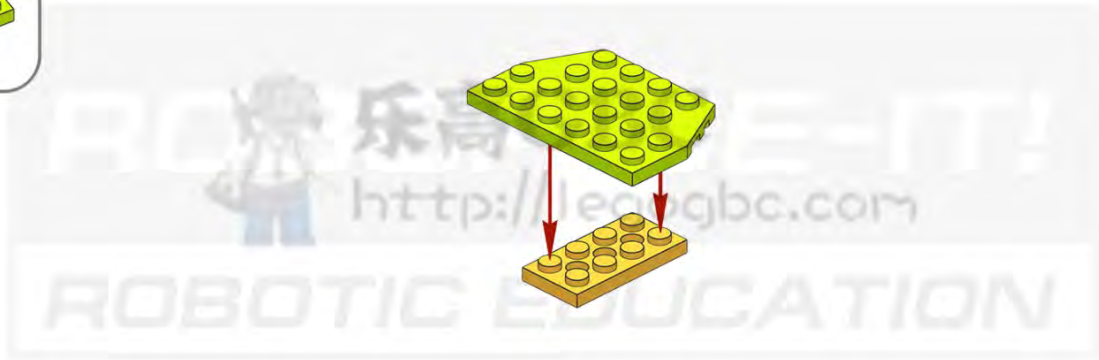
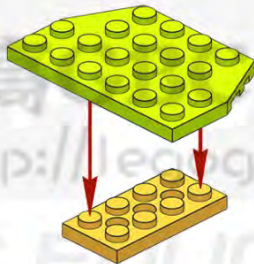
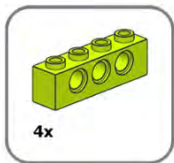
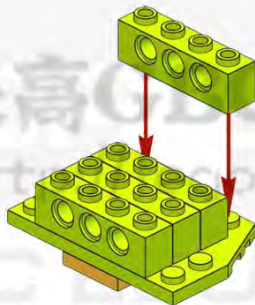


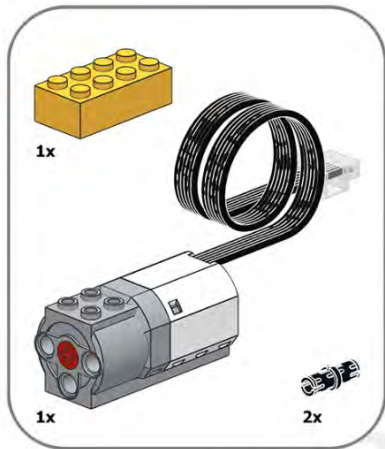
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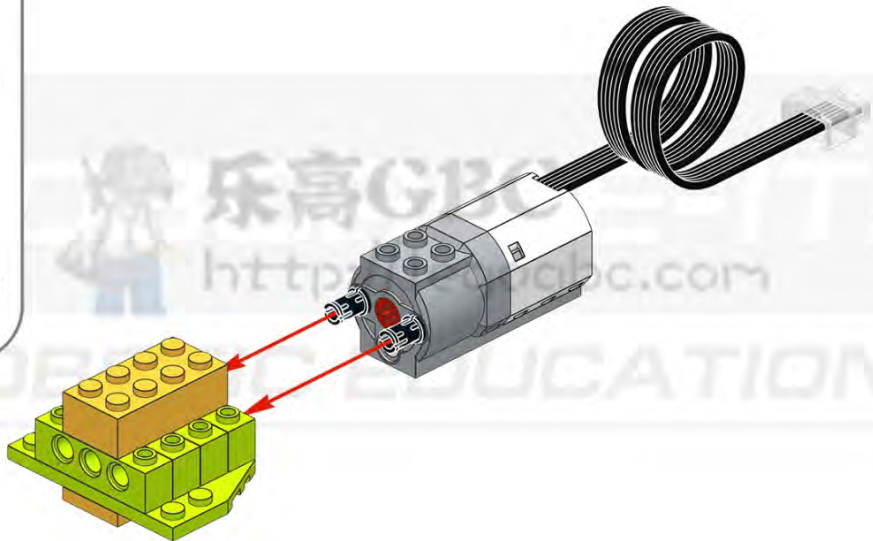


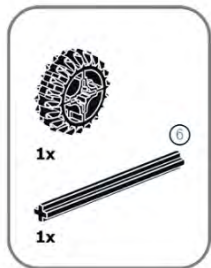
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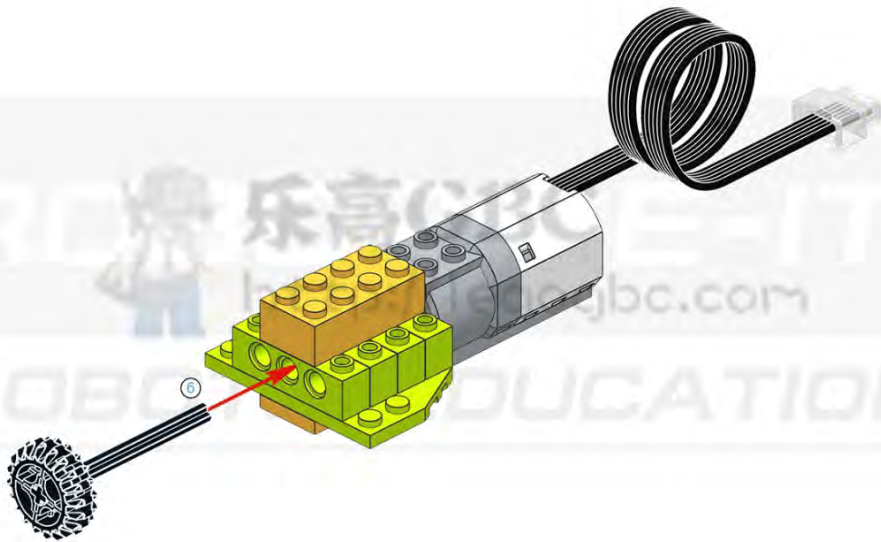


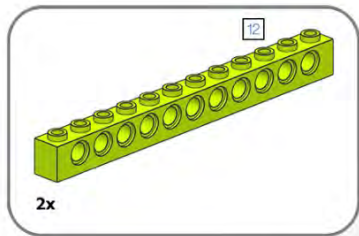
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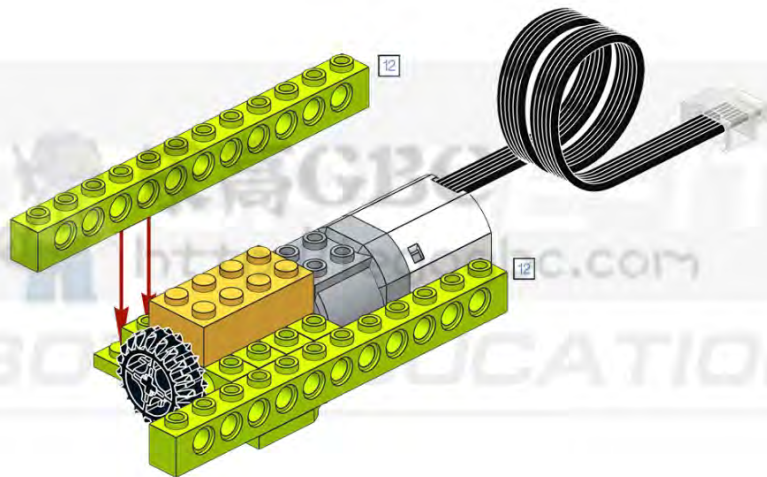


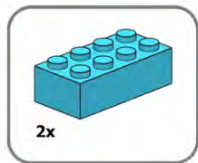
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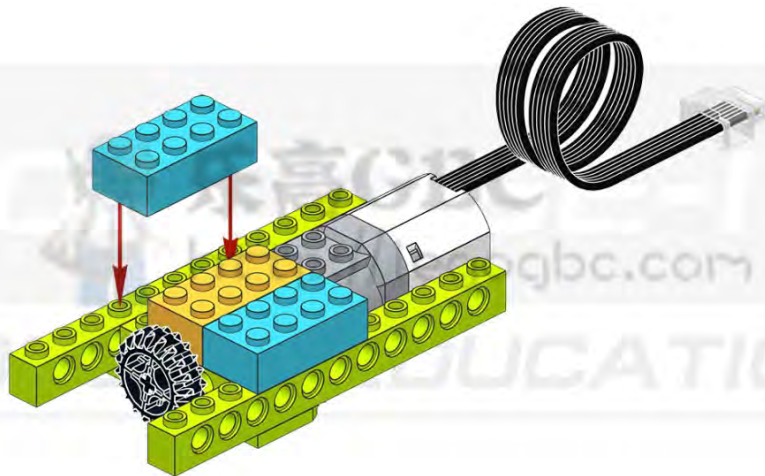


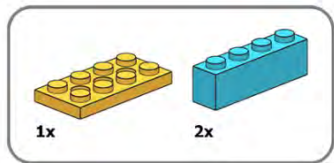
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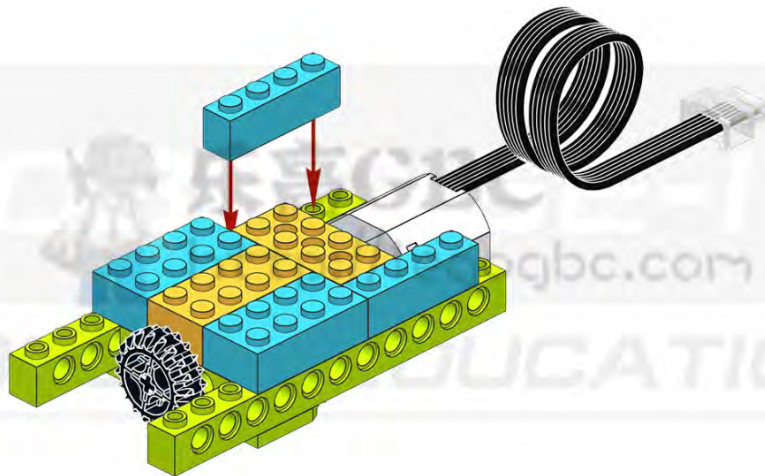


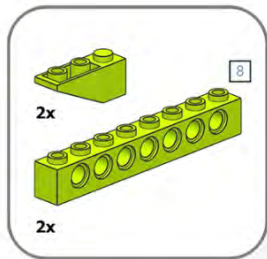
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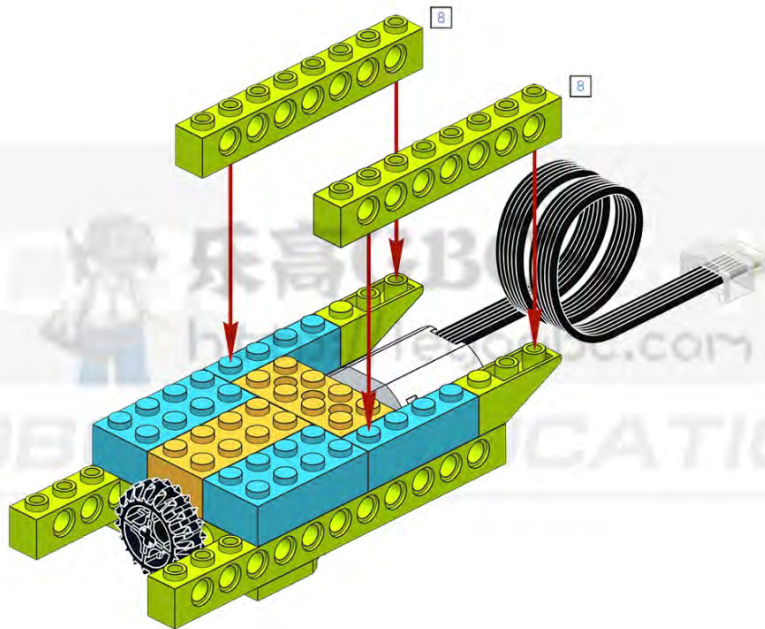


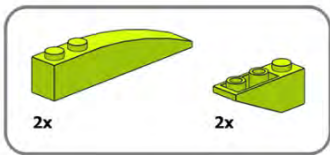
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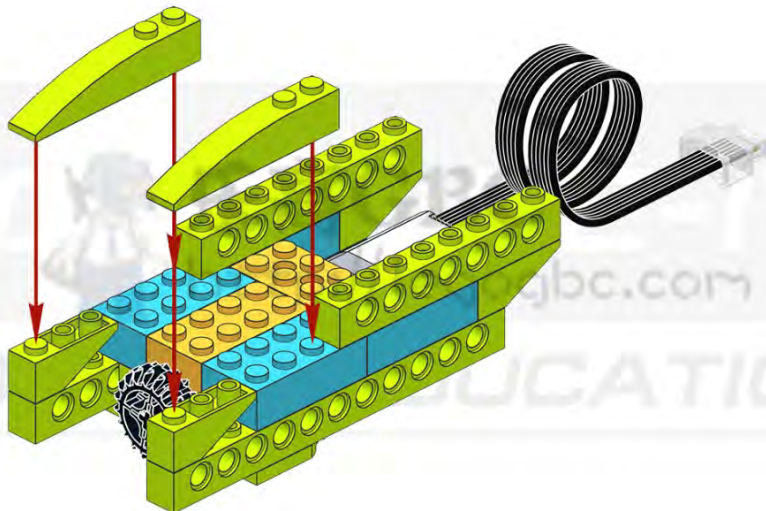


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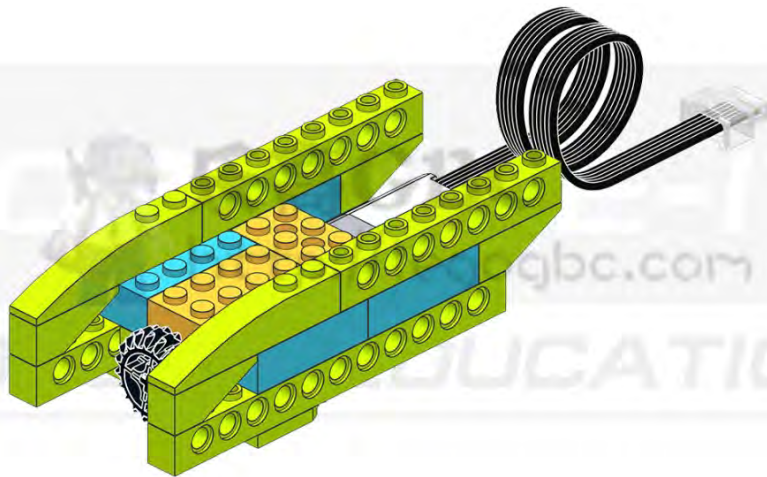


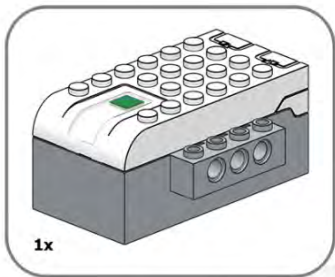


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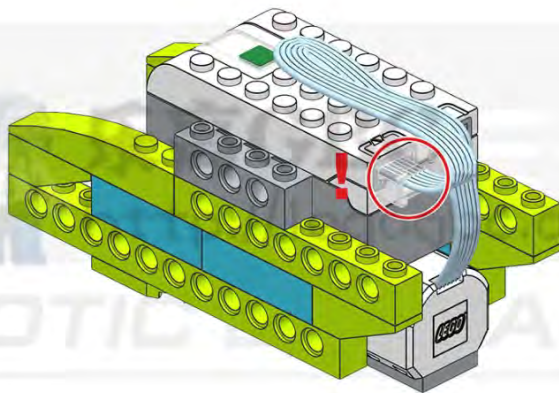


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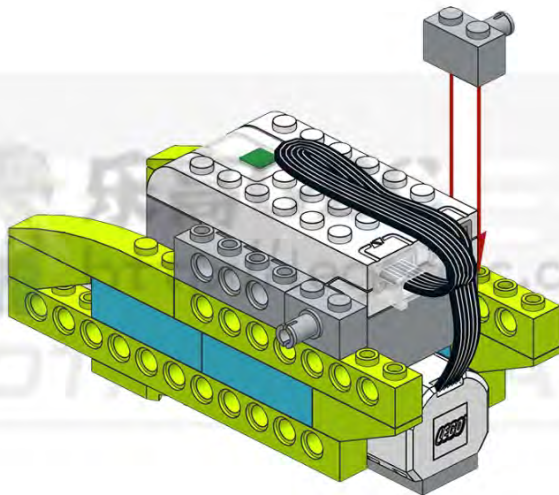
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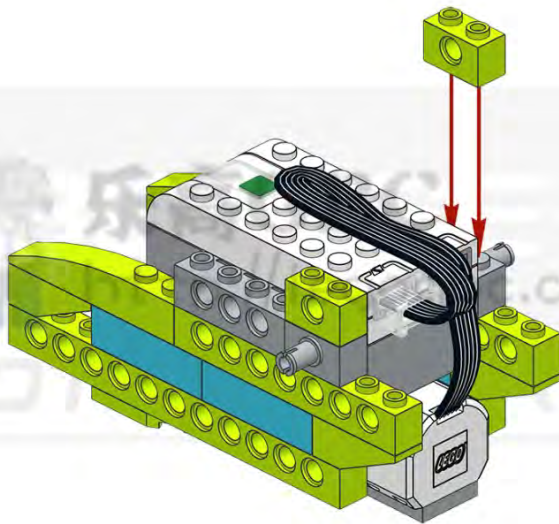
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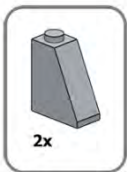




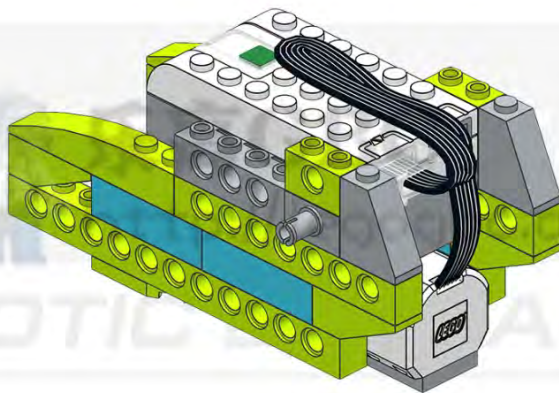
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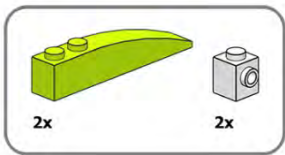
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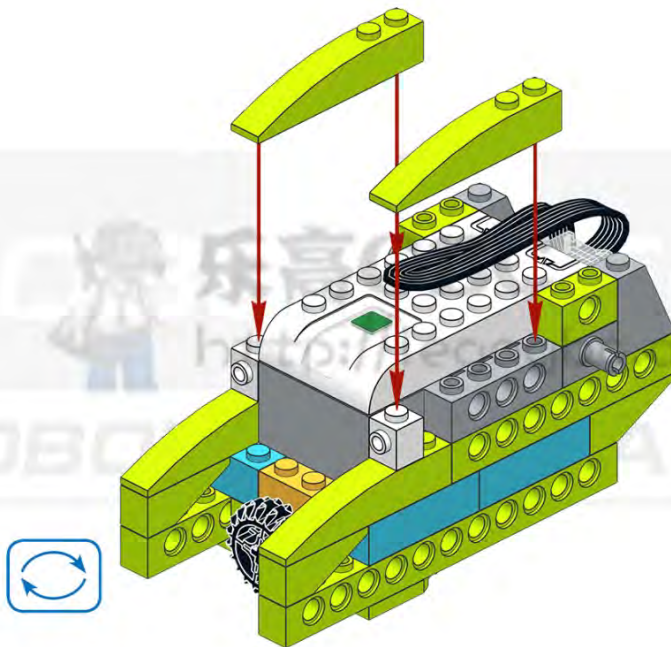


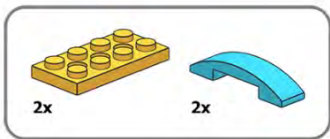
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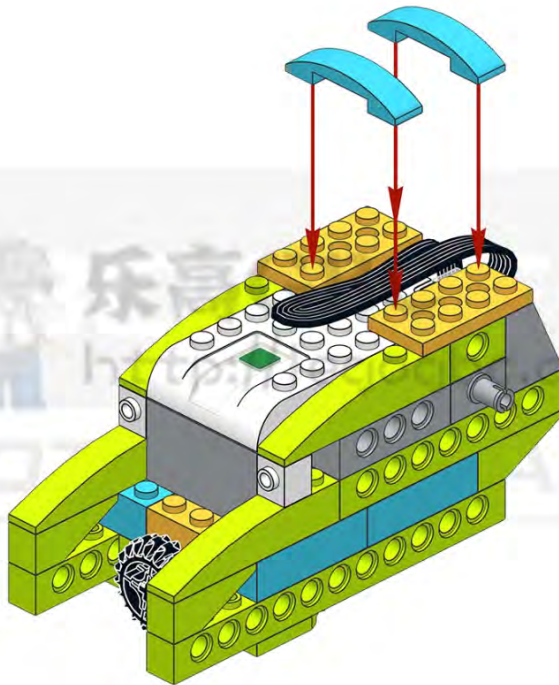


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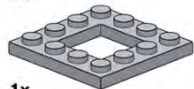


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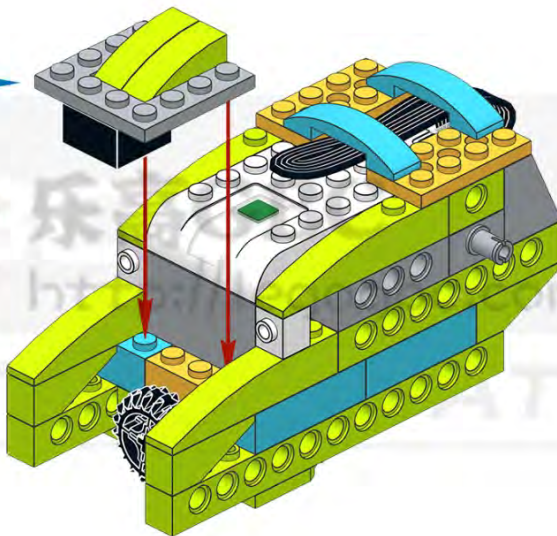
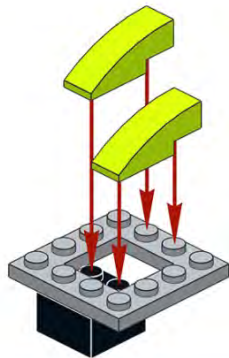
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1x



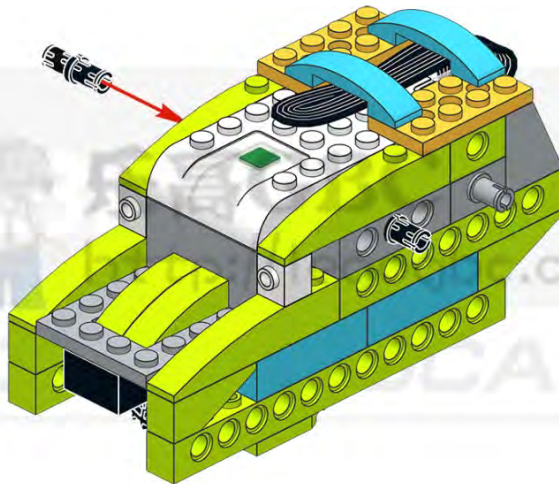
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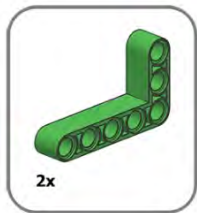




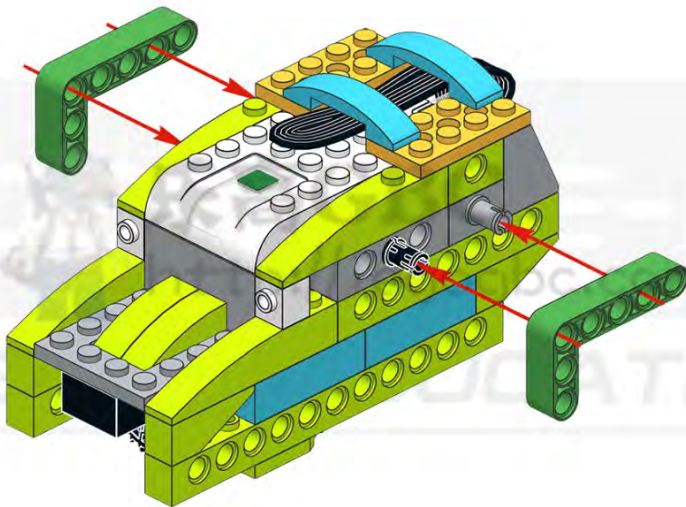
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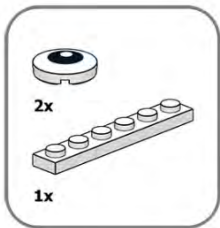
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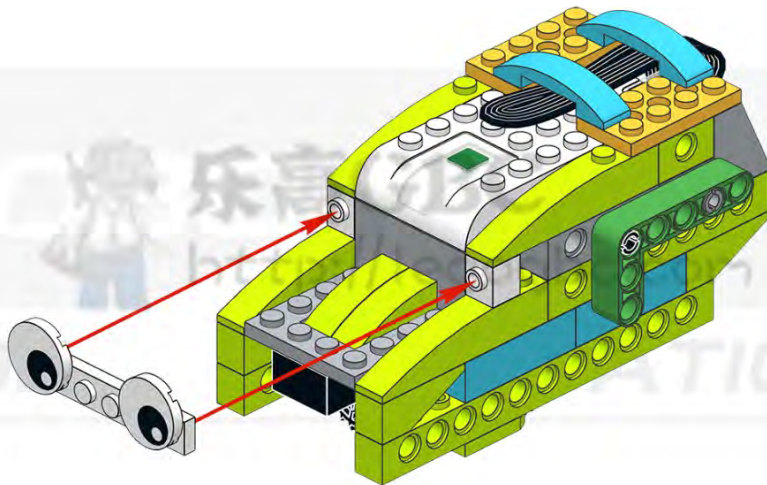


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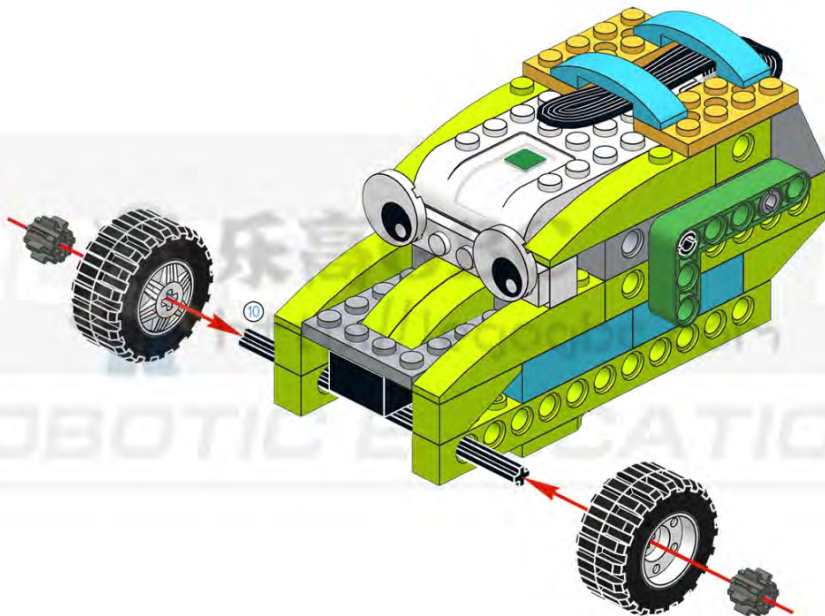


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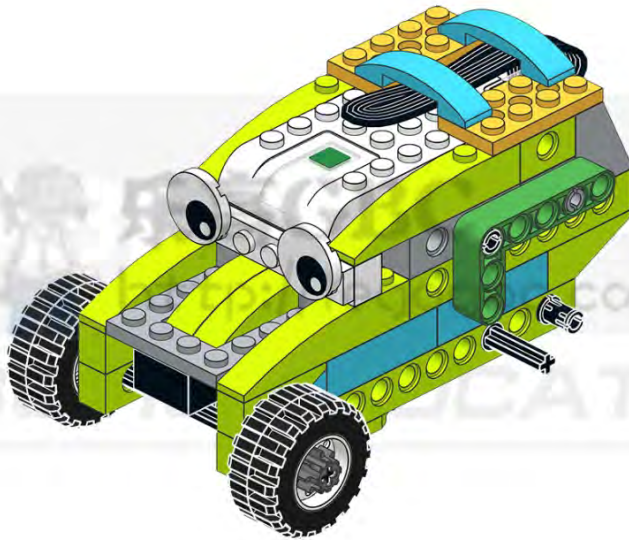


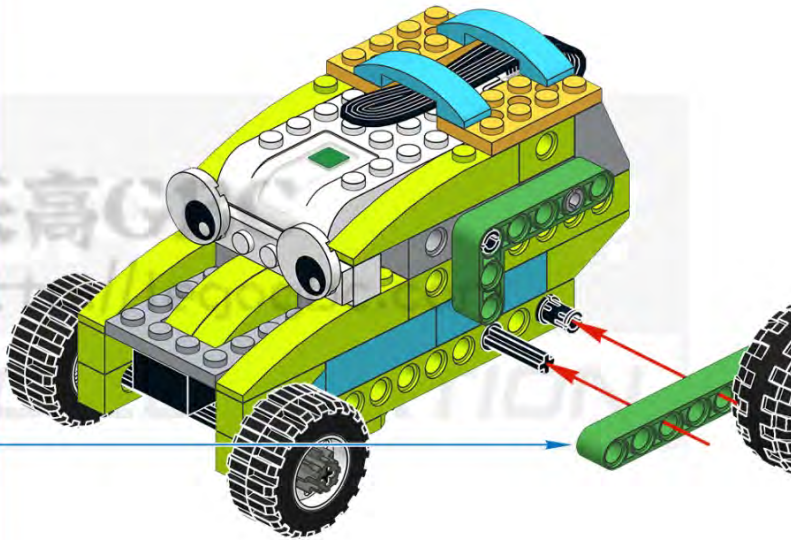
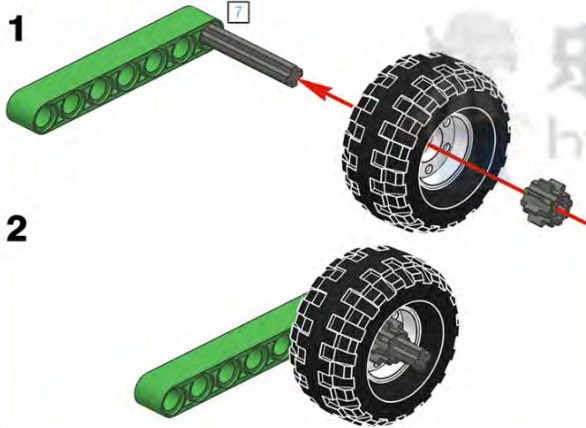
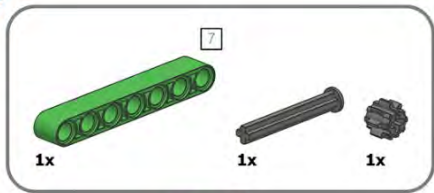


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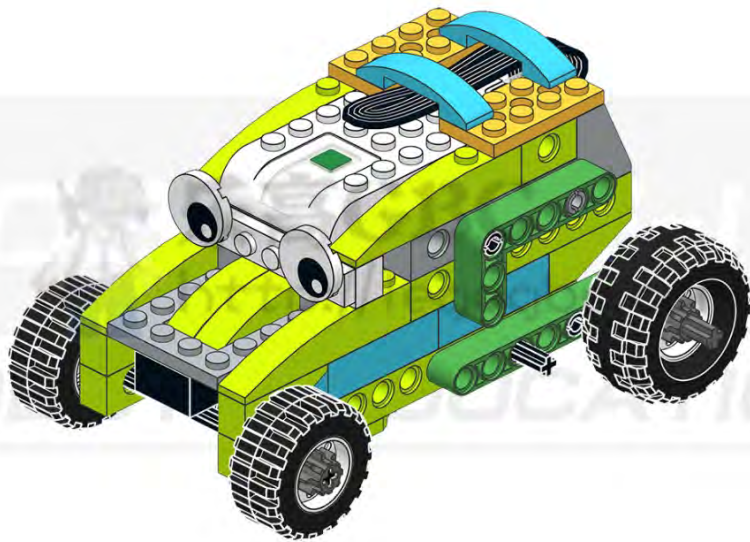
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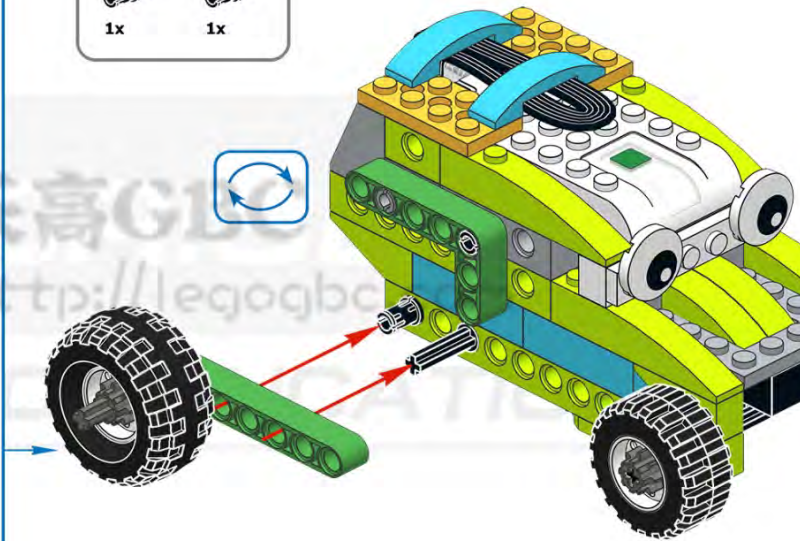
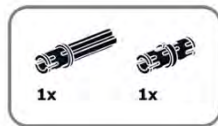
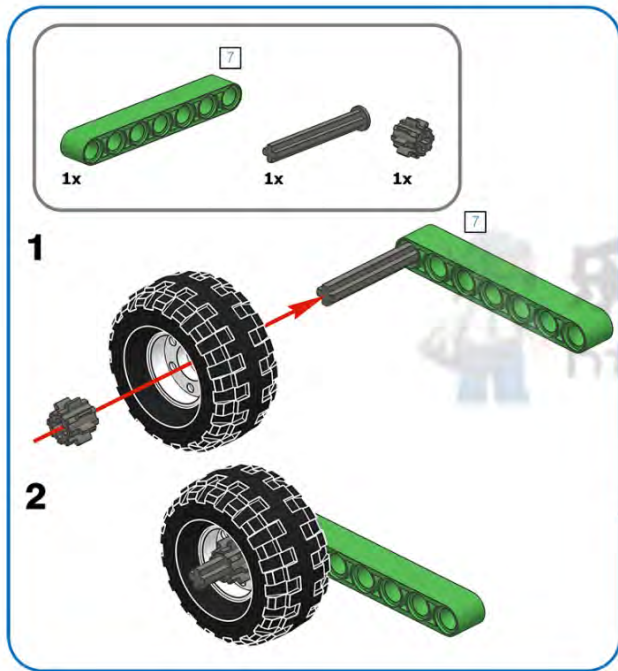
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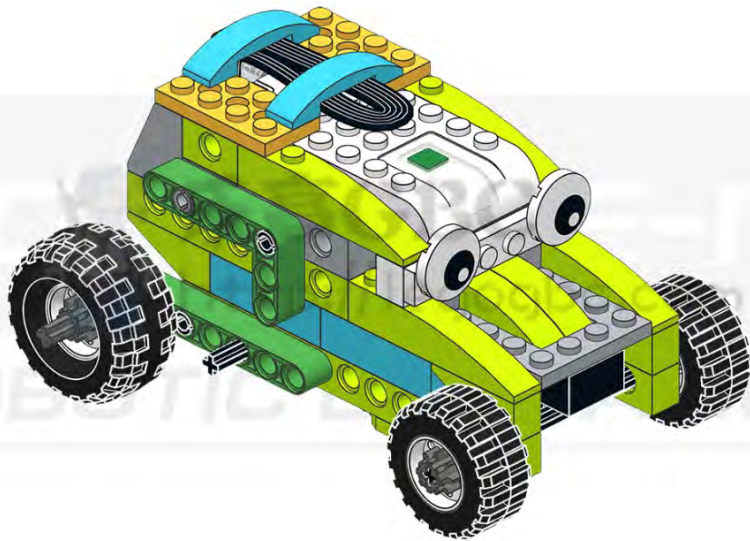




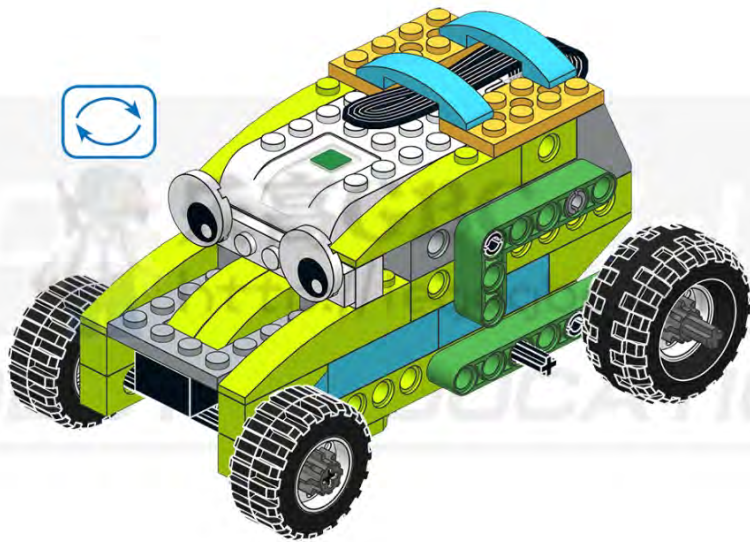
24







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Ramp

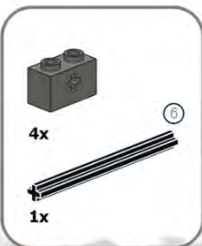


Build a ramp to test the robot

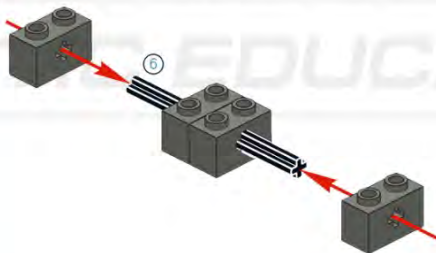


Go to the first slide of
the instruction





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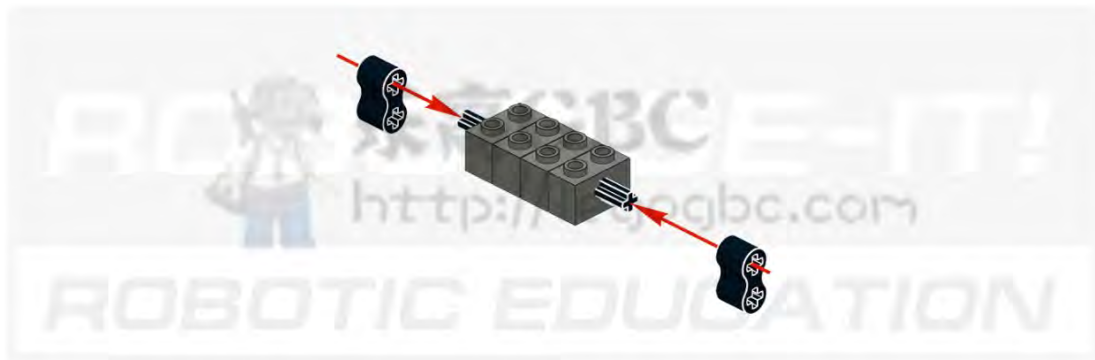
乐高GBC-E-IT!

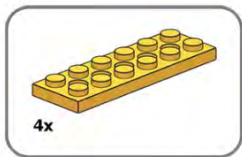
<http://legogbc.com>

EDUCATION

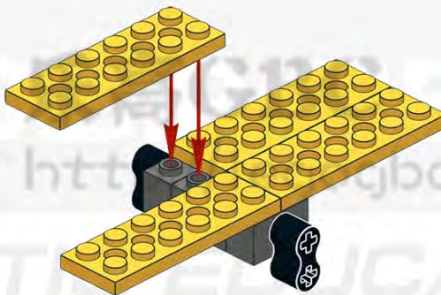


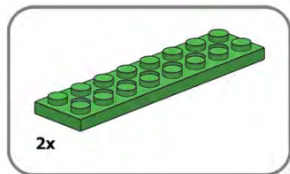
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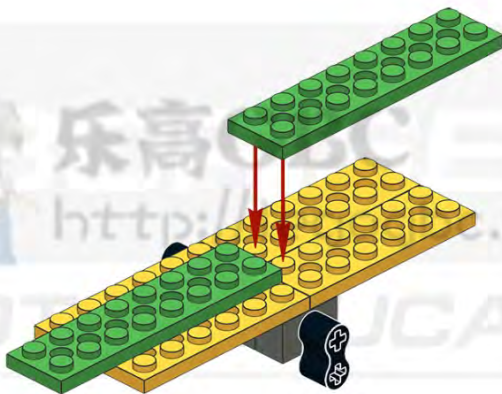


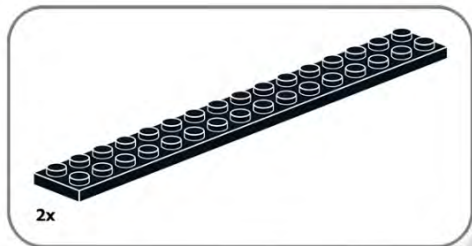
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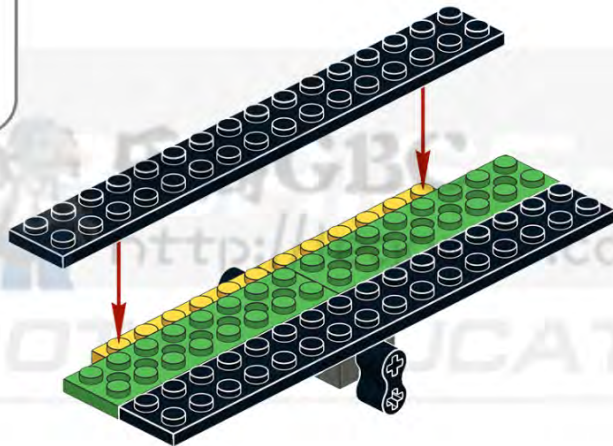


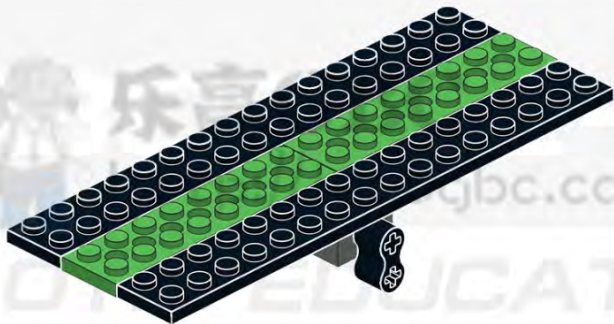
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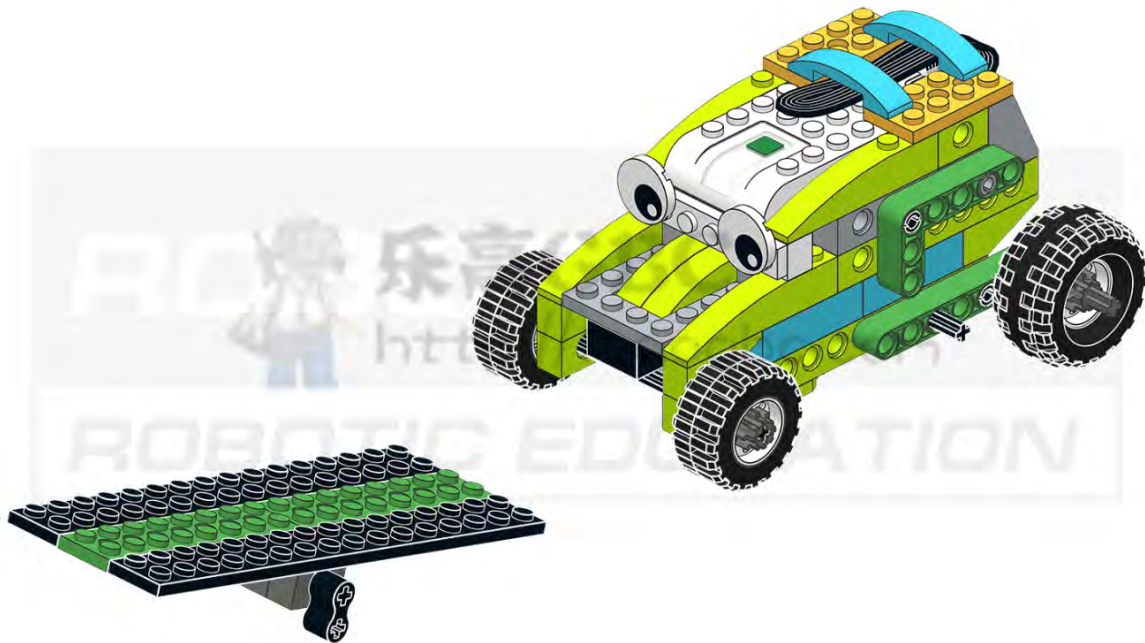


33





35





Extended version



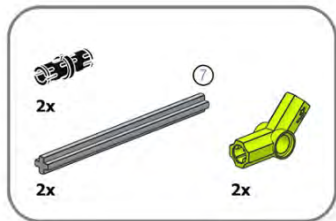
Build antennas to improve network connectivity.



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the instruction

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Note!



The cables must not rub while the robot is moving!



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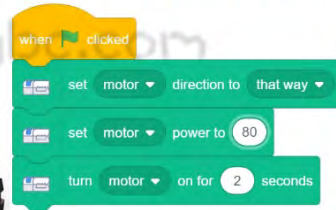
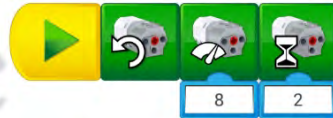
<http://legoblog.com>



Task 1



Program the movement of the robot and check if it can move.
Inspect the robot and determine what is not working correctly.





Discuss!



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<http://legogbc.com>

What's missing robot so that it could move?



Design features



The motor is placed longitudinally, so an bevel gear is used to transmit rotation





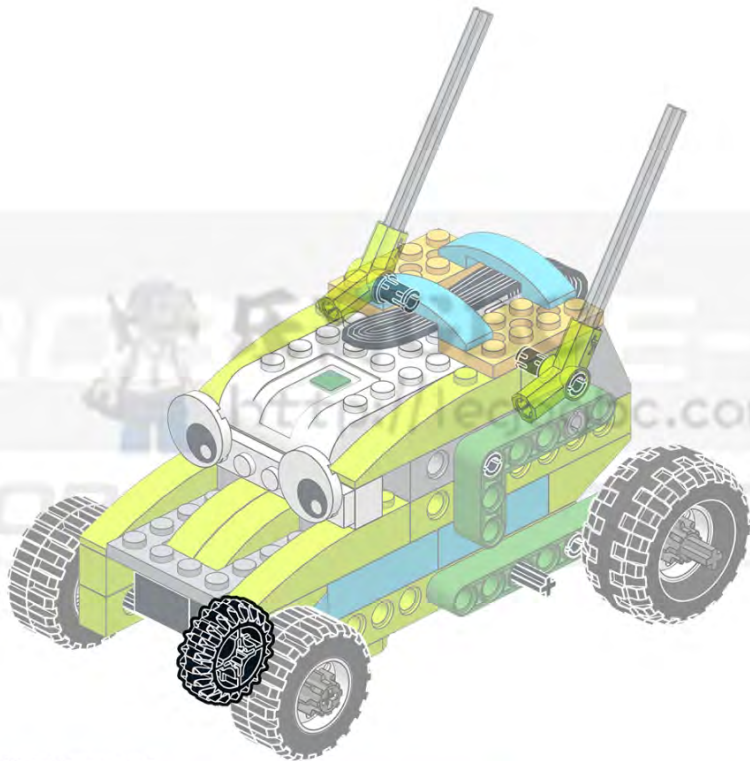
Transmission



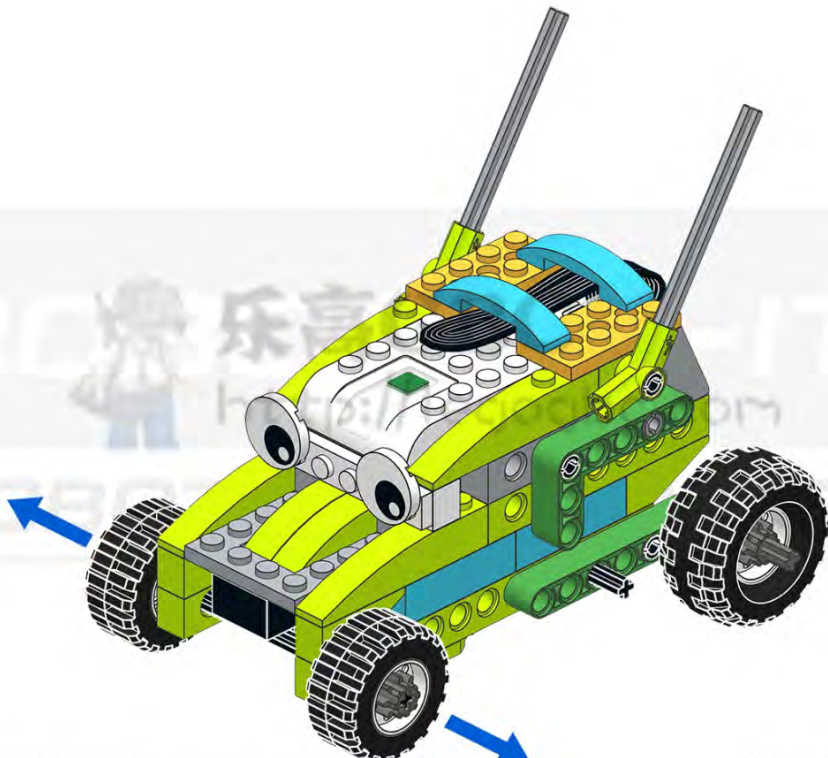
Repair the transmission of the robot - add the gear that is missing



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the instruction

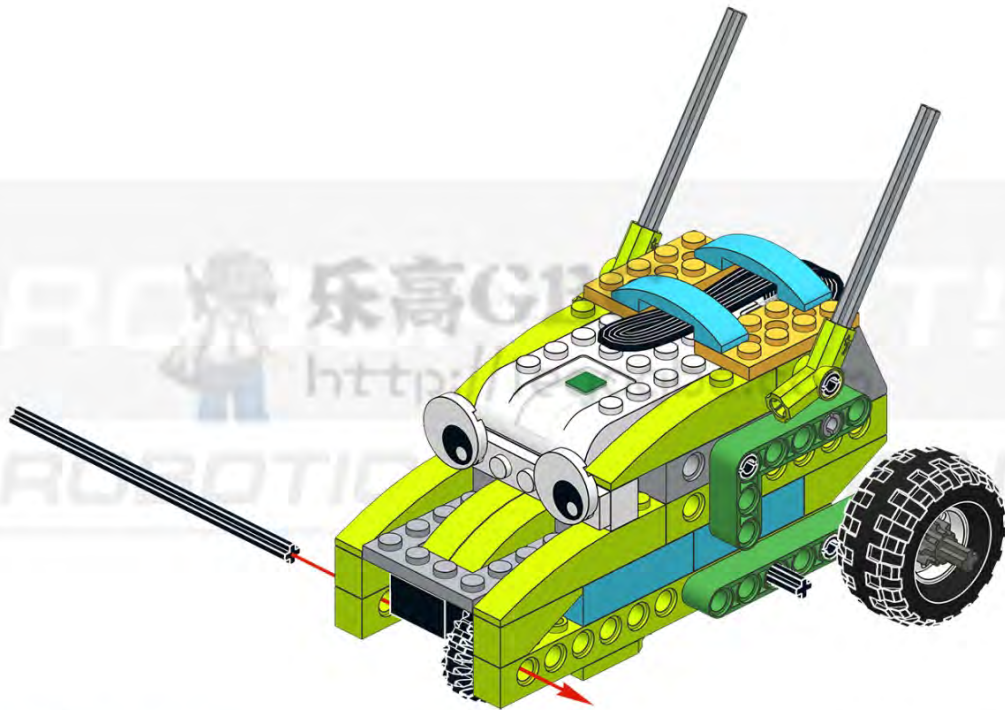


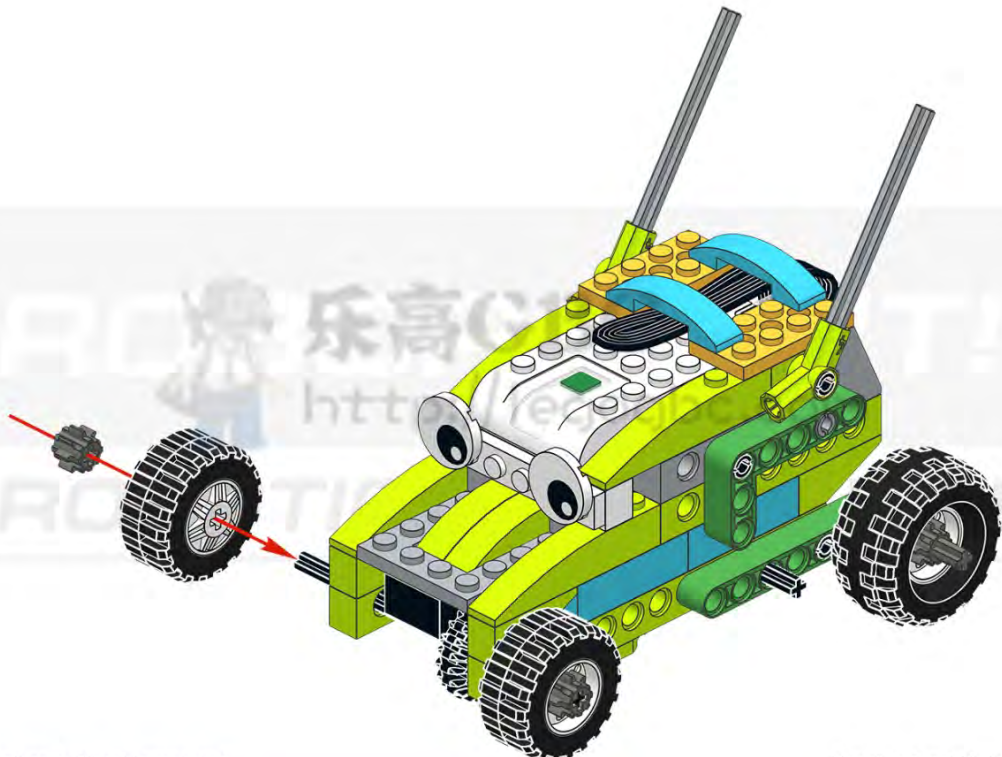
40





41





43





Task 2



Repeat testing. The robot can move back and forth.





Task 3



Test an immovable robot on a ramp. You can see that one wheel of the robot always does not touch the surface.





Task 4



Program the drive ahead and watch the robot pass the ramp. Pay attention to the smooth movement of the robot.



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Buggy competition



Buggy races usually take place over rough terrain. Therefore, machines must be prepared for very harsh conditions.





Buggy competition



The stages of the competition can include both high-speed sections and sections of very difficult off-road terrain, which must be passed for accuracy. For these parts of the competition, the car must have large suspension travel.





Discuss



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What do you think the suspension functions do?
What is it for at all?

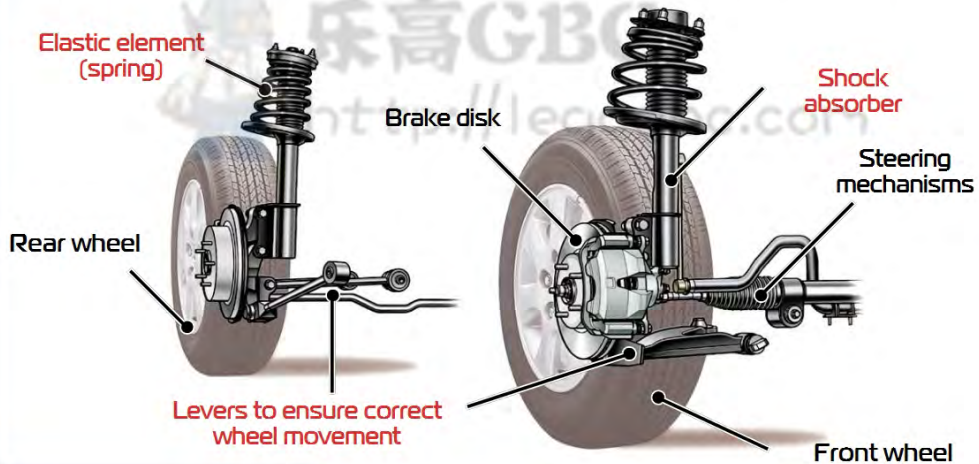


Suspension



The suspension secures the wheels so that they remain in constant contact with the surface. This is its main task. Because to move in the intended direction, the car must have the best possible grip. This will be needed for acceleration, and for stopping, and for maneuvering.

The suspension includes elastic elements, shock absorbers (dampen vibrations) and levers (provide wheel movement)





Buggy competition



The buggy in the photo has very long suspension travel, ensures contact of all wheels with the surface. Thanks to this, the car moves in such difficult terrain.





Design features



In your robot, rubber bands play the role of an elastic suspension element. By changing the position of the black connector, you can adjust the tension of the elastic. This changes the stiffness of the suspension.



Find:

- Rubber bands
- Connectors



Design features



The robot, equipped with rear wheel suspension, ensures wheel contact with the surface when terrain or load changes.





Design features



Watch the video for a better understanding of how to rebuild your robot.





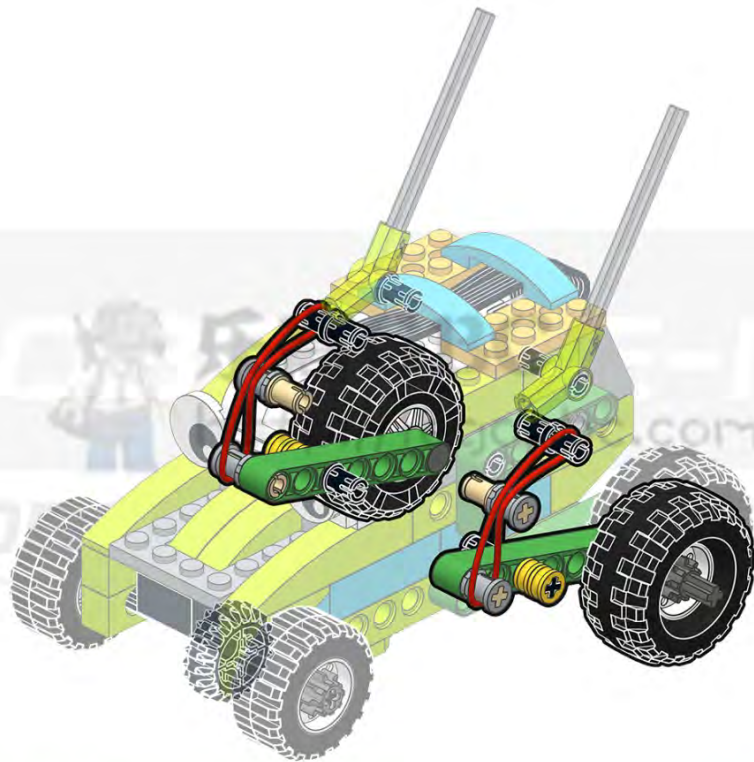
Suspension



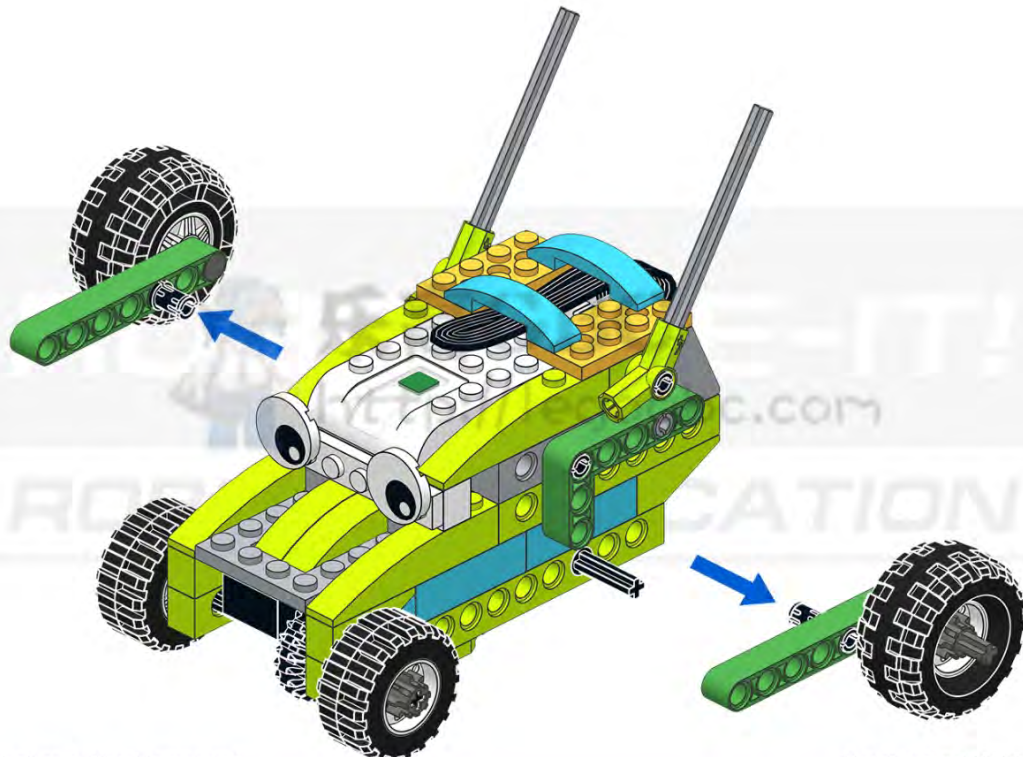
Rebuild the robot chassis to give the robot rear wheel suspension.



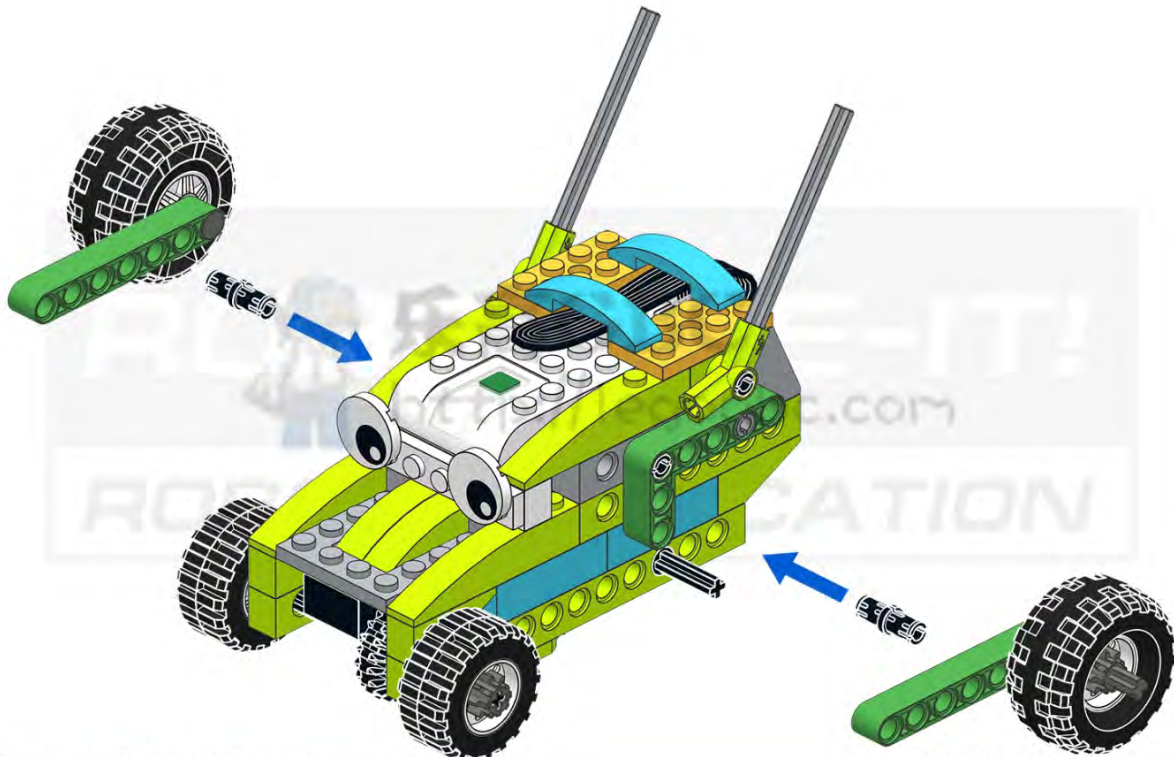
Go to the first slide of
the instruction



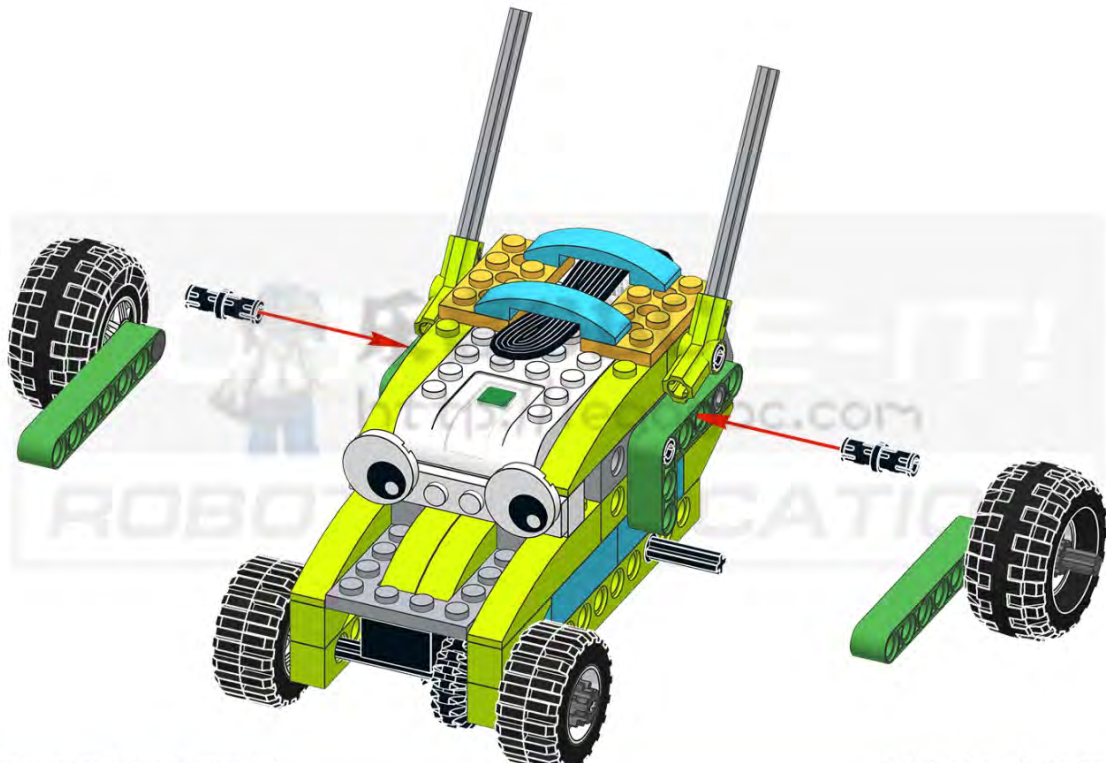
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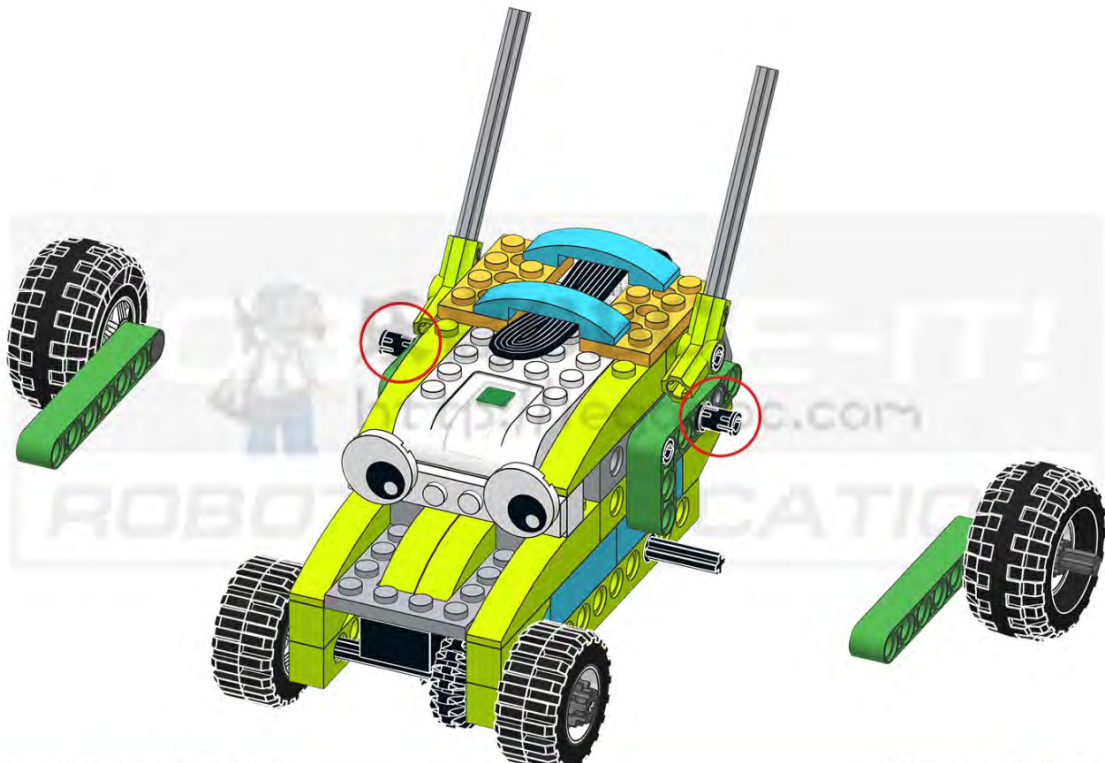
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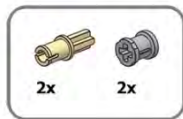
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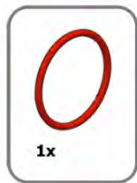
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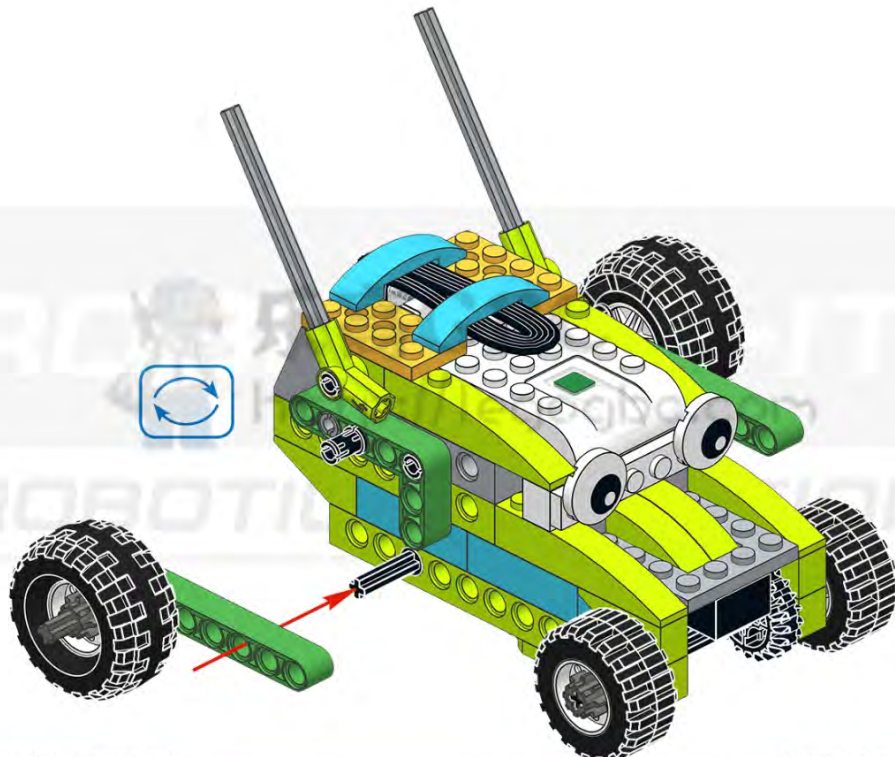




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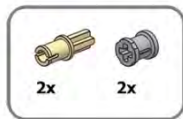
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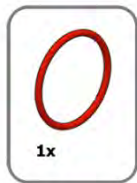
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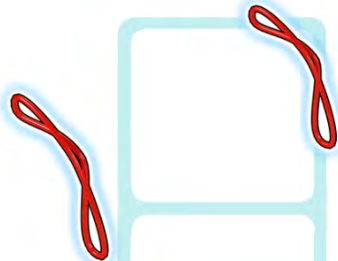
57





Tasks

Place the robot parts in the correct places





Task 5



Repeat the test of the immovable robot on the ramp. Thanks to the suspension, all four wheels can touch the ground when driving on uneven surfaces.





Task 6



Repeat the test with passing the ramp. Thanks to the suspension, the robot can move much smoother





Task 7 *



Change the suspension stiffness. To do this, rearrange the black connector as shown in the video. In this position, the suspension should be too soft.





Task 8 *



Test suspension that is too soft. What has changed in the movement of the robot while passing the ramp?





Task 9 *



Now change the suspension settings the other way - make it too stiff. To do this, rearrange the black connector as shown in the video.





Task 10 *



Test the robot again. The movement of a robot with a suspension that is too stiff resembles the movement of a robot without a suspension, because it almost does not allow the rear wheels to move.





Question



Which of the suspension options shown is soft?





Tasks



Select the direction of rotation of the motor in which the robot will move forward



Check
answer





Question



Scratch



WeDo Software



Click on the program block that sets the duration of the rotation of the motor



when clicked

set motor direction to that way

set motor power to 80

turn motor on for 2 seconds



Question



Scratch



WeDo Software



Click on the program block that sets the duration of the rotation of the motor





Discuss!

- ▶ Why couldn't the robot move?
- ▶ What gear did you use to fix the robot's transmission?
- ▶ What is the role of the suspension? List its three main components.
- ▶ What suspension element did your robot lack?
- ▶ Why does a suspended robot move smoothly on an uneven surface?
- ▶ What does the stiffness of the suspension affect? Why are too hard and too soft suspensions rarely used?





Your achievements

Total:

0



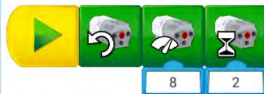
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4

