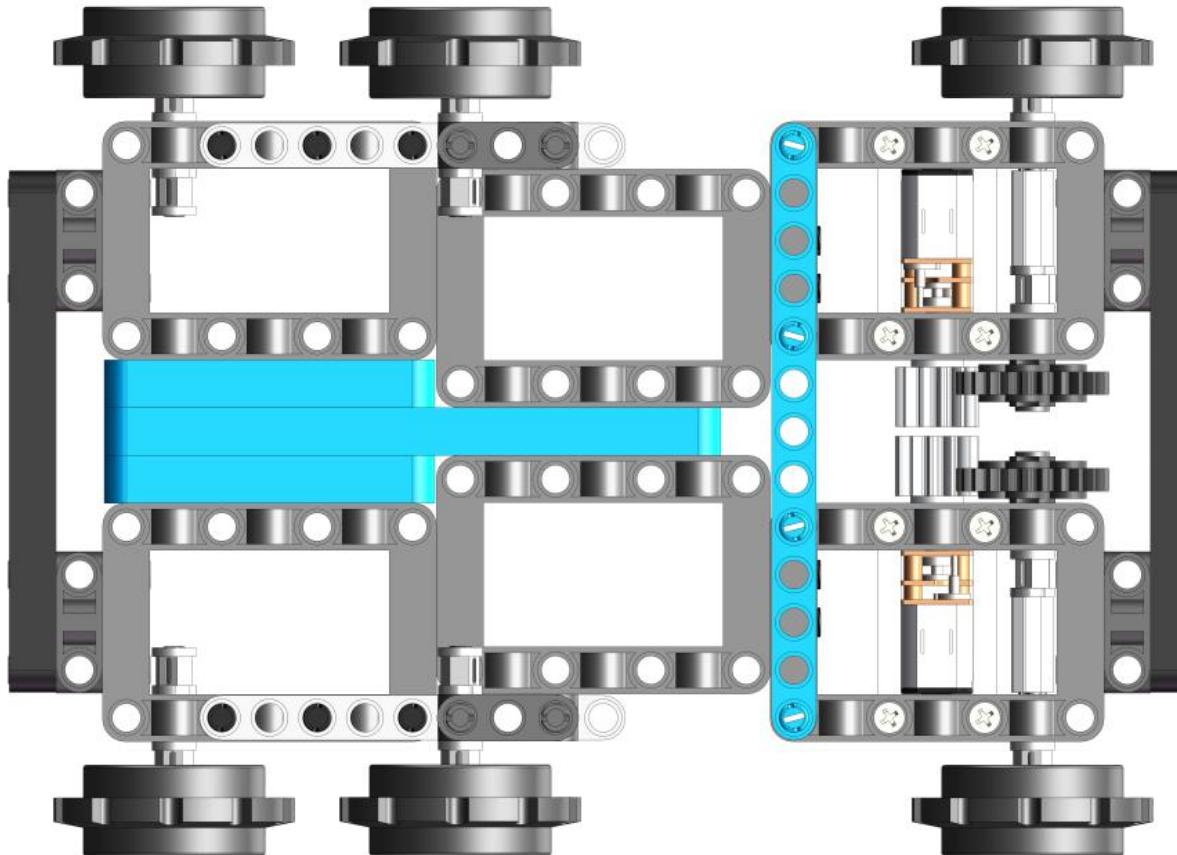


Step 18: Using the bushings, combine the four tracked wheels that we have assembled in the previous one onto the overall frame of the tank.



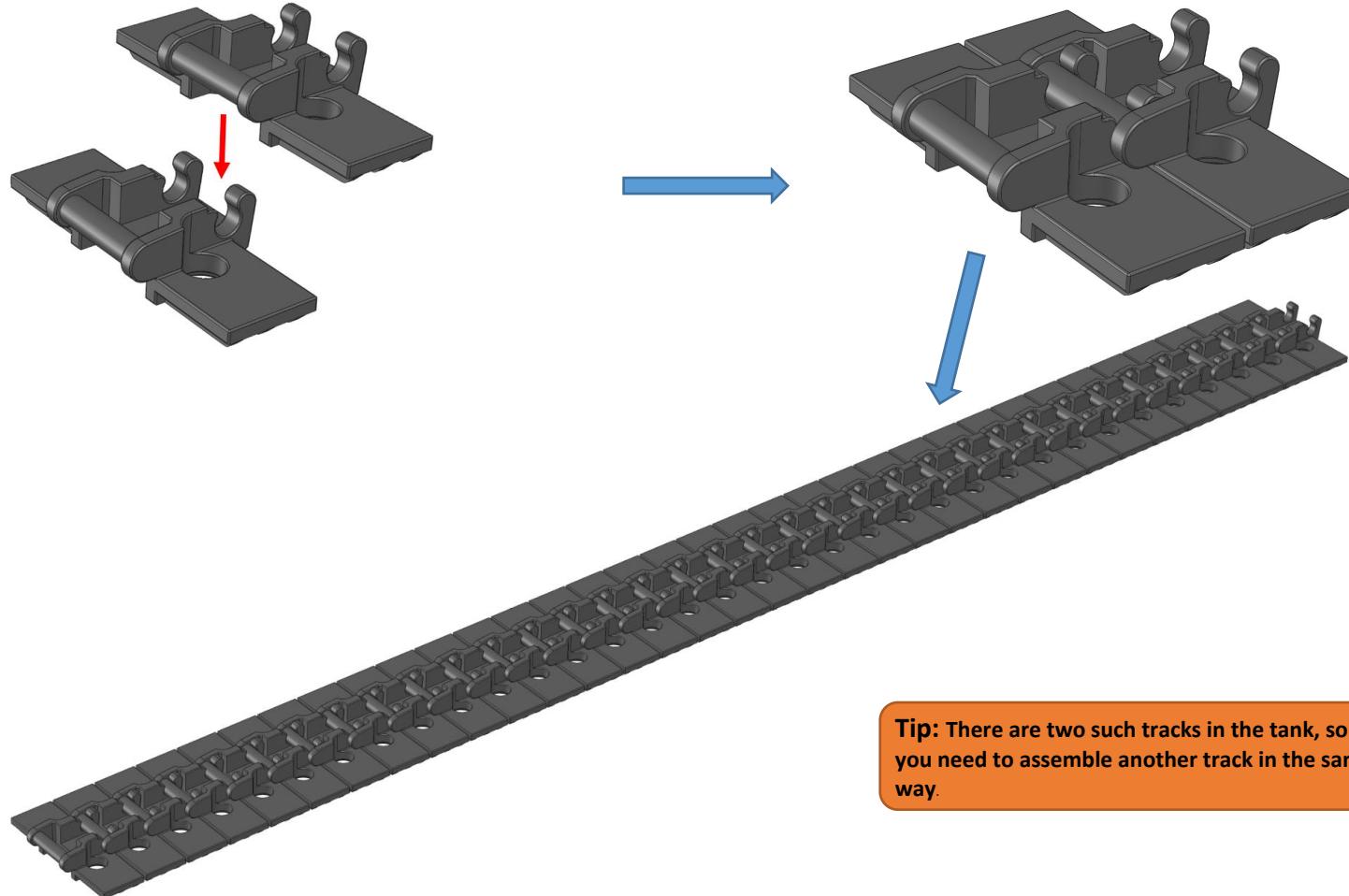


Step 19: The two crawler wheels on the other side of the tank are assembled in the same way. After the assembly is completed, the following figure is shown.



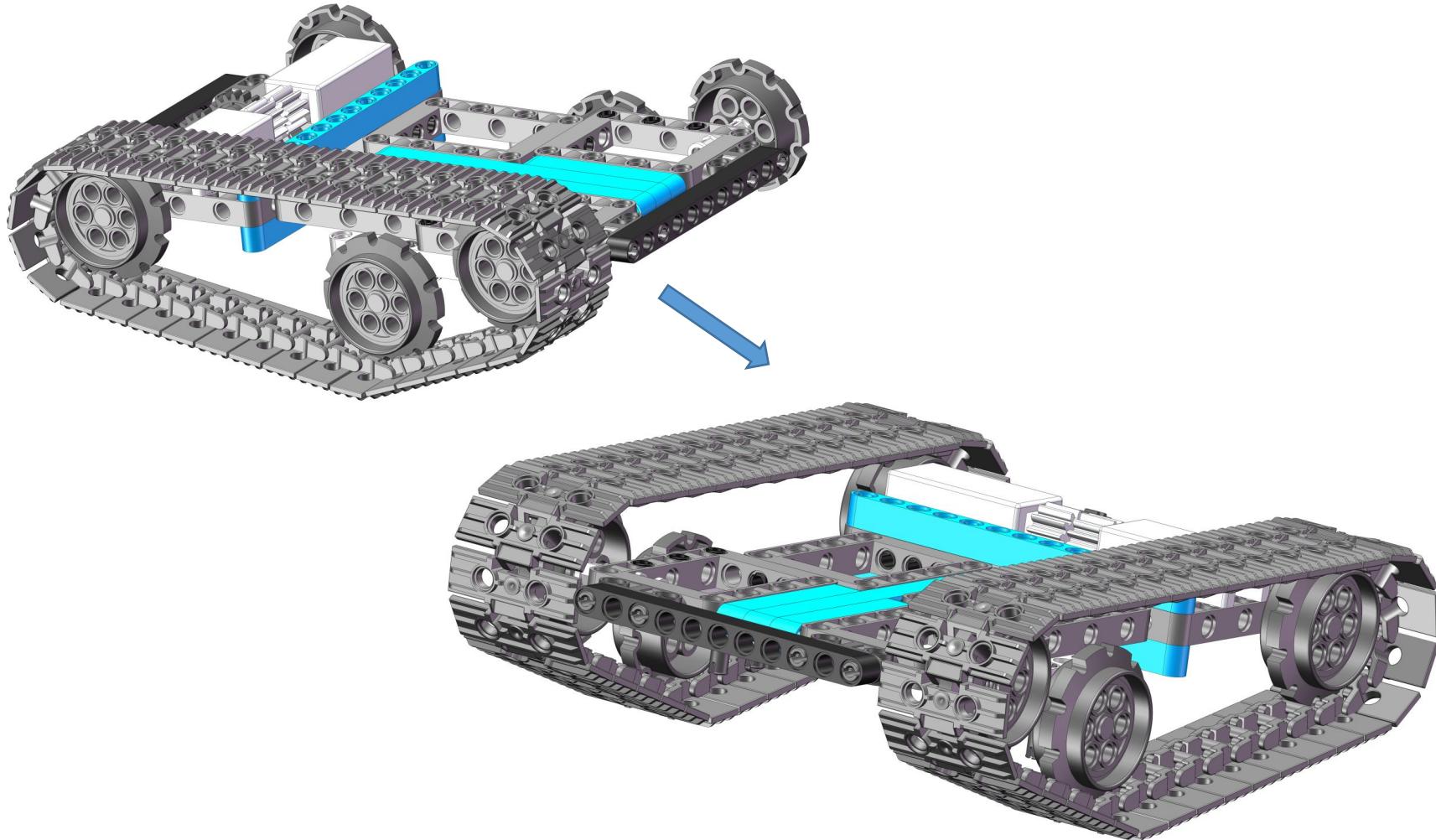


Step 20: Find plastic tracks, and each stitched together to form a track. Each track requires 34 plastic tracks to be spliced together.

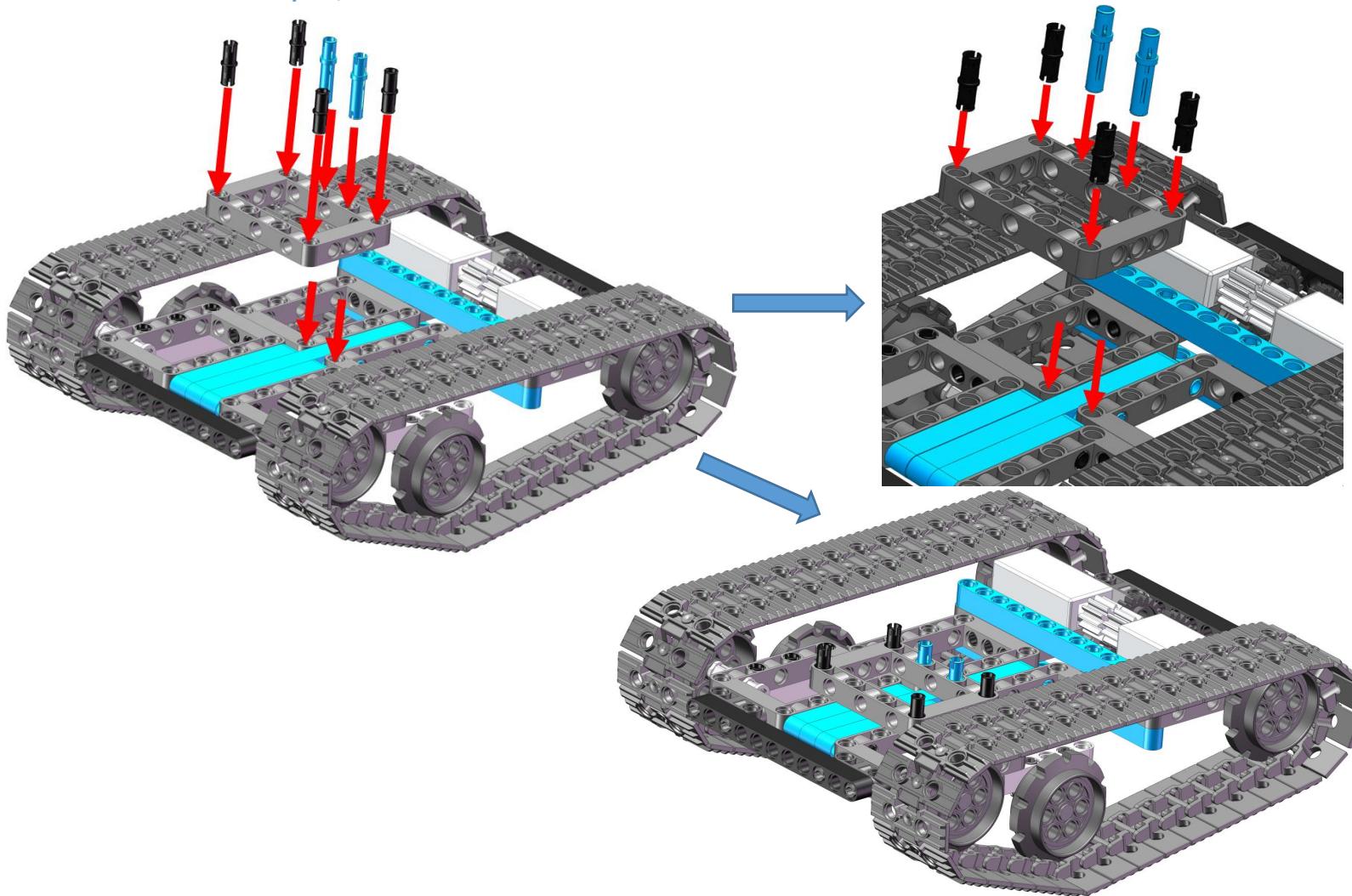


Tip: There are two such tracks in the tank, so you need to assemble another track in the same way.

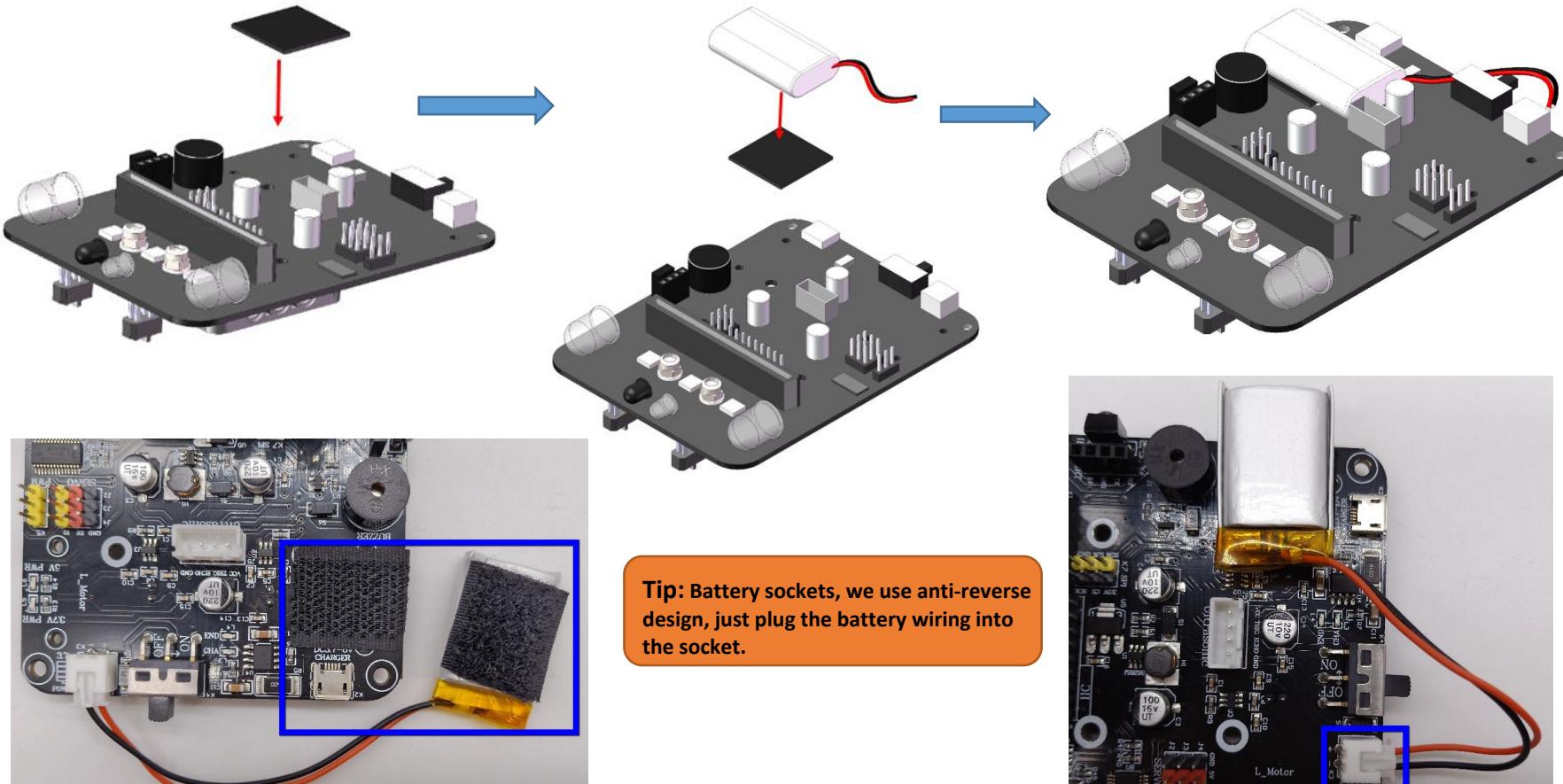
Step 21: Install the track correctly on the wheel of the tank.



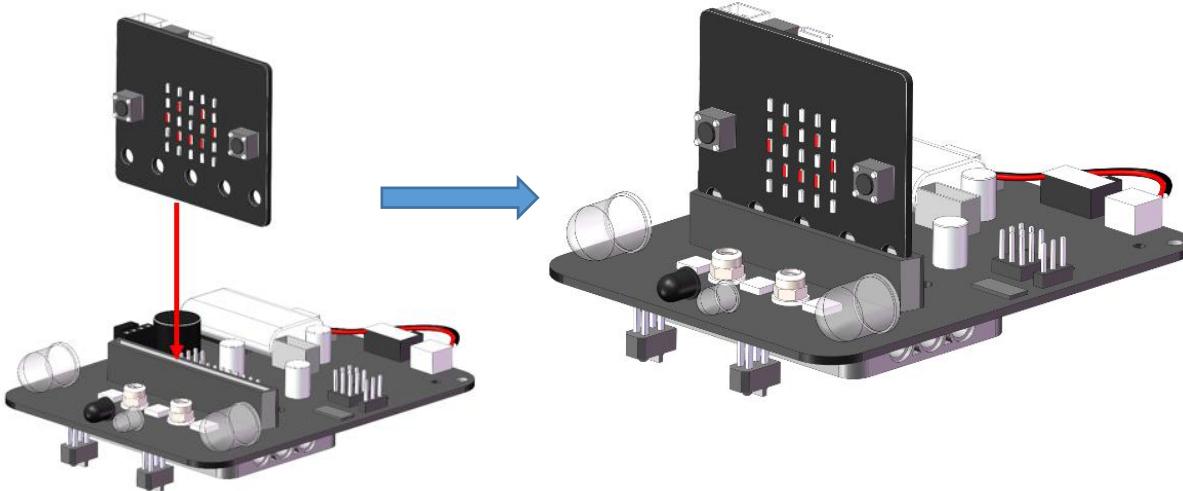
Step 22: Find four 1x2 friction pins, two 1x3 bolts and a 5x7 frame beam to assemble it onto the frame.



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.



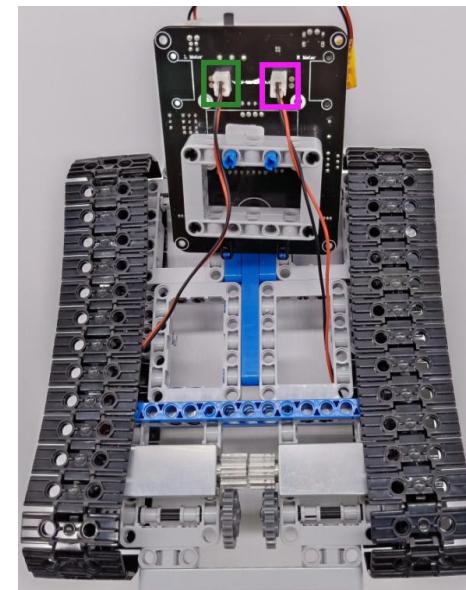
Step 24: Locate the micro:bit board and insert the board into the expansion board correctly.



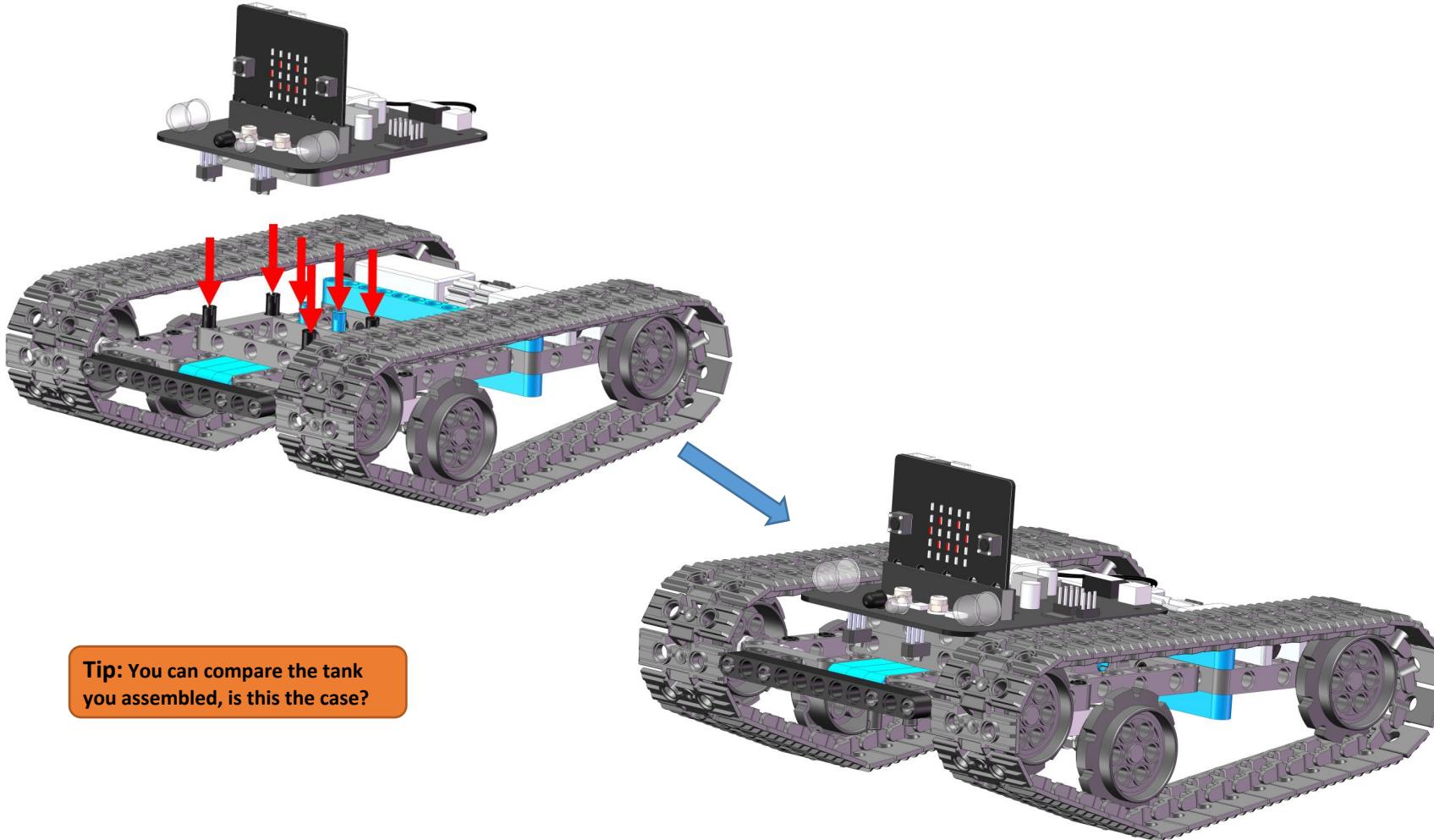
Tip: The micro:bit board is equivalent to the "brain" of the car, so we need to make sure it is installed correctly. In this case, the tank car will work properly.

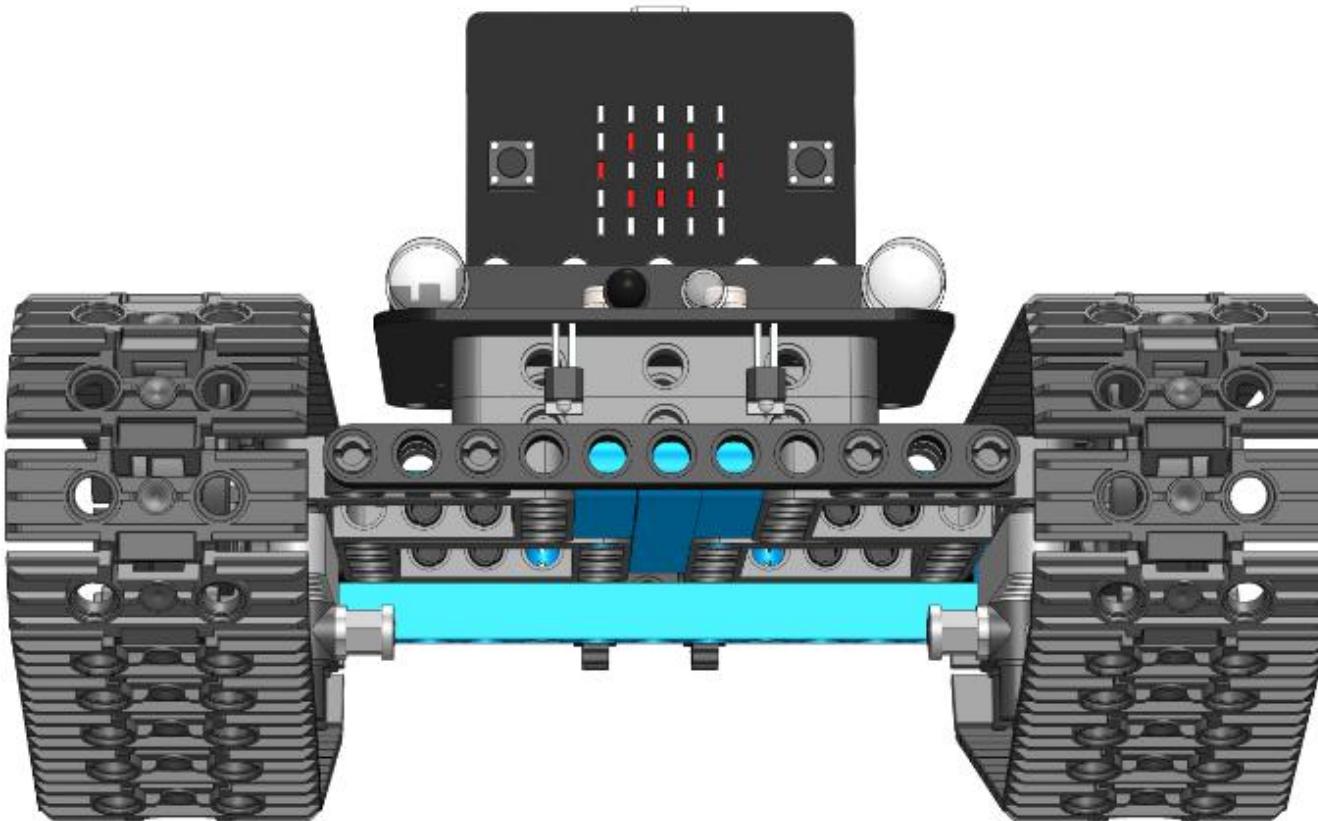
Step 25: Connect the wiring of the two motors correctly to the micro:bit expansion board, and then assemble the expansion board.

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.



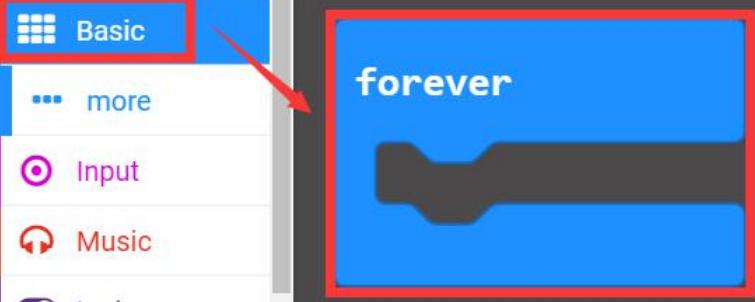


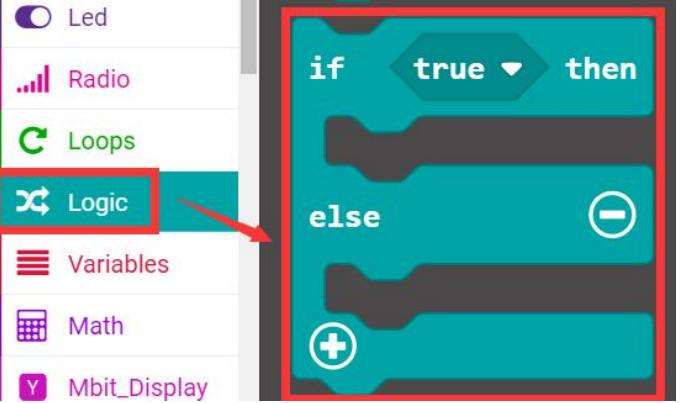
Thinking: This session is mainly to teach you how to use graphical programming to control the tank.

Preparation

- USB cable *1
- Tank car *1

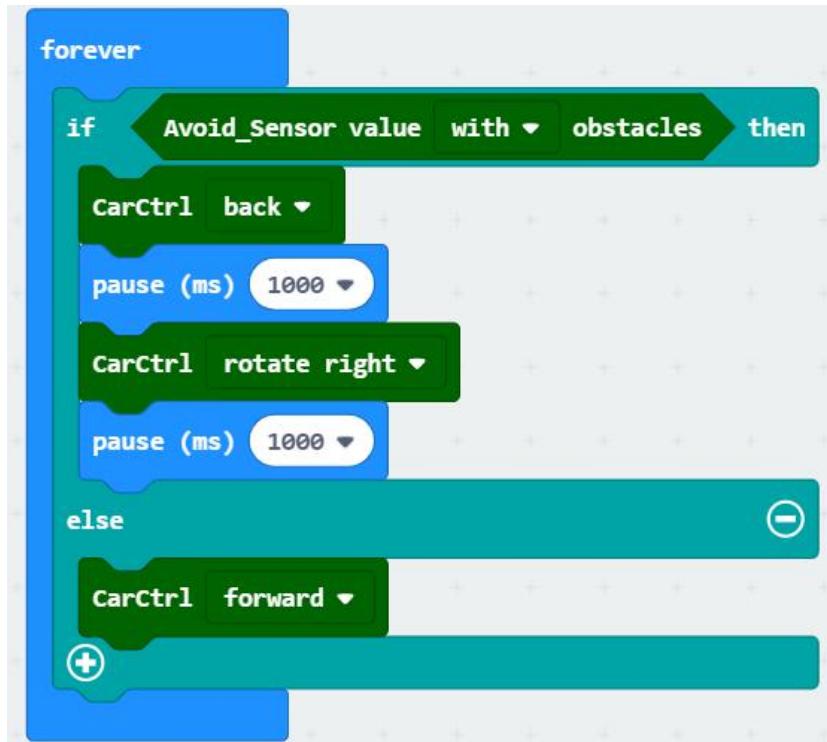
Blocks

| 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 |
|--|--|
|  <p>A Scratch script showing a logic if-else block. The script consists of two blocks: an 'if true then' block containing a 'forward 10 steps' block, and an 'else' block containing a 'stop' block.</p> | <p>If true then execute. If it is false, it will not be executed.</p> |
|  <p>A Scratch script showing an 'Avoid_Sensor value with obstacles' block. This block is triggered by an infrared sensor (Mbit_IR) and controls the robot's movement based on sensor values.</p> | <p>The infrared sensor detects if there is an obstacle in front.</p> |
|  <p>A Scratch script showing a 'CarCtrl forward' block. This block is triggered by a Mbit_Robot sensor and controls the car's motion state.</p> | <p>The car's motion state selection: forward, back, turn left , turn right , rotate left, rotate right and stop.</p> |

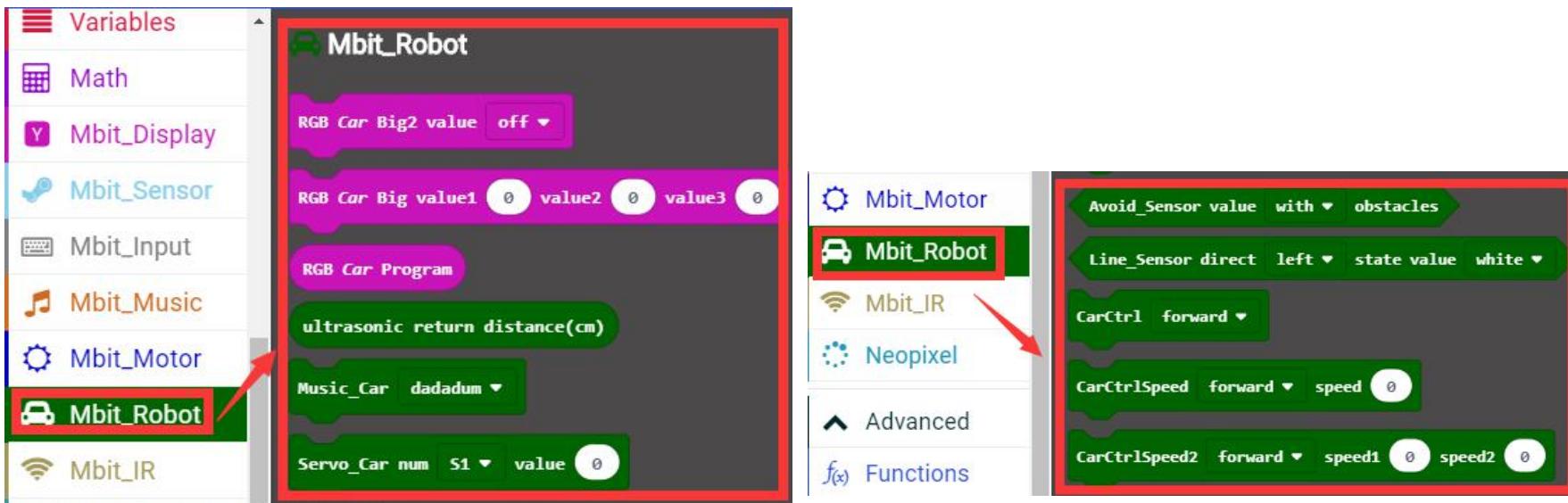
Programming

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