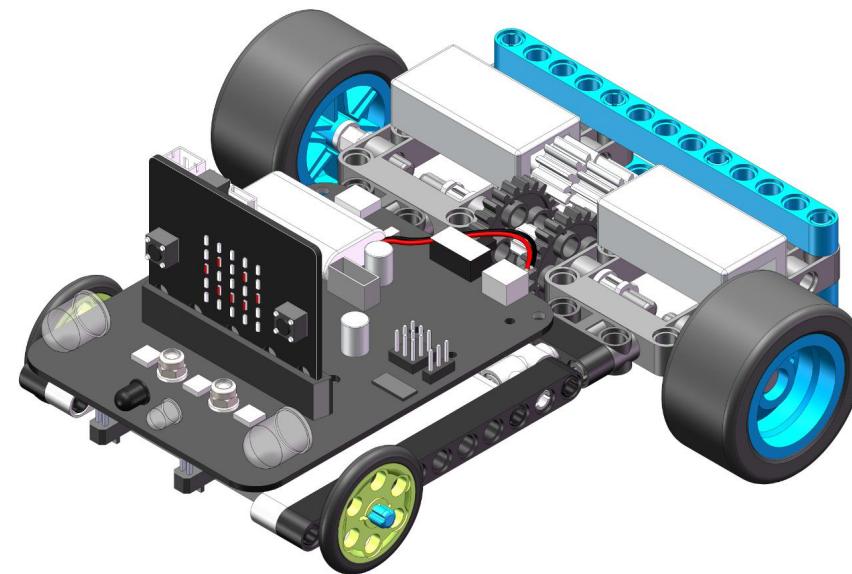
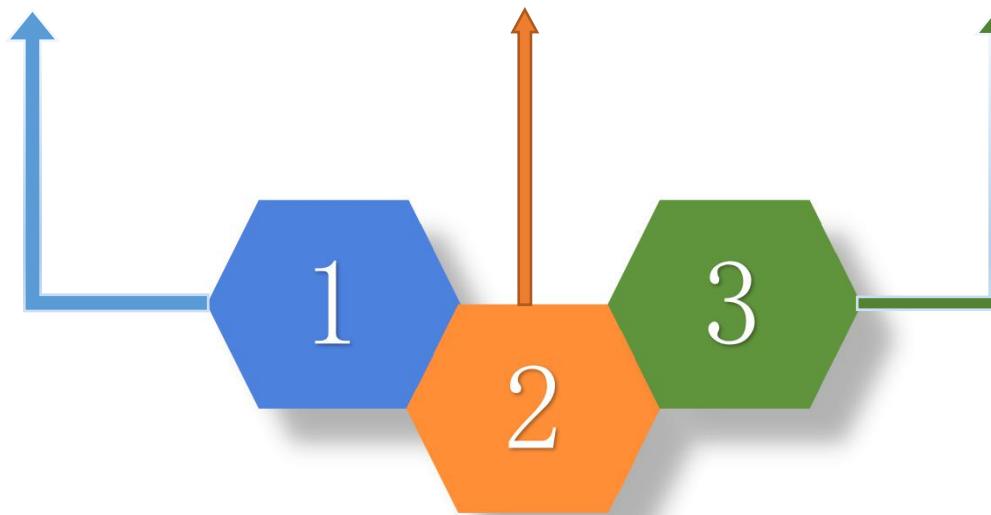


# Yahboom Building:bit blocks

## No.8 Following car



DIY      Thinking      Creativity





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

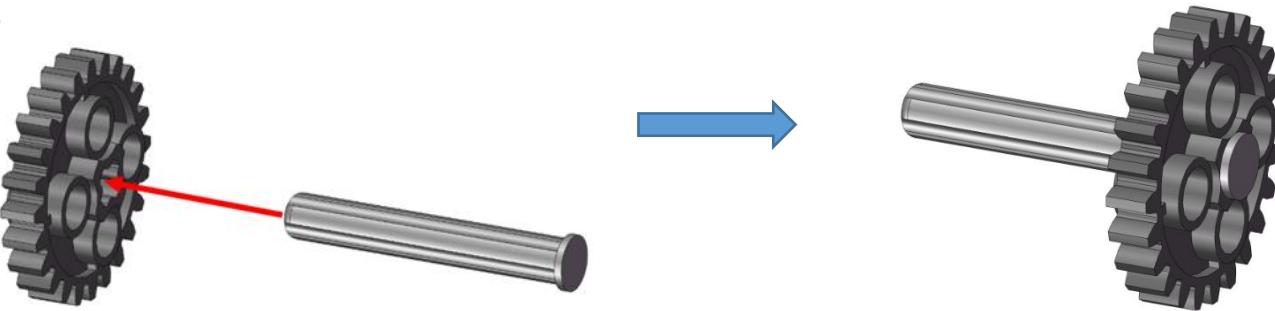
Prepare the following blocks and we will assemble a building block following car.



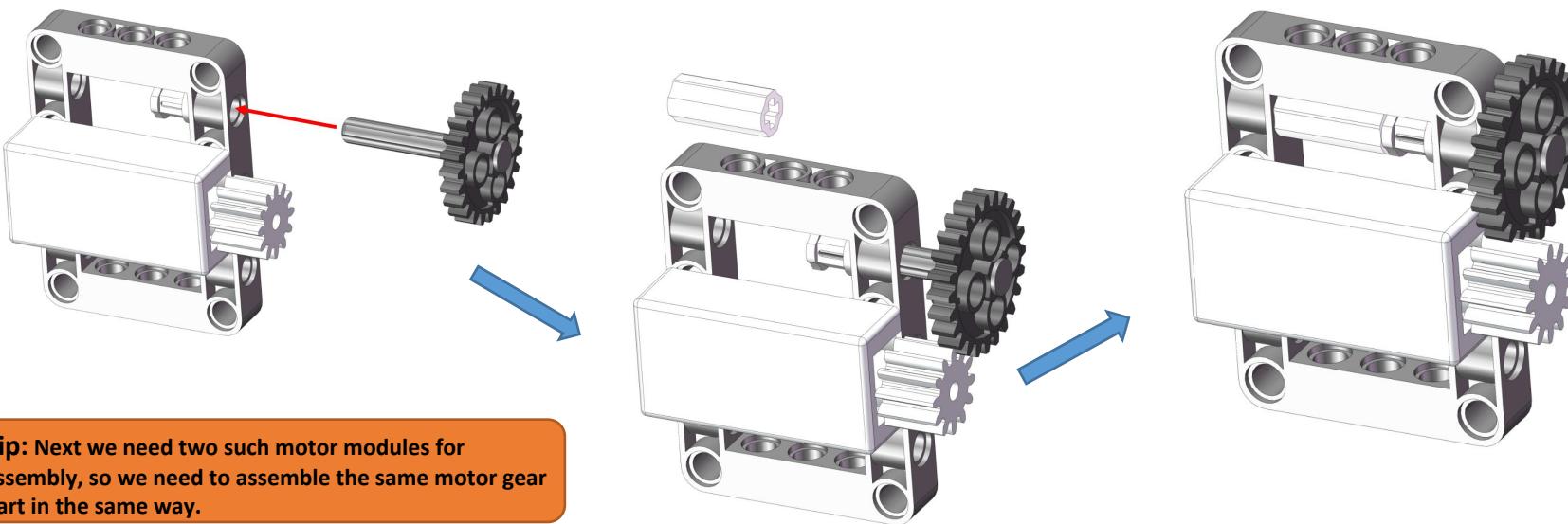
A black rectangular board with a central microcontroller chip and several pins and connectors around the edges.	A dark grey rectangular board with multiple circular holes and some internal components.	An open motor module showing a purple DC motor and its gear assembly.	A square frame made of grey beams with a central opening and four corner supports.	A black circular gear with 24 teeth.
A small white battery pack with a red and black cable.	A blue cylindrical connector piece.	A long blue beam with 13 circular holes along its length.	A long black beam with 11 circular holes along its length.	A long grey beam with 9 circular holes along its length.
A small silver cylindrical bushing.	A silver cylindrical connector piece.	A black cylindrical friction pin.	A blue cylindrical shaft.	A complex multi-hole connector piece.



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.

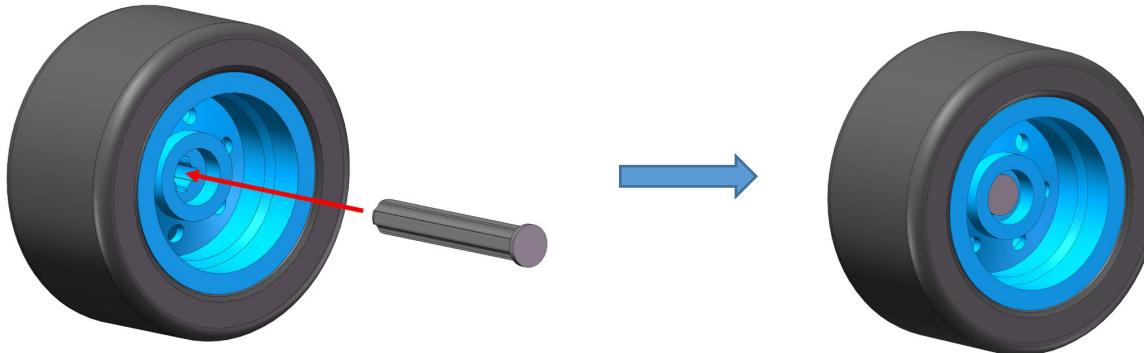


Step 2: Find a motor module, a 1x2 shaft connector and a bushing to complete the motor gear section installation.



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

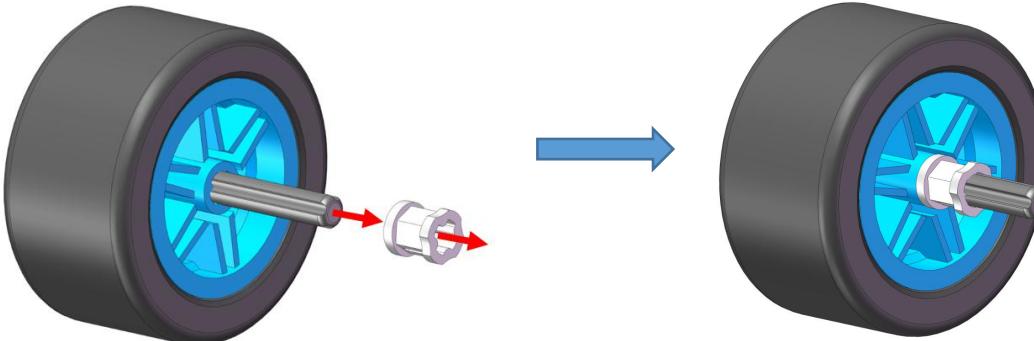
Step 3: Find a 43\*22mm wheel and a 1\*4 shaft cutoff, and pass the 1\*4 shaft cutoff through the middle of the wheel.



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

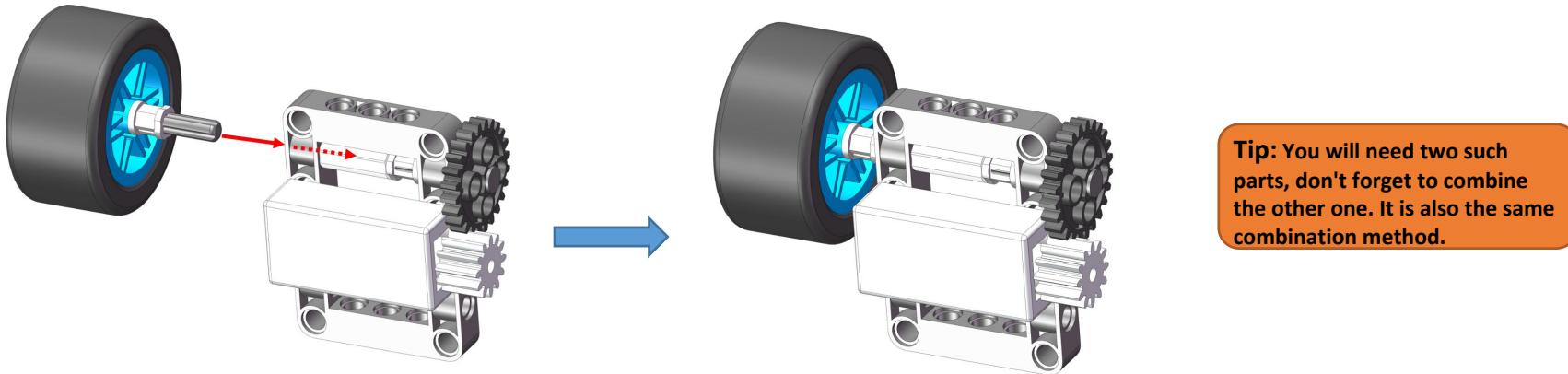
Step 4: Find a bushing and pass the assembled 1\*4 shaft cutoff from the middle of the bushing to complete the assembly of the wheel.

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



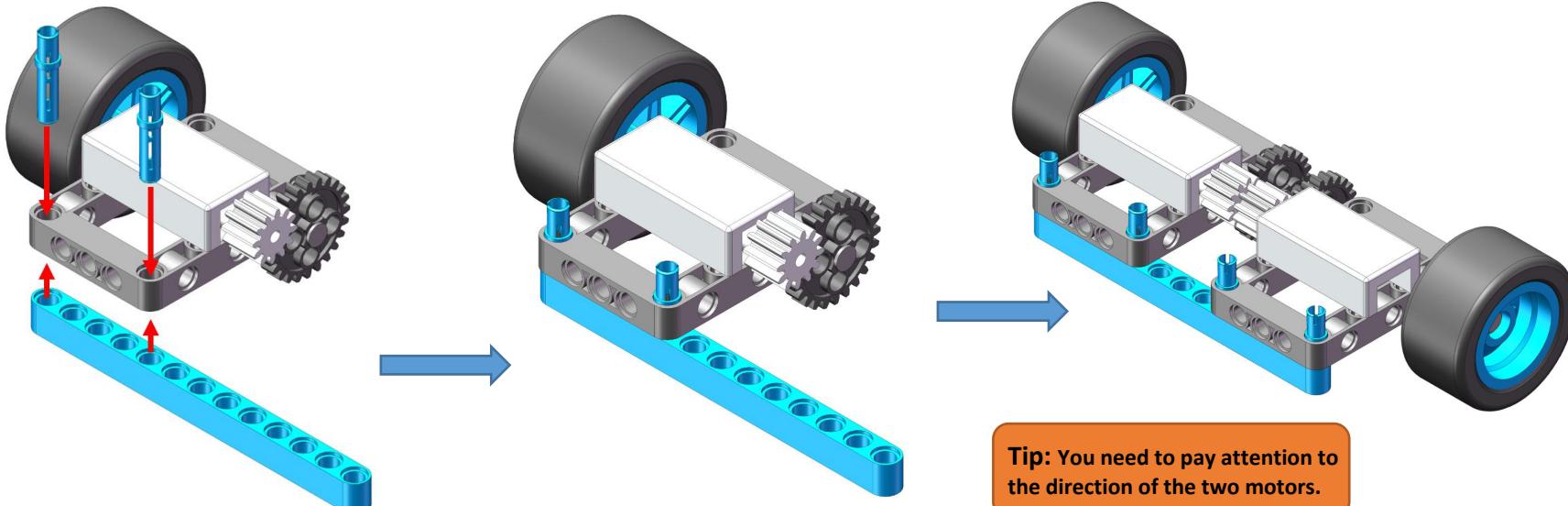
**Tip:** We need two such wheels to assemble, so we need to use the same method to assemble a identical wheel.

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



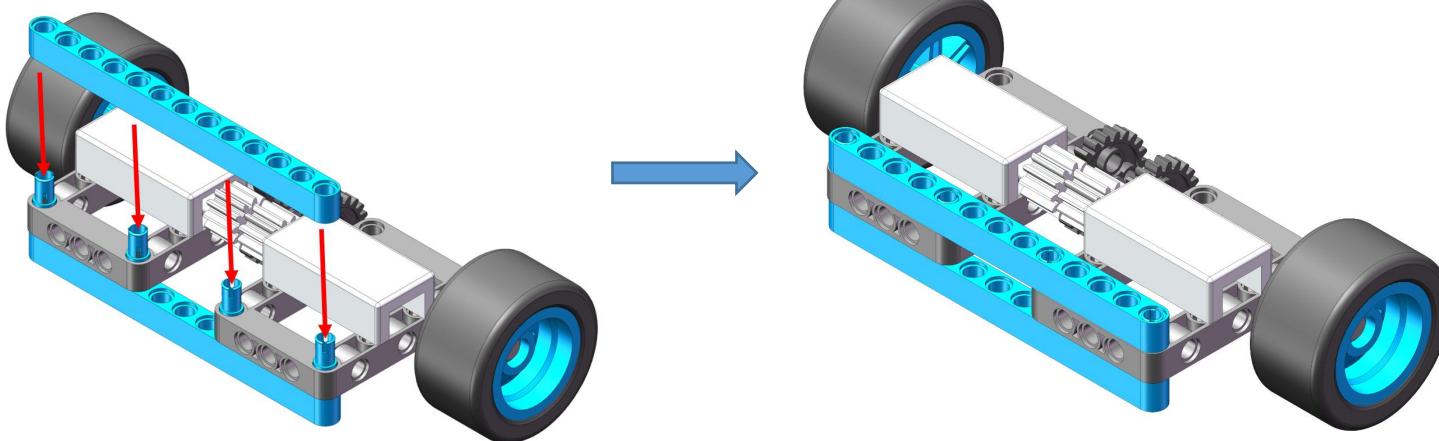
**Tip:** You will need two such parts, don't forget to combine the other one. It is also the same combination method.

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

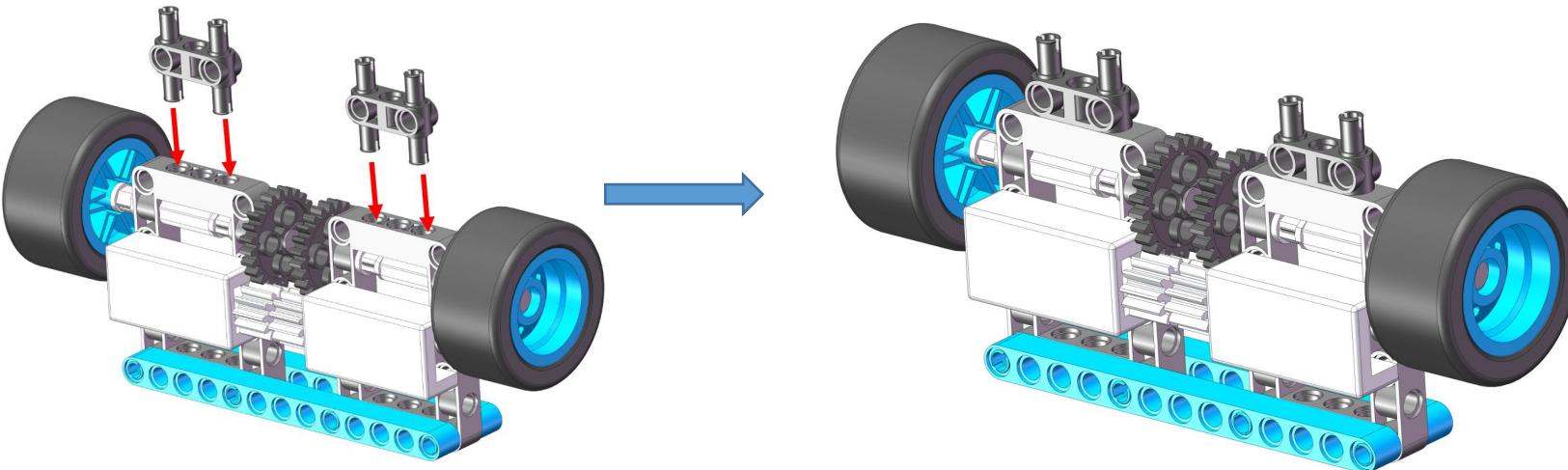


**Tip:** You need to pay attention to the direction of the two motors.

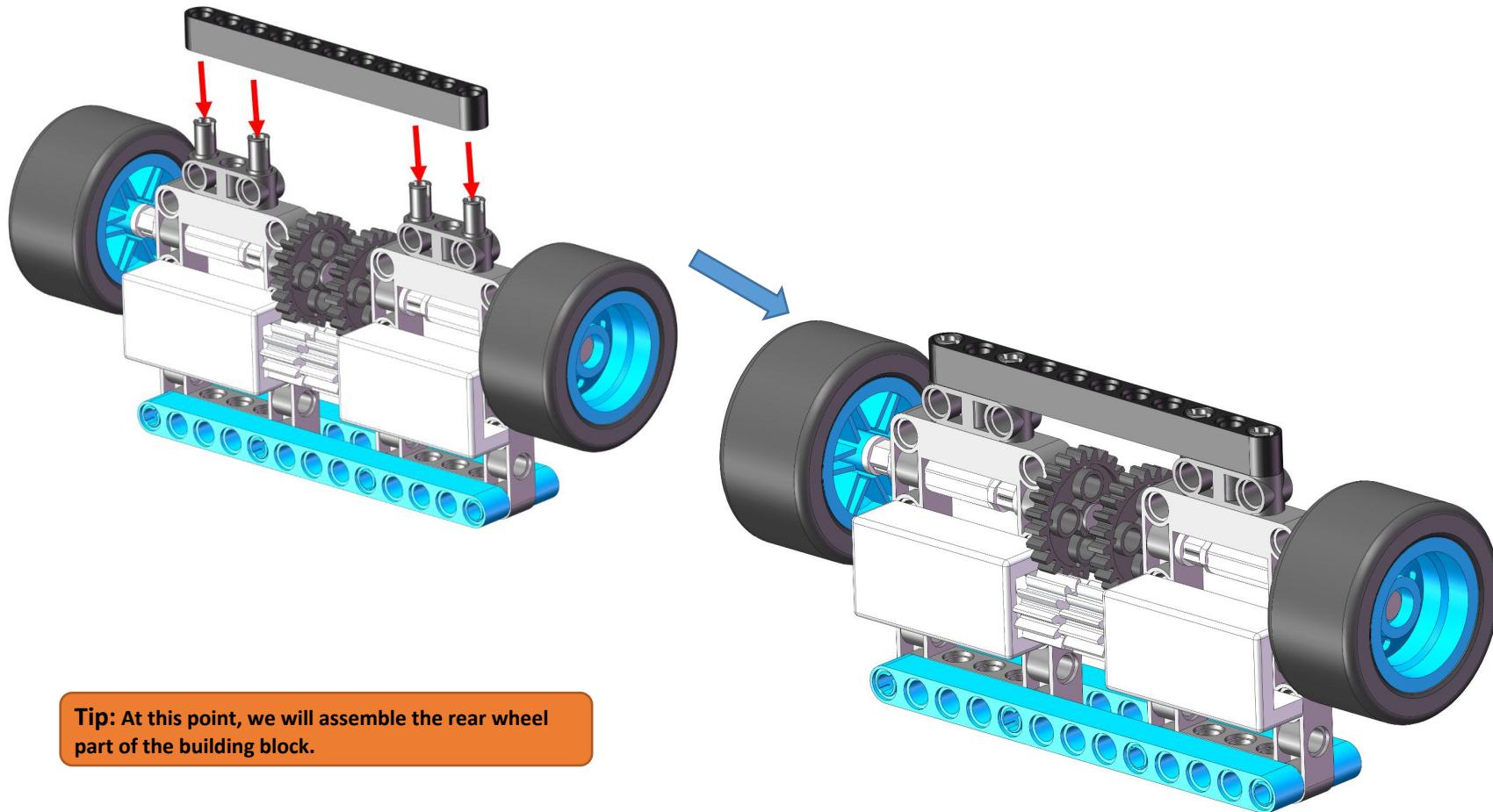
Step 7: Find another 1x13 hole arm and install it.



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

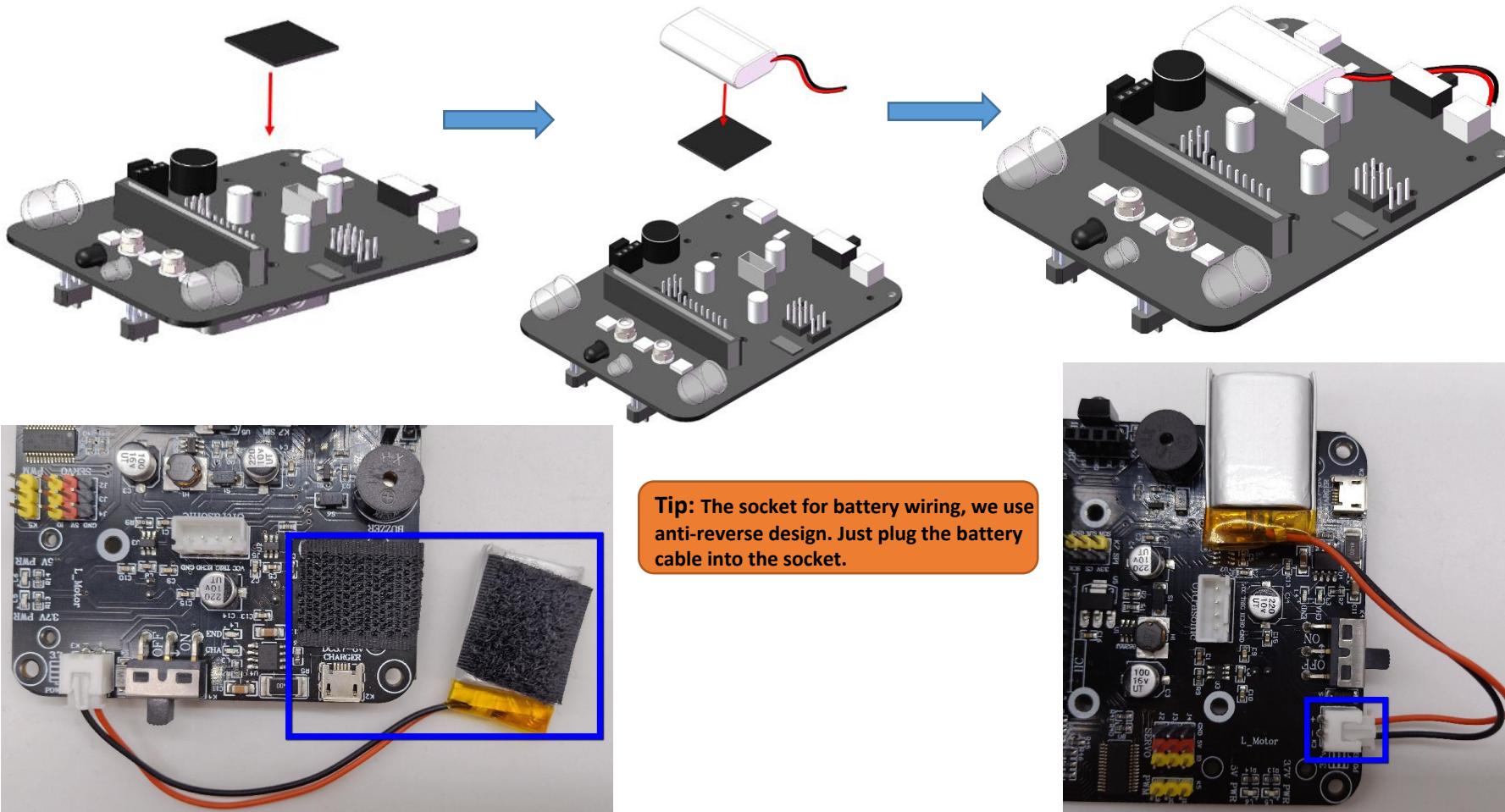


Step 9: Locate a 1x11 hole arm and attach it to the two 3x3 bolt connections.

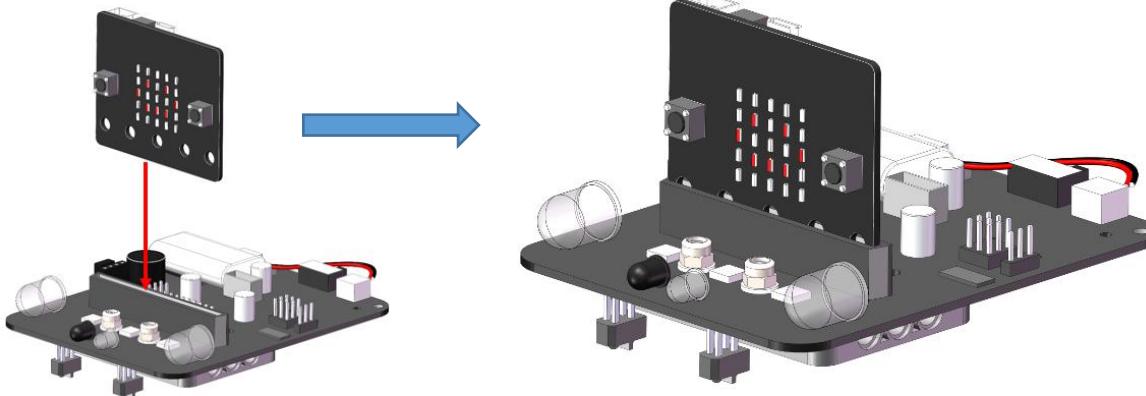


**Tip:** At this point, we will assemble the rear wheel part of the building block.

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.

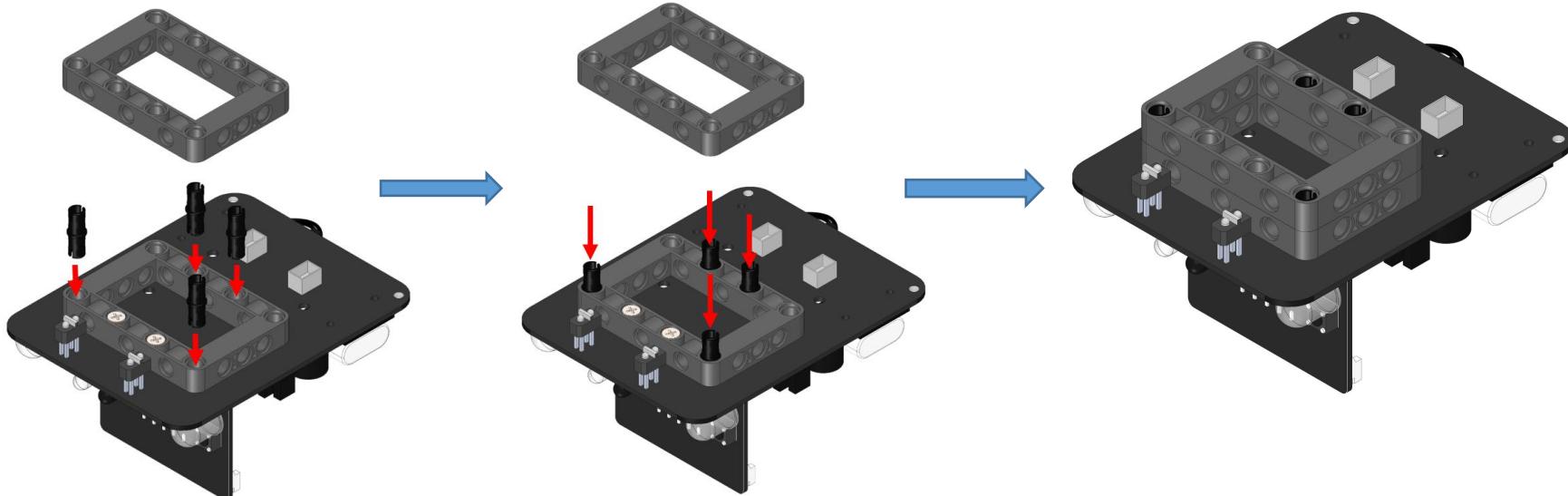


Step 11: Find the micro:bit board and insert it correctly into the micro:bit expansion board.



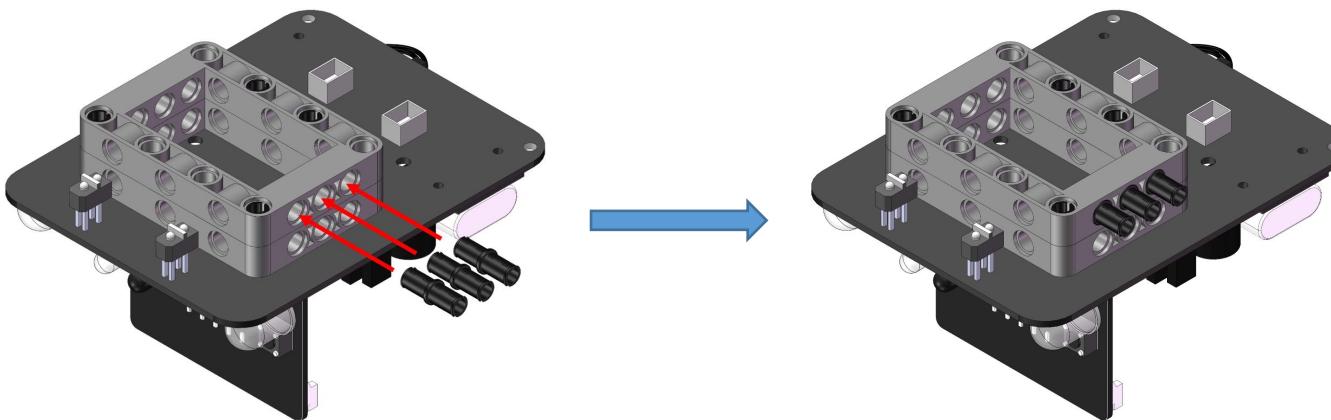
**Tip:** The micro:bit board is equivalent to the "brain" of the car, so please remember to install it correctly.

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

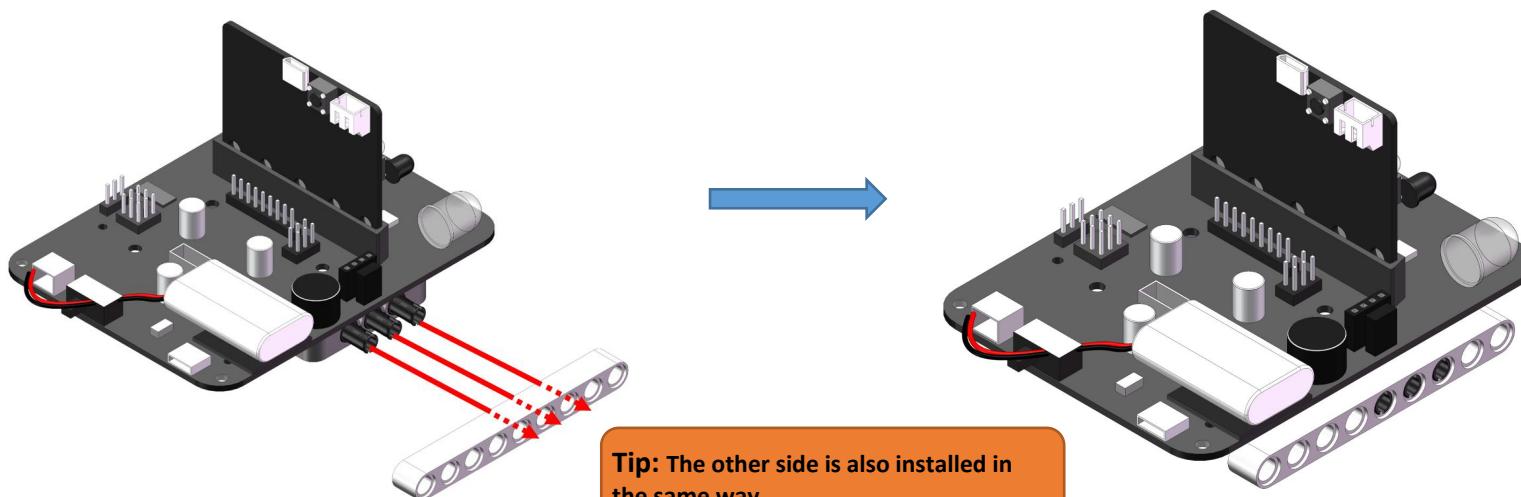




Step 13: Locate the three 1x2 friction pins and insert them into the holes in the side of the 5x7 beam frame we installed in the previous step.

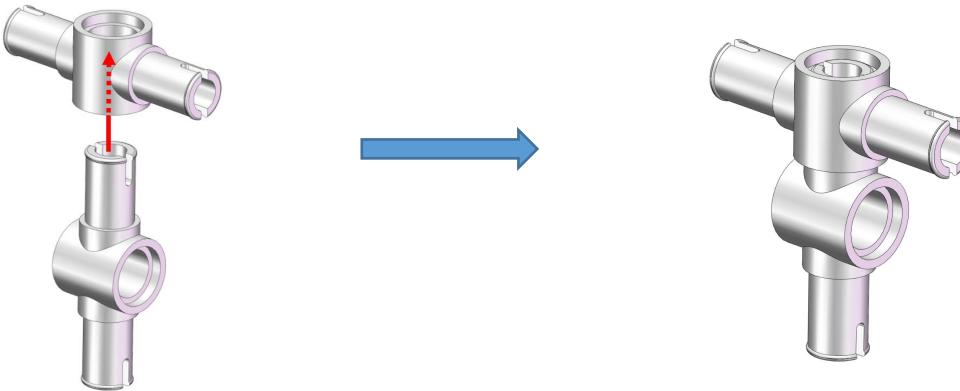


Step 14: Locate a 1x9 hole arm and install it on the 1x2 friction pin we have installed in the previous step. The three friction pins are respectively inserted into the holes 3rd, 4th, and 5th of the hole arm starting from the right side.

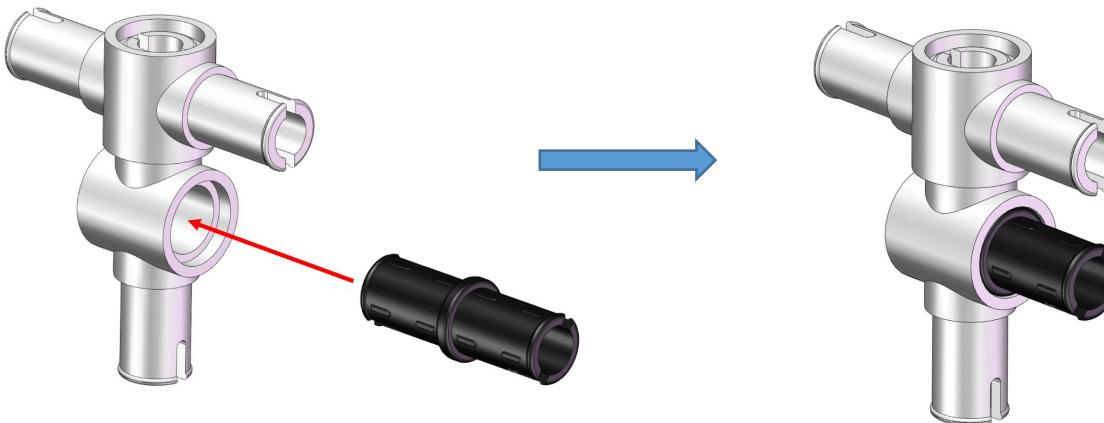




Step 15: Find two 1x3 bolt connectors and combine them.

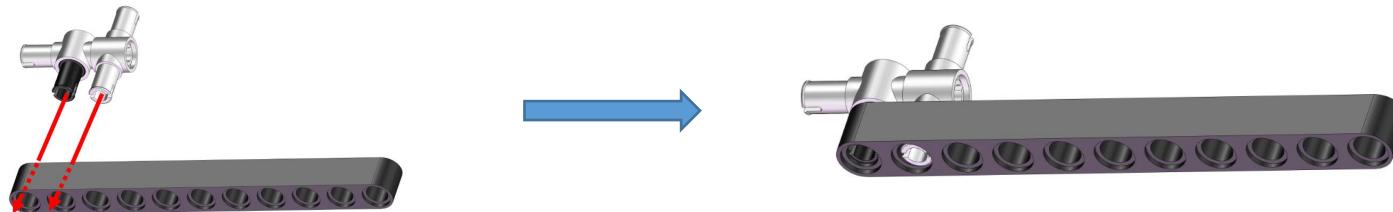


Step 16: Find a 1x2 friction pin and insert it into the corresponding hole of the 1x3 bolt connector.



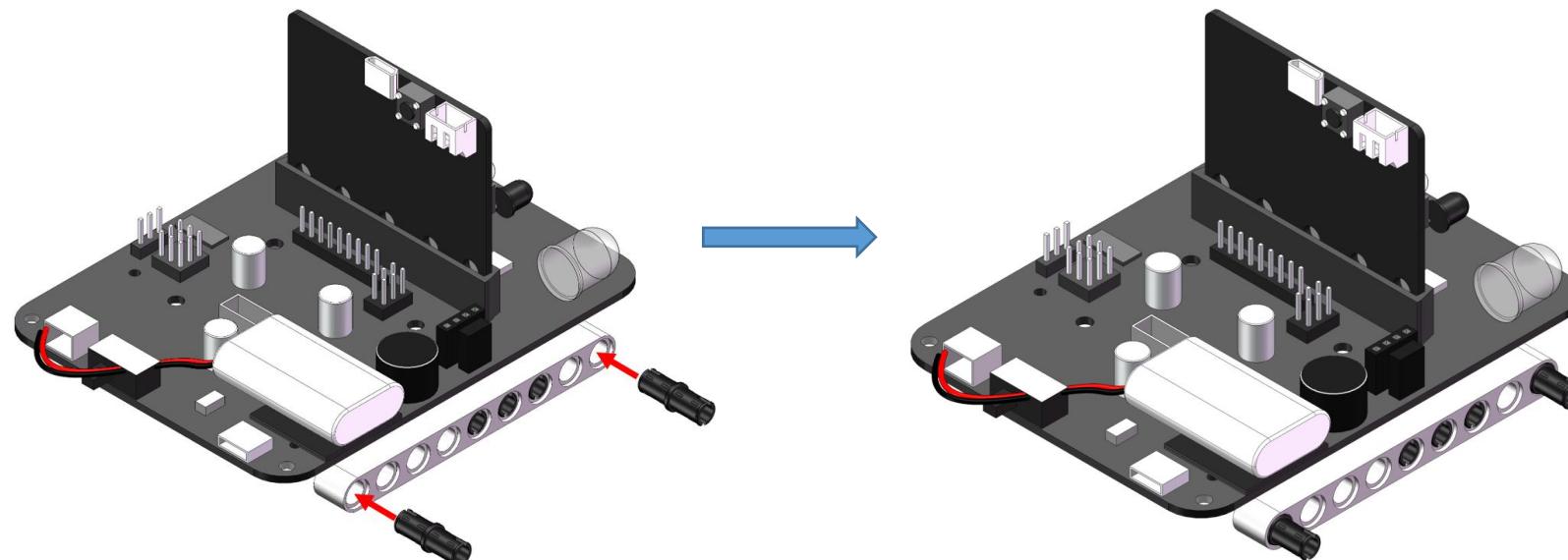
**Tip:** Two such bricks are needed in the rear installation, so here we have to assemble two pieces of bricks.

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.

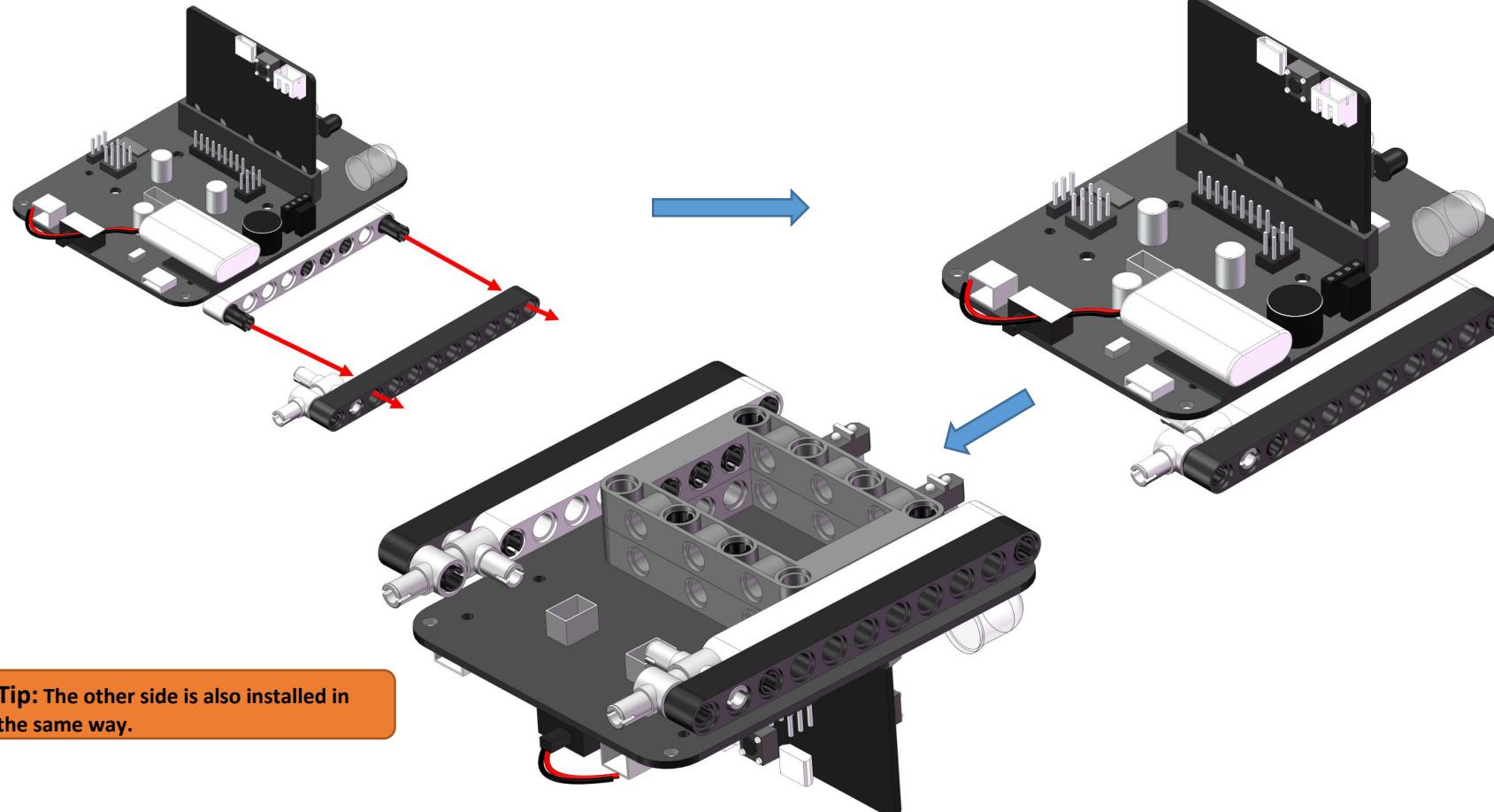
Step 18: Locate the two 1x2 friction pins and insert them into the hole at the ends of the 1x9 hole arm.





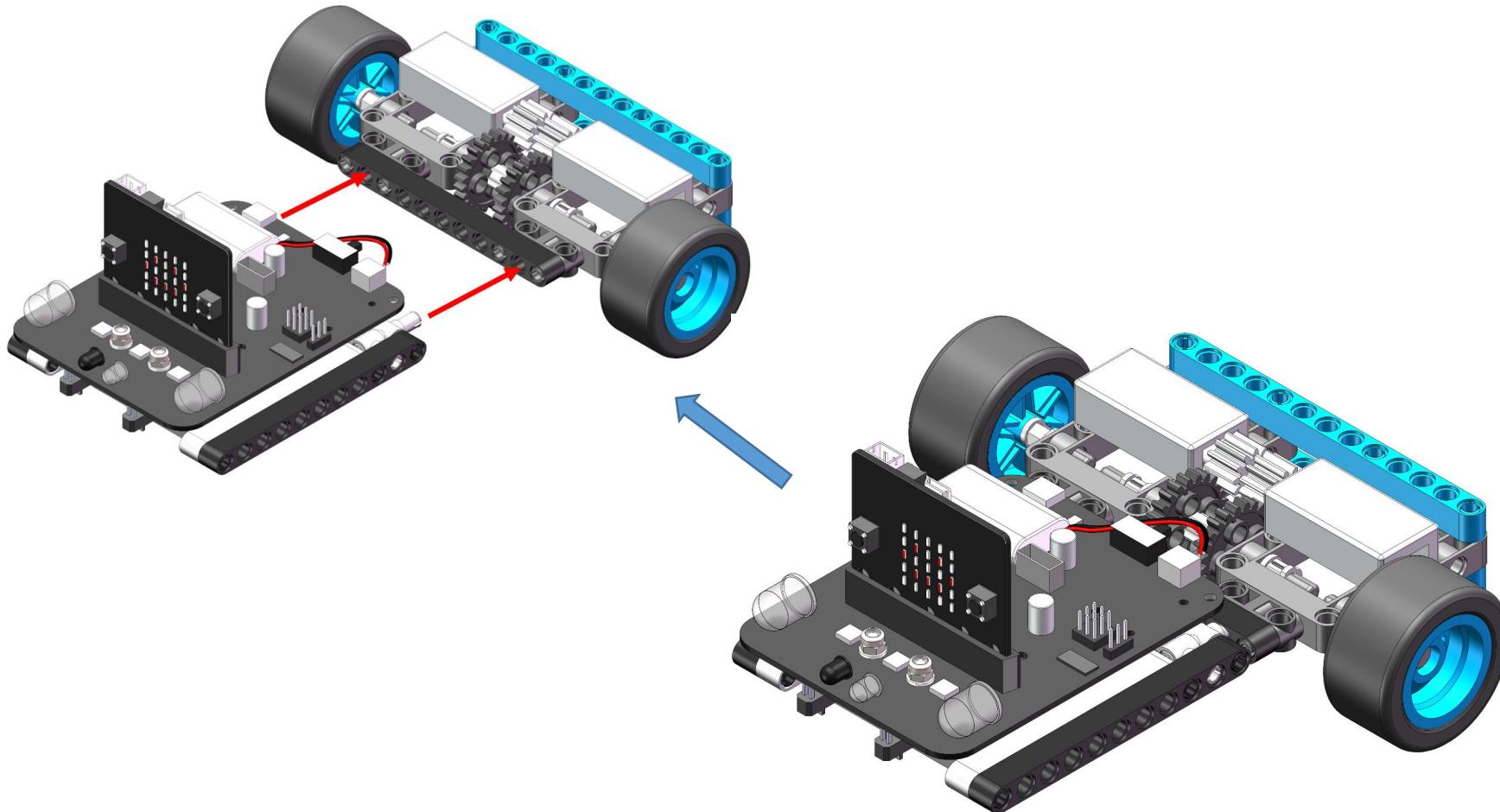
Step 19: Combine the two parts that we have assembled in steps 17 and 18 to complete the installation of the front body part of the following car.

**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.



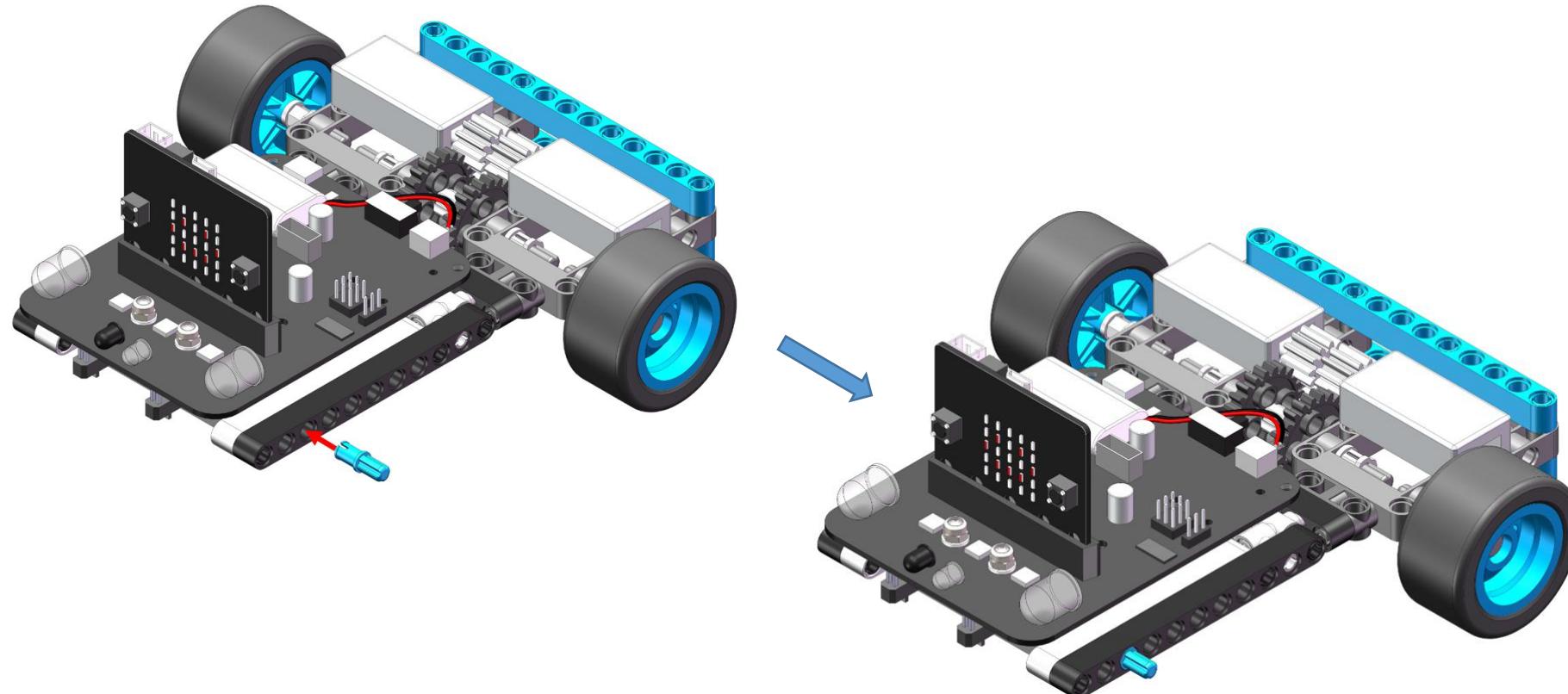
**Step 20: Combine the assembled rear wheel part and the front body part.**

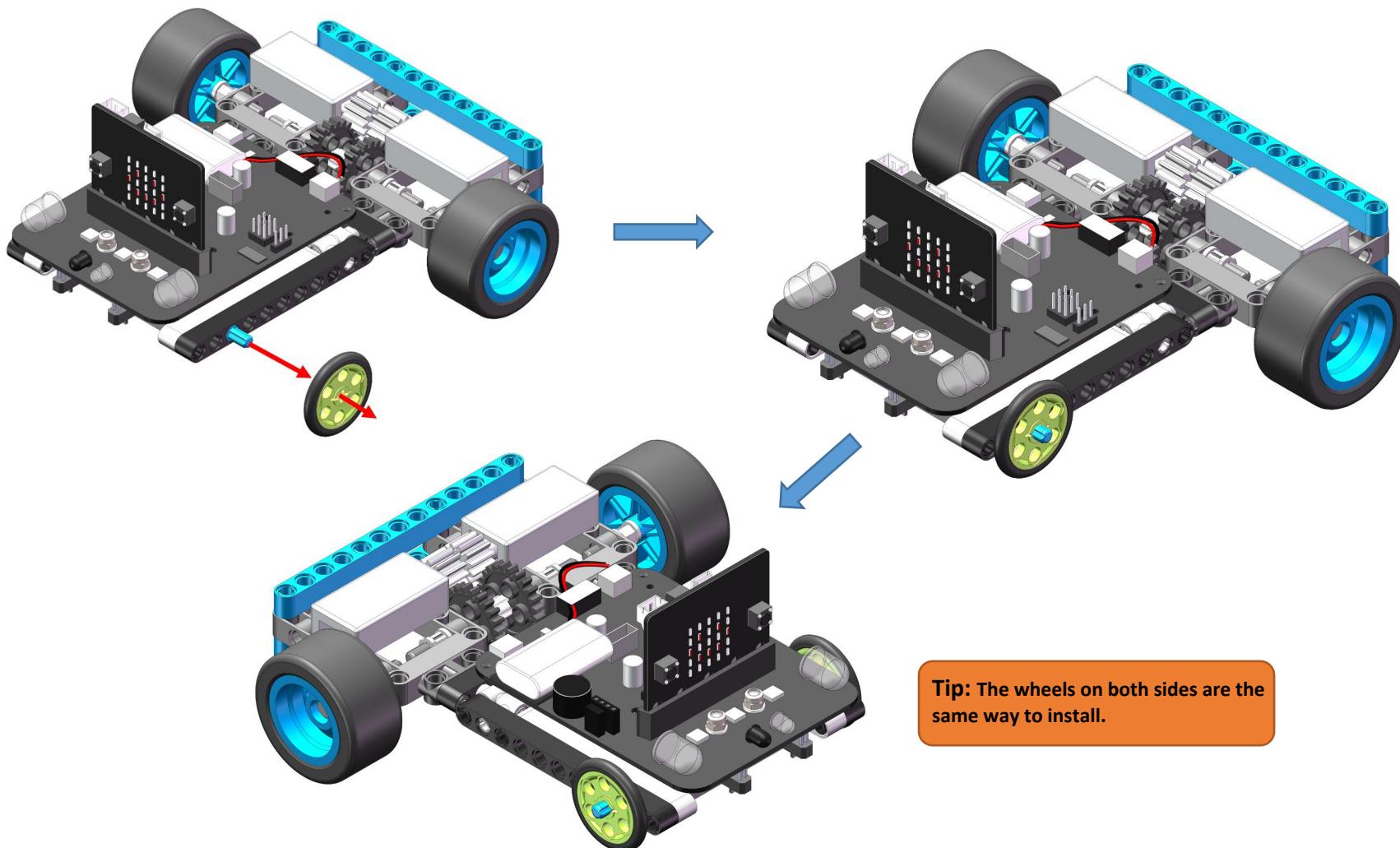
**Combination method: insert two 1x3 bolt connectors on the front body into the No. 2nd and 10th holes of the rear wheel part 1x11 hole arm.**





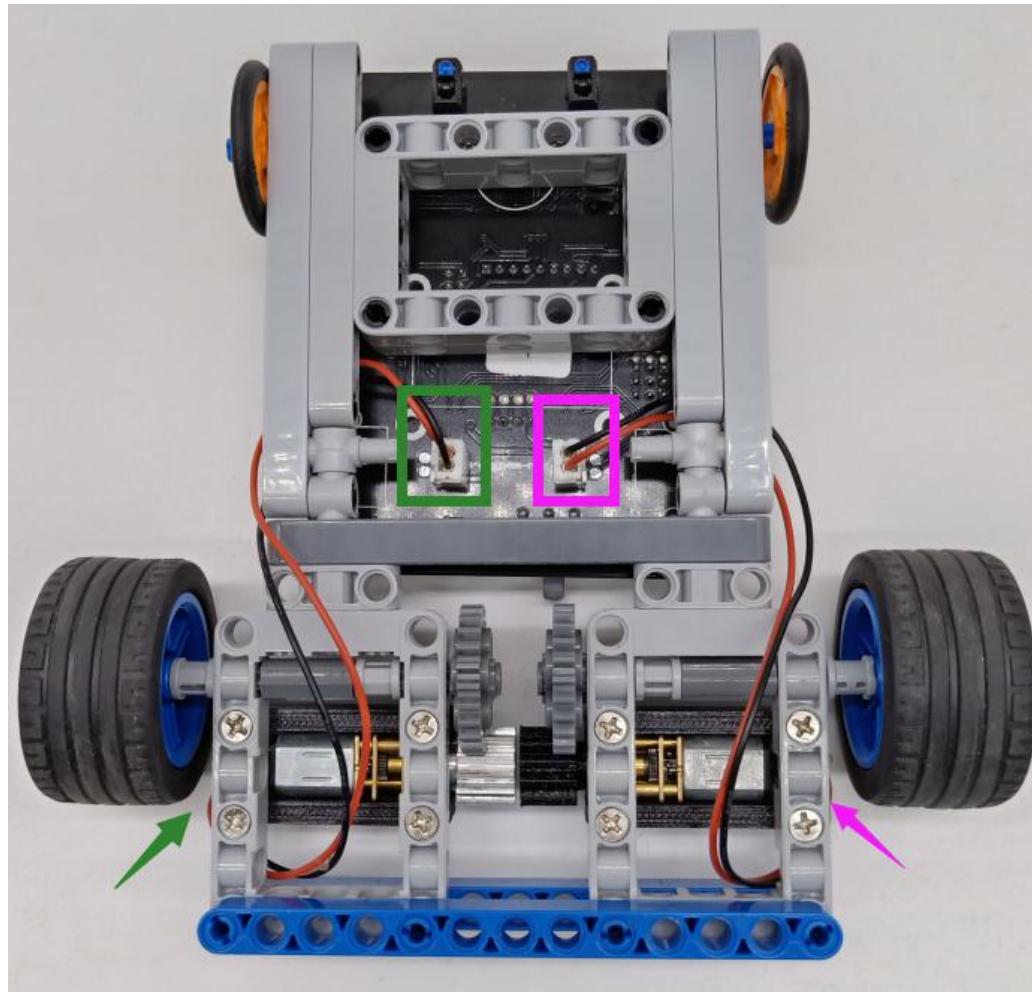
Step 21: Find two 1x2 shaft and bolt connector and two rubber rings +24 pulleys. First insert the two 1x2 shaft bolts into the 3rd hole on the left side of the 1x11 hole arm on both sides of the trolley. Rubber ring + 24 pulleys are mounted to the two 1x2 shaft and bolt connector on each side.



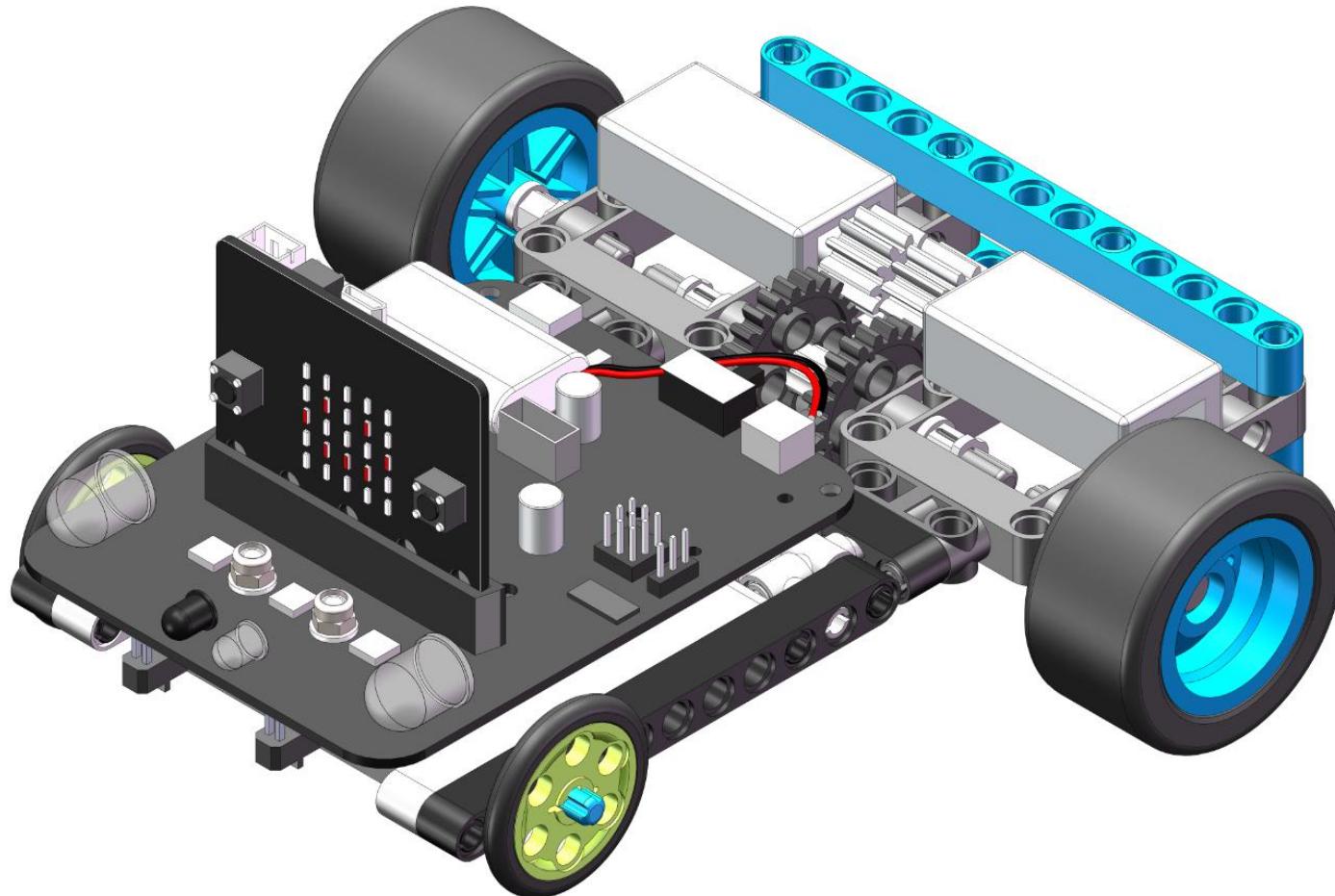




Step 22: Wire the wiring as shown below.



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

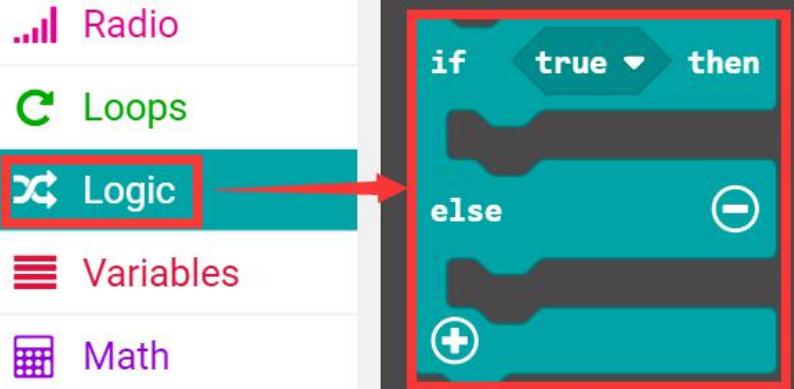


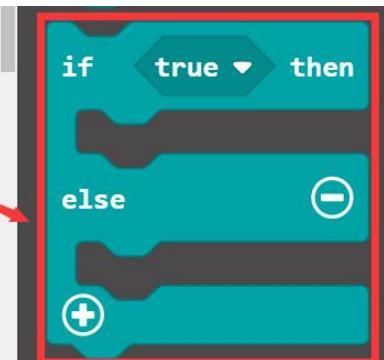
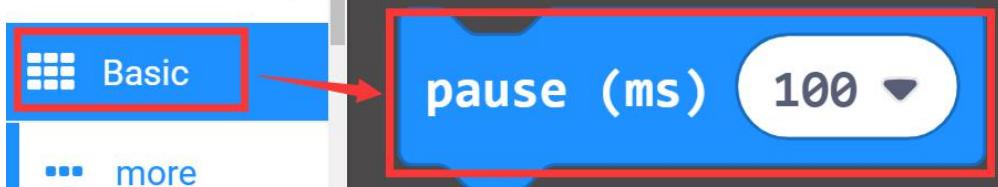
Thinking: This session is mainly to teach you how to use graphical programming to control the following car.

### Pre

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

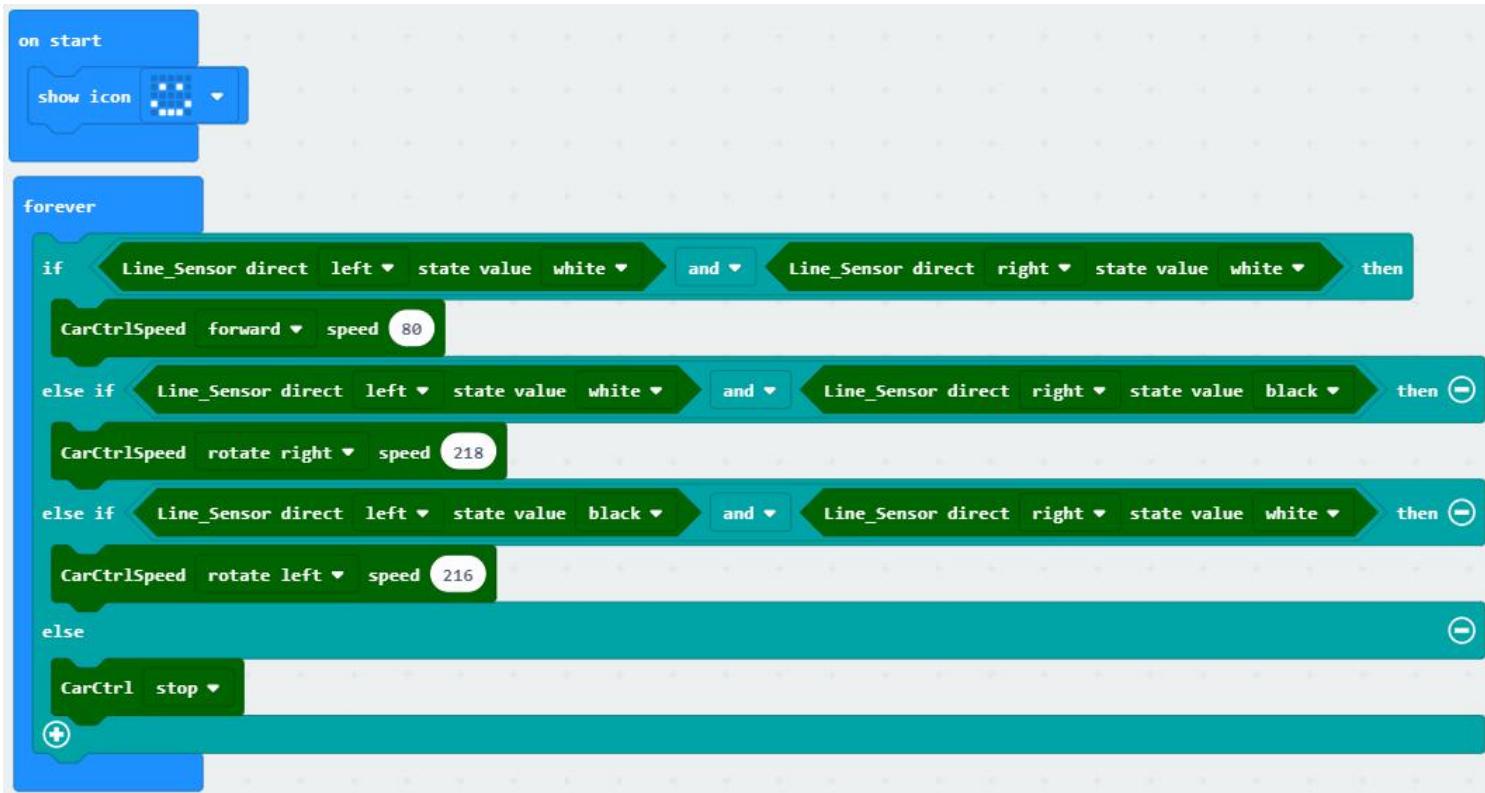
### Blocks

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.

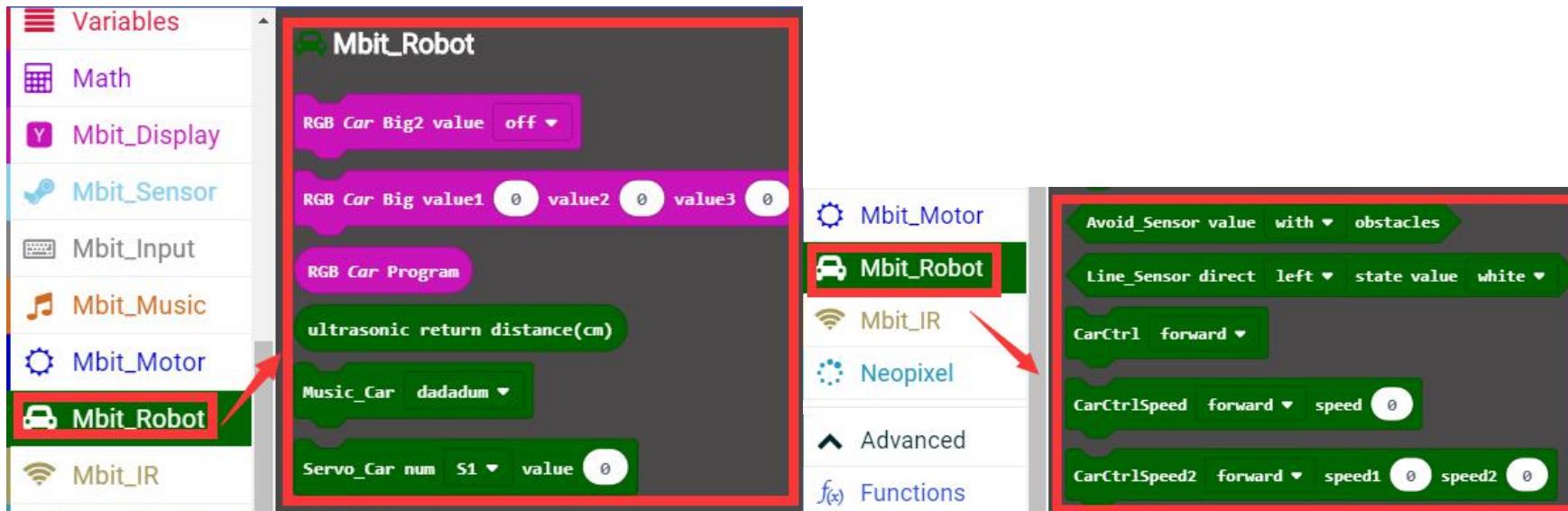
## Programming

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](http://www.yahboom.net/study/Building_bit)