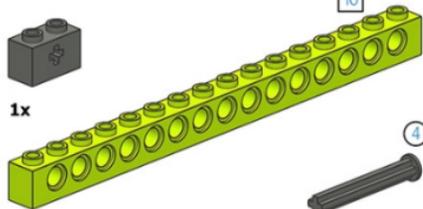




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16



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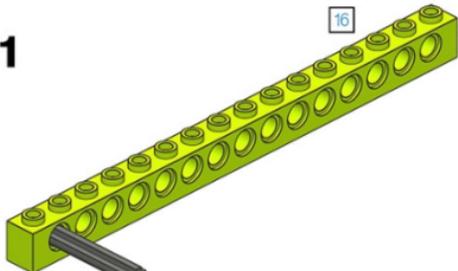
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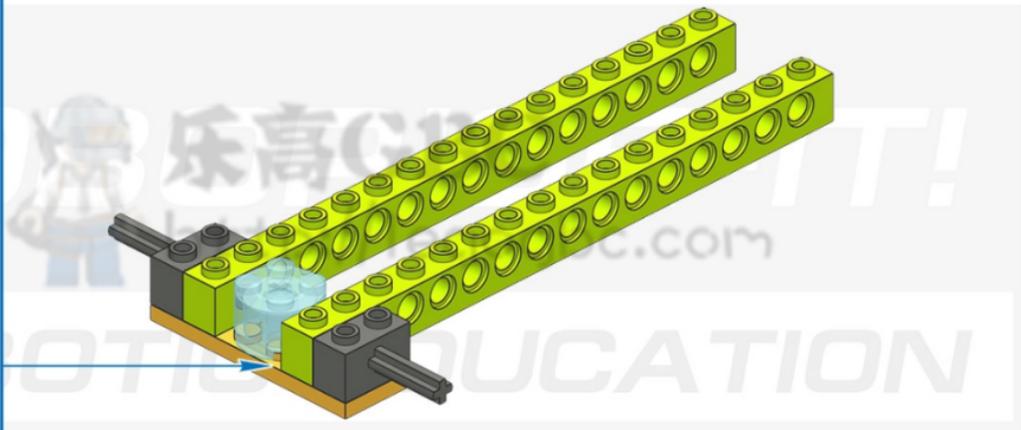
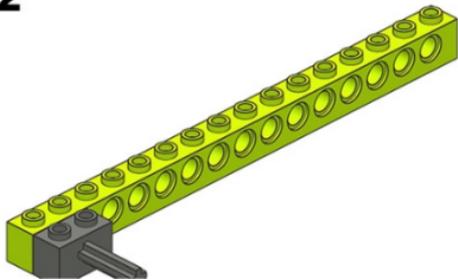
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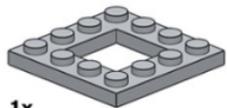
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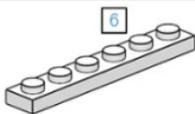


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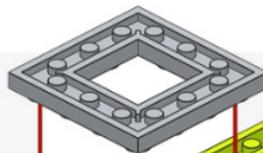


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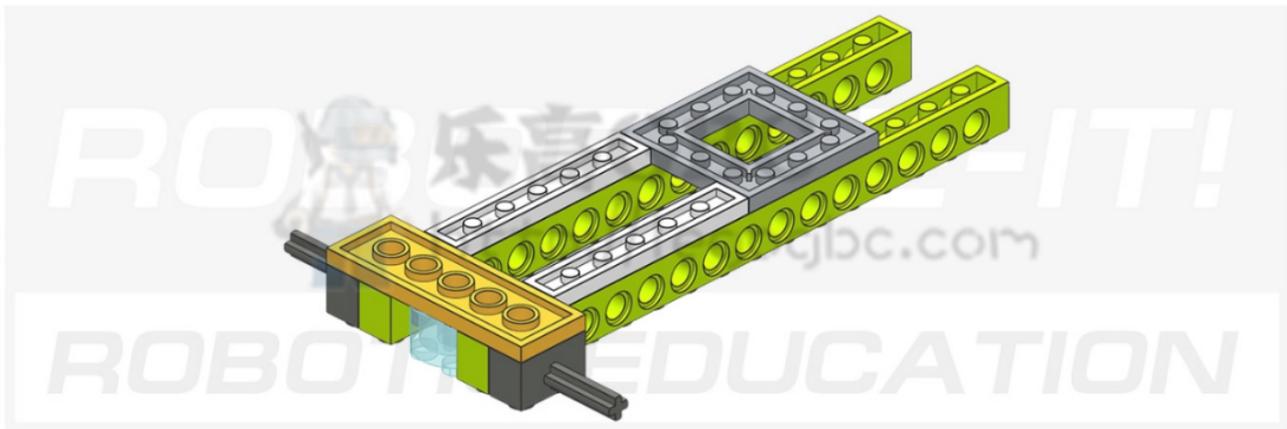


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6



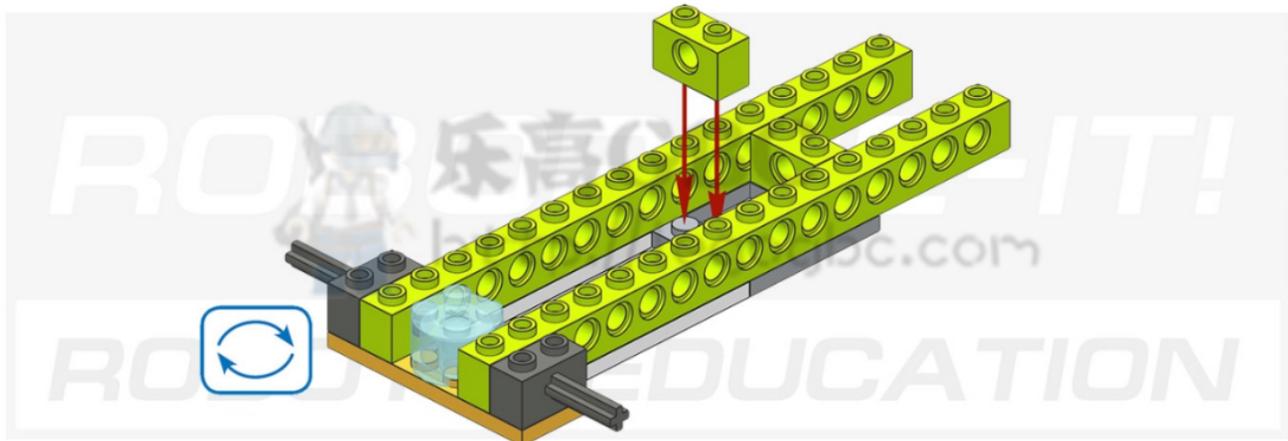
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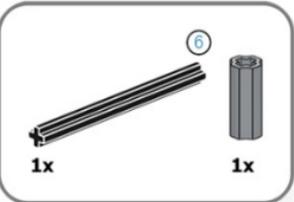




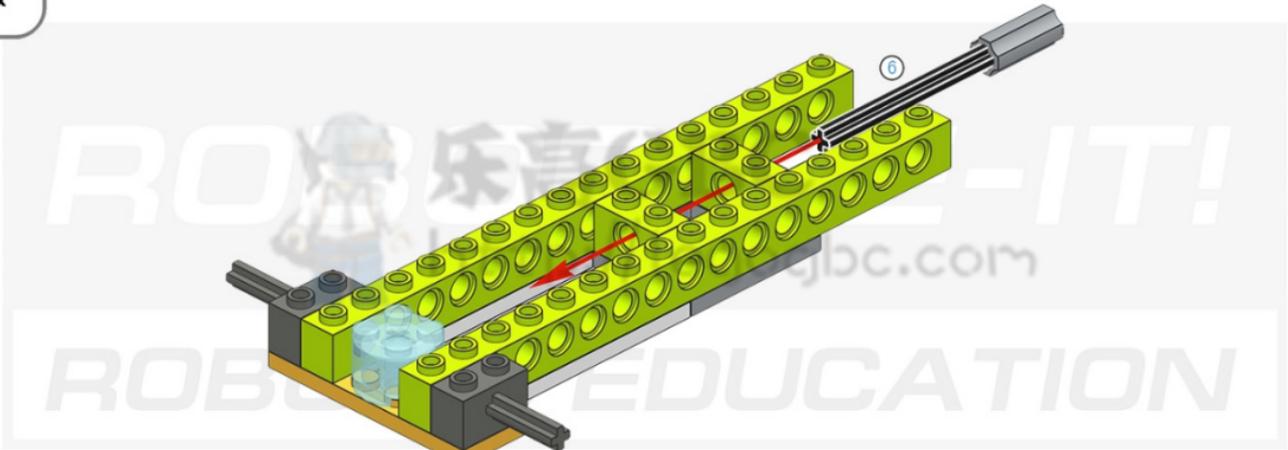
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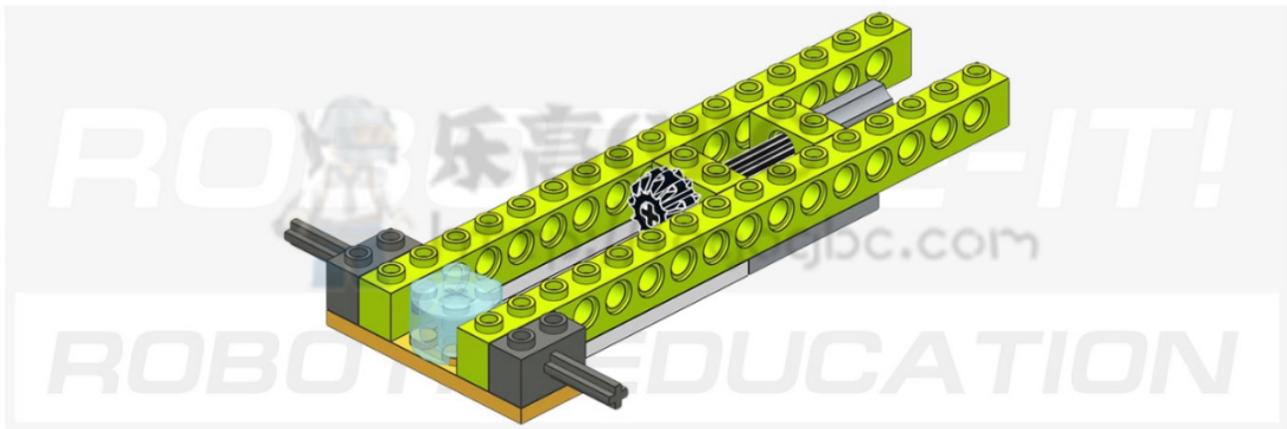
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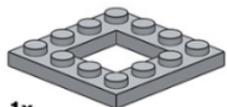




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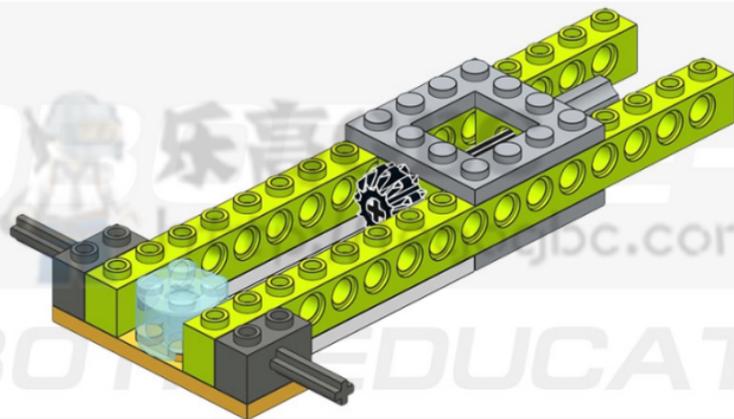
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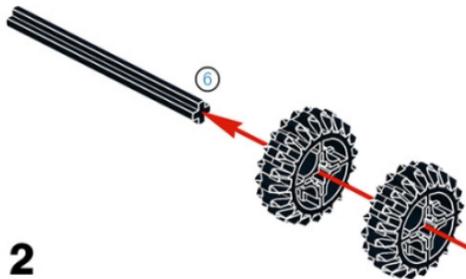


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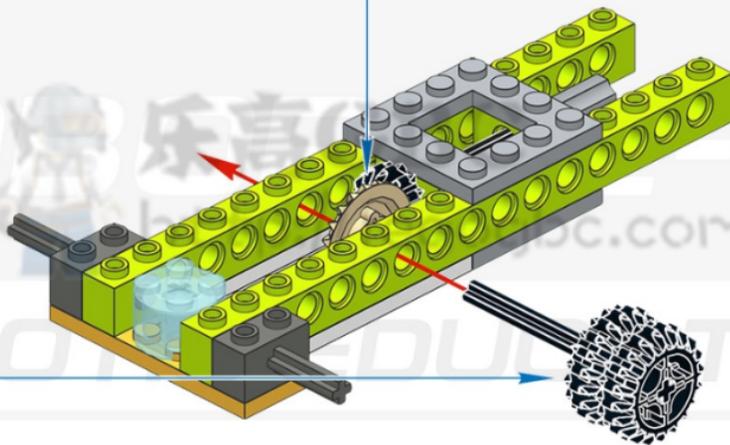


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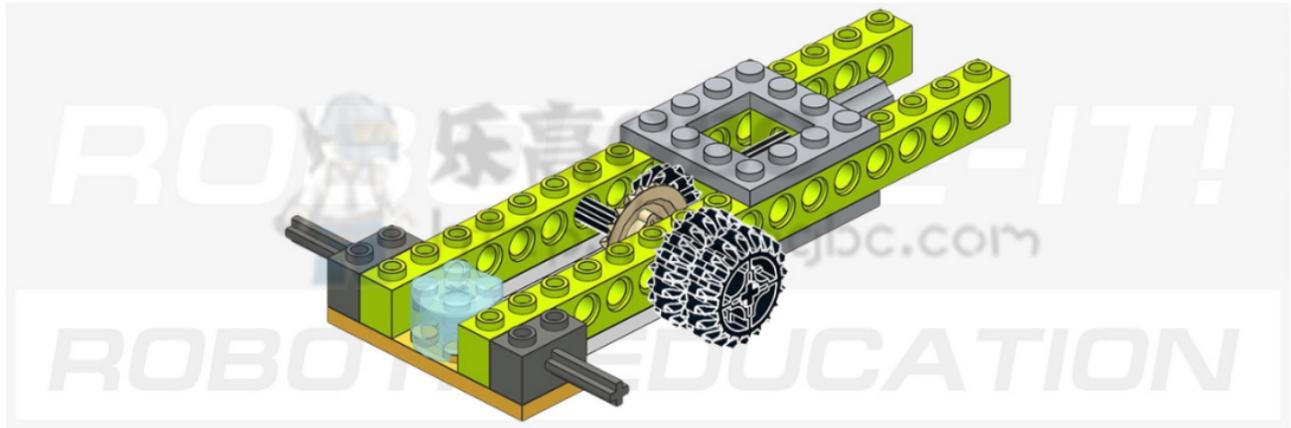
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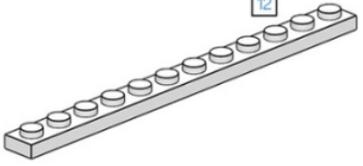
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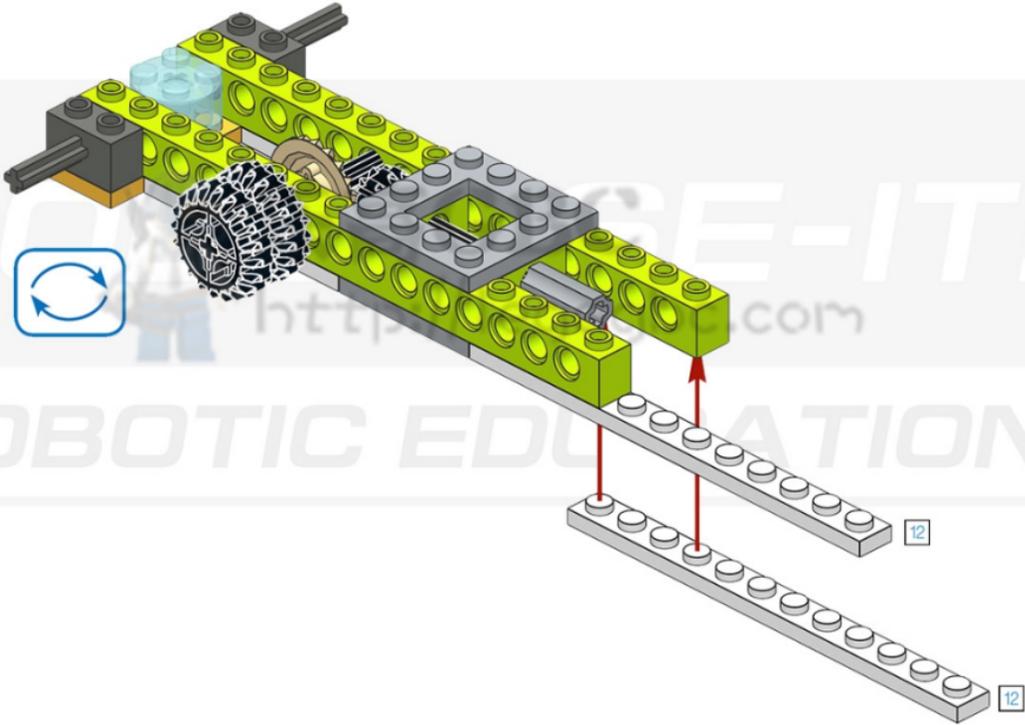


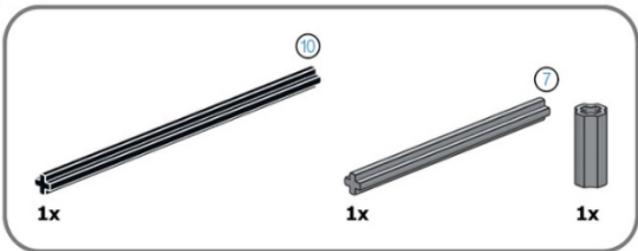
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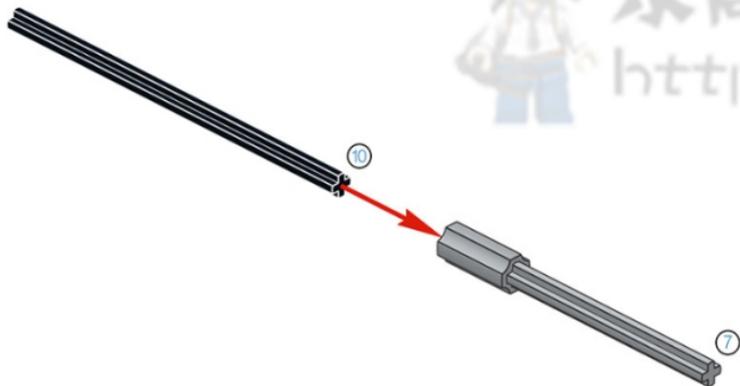
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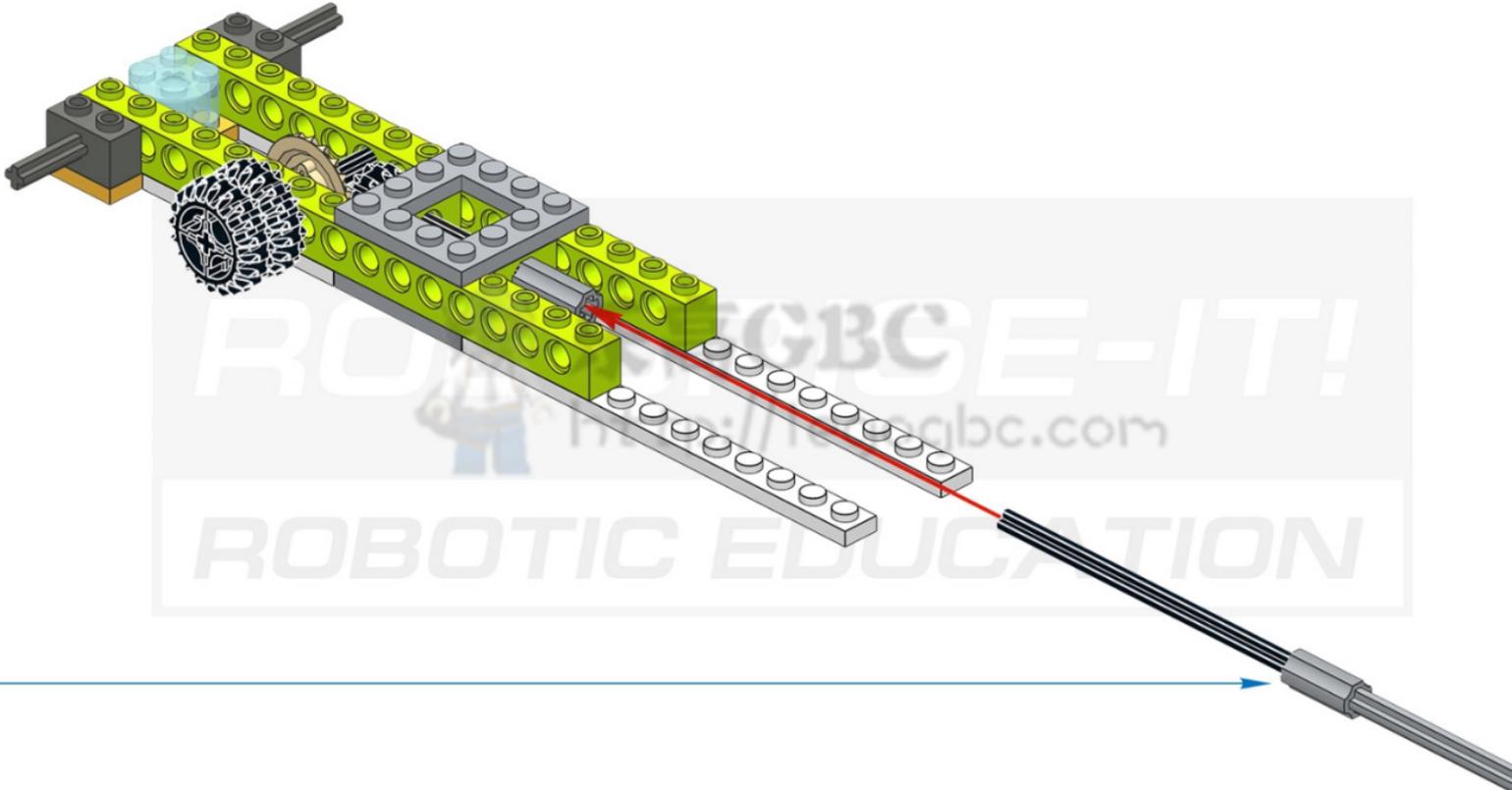
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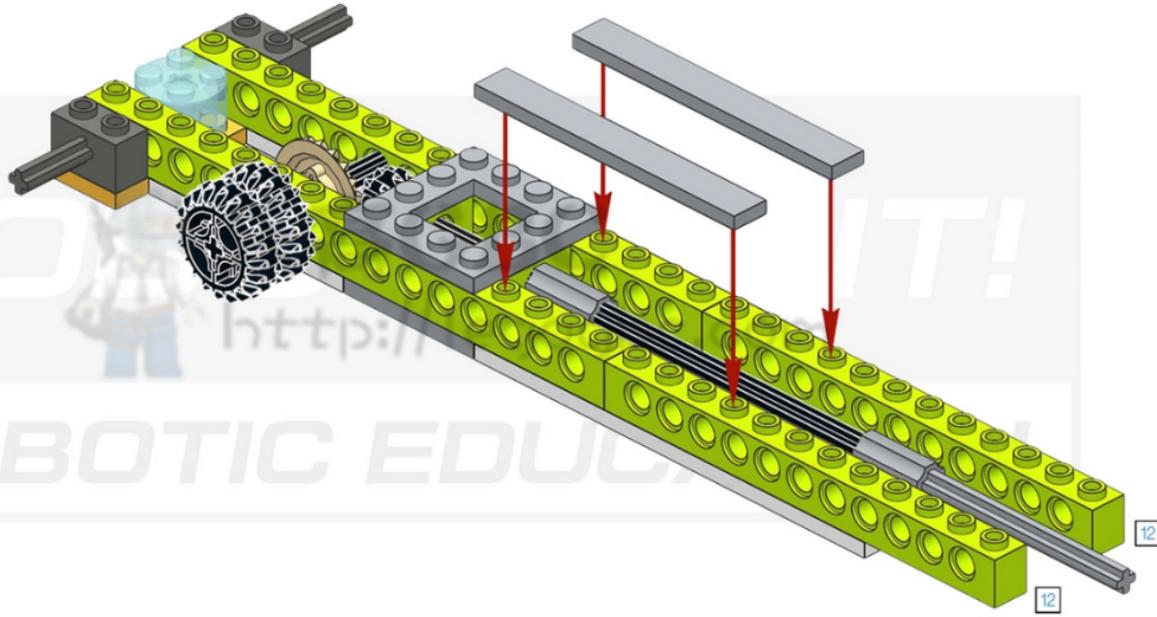
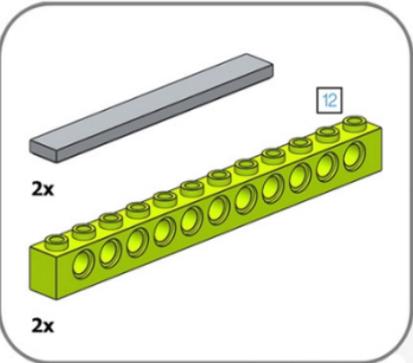


13



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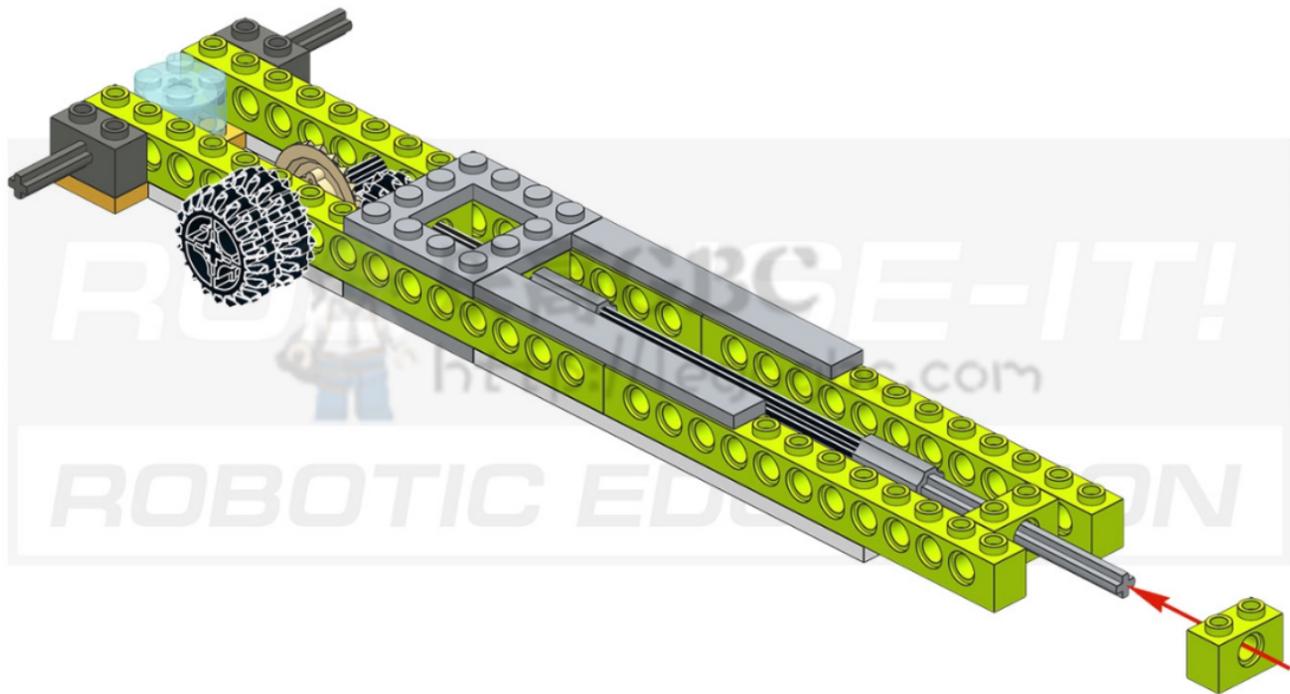
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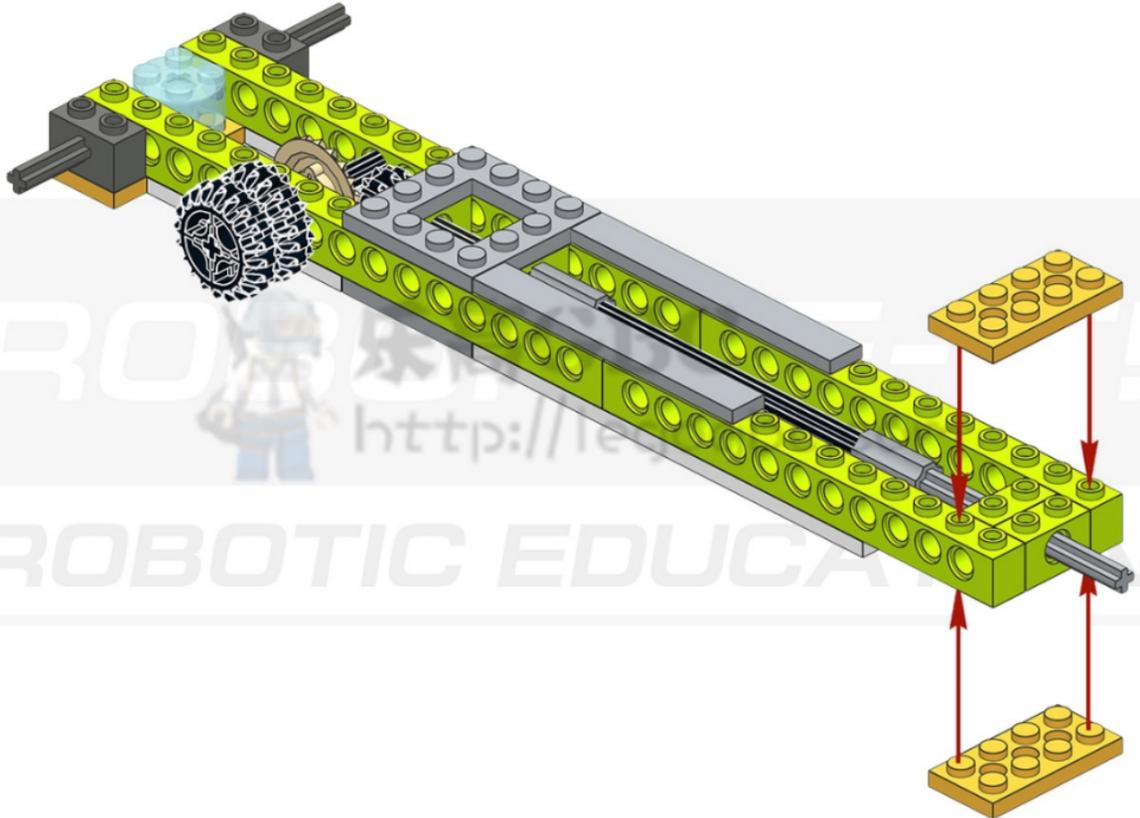
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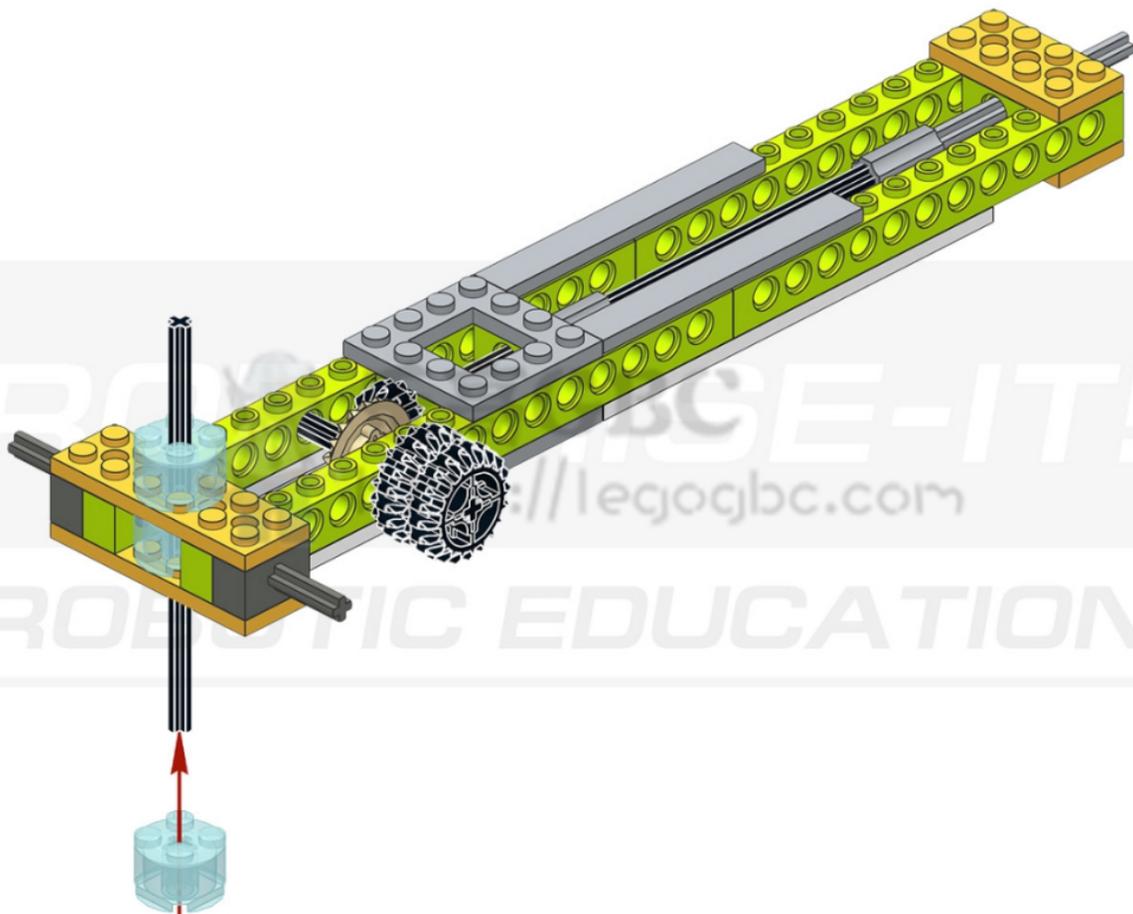


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2x

19



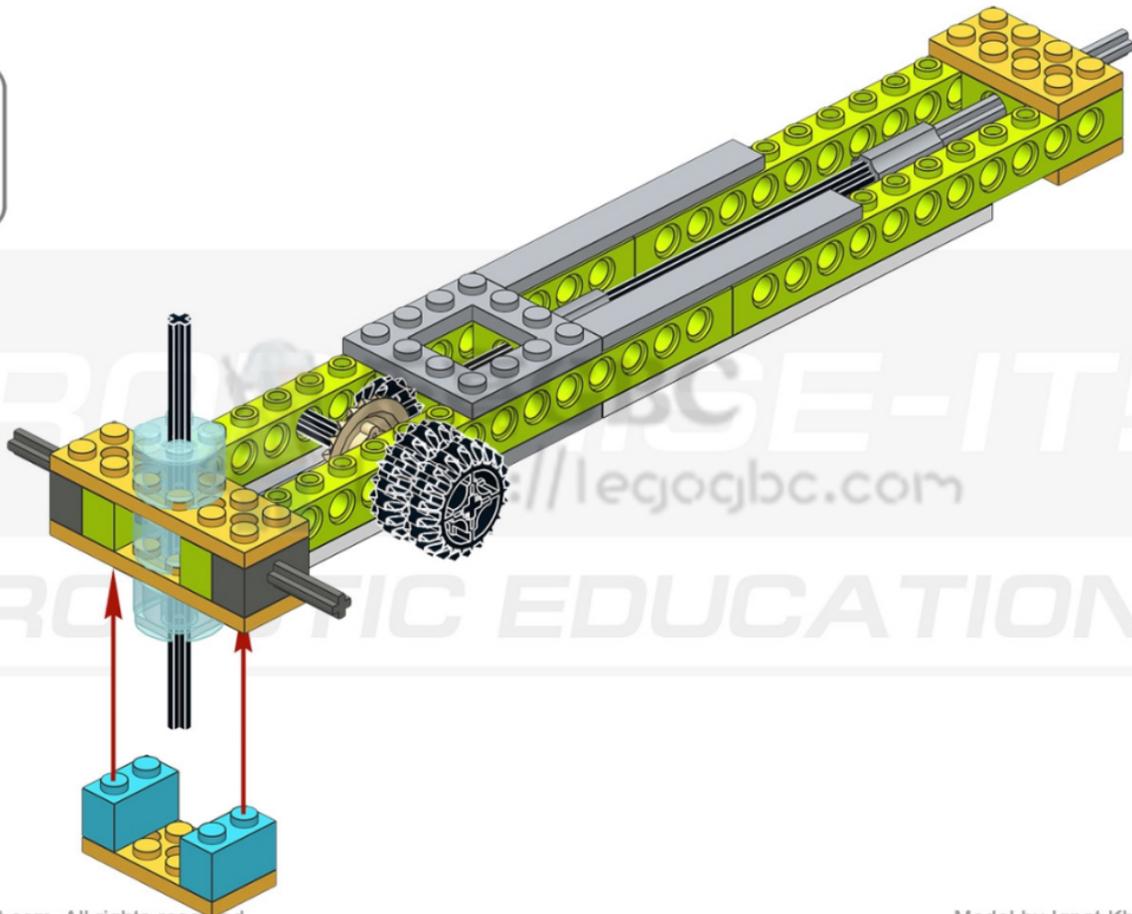


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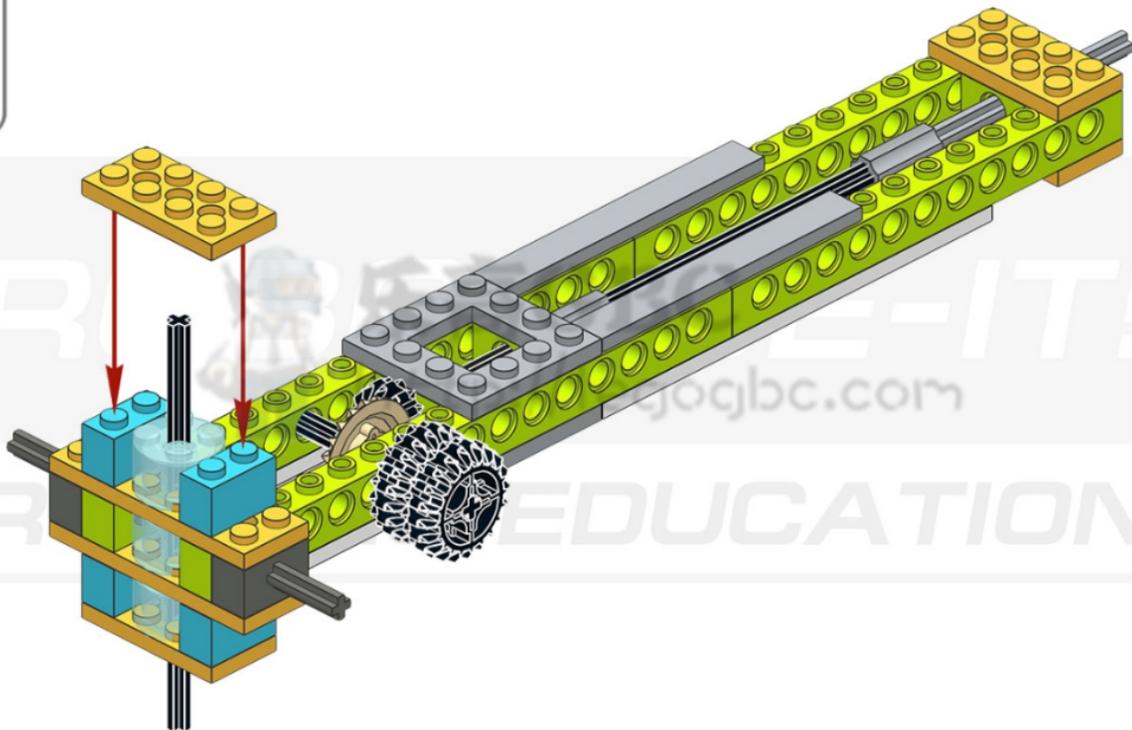


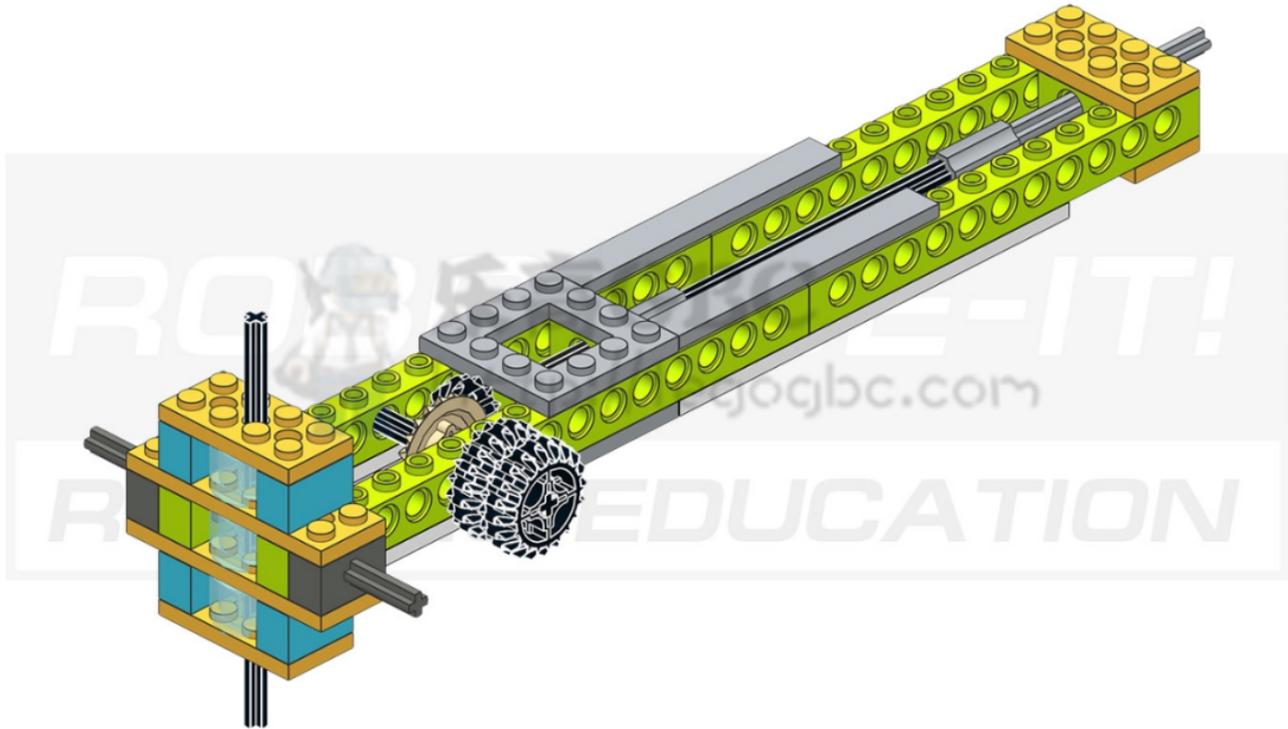
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21







1x



1x



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1



2





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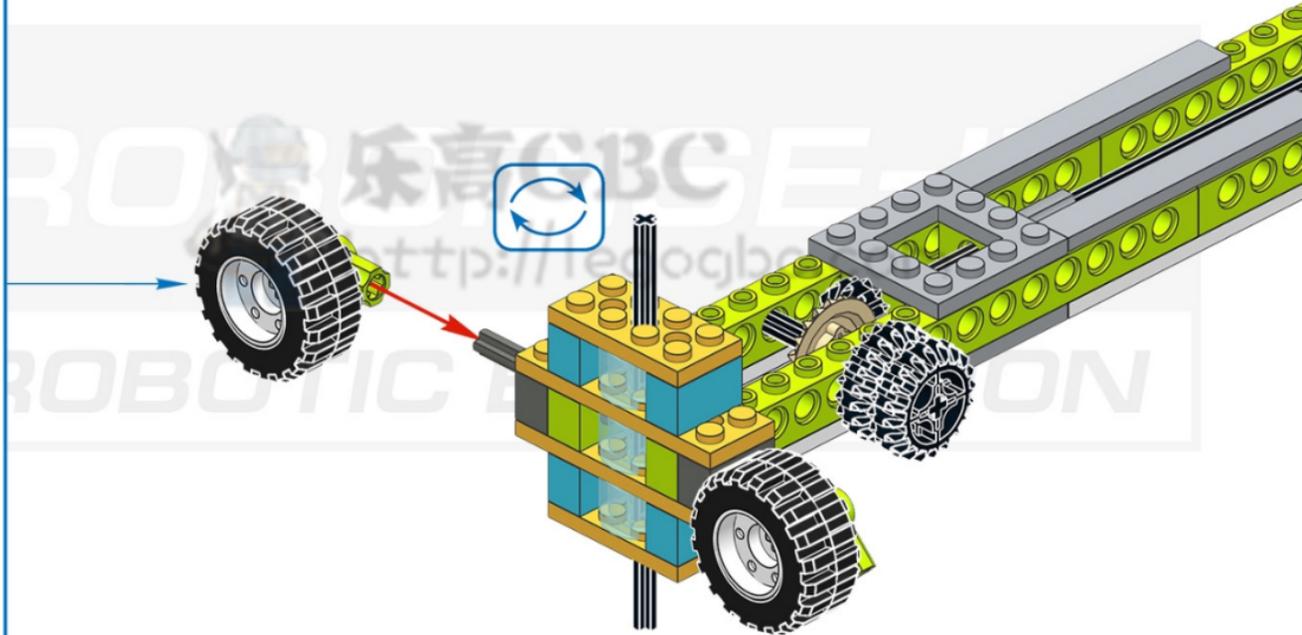


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1



2





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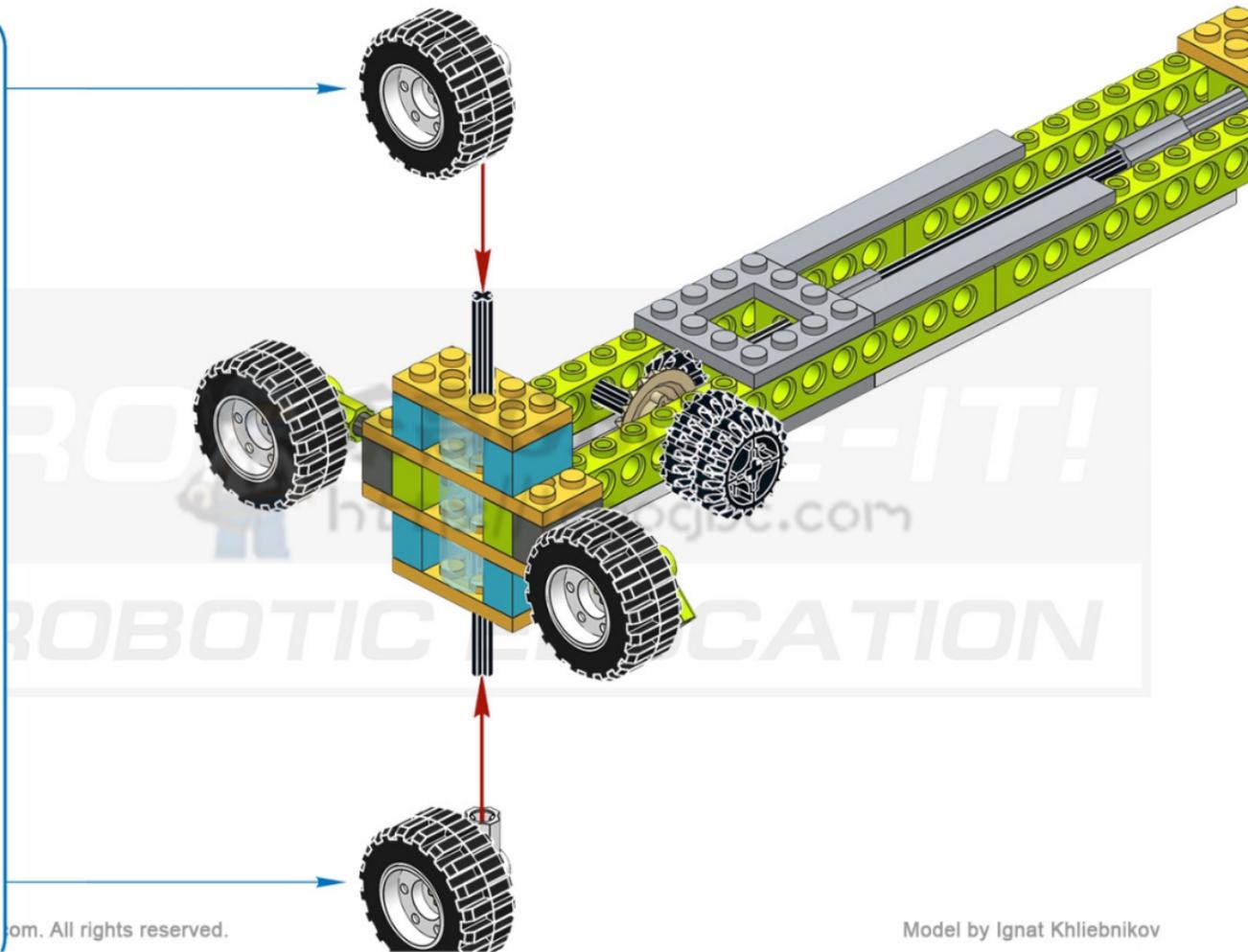
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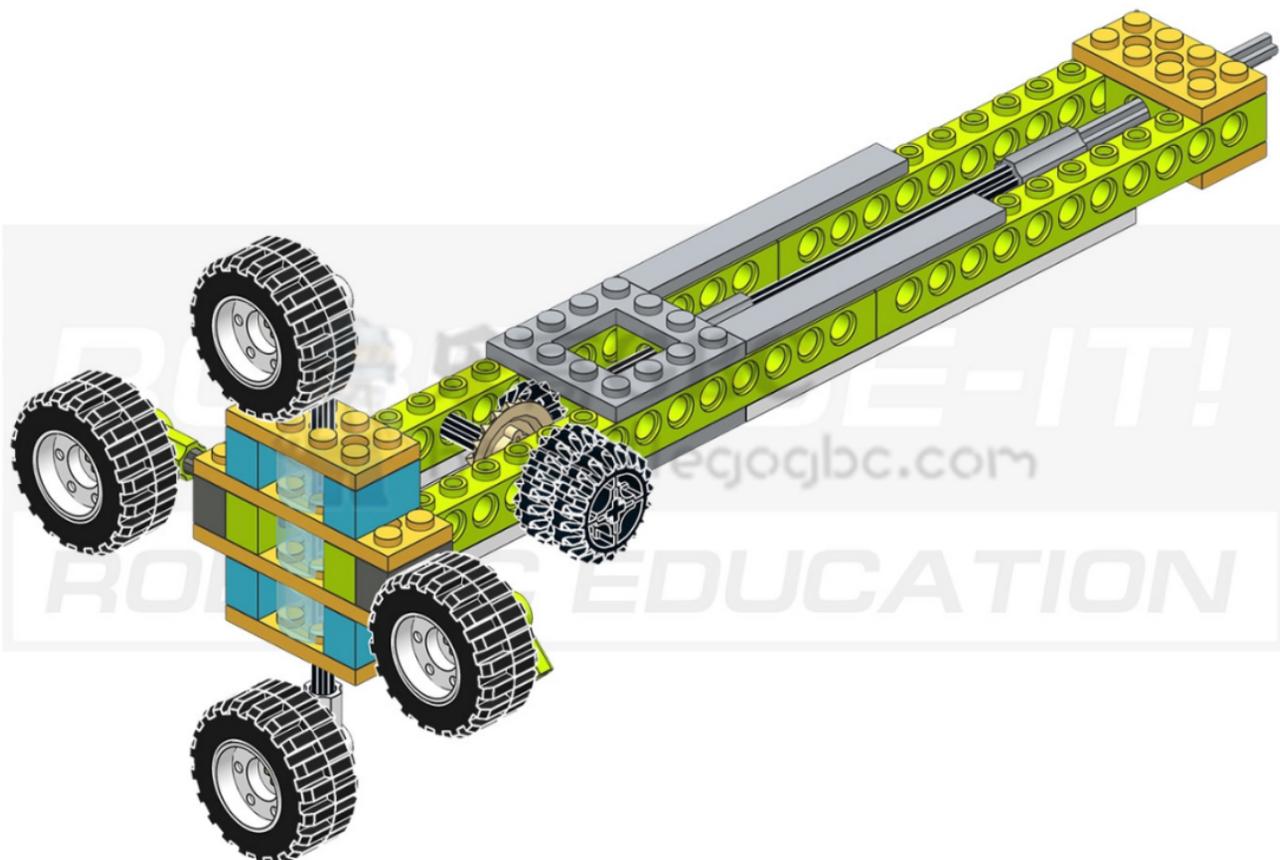


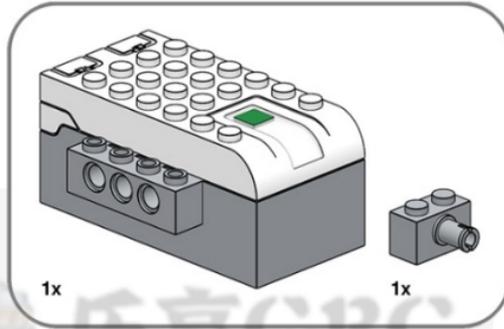
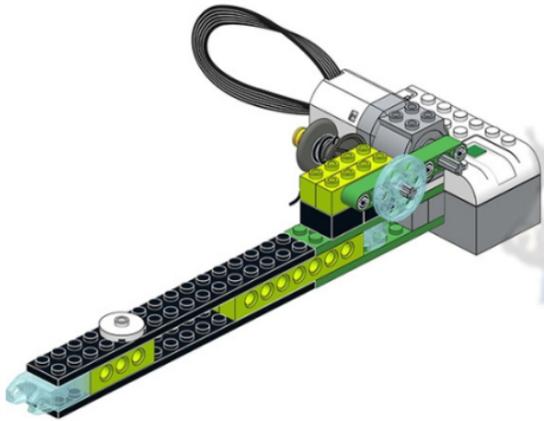
2x

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Model by Ignat Khlebnikov

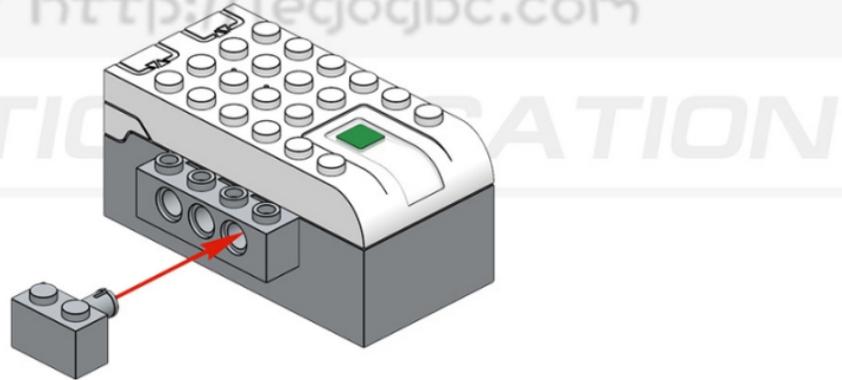


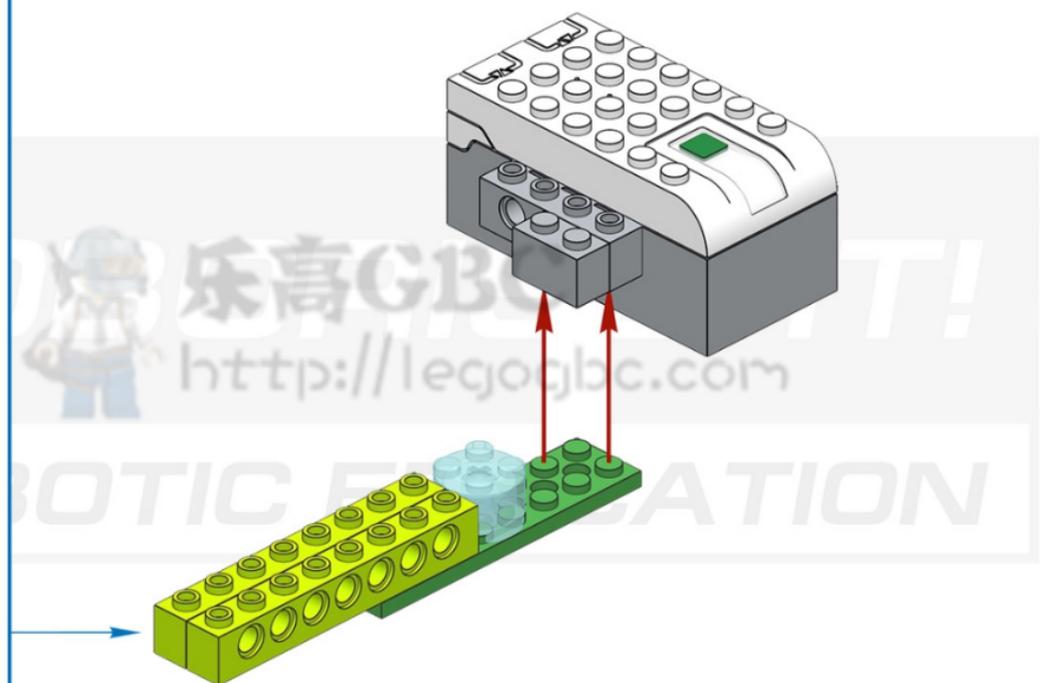
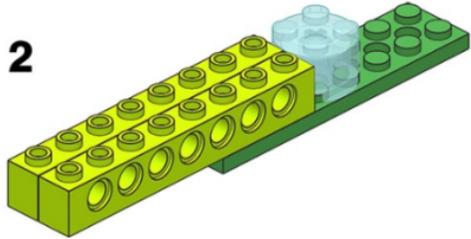
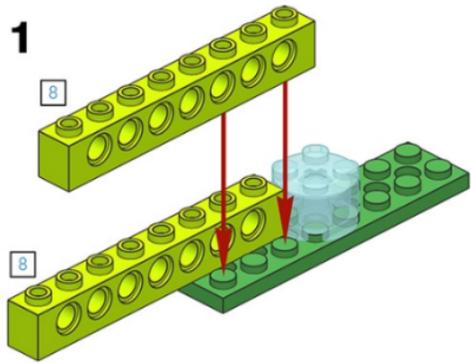
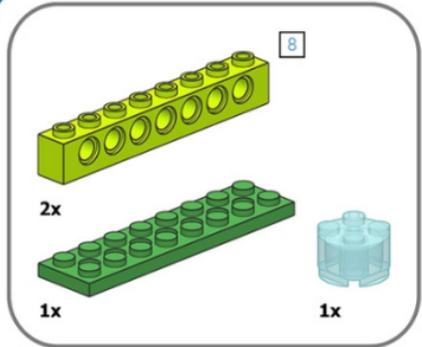


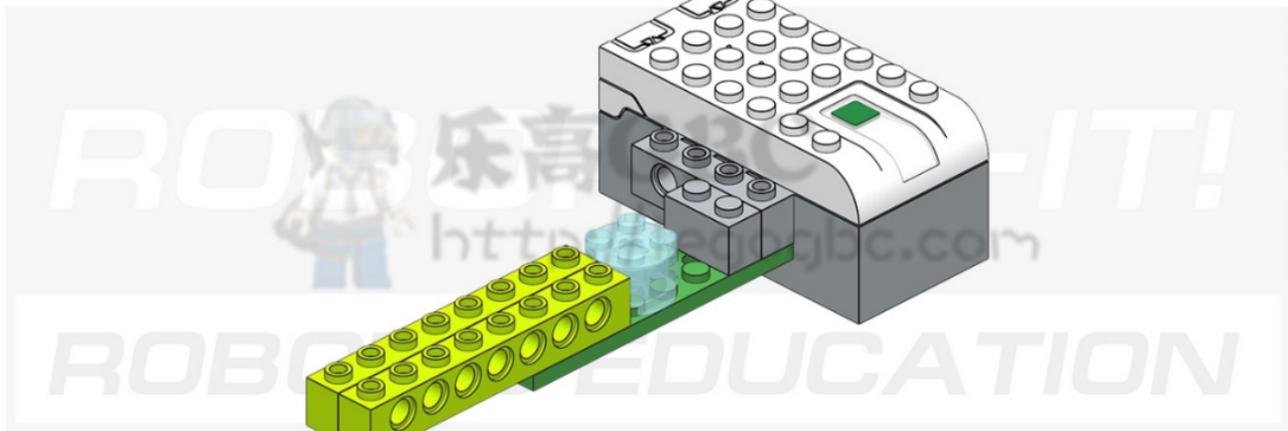


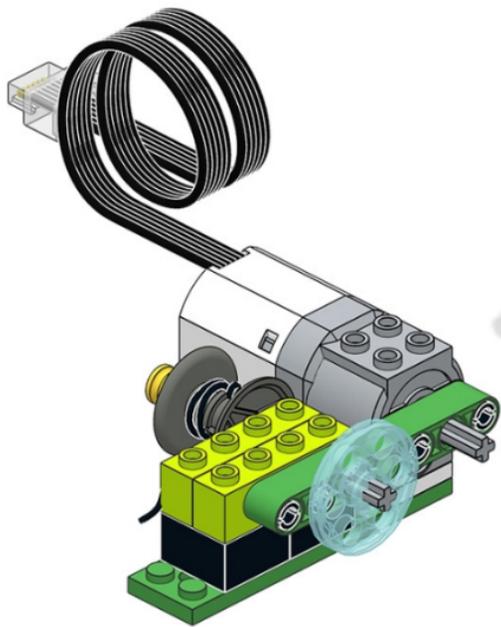
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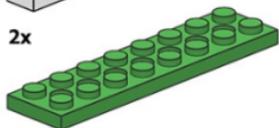








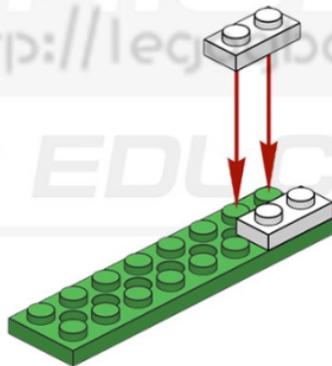
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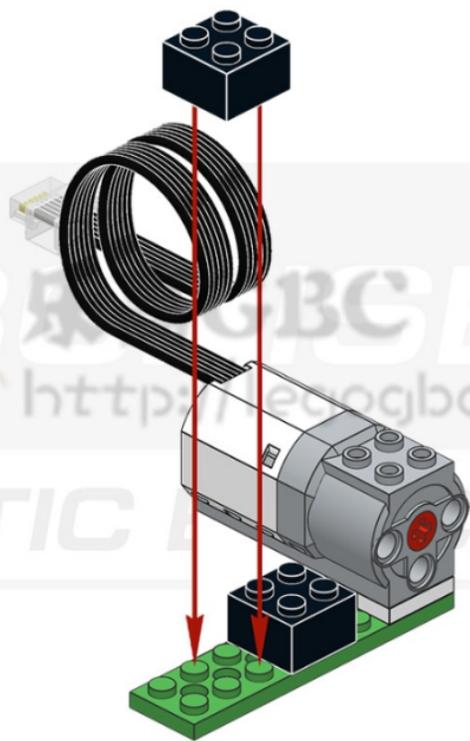


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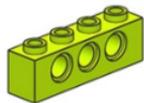
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32



2x

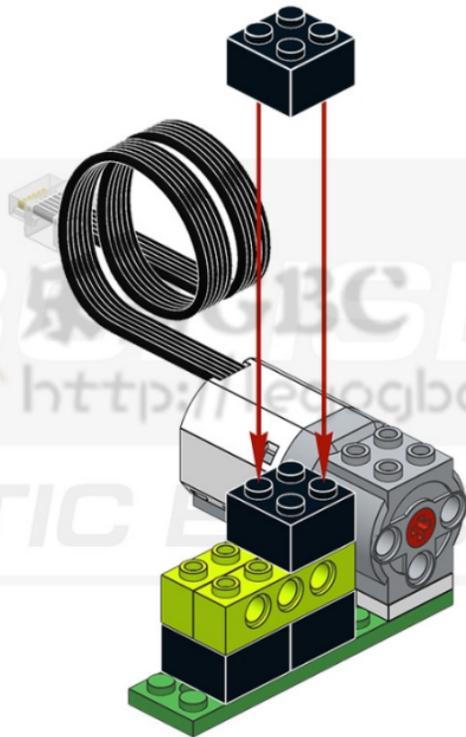
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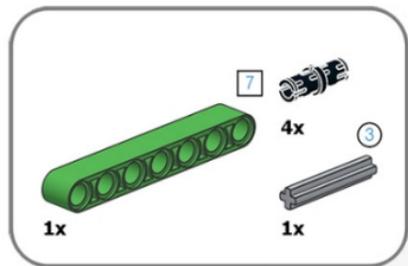
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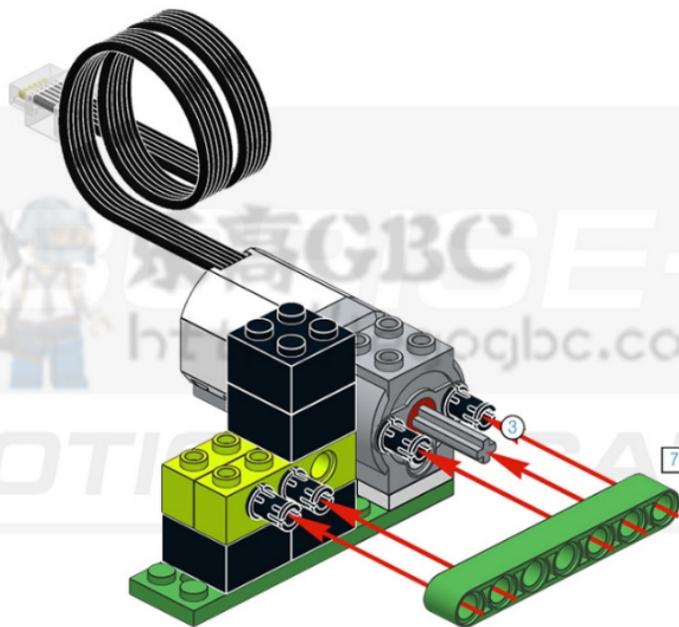
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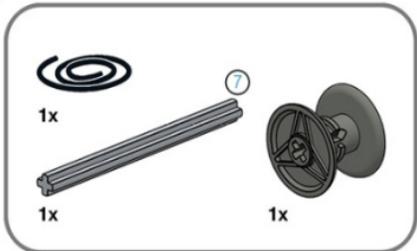
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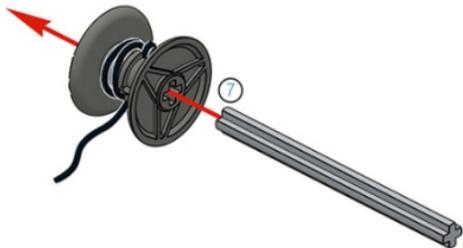


35





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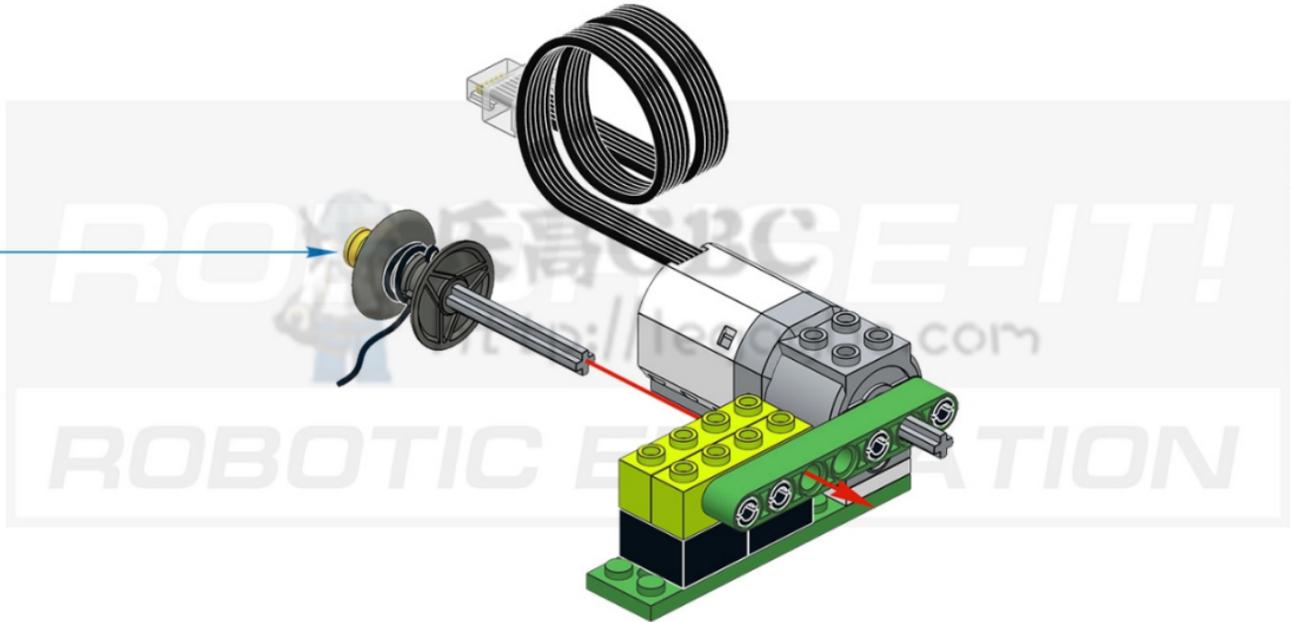
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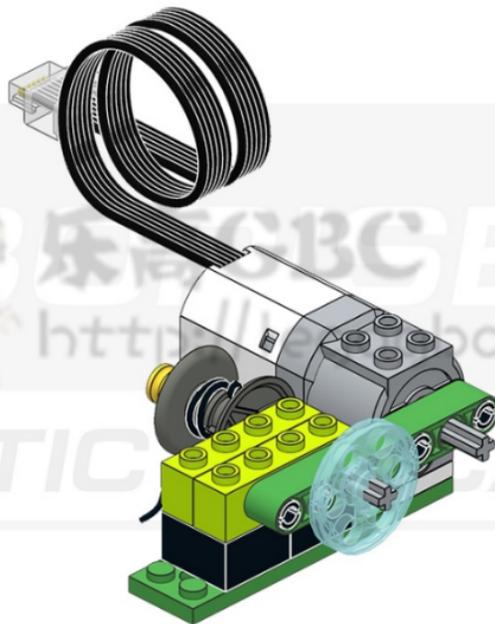
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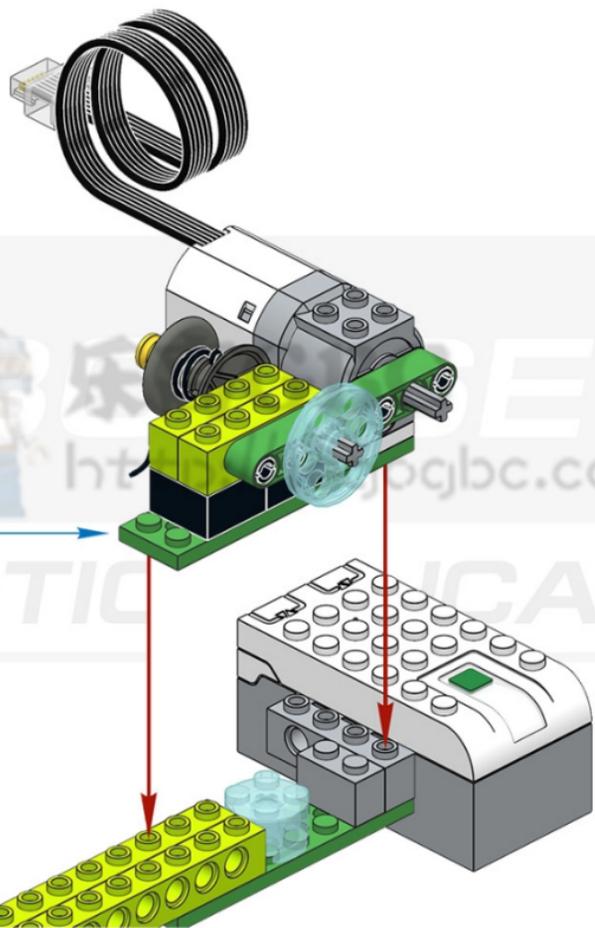


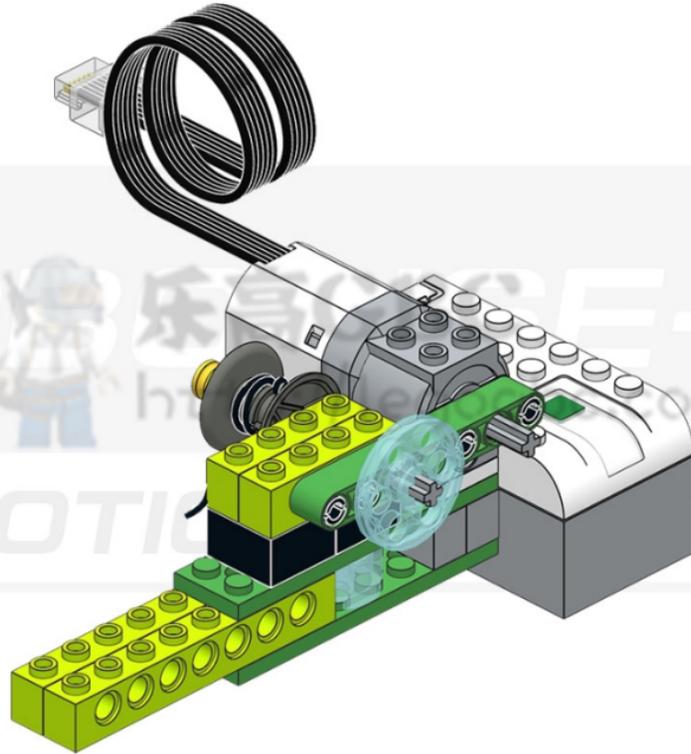
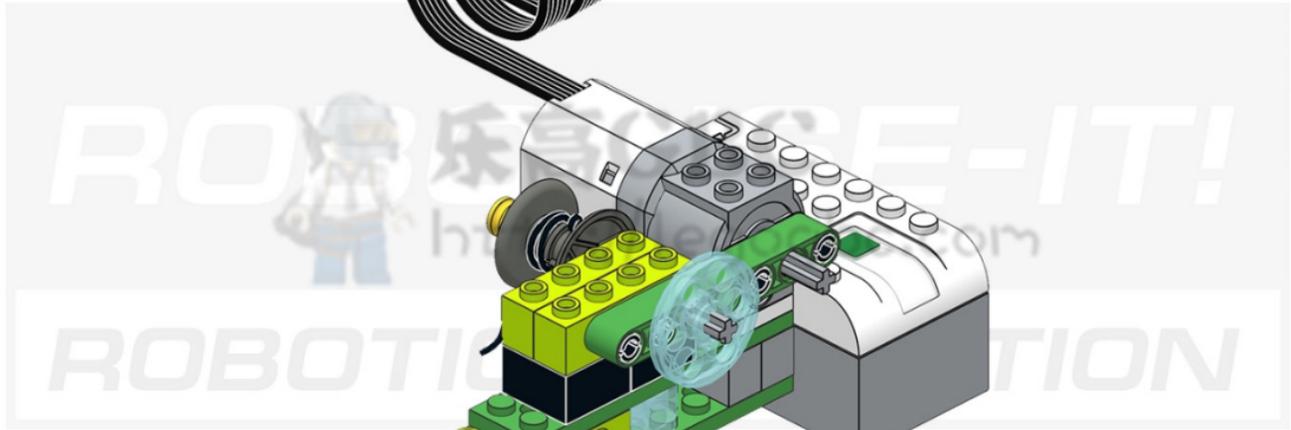


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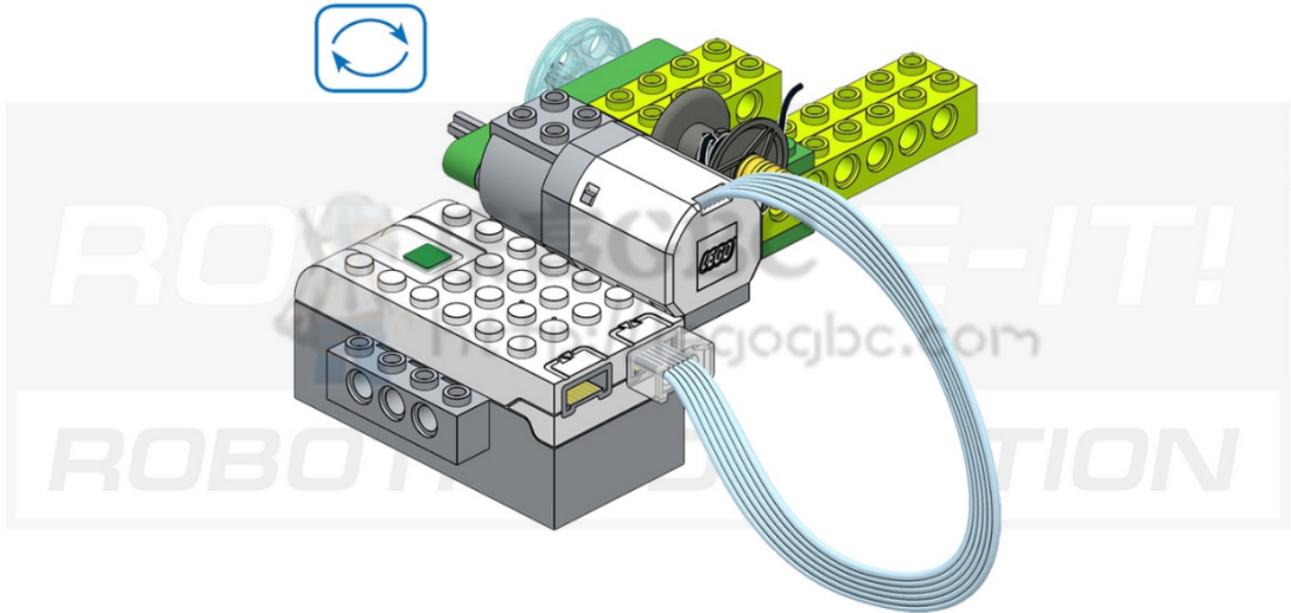
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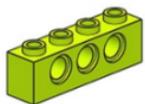






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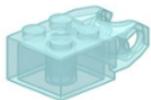




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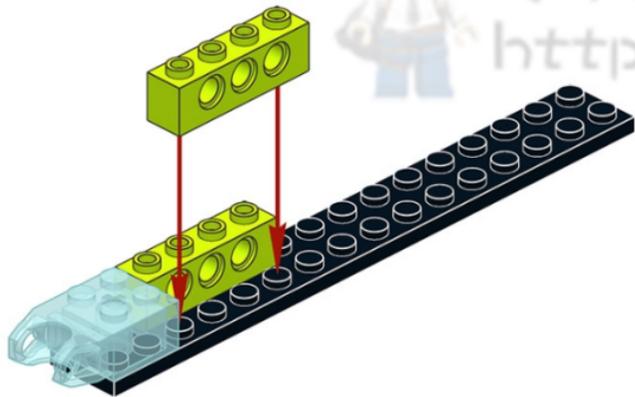


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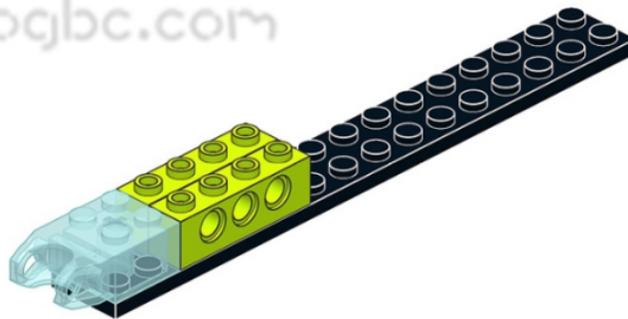


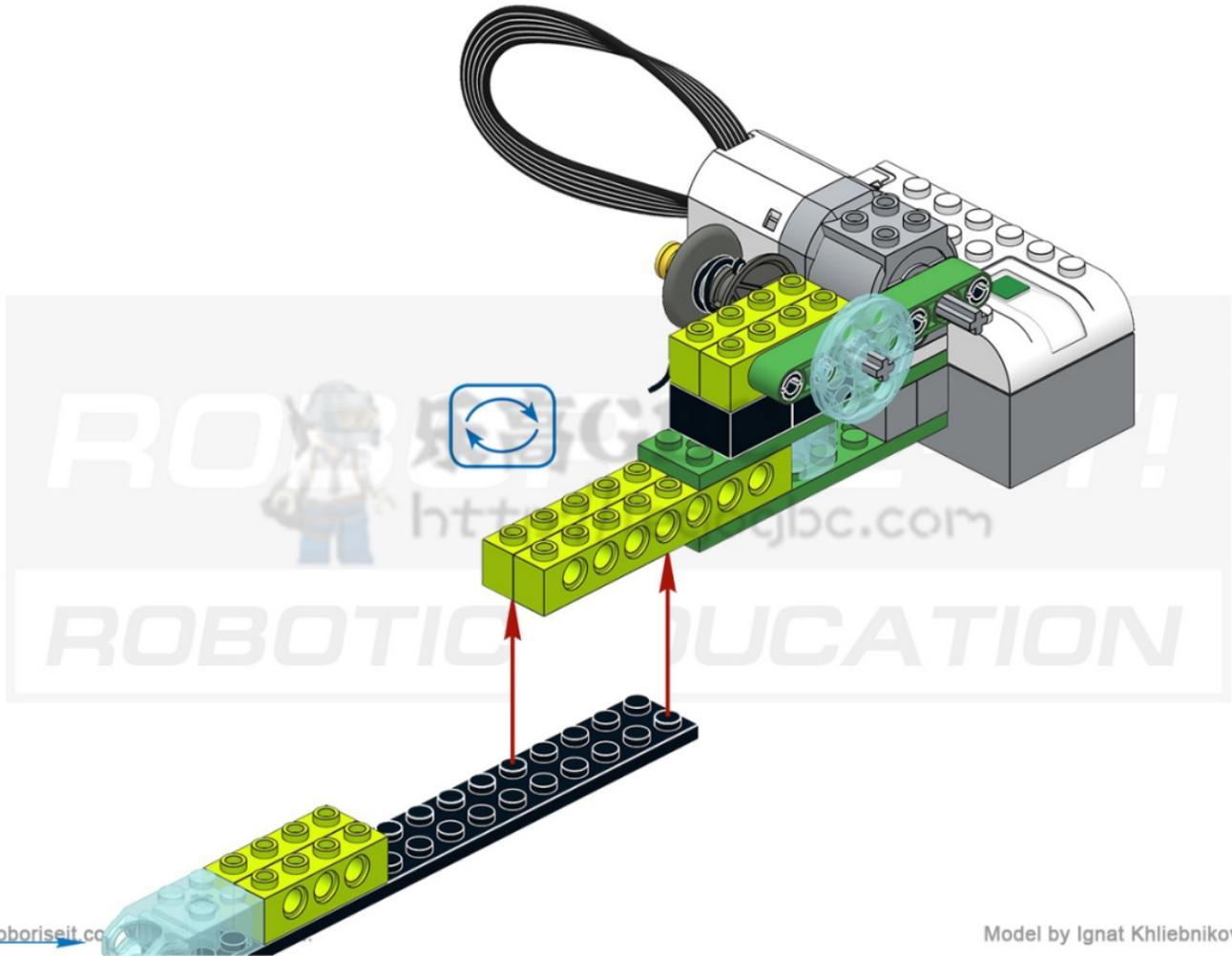
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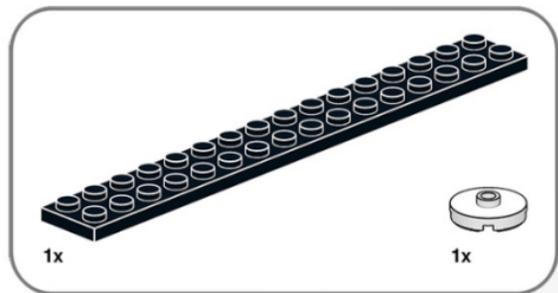
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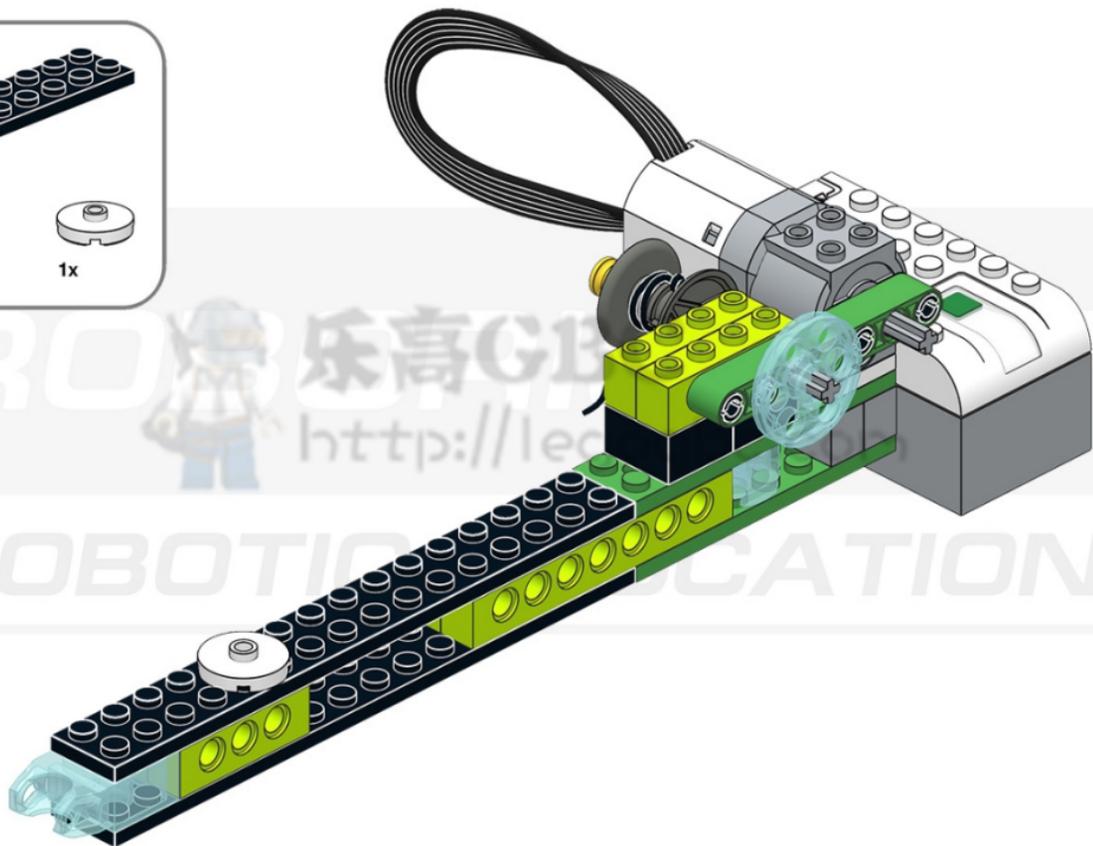
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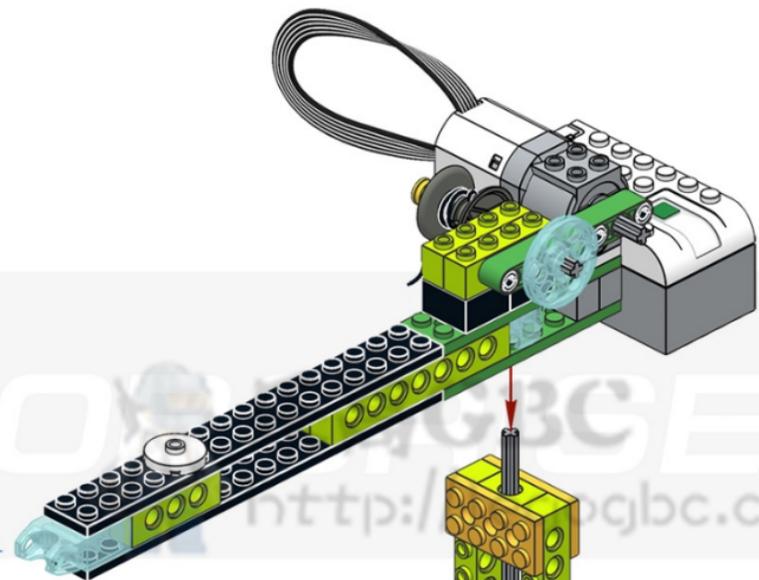




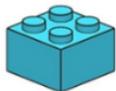
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45



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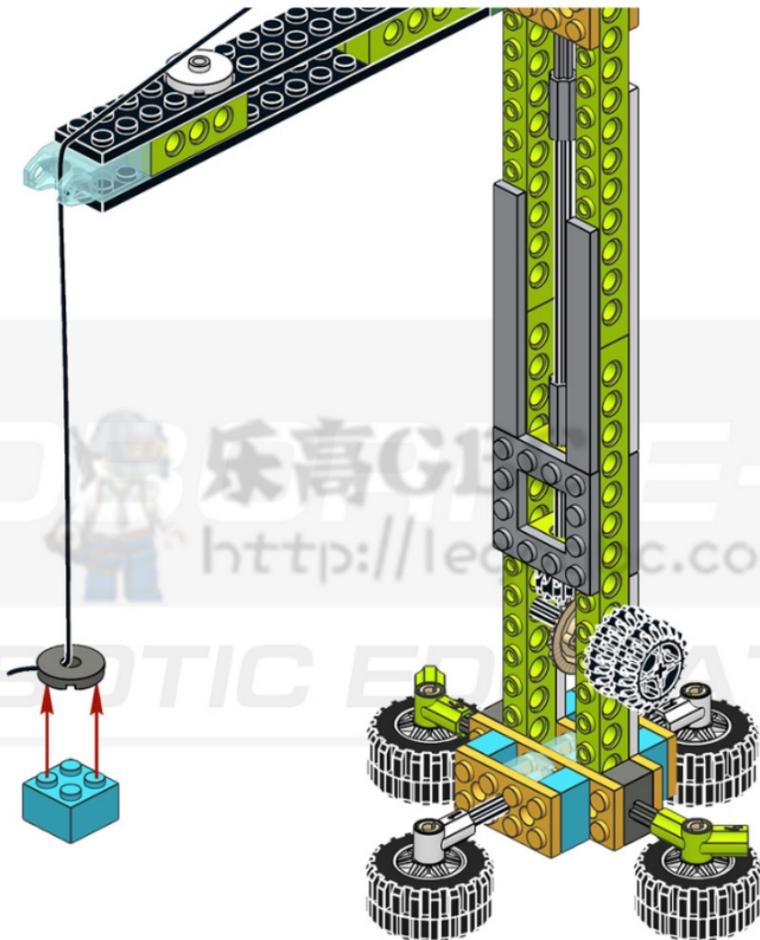


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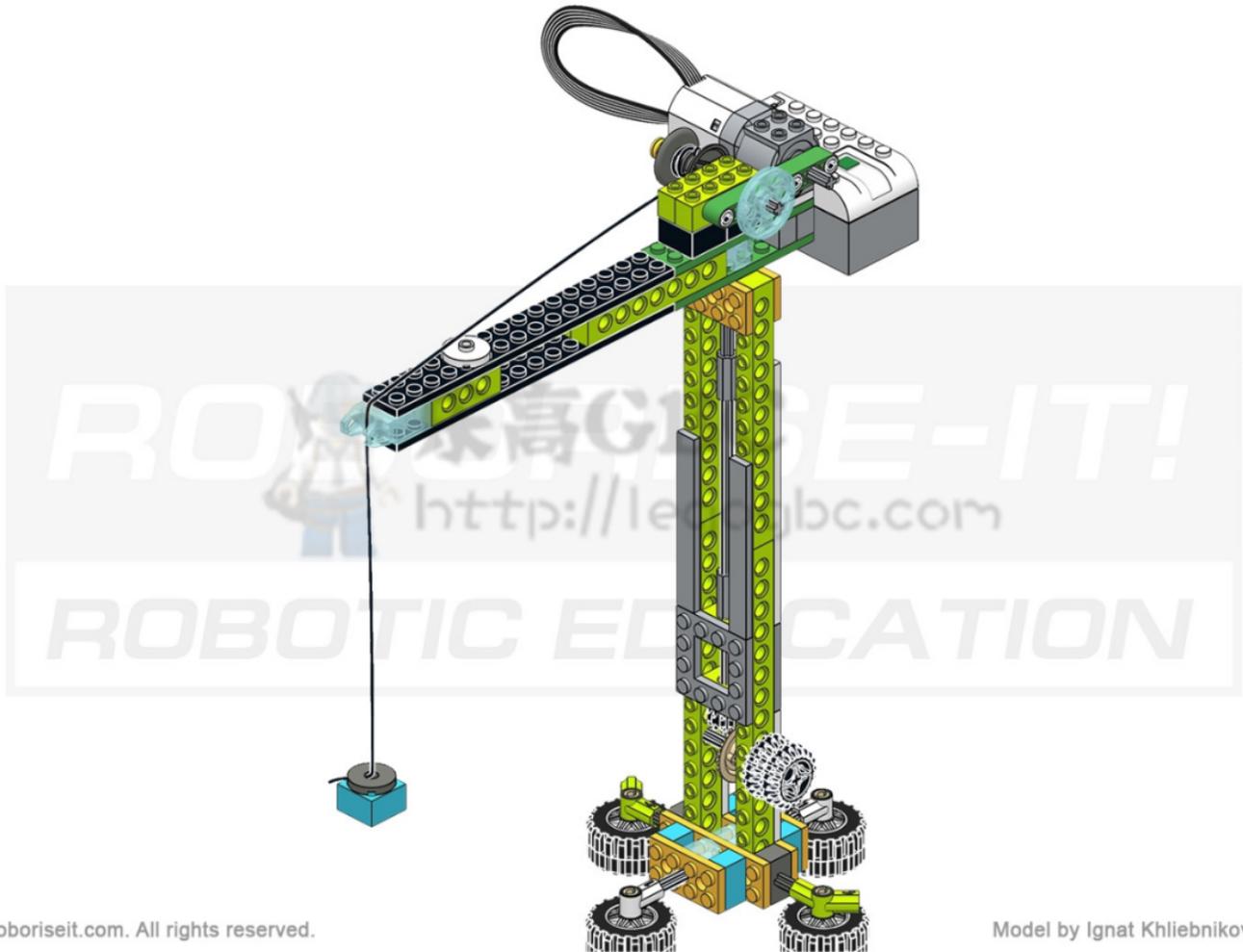


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46



47





Extended version



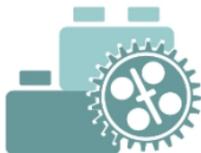
Extend operator cab and boom cable

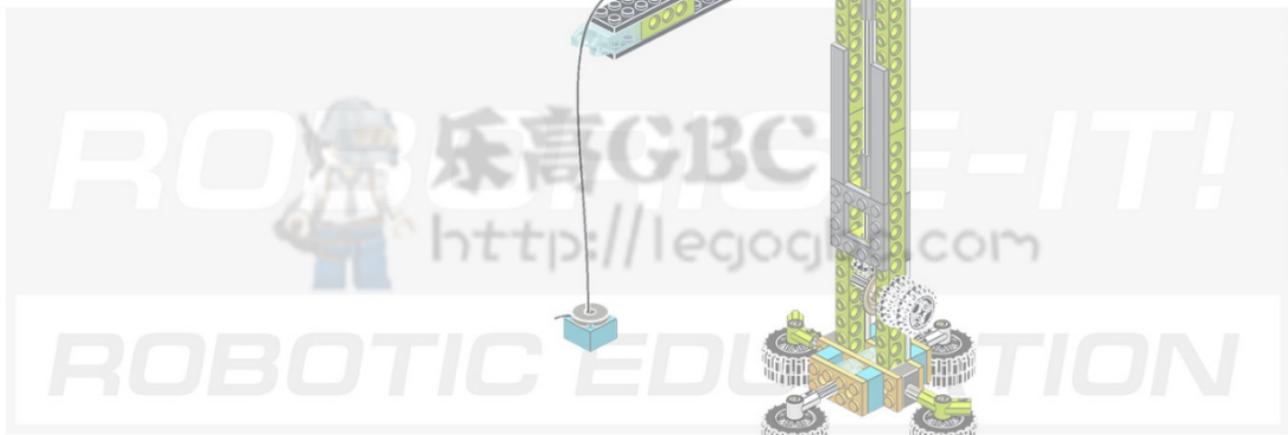


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the instruction



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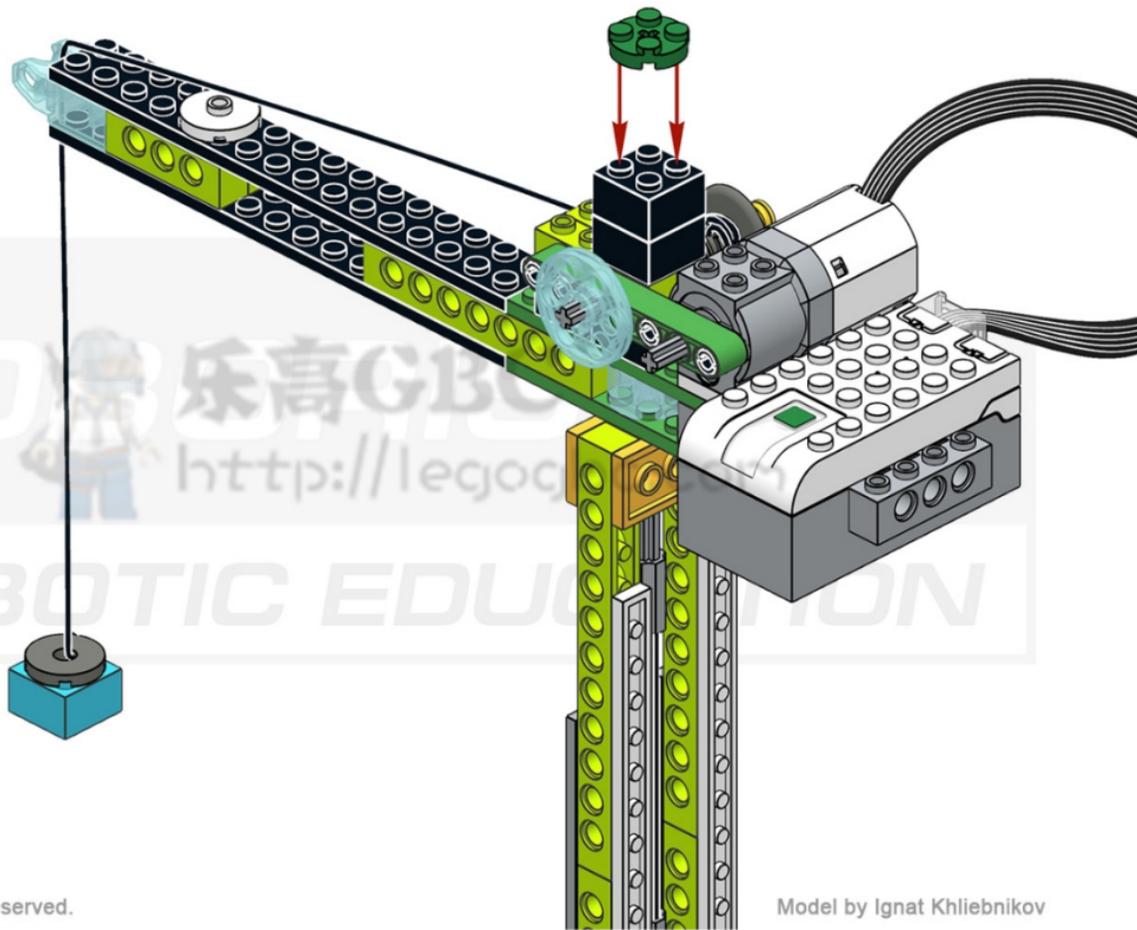


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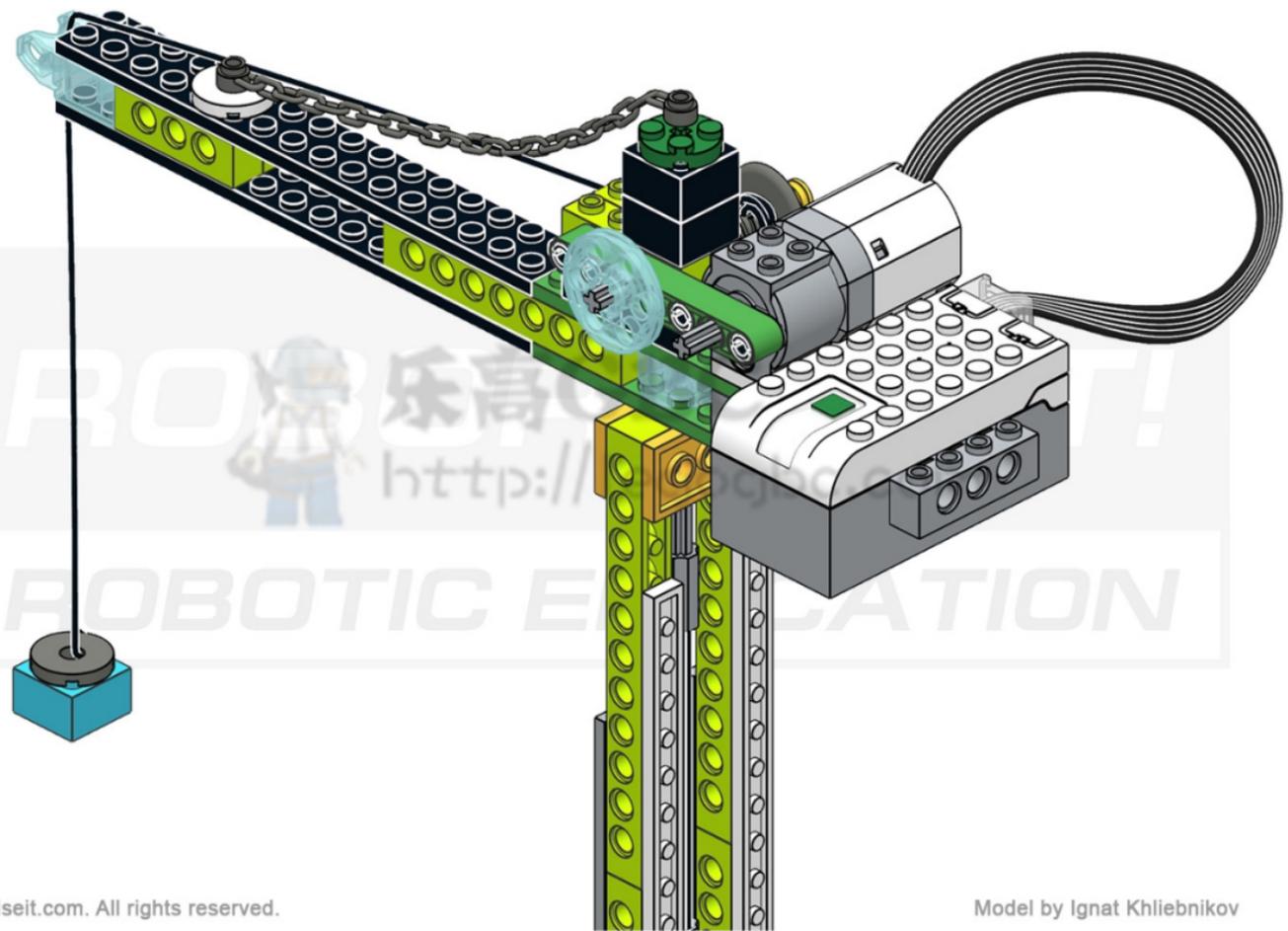
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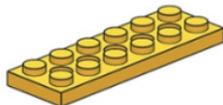
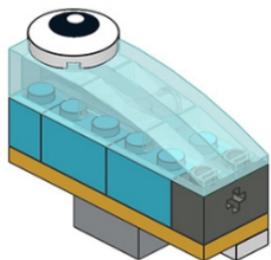


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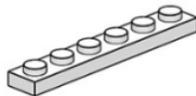


50





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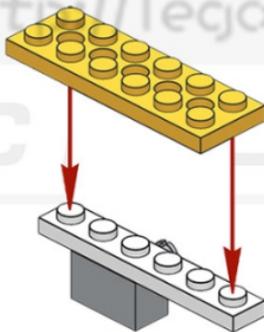


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51



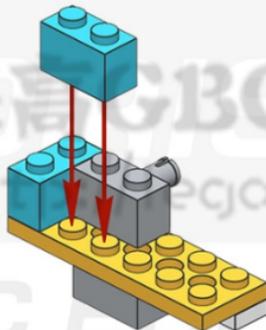


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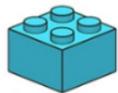
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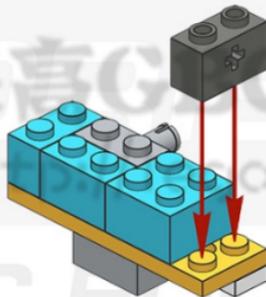


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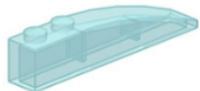
53



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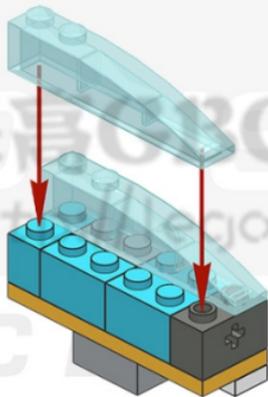
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2x

54



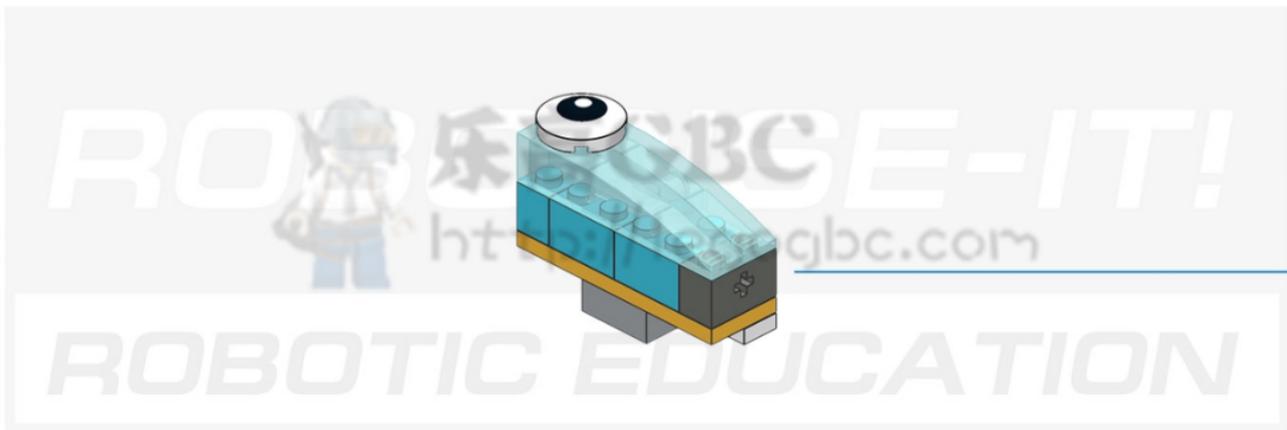
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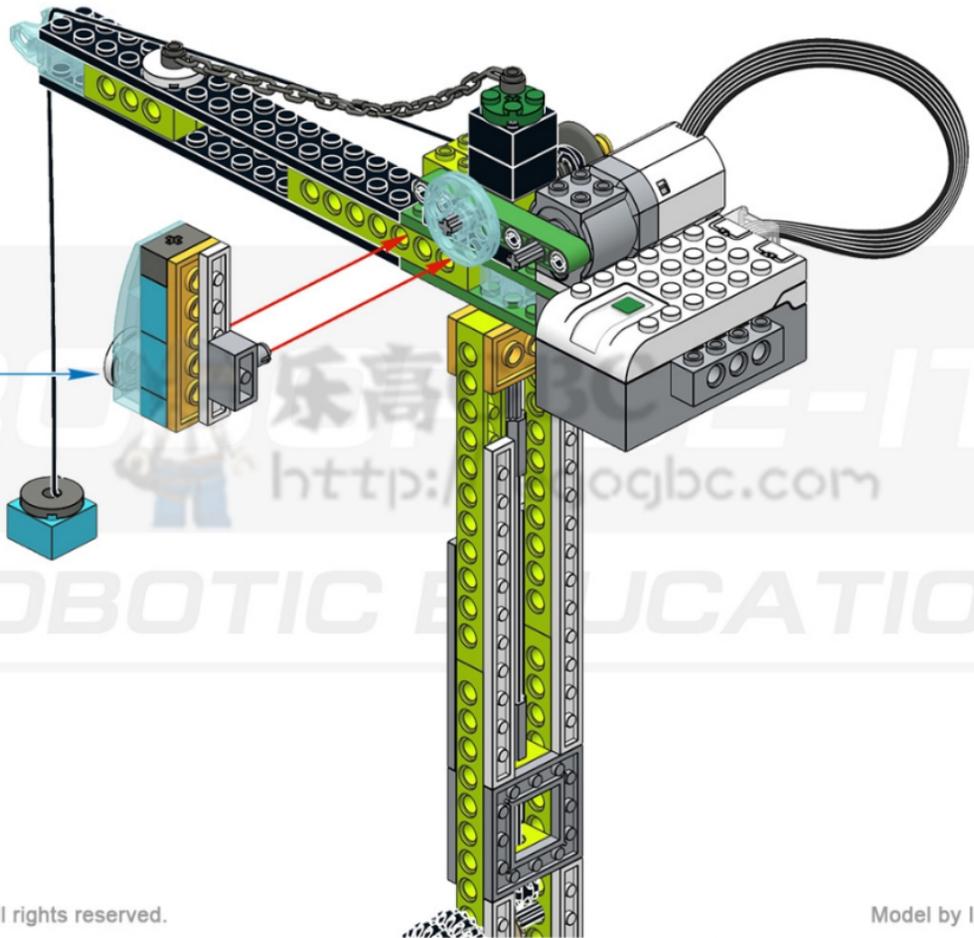
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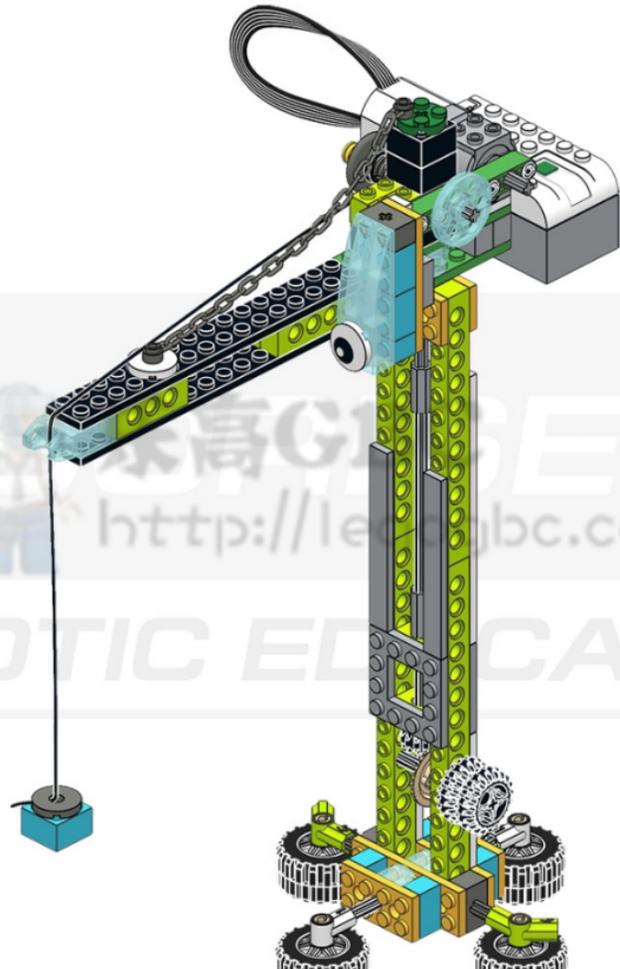


55



56







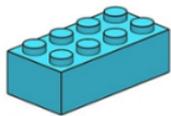
House elements



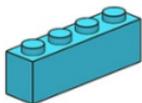
Build the elements of the house from which the building will be constructed



Go to the first slide of the instruction

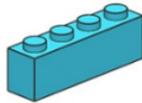
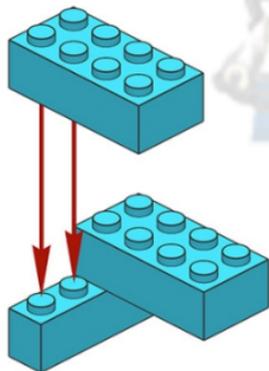


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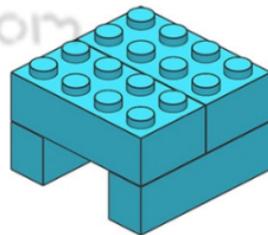
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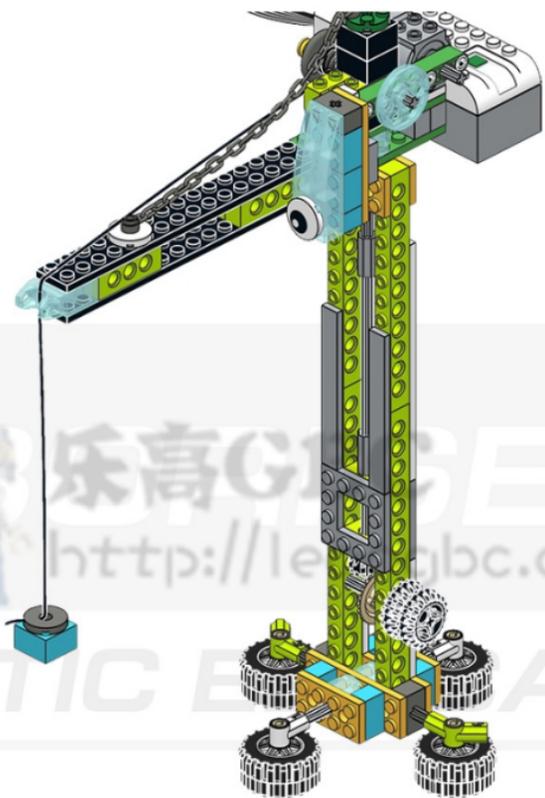


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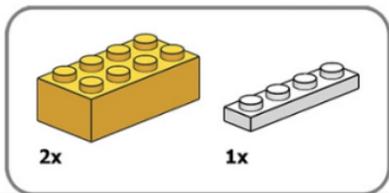
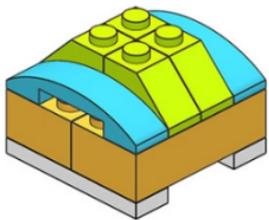
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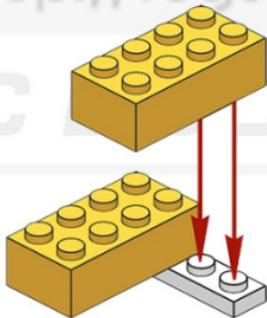
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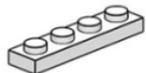


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<http://leboriseit.com>
ROBOTIC EDUCATION



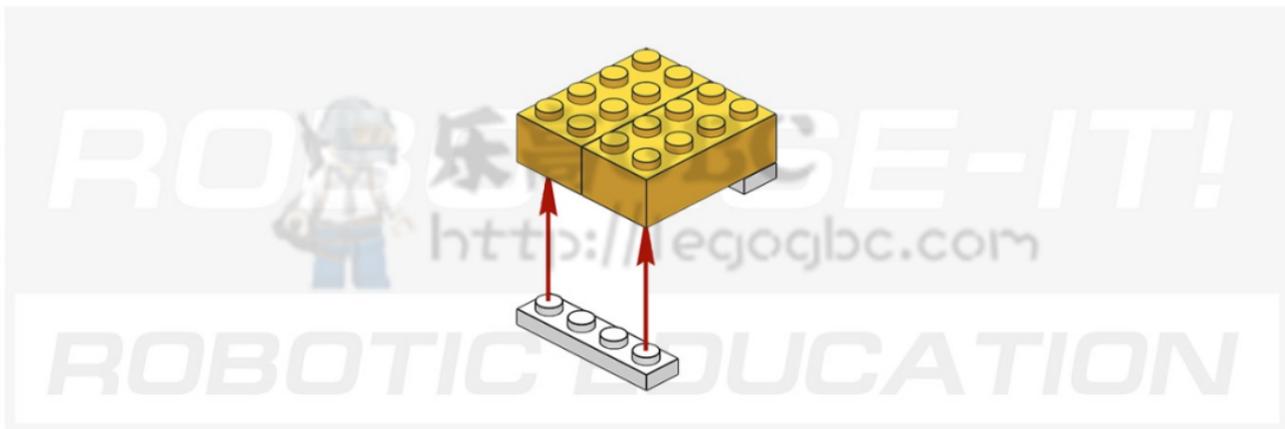
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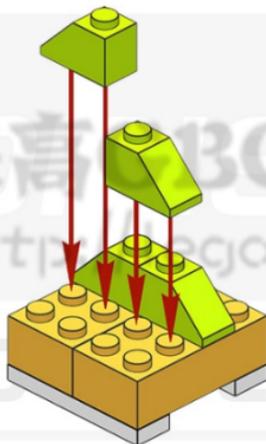
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62



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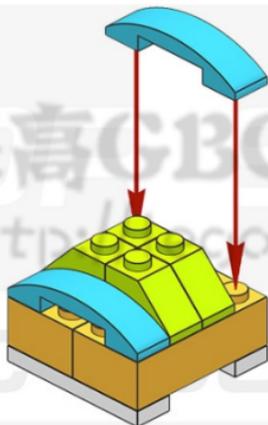
<http://legogbc.com>

ROBOTICS EDUCATION



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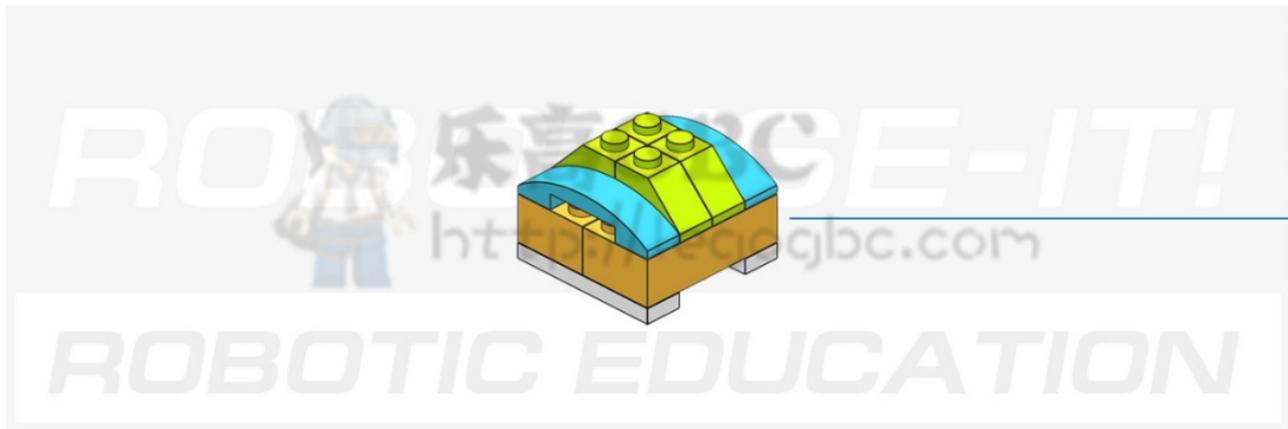
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<http://roboriseit.com>

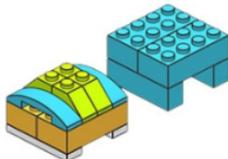
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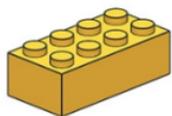


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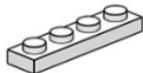


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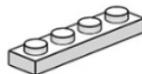
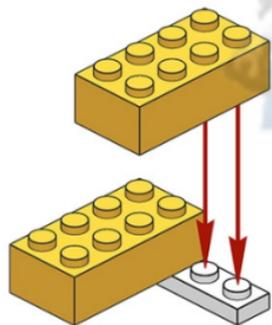


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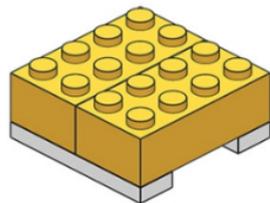
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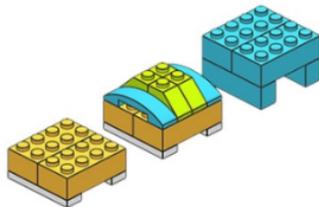
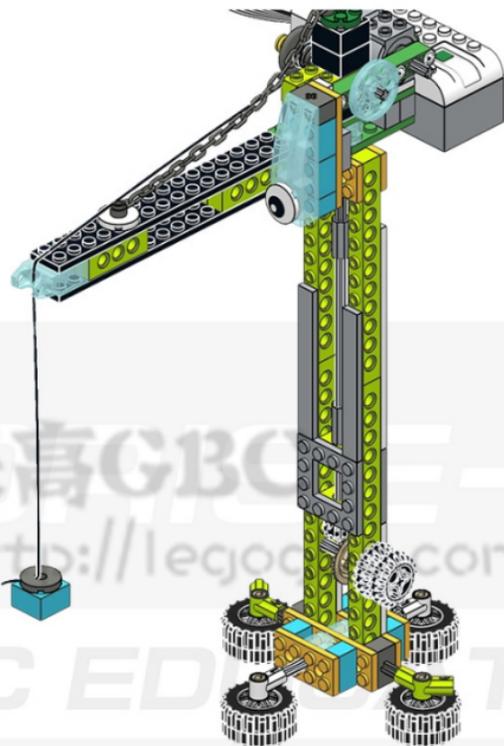


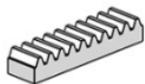
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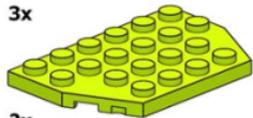


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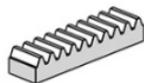
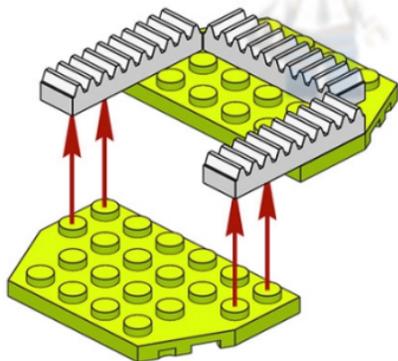


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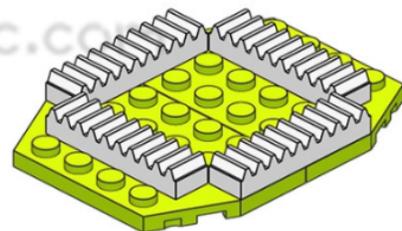
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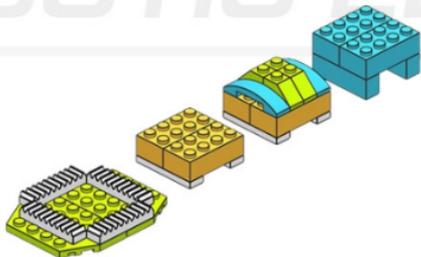
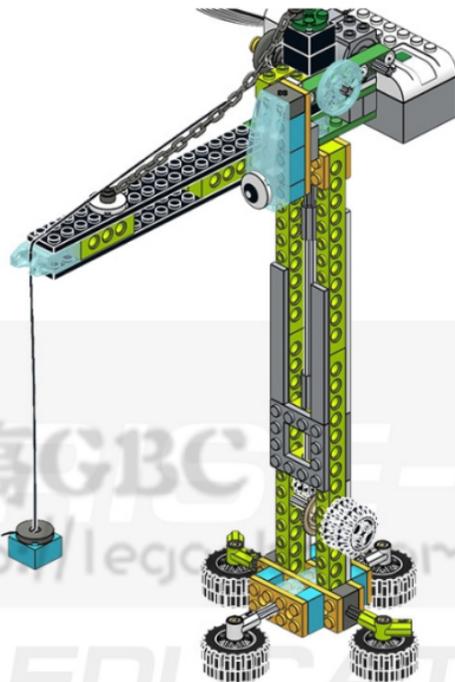
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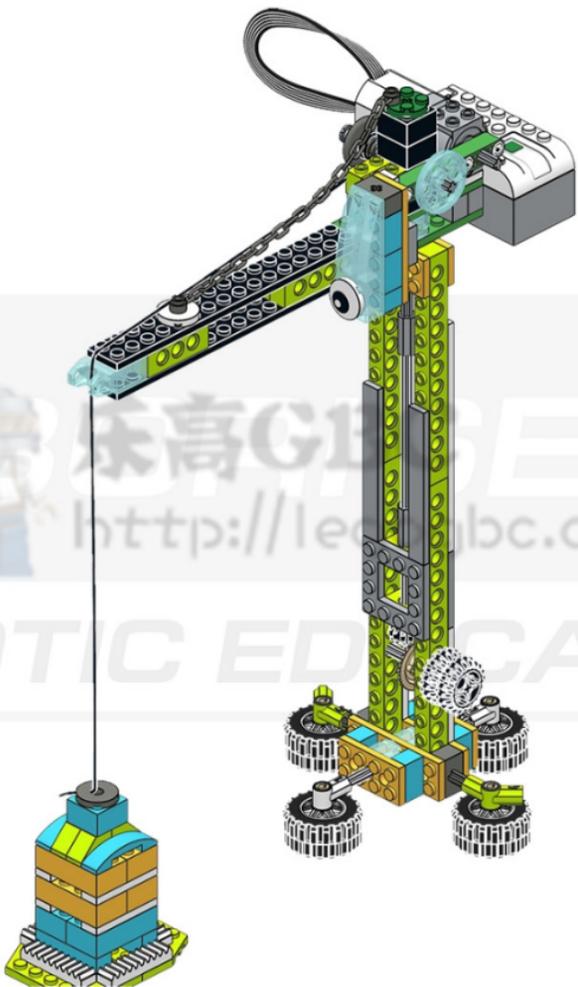


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Note!



The cables must not rub while the robot is moving!





Task 1



Consider the winch drive mechanism. What parts are missing? How can the winch drive be restored and the robot repaired?



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<http://legogbc.com>



Task 2



Repair the robot transmission by installing a pulley of the same diameter on the motor shaft as on the winch shaft.





Task 3



Program the manual operation of the robot winch by pressing the buttons. Try building a house with a friend. One team member operates the winch and the other manages the crane swing.





Task 3. Program



Scratch

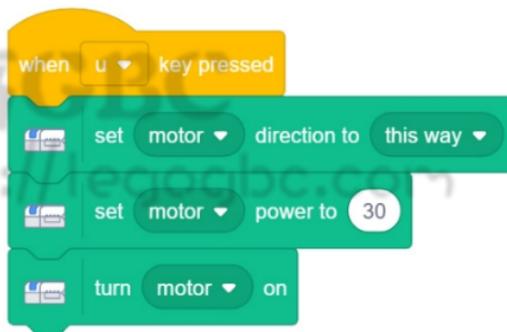
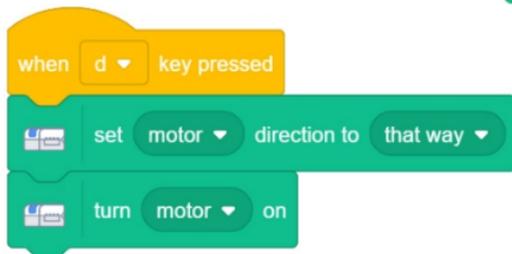
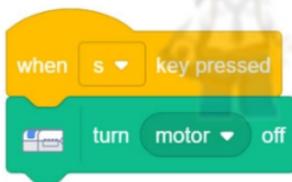


WeDo Software



Program the manual control of the robot winch.

In the Scratch 3.0 programming environment, the program looks like this:





Task 3. Program



Scratch



WeDo Software



Program the manual control of the robot winch.

In WeDo Software, a similar program looks like this:





Task 3



Build a house with a friend. One team member operates the winch and the other manages the crane swing.





Task 4



Select a speed of rotation of the motor at which the next program will lower the cube to the surface, and then raise it to its original position





Task 4. Program



Scratch



WeDo Software



Write the following test program:

In the Scratch 3.0 programming environment, the program looks like this:





Task 4. Program



Scratch



WeDo Software



Write the following test program:

In WeDo Software, a similar program looks like this:



To set the speed, either the program for moving the load upwards or the following program can be used:





Task 5



Change the transmission of the robot so that the loads rise and fall faster. Build an overdrive belt drive.





Task 6



Select such a duration of rotation of the motor in the test program, so that the load again moves from the top point to the bottom and returns back.





Discuss!



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<http://legogbc.com>

How long have you set the motor to rotate so that the load moves in the same way as in the first test?



Step-up gear transmission



You have assembled a step-up gear transmission that tripled the output speed because the pulley diameters are three times different. Therefore, it took about three times less time for the cargo to travel the same path as at the beginning.





Task 7



Change the transmission of the robot so that the weights rise and fall more slowly than in the first test. Build a belt drive.





Task 8



Again, select such a duration of rotation of the motor in the test program so that the weight moves from the top point to the bottom and returns back.





Discuss!



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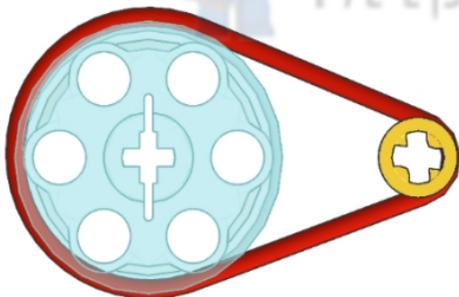
How long have you set the motor to rotate so that the load moves in the same way as in the first test?



Step-down gear transmission



You have assembled a step-down gear transmission that has tripled the output speed because the pulley diameters are three times different. Therefore, in order for the cargo to travel the same path as at the beginning, it took about three times as long.

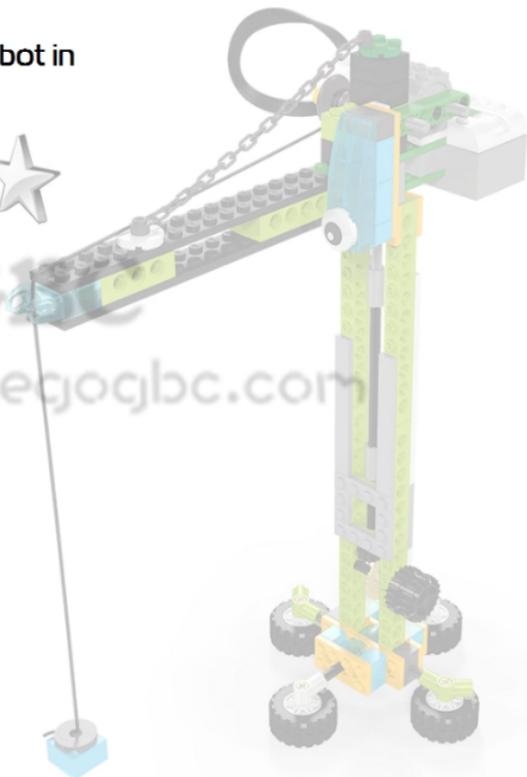




Tasks



Place the pieces of robot in
the right places





Task 9 *



Attach the tilt sensor to the robot to control the winch.





Task 10 *. Program



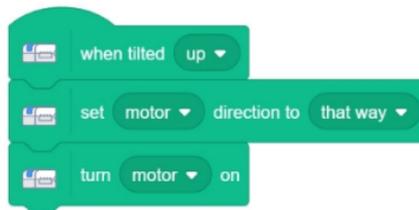
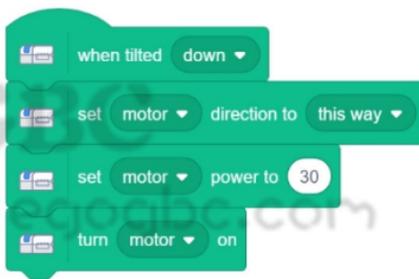
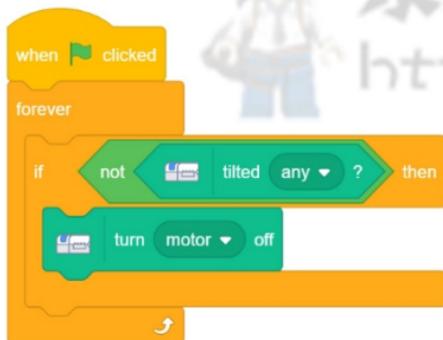
Scratch



WeDo Software



Write the following programs:





Task 10 *. Program



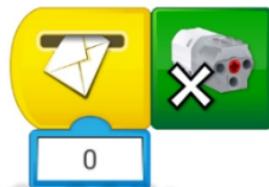
Scratch



WeDo Software



Write the following programs:

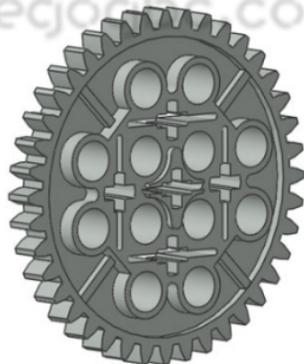




Question



What gears can you use when building a bevel gear?



高GBC
<http://legoobs.com>



Question



Which of the gears shown increases the rotational speed of the output axle?



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<http://legogbc.com>



Question



Scratch



WeDo Software



Which blocks are triggered when the tilt sensor conditions are met?



Scratch script blocks for a WeDo 2.0 robot:

- Script Area 1 (Left):**
 - when **u** key pressed
 - set motor direction to **this way**
 - set motor power to **30**
 - turn motor **on**
- Script Area 2 (Right):**
 - when **d** key pressed
 - set motor direction to **that way**
 - turn motor **on**
- Script Area 3 (Bottom Left):**
 - when tilted **up**
 - set motor direction to **that way**
 - turn motor **on**
- Script Area 4 (Bottom Right):**
 - when **s** key pressed
 - turn motor **off**



Question



Scratch



WeDo Software



Which block is sending the tilt sensor data?





Discuss!

- Where and what are tower cranes used for?
- What functions does your robot have?
- What's broken in the robot and how did you fix it?
- What is the difference between step-down and step-up gear transmission?
- Why is it desirable to use a belt drive in this robot?





Your achievements

Total:

0



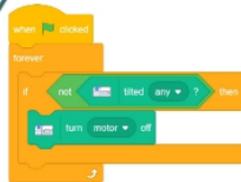
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2



3



4

