



Tyrannosaurus



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T-Rex



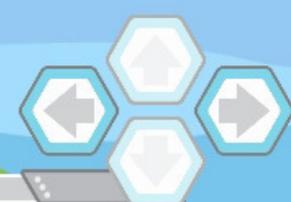
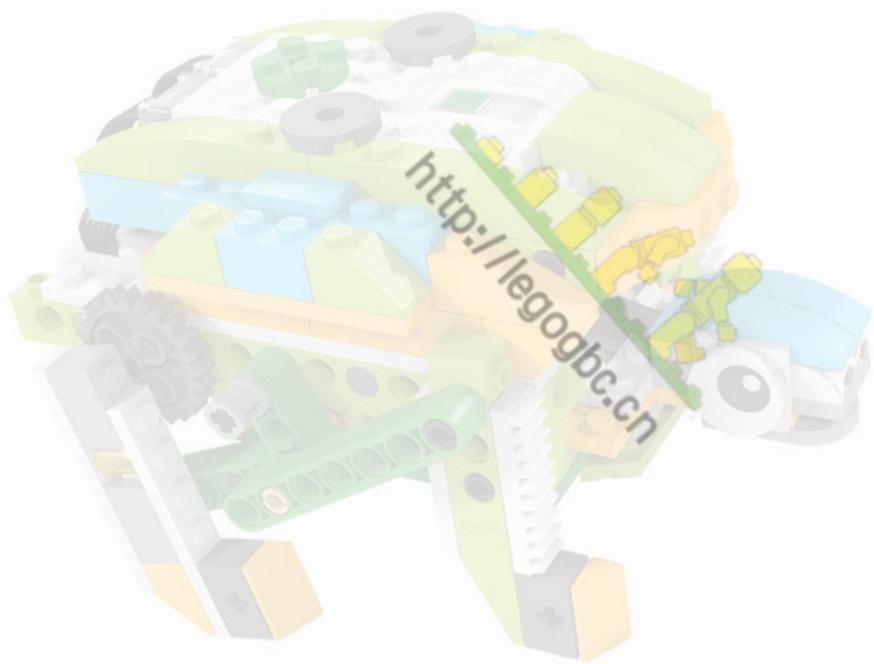


Let`s remind. Meiolaniidae



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Place parts of the robot on the right places



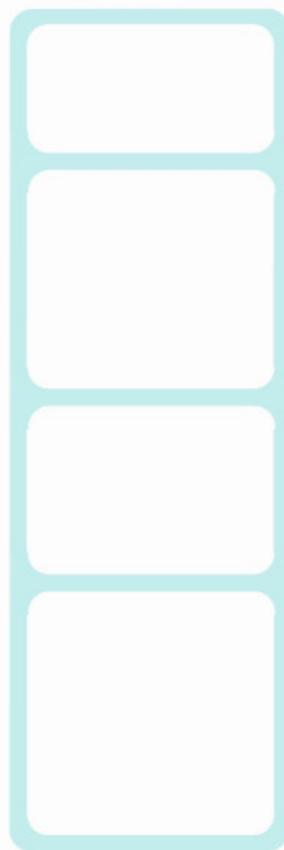
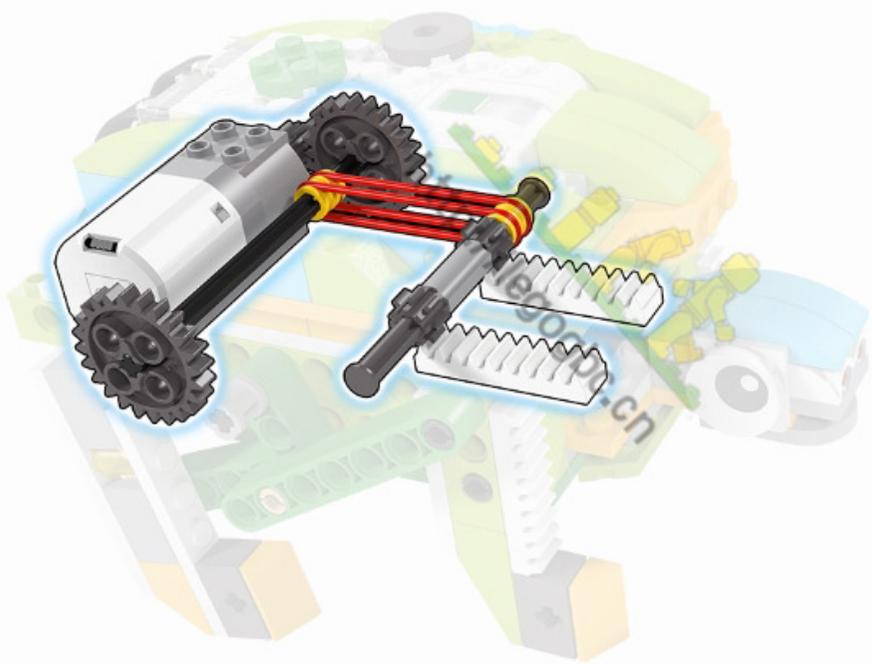


Let`s remind. Meiolaniidae



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Place parts of the robot on the right places





Let`s remind. Meiolaniidae



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How do turtles breed?



Lay eggs

The live turtles are born

Lay caviar



4



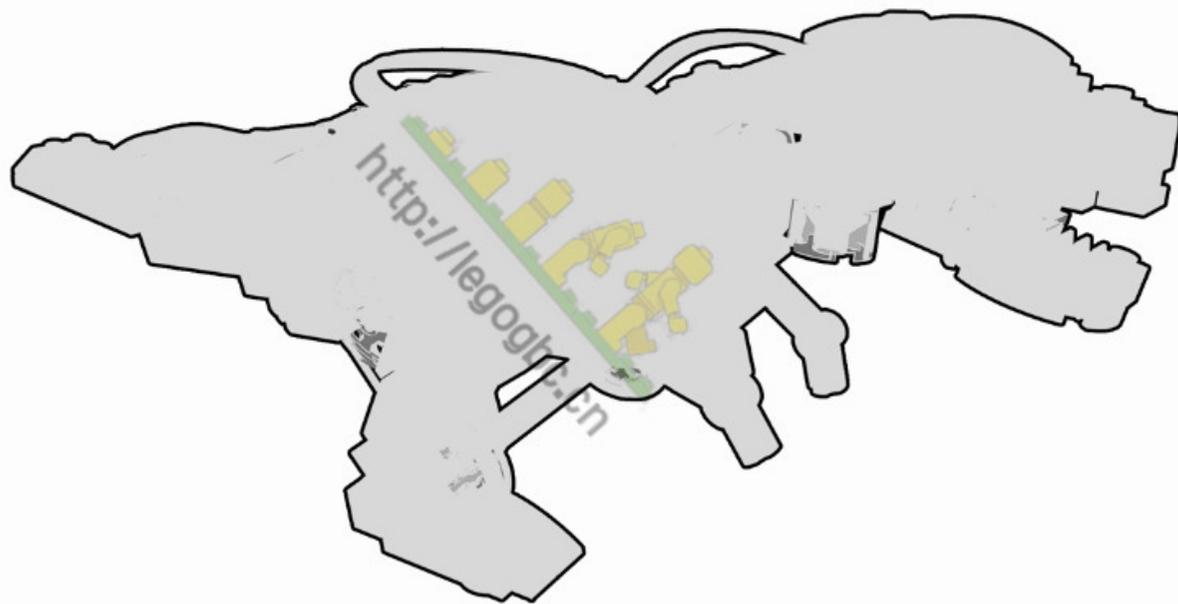
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Dino Park

Today we continue to create a modern Dino Park. We must develop a robot for the exposition of the predators of the Cretaceous period Mesozoic.



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Let`s remind

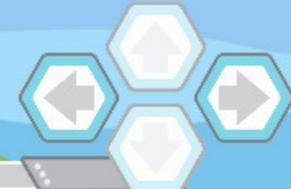


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Which five groups do dinosaurs divide into the structure of the skeleton?

<http://legoabc.com>





The structure of the dinosaur skeleton

Scientists have come to the conclusion that most of the found skeletons of the dinosaurs by structure can be attributed to one of

Dinosaurs from which groups did you already create?



THEROPODS



SAUROPODS

DINOSAURS

STEGOSAURUS



ORNITHOPODS



CERATOPS



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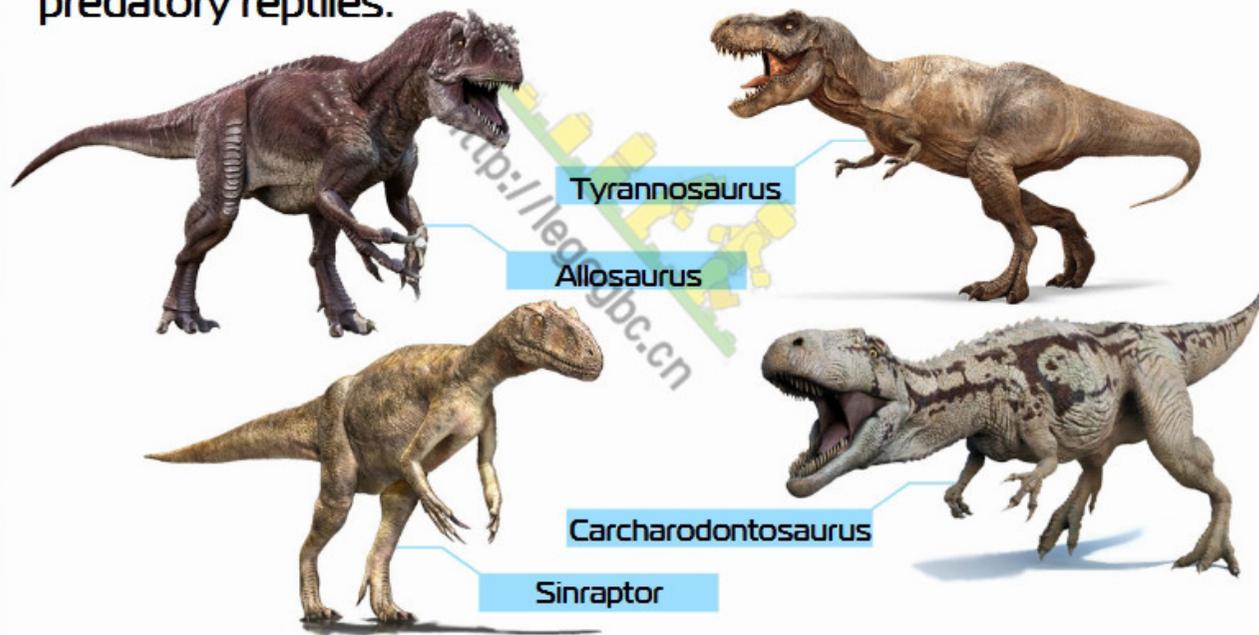
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Theropods

Theropods - a group of dinosaurs that walked on two rear legs. These were the most effective predators of their time. They existed from the late Triassic period to the late Cretaceous (230-65 million years ago). These include Tyrannosaurus and other predatory reptiles.



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Theropods group hunting



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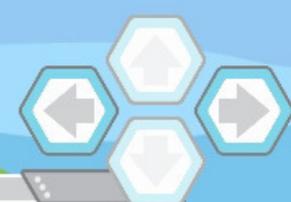


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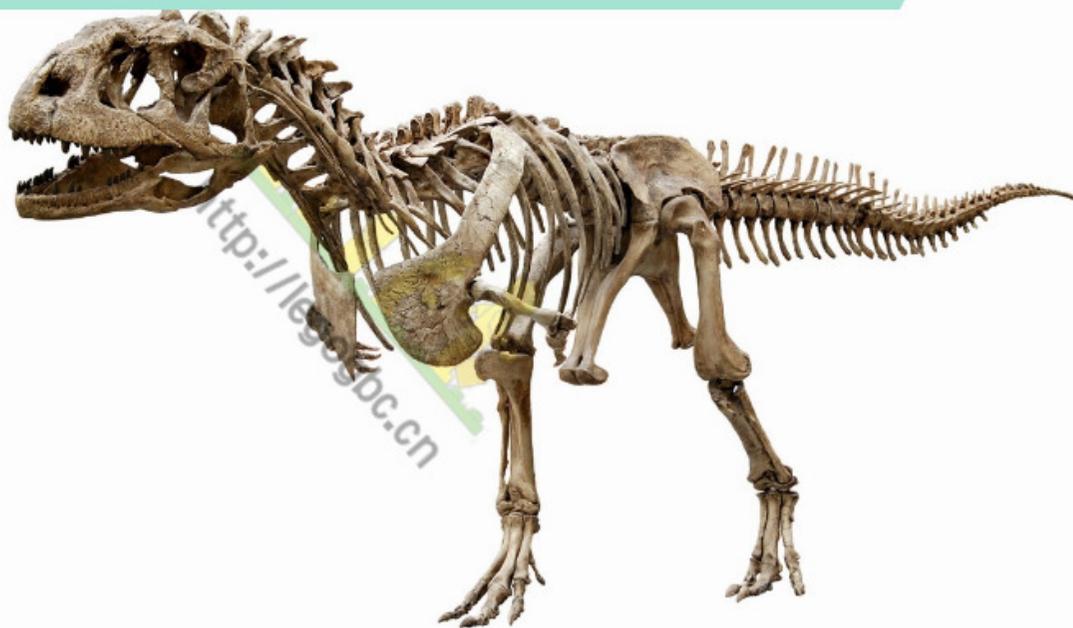
What features of the skeleton structure allowed the Theropods to move on two legs?





Theropods

Theropods have a specific leg structure that allows to carry all weight of the dinosaur only on two legs. The tail was used as a balance.



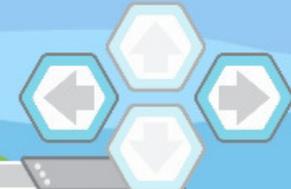
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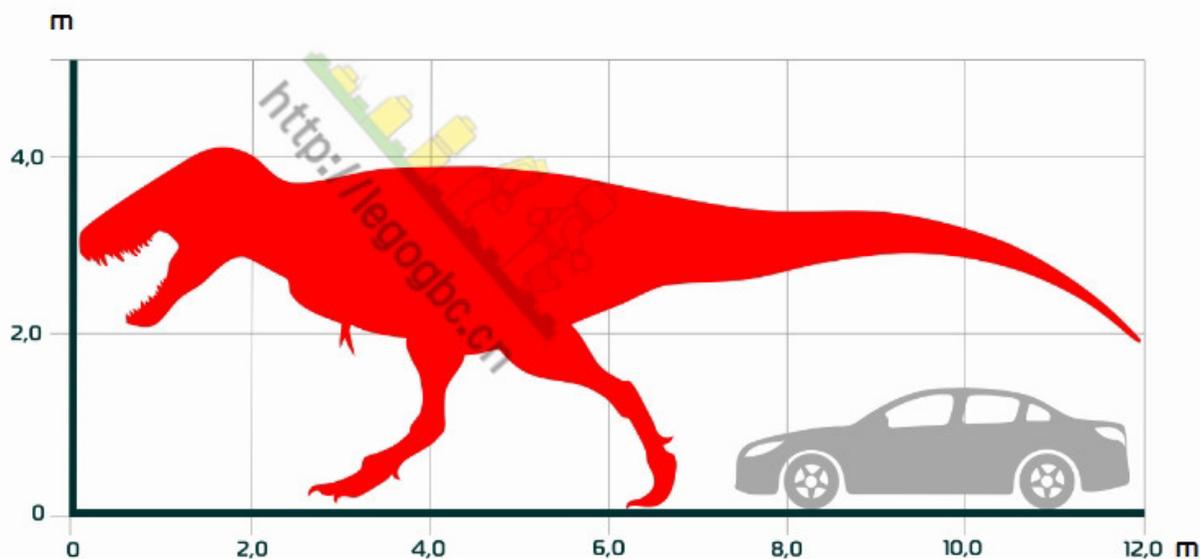


Tyrannosaurus



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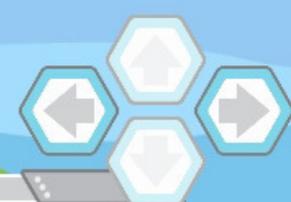
Tyrannosaurs had a length of 12 meters and a weight of 9 tons. They hunted on Triceratops and other herbivorous dinosaurs.



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Tyrannosaurus

Investigation of fossilized remains of Tyrannosaurus shows that adult individuals had scaly skin, and the skin of the young could be covered with primitive feathers.



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Tyrannosaurus

The front paws of Tyrannosaurus had only two fingers and could not even reach out to the mouth. However, the predator could use them to hold the prey.



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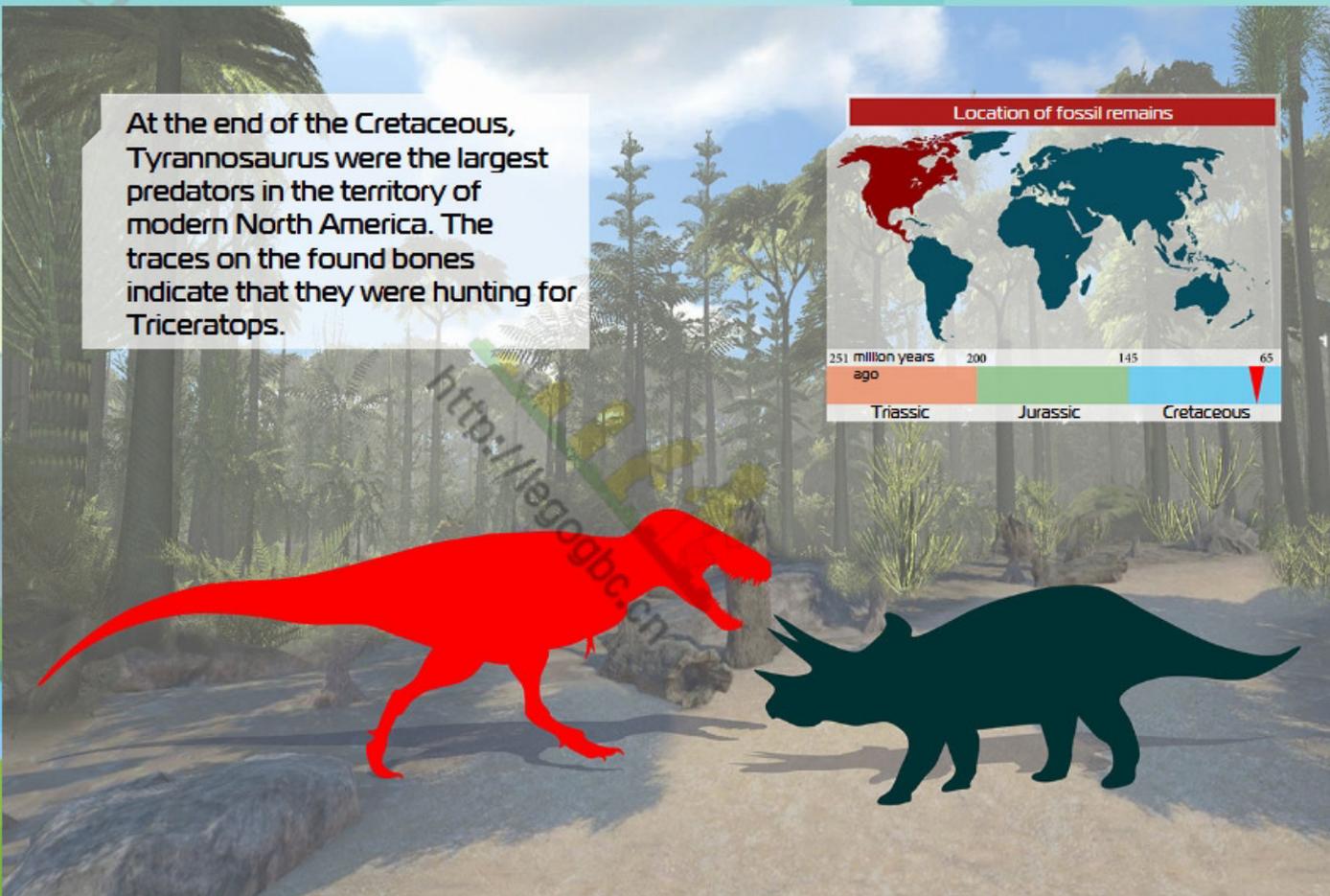
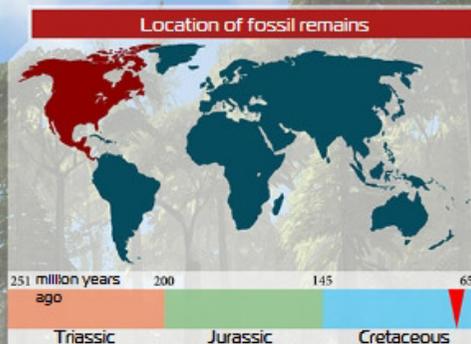


Tyrannosaurus



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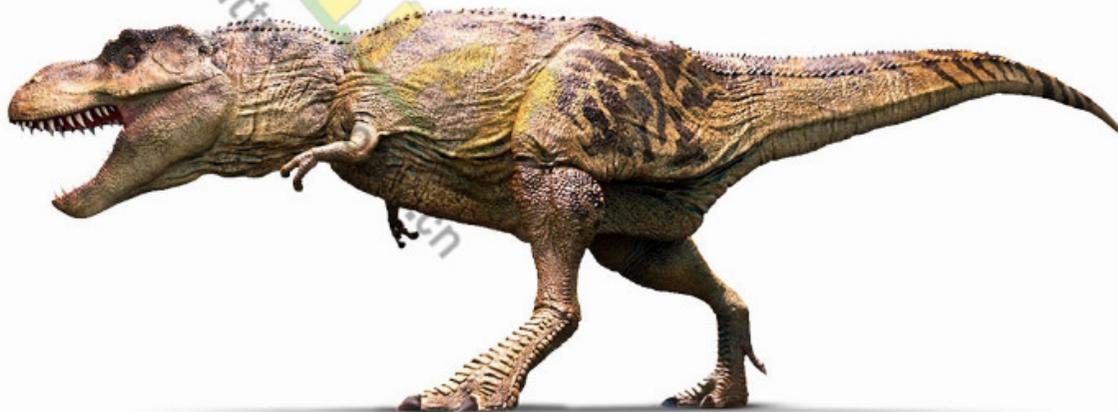
At the end of the Cretaceous, Tyrannosaurus were the largest predators in the territory of modern North America. The traces on the found bones indicate that they were hunting for Triceratops.





Dino Park

Tyrannosaurus is the largest predator that was on the planet during the heyday of dinosaurs. And thanks to the films, it is also one of the most famous. Its abbreviated is called T.Rex. From Latin it means "king of lizard-tyrants".



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Other predators

On dry land, Tyrannosaurus was the largest but not the only predator of the Cretaceous period. For example Sarcosuchus giant crocodiles up to 10 meters eat fish and small dinosaurs. Very similar to modern crocodiles, Sarcosuchus were their distant relatives.



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TASK



Task

- create a robot for the exposition of predators of the Cretaceous period



Requirements

- must be Theropod and move on two legs
- must have a high speed



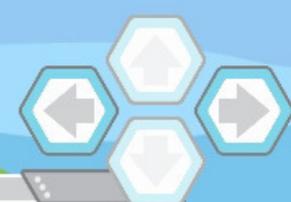
Tyrannosaurus's appearance



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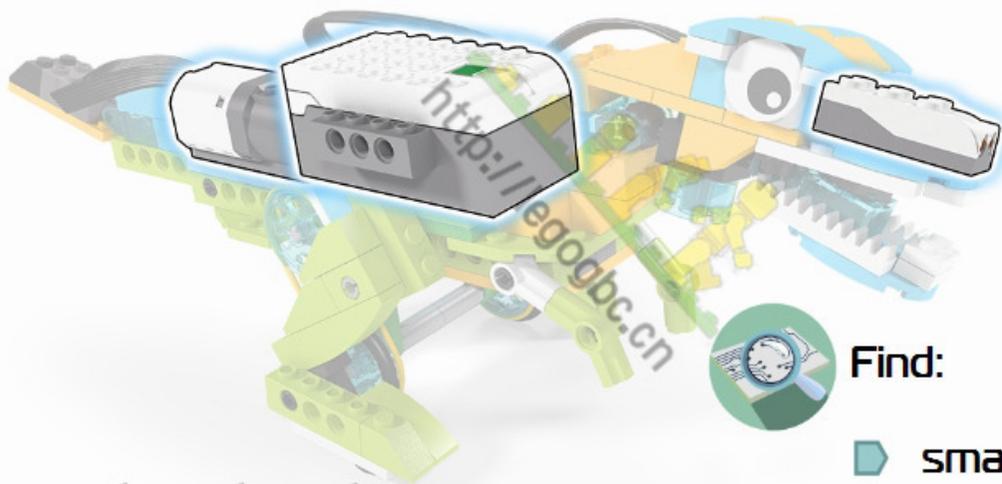
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Design features

T-Rex uses the motor for wheel drive. The motion sensor is placed so that the robot "see" the pray and obstacles in the way of movement.

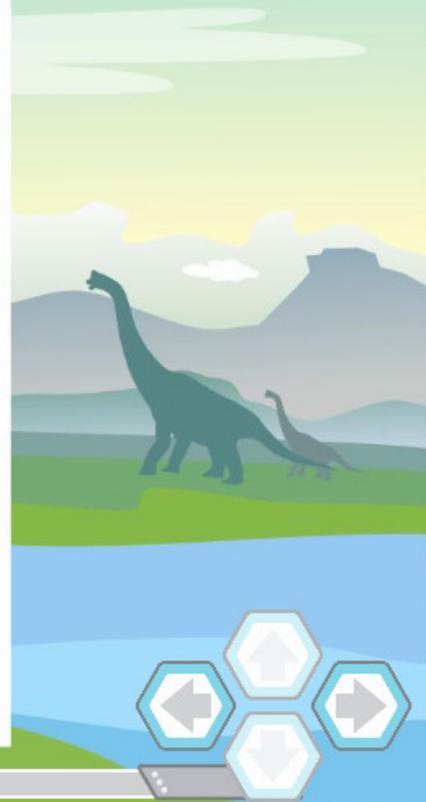


Find:

- smarthub
- motor
- motion sensor



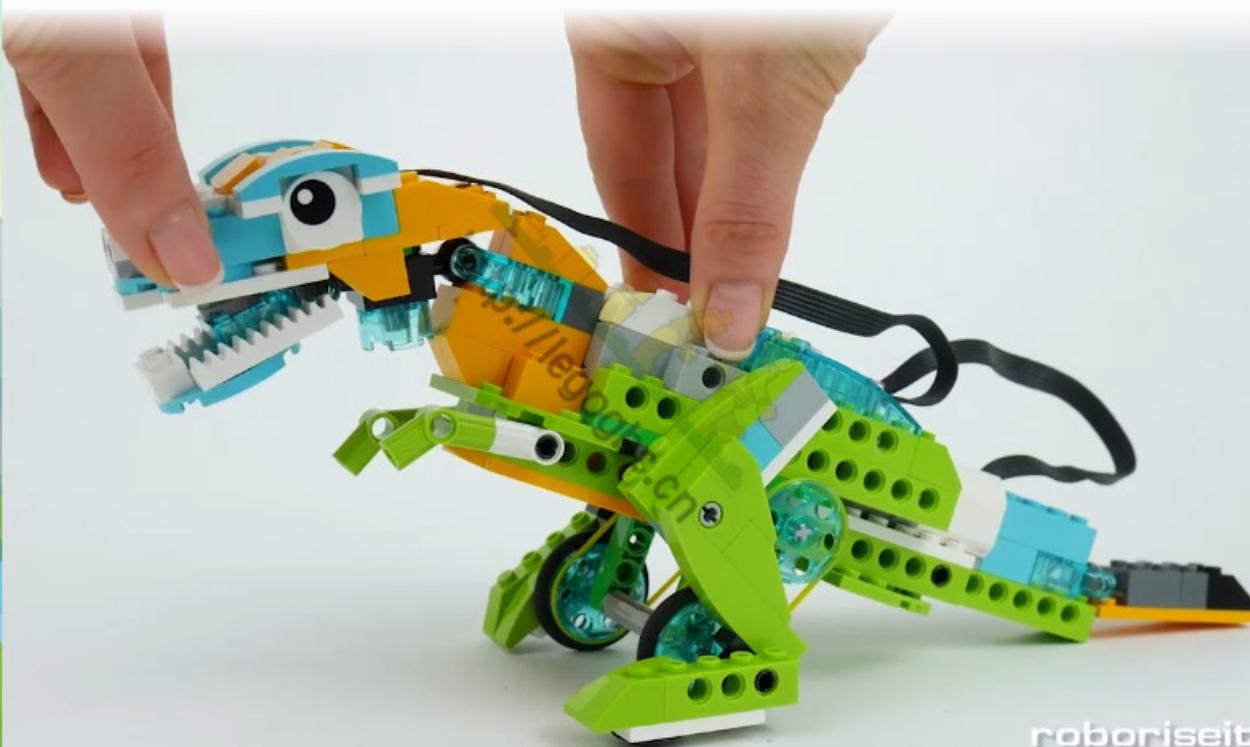
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Design features

The main weight of the robot is placed high enough so the robot is not stable during the braking. Take this into account when programming!



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Design features

The rotation from the motor to the wheels is transmitted through a direct gear, an angular gear, and then - through a belt drive.



Find:

-  direct gear
-  angular gear
-  belt drives



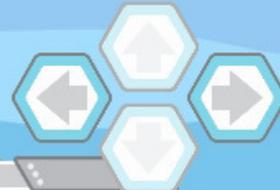
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Design features

T-Rex - one robot in the park that moves on wheels. This makes it the fastest. Legs perform only a decorative function.



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Design features

T-Rex - one robot in the park that moves on wheels. This makes it the fastest. Legs perform only a decorative function.



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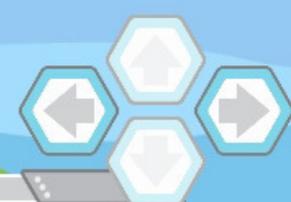
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Design features

T-Rex - one robot in the park that moves on wheels. This makes it the fastest. Legs perform only a decorative function.



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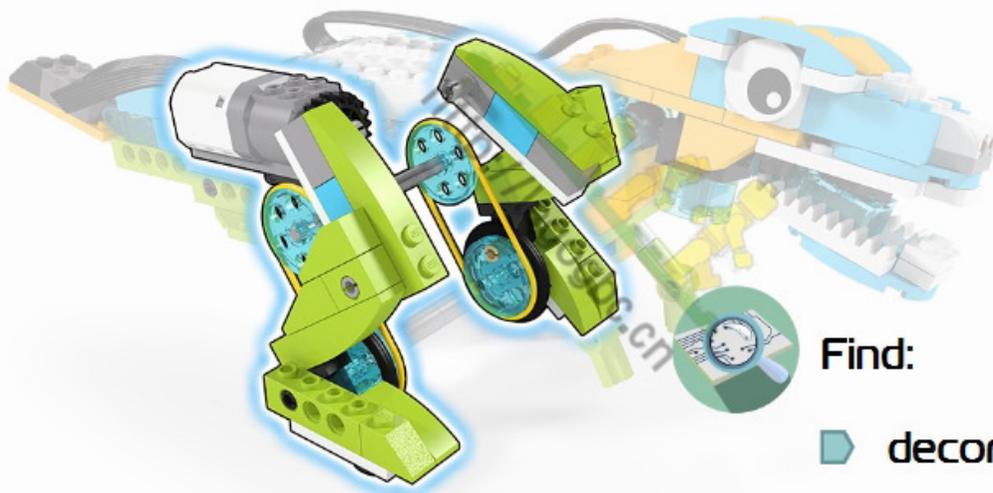


Design features



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In general, the robot chassis looks like this:



Find:

-  decorative leg
-  motor and wheels



4



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Design features

The outer pulleys with tires work like wheels, and rotation is transmitted through the belt drive to the inside pulleys. The pulleys are also cranks because the decorative legs of the robot are fixed on them.



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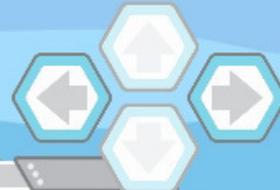
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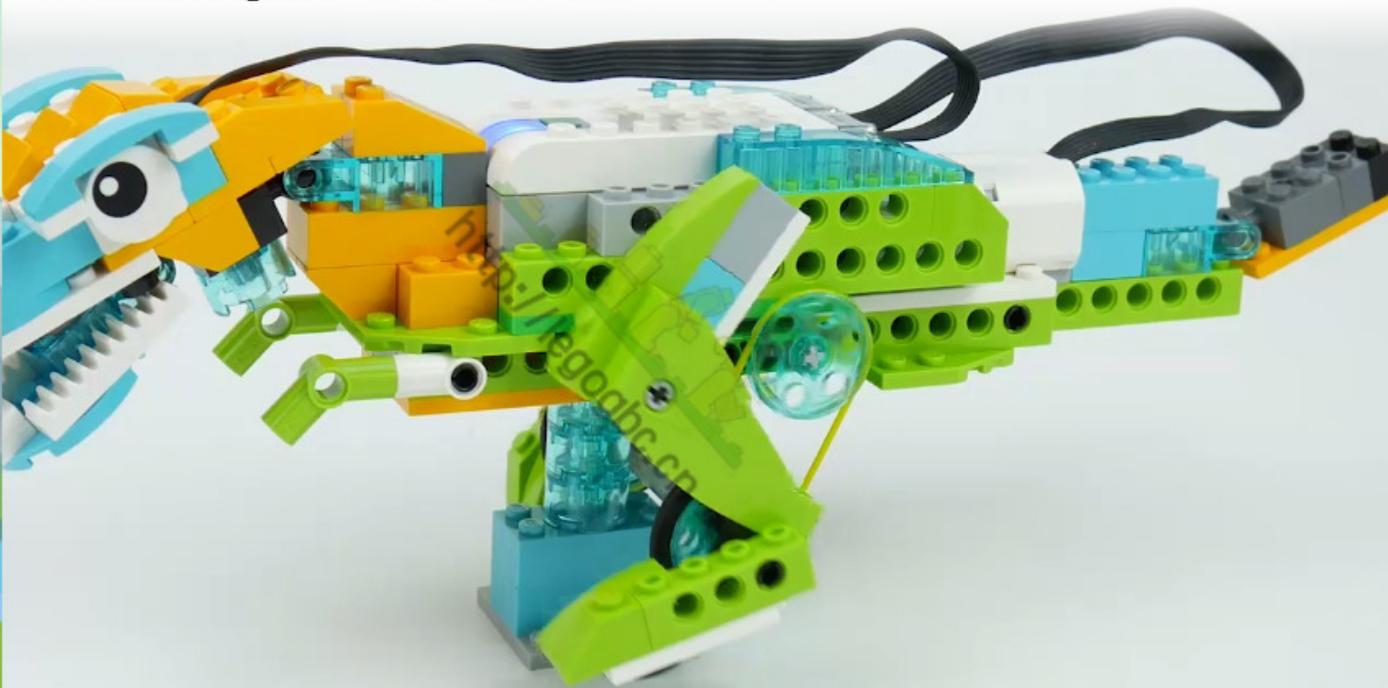
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Design features

The outer pulleys with tires work like wheels, and rotation is transmitted through the belt drive to the inside pulleys. The pulleys are also cranks because the decorative legs of the robot are fixed on them.



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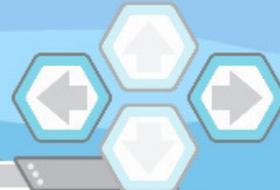
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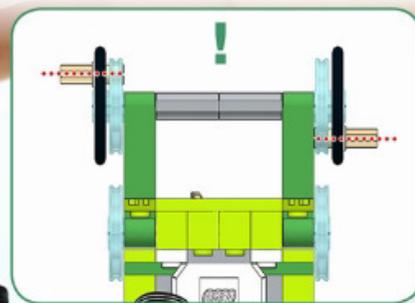
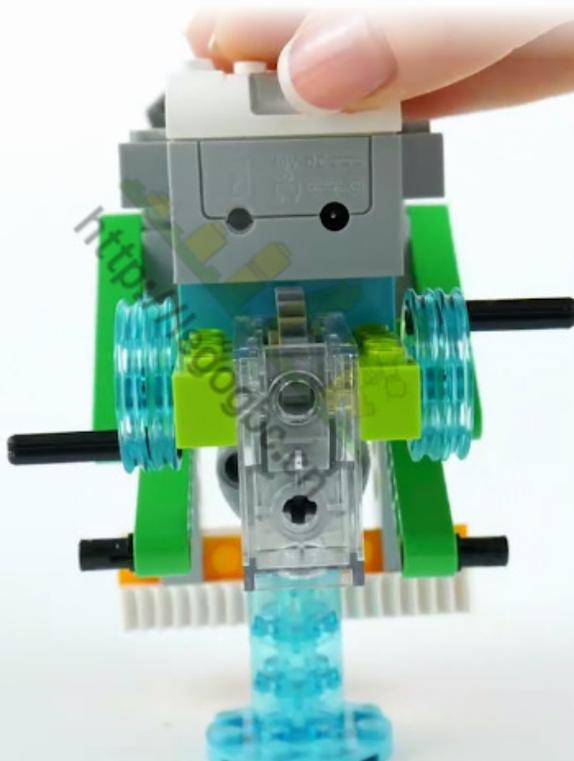


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Pay attention!

When building the robot correctly fix the crank mechanism. If on the left it is at the top point, on the right it should be in the bottom, and vice versa:



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Build the robot!



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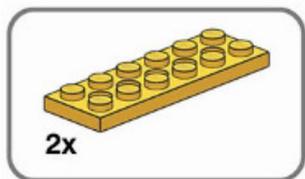


T-Rex

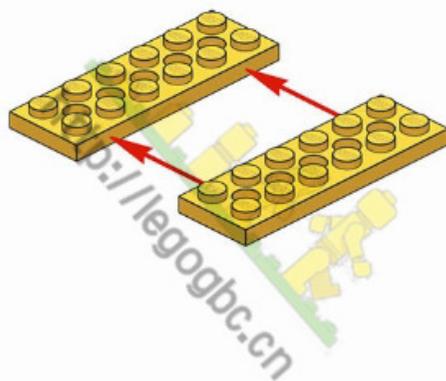




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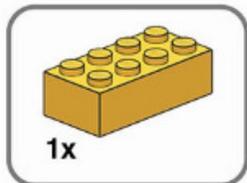


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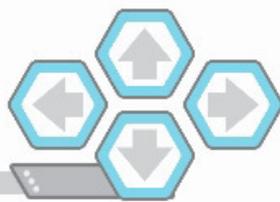
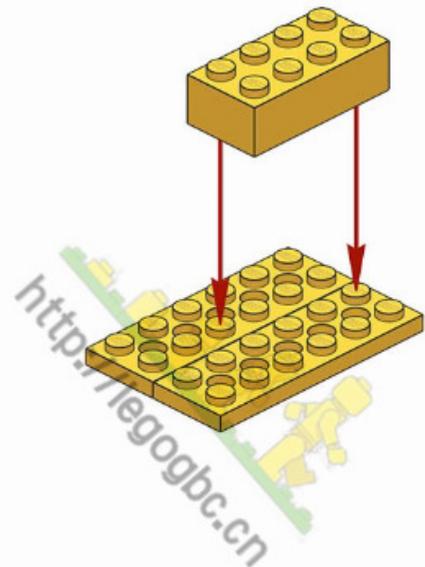




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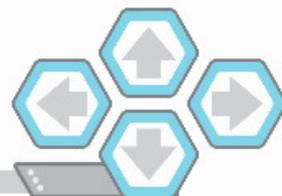
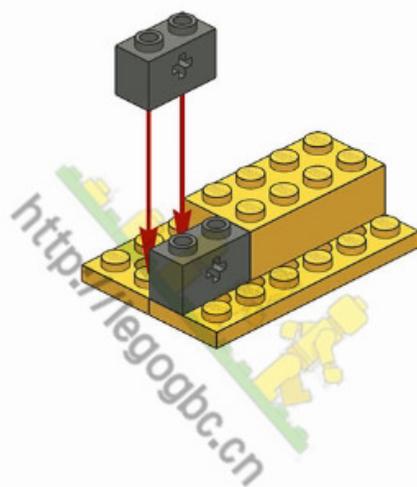




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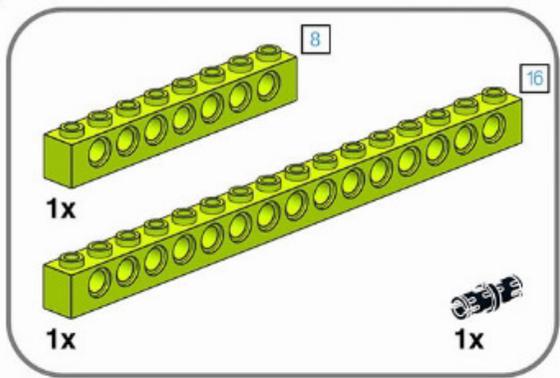


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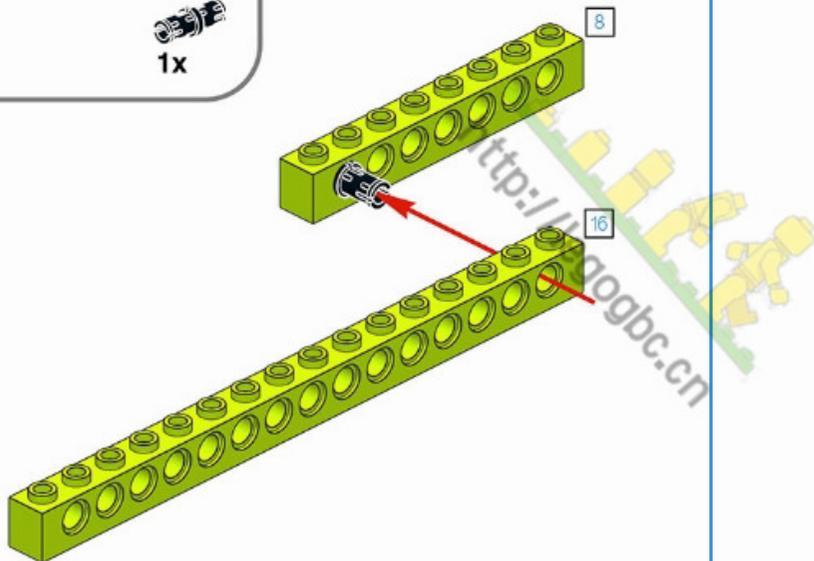




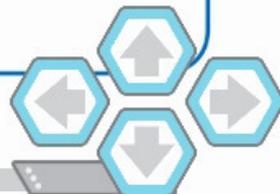
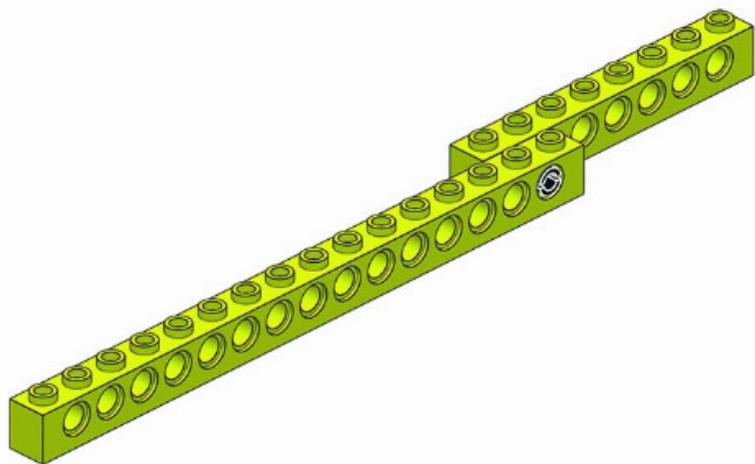
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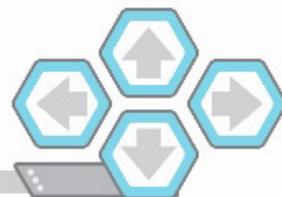
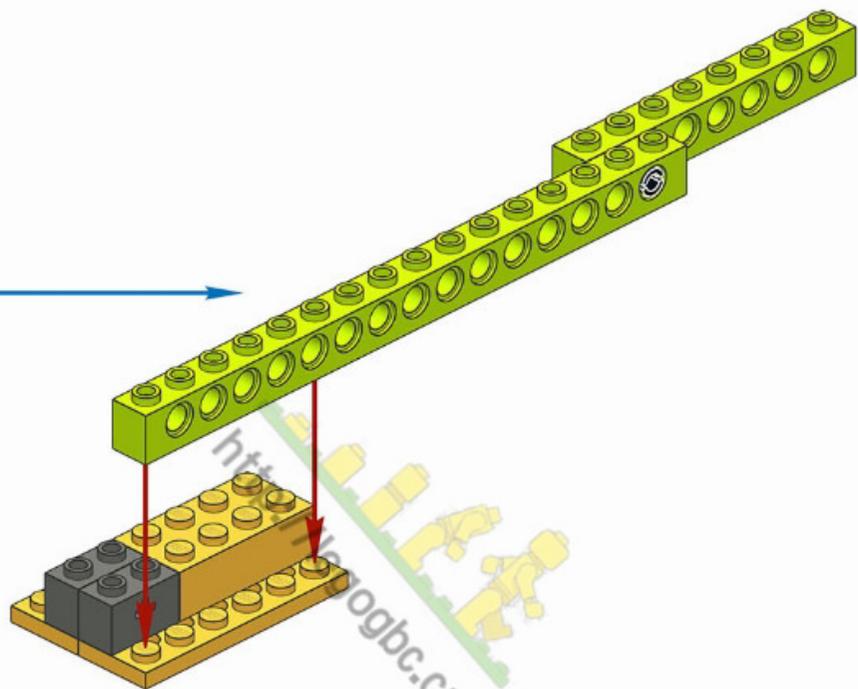
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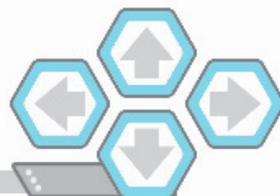
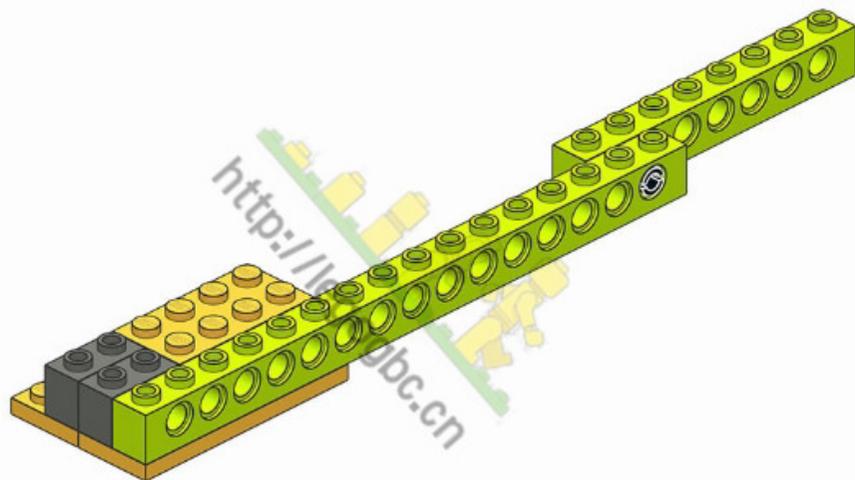
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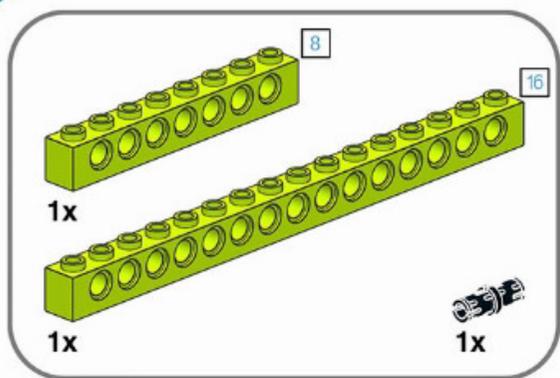
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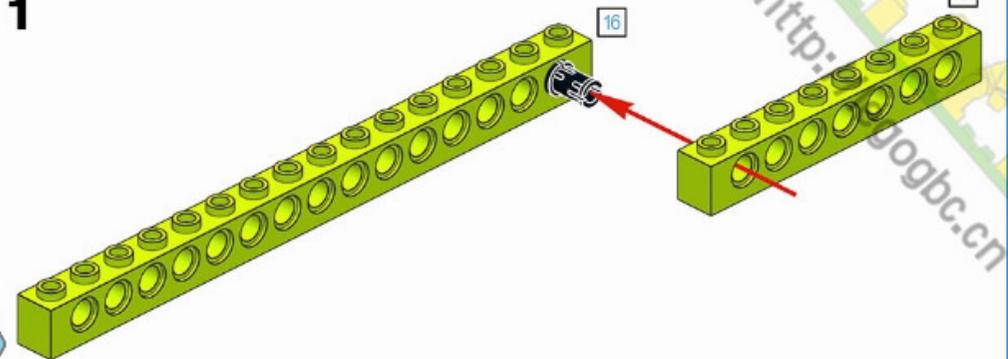




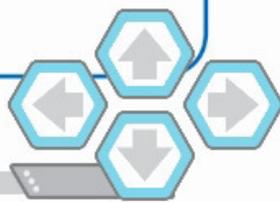
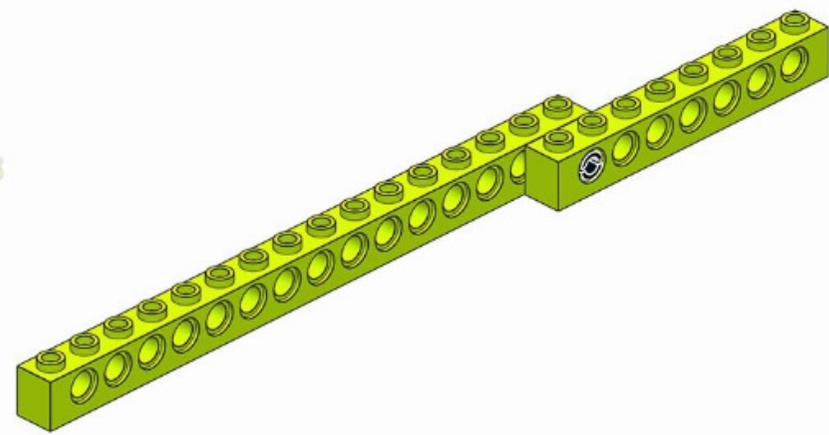
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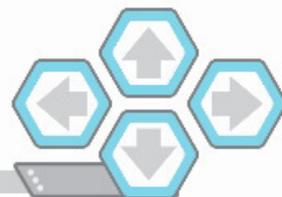
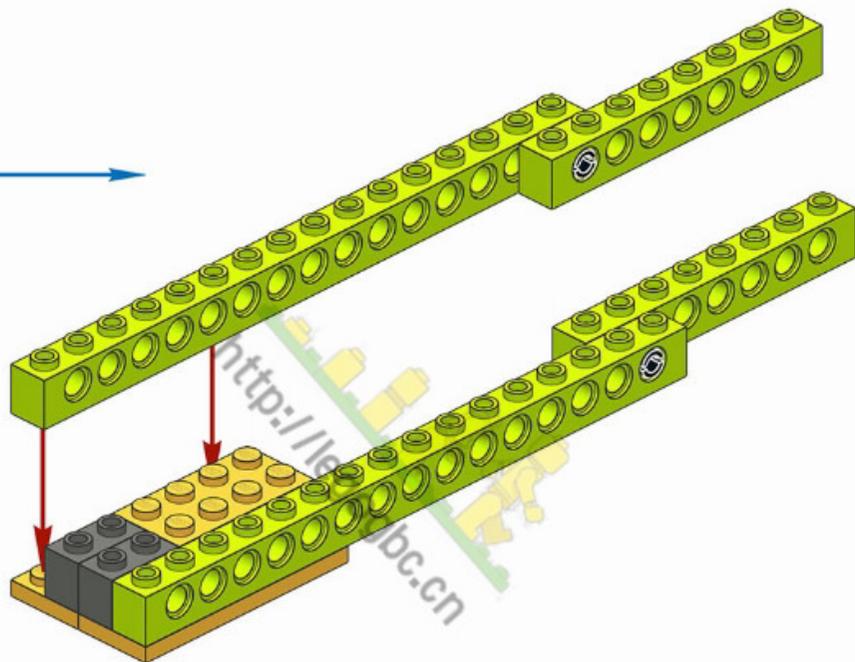
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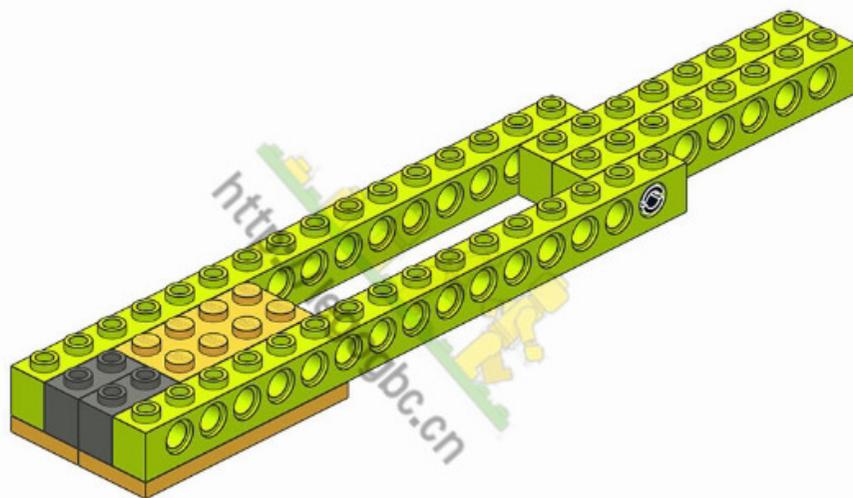
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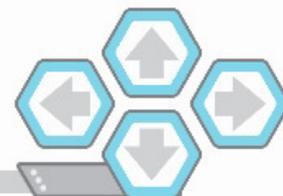
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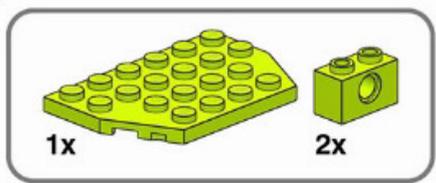


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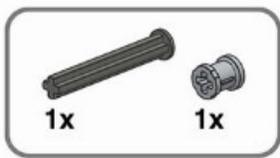
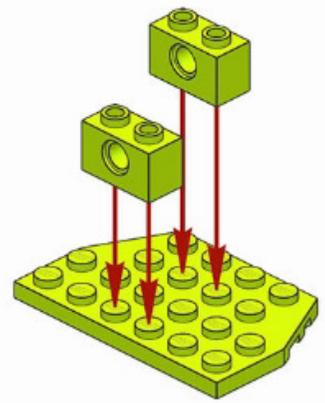




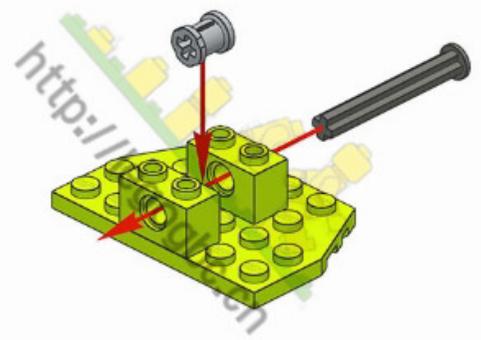
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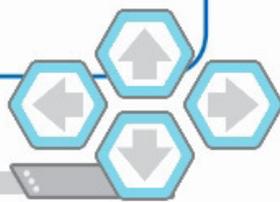
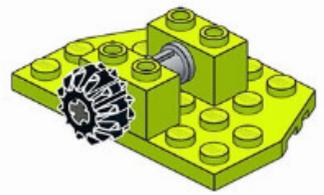
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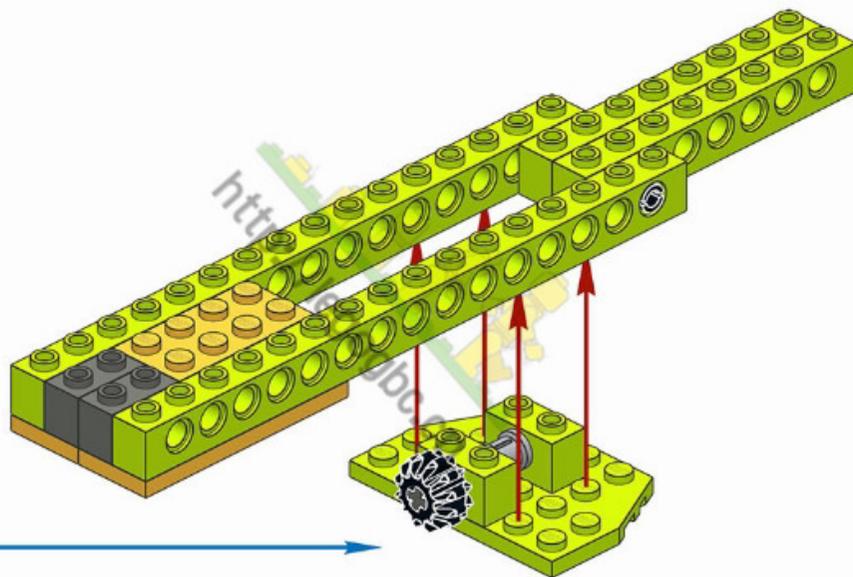
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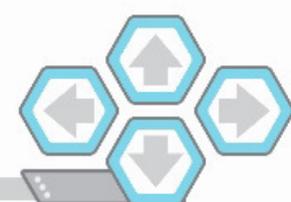
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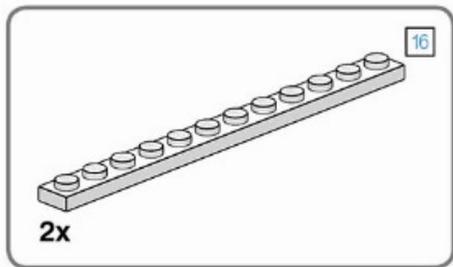
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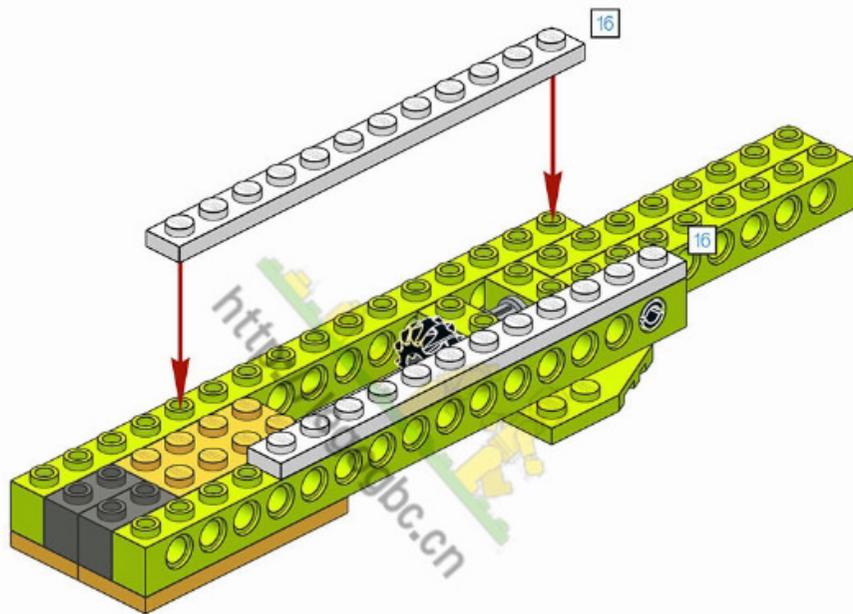




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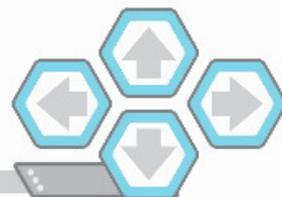
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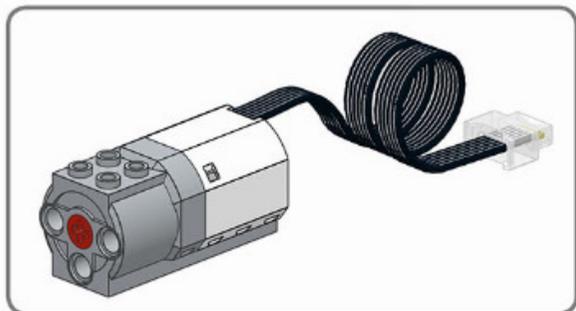
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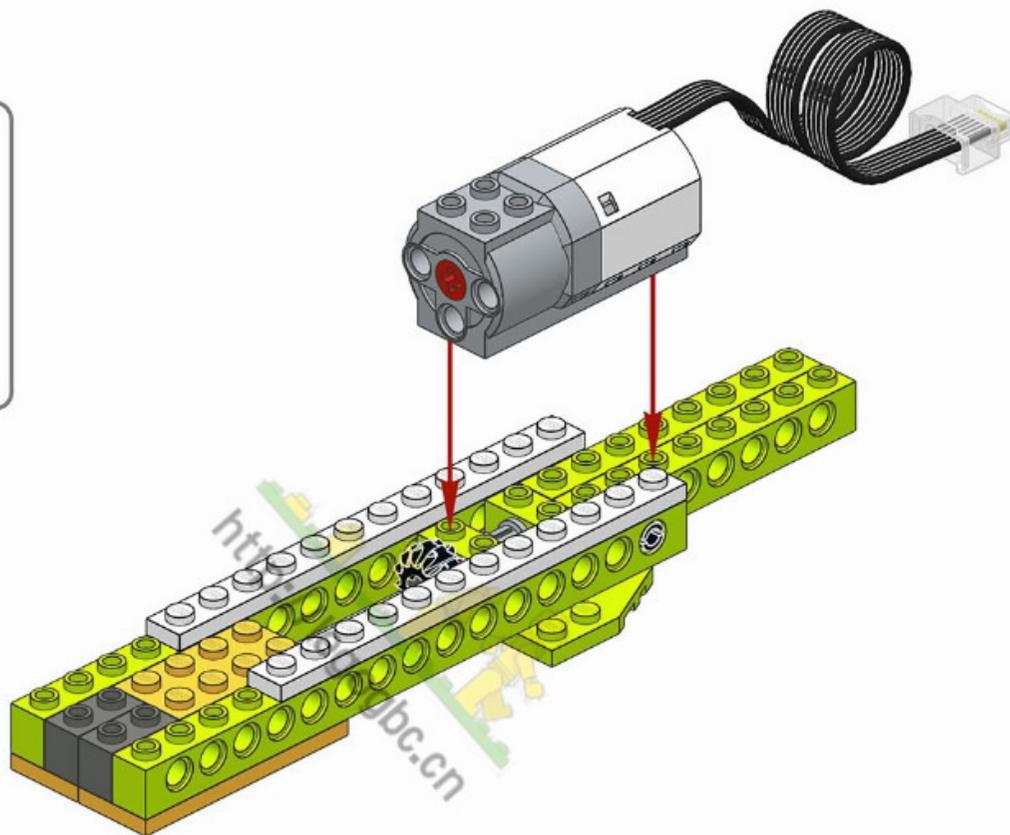




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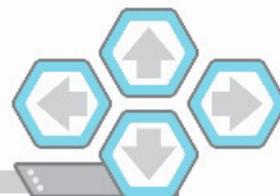
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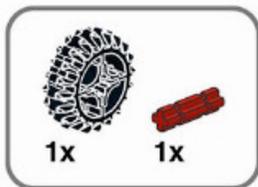
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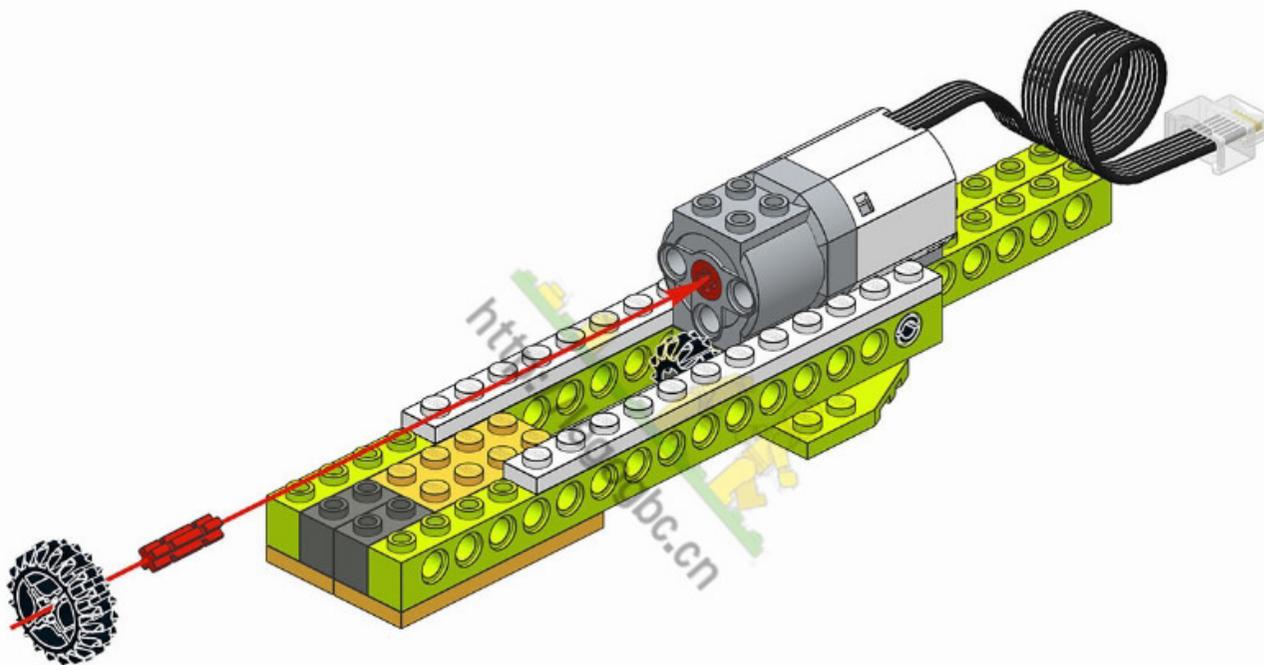




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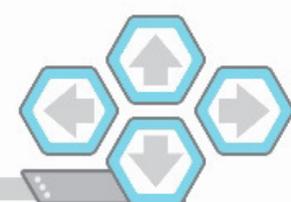
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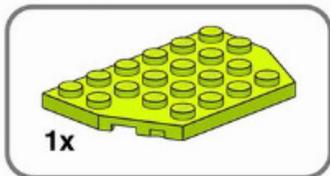
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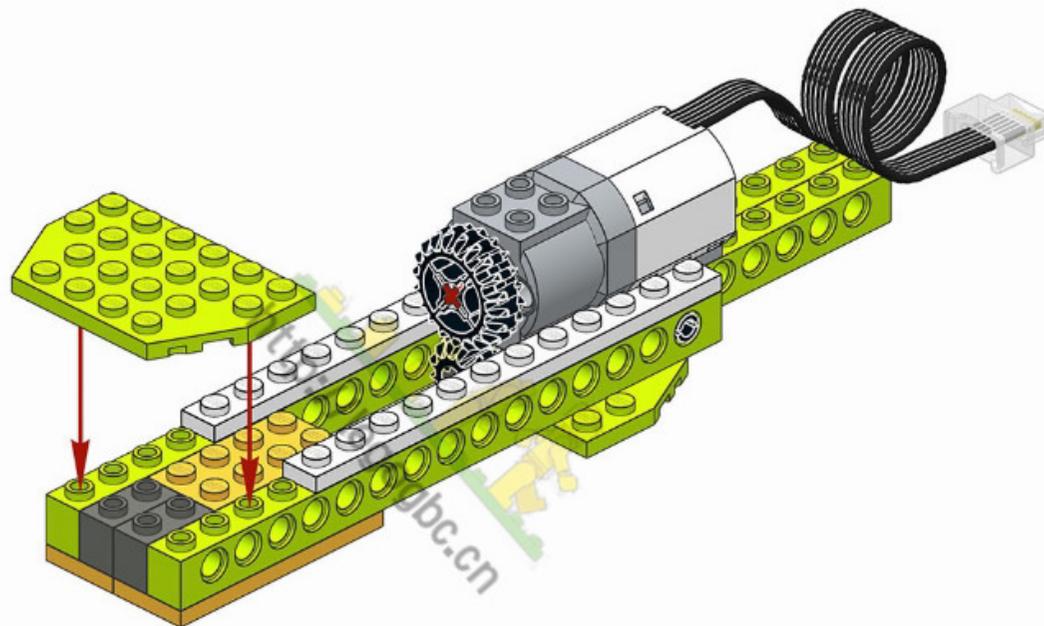


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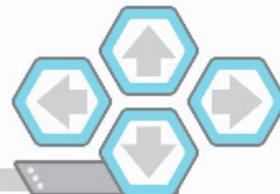


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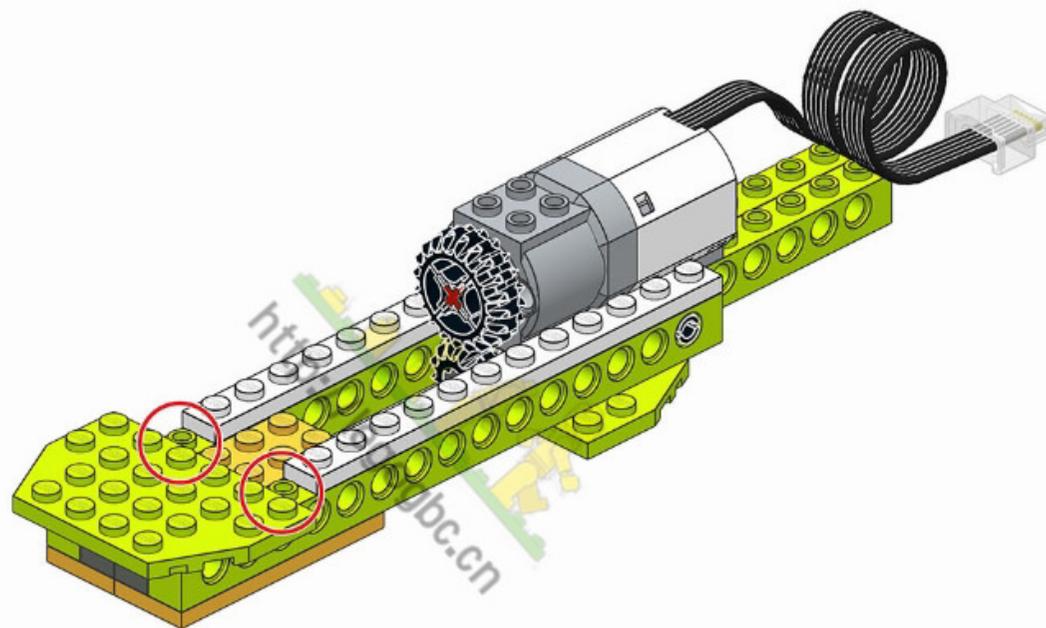
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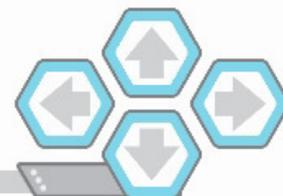
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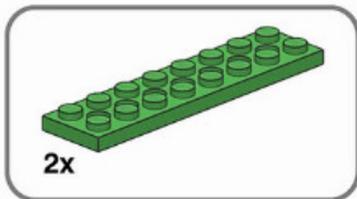
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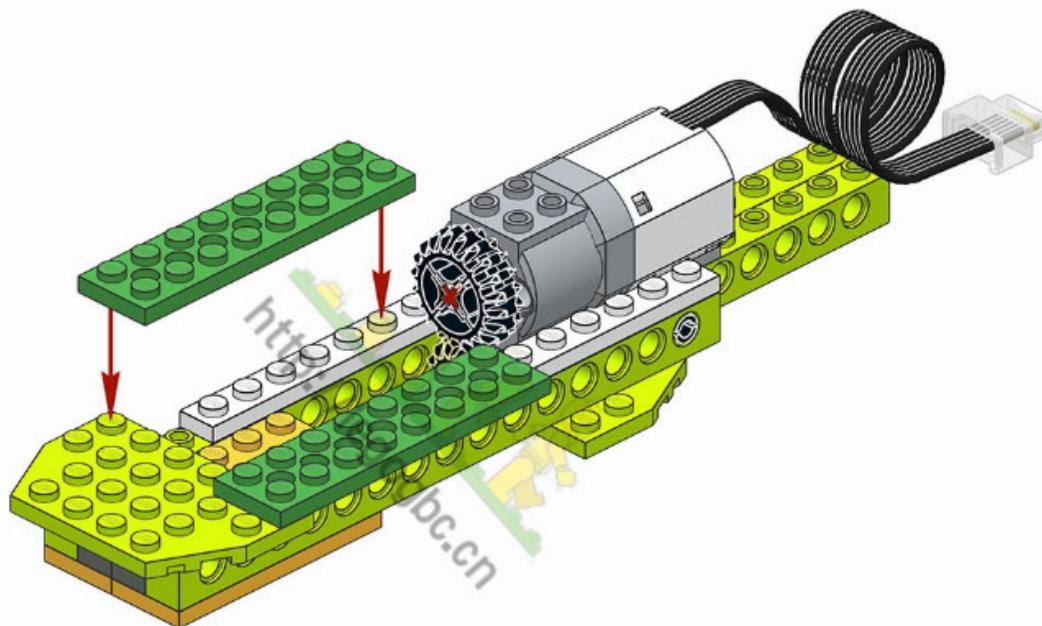




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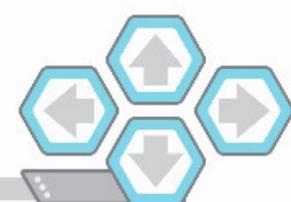
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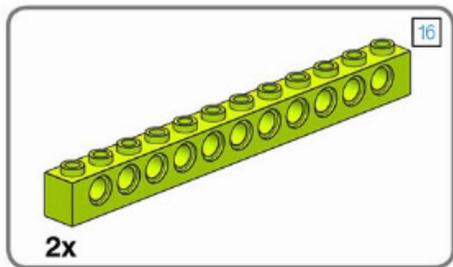
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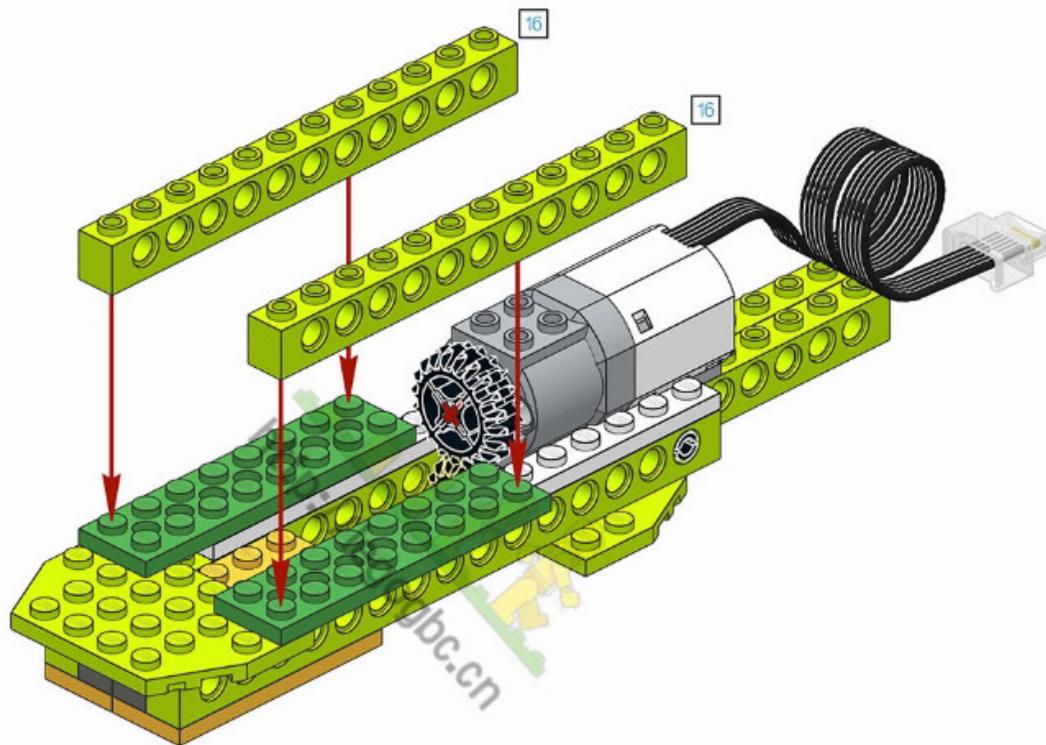




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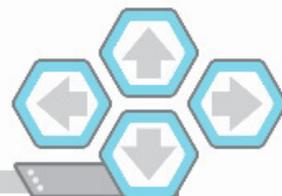
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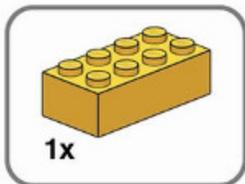
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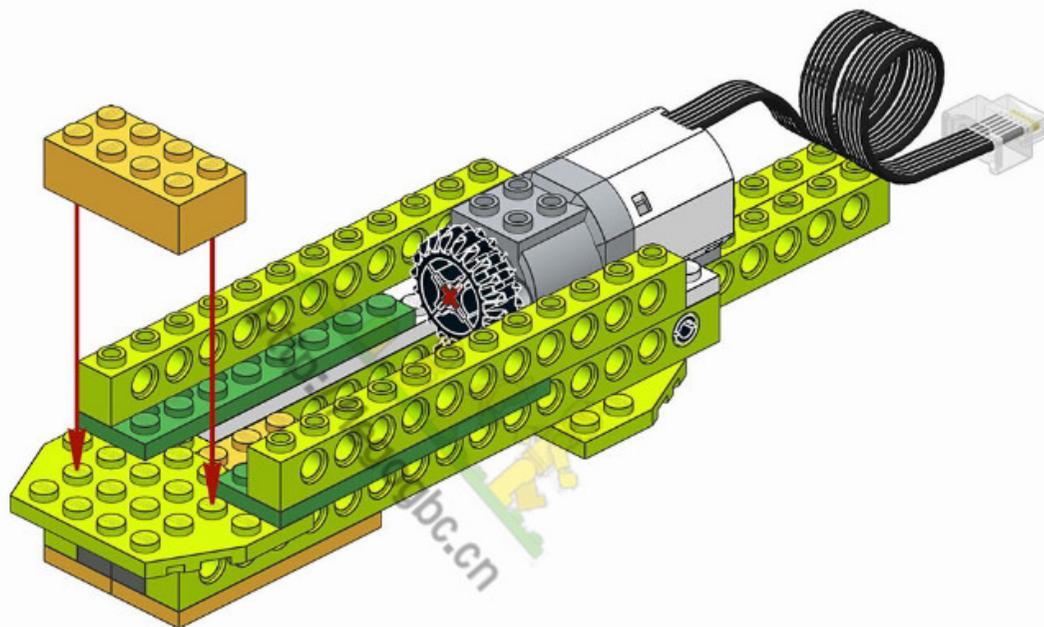


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1x

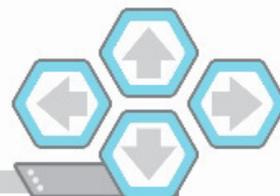
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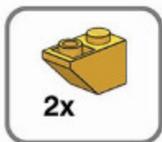
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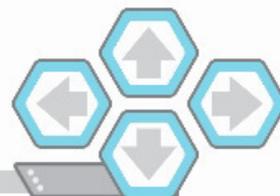
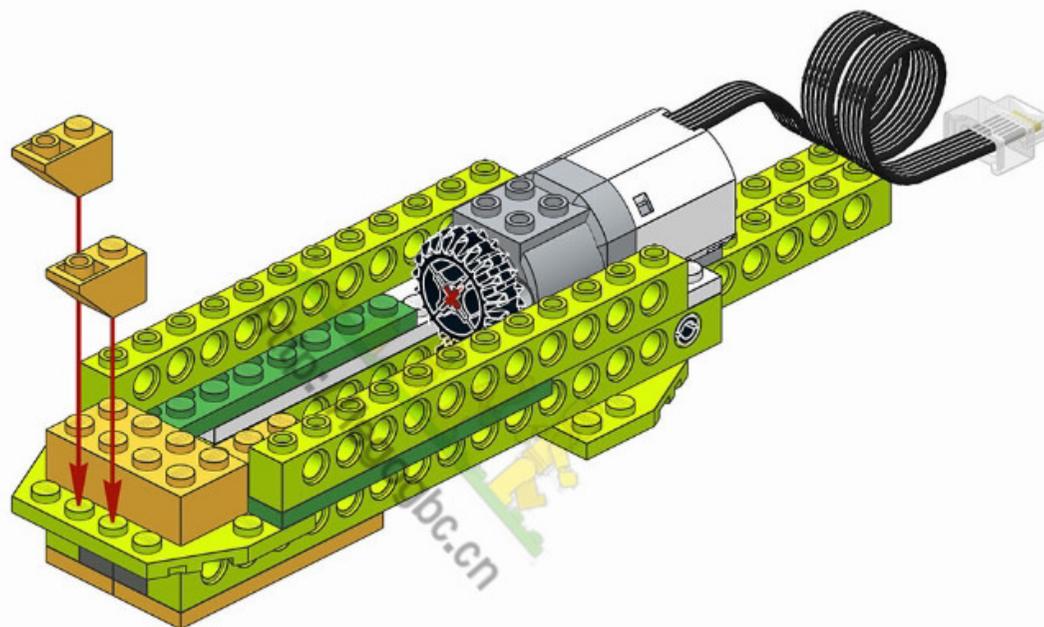




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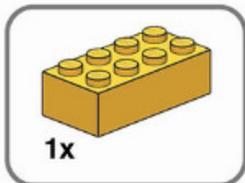


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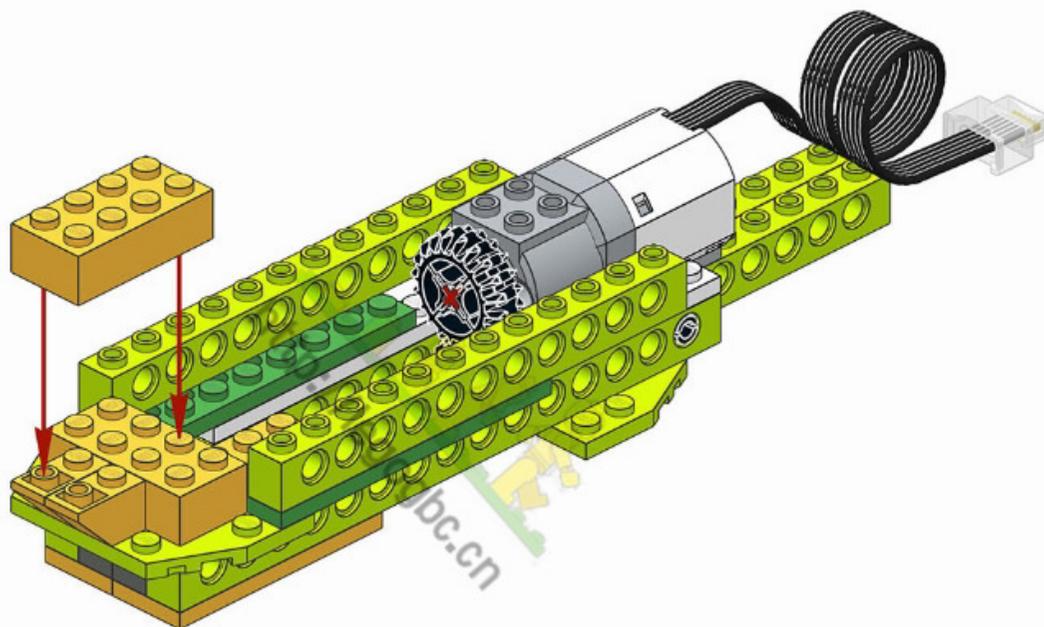


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1x

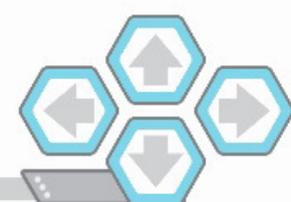
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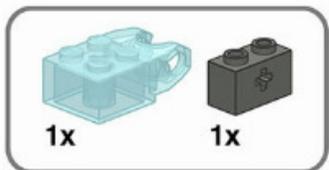
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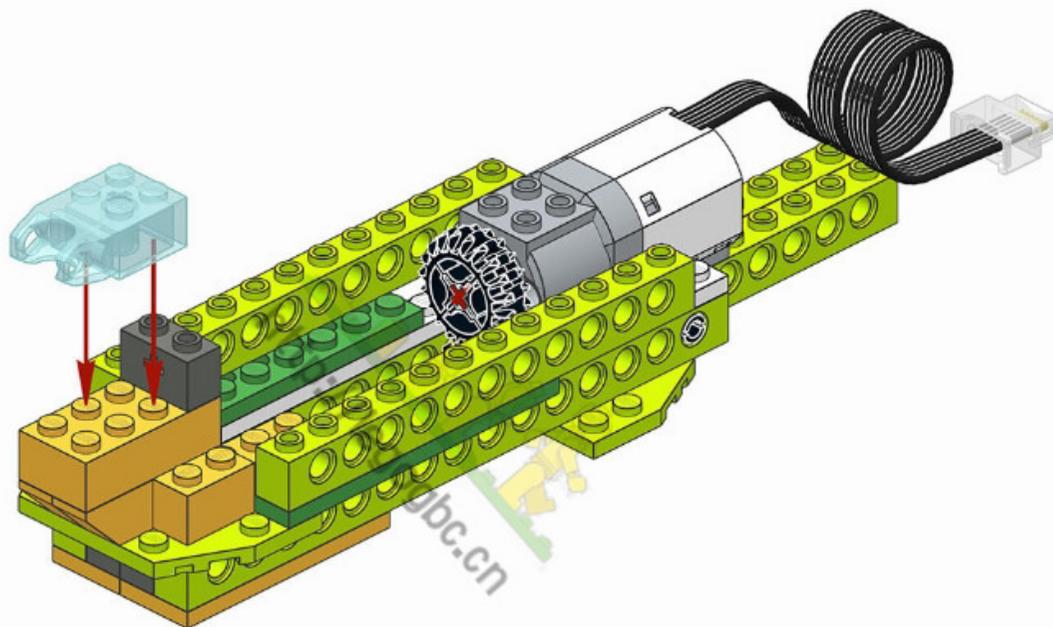




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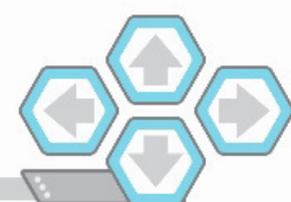


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22/70

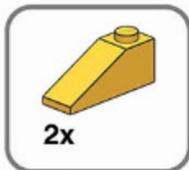
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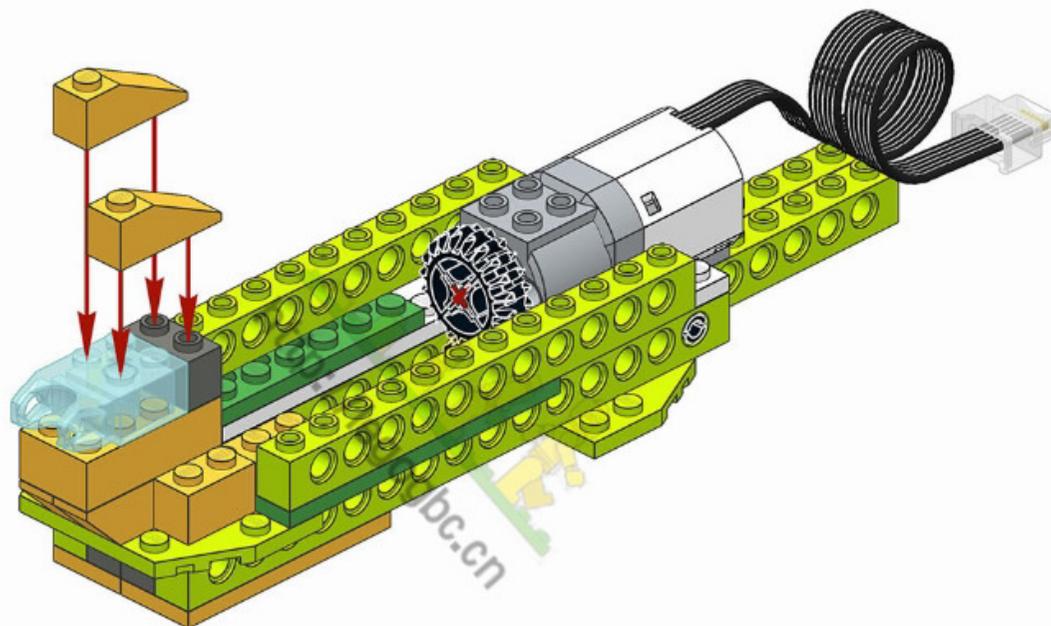




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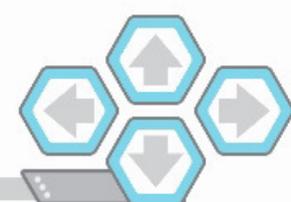


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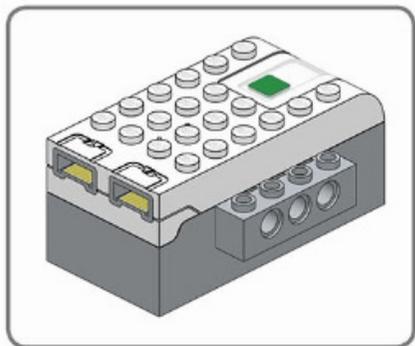
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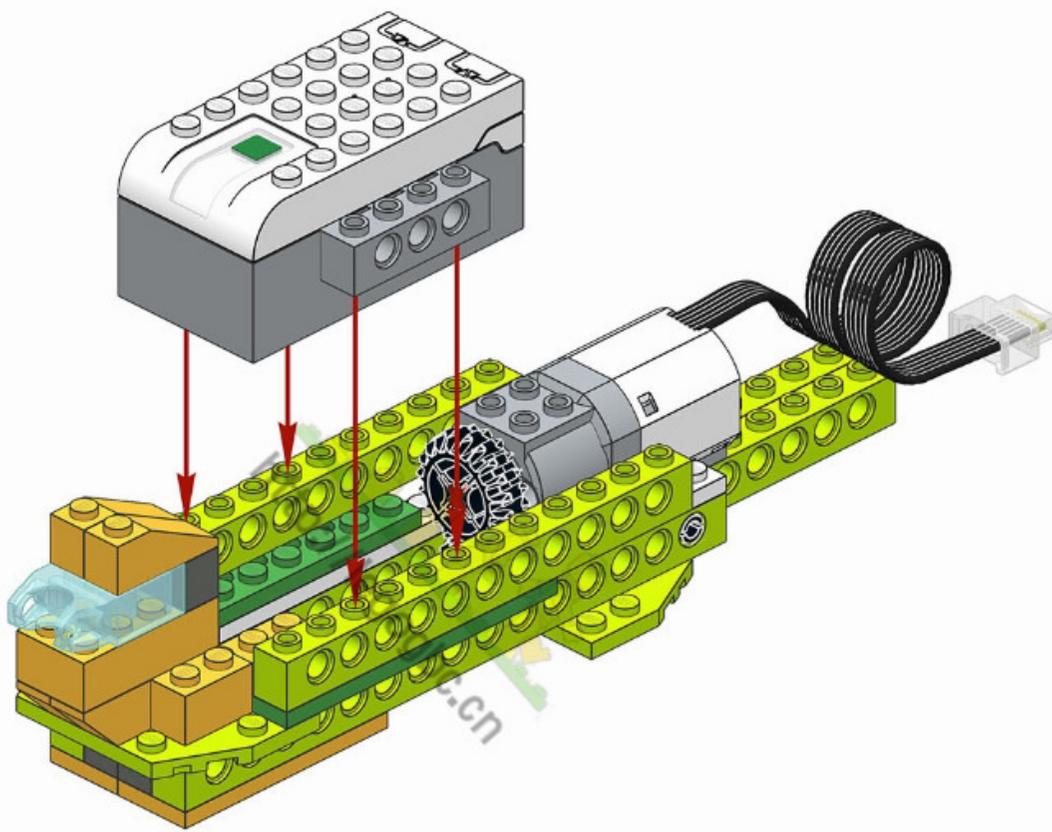




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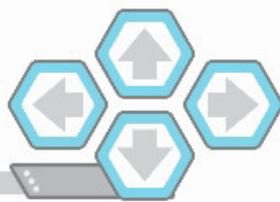
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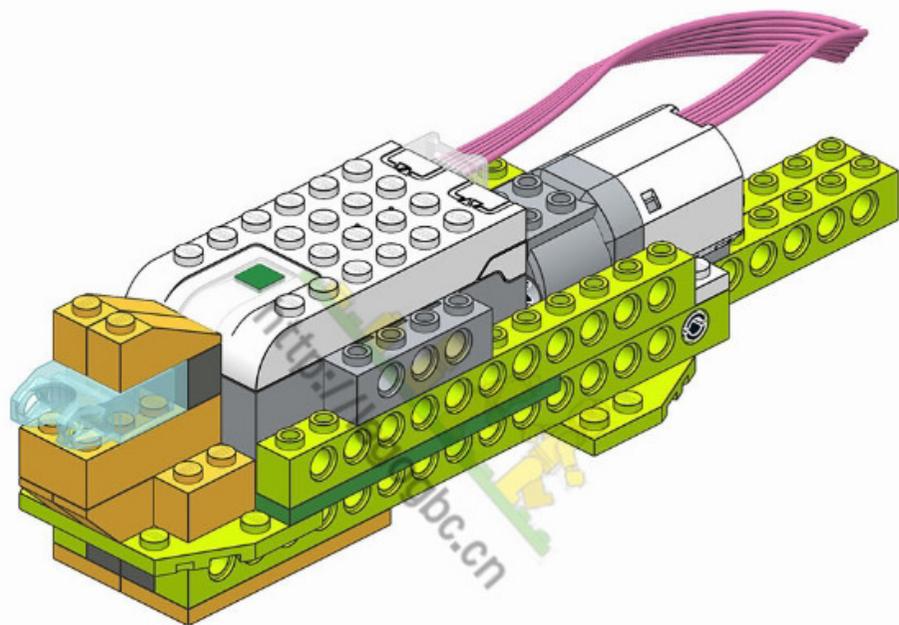
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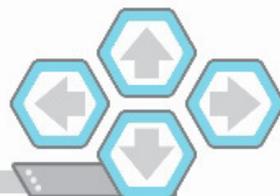
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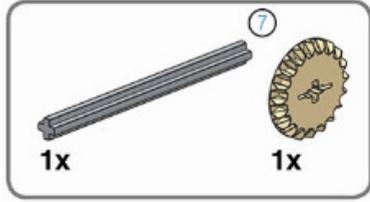
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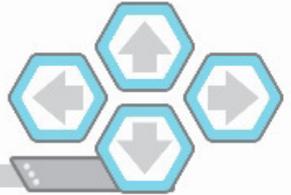
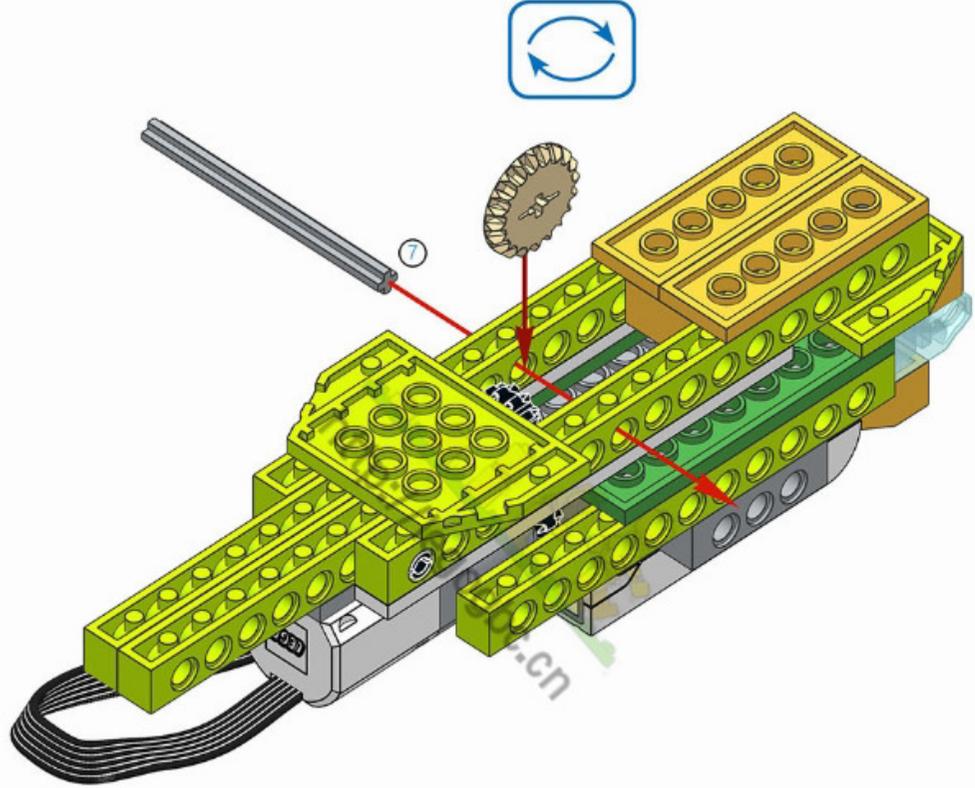




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26

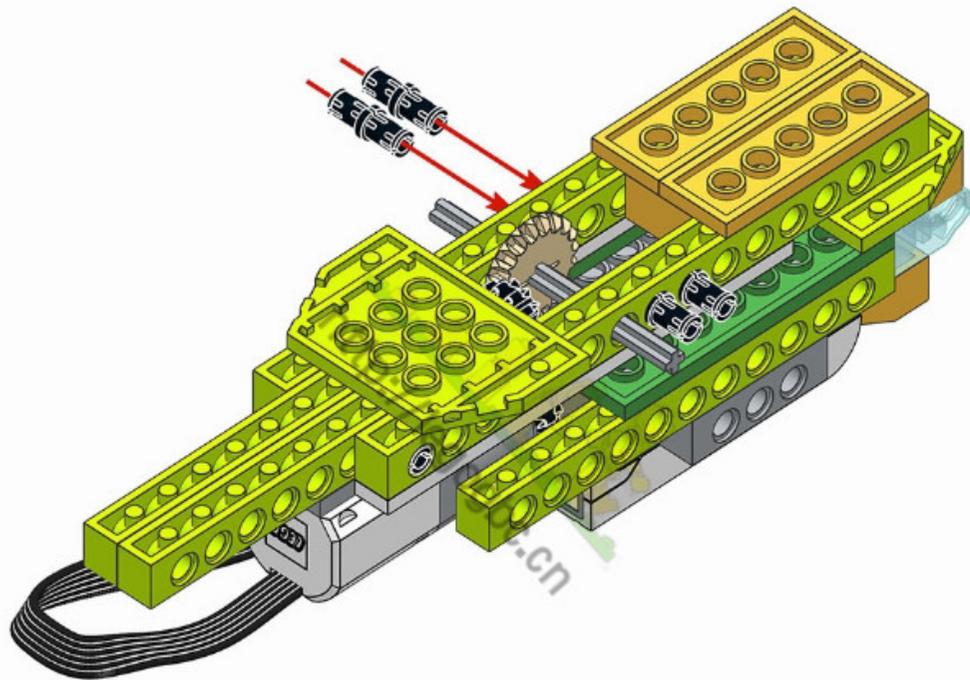




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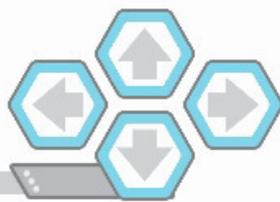


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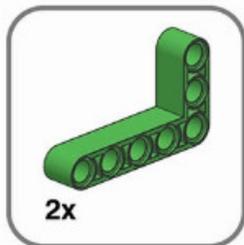
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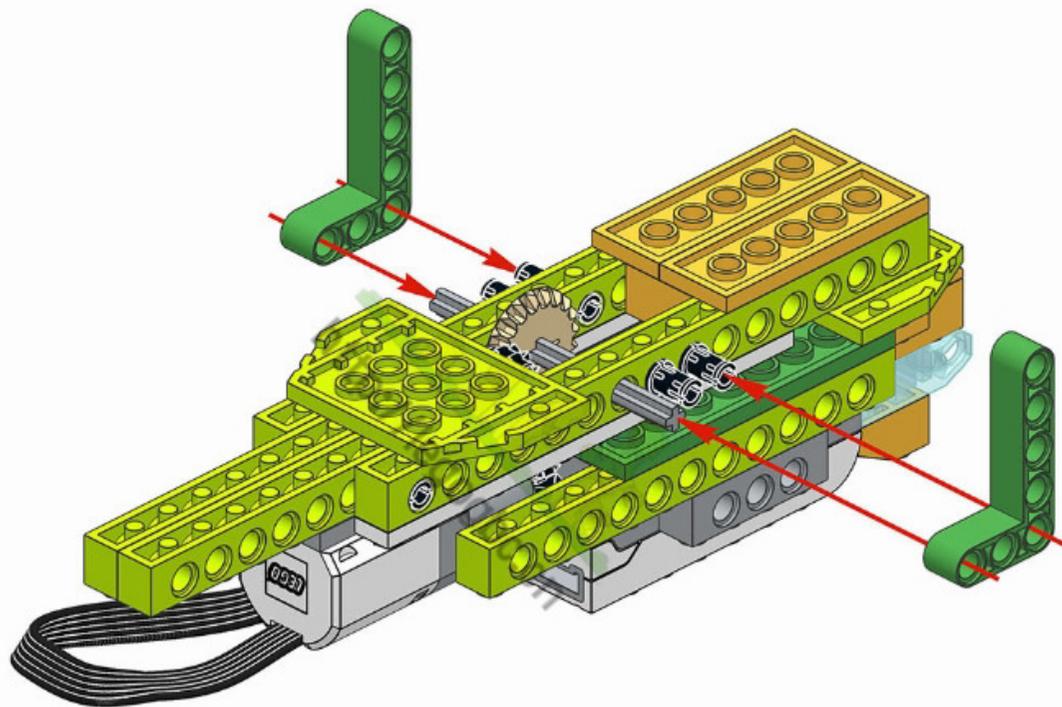




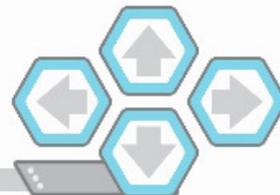
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28

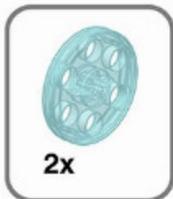


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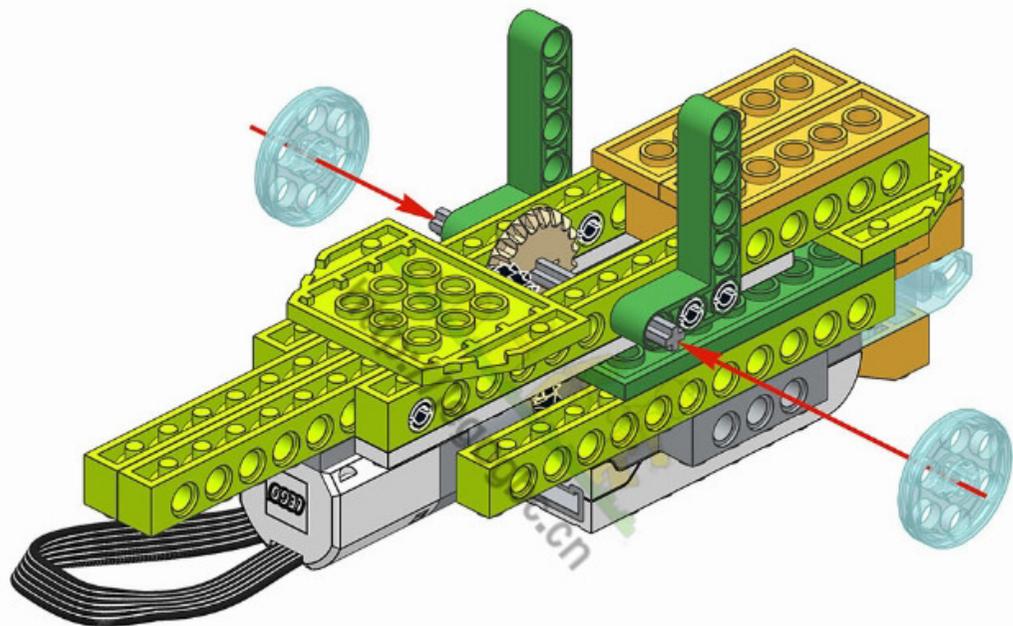


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2x

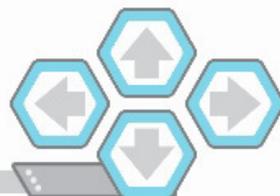
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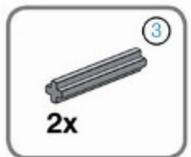
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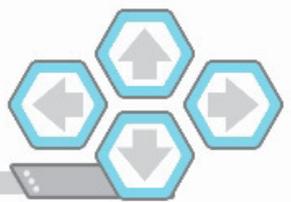
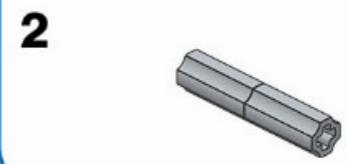
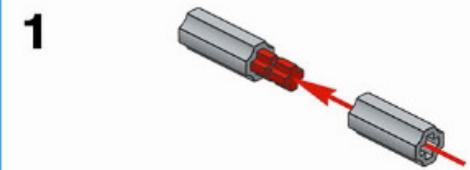
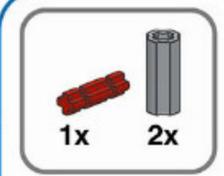
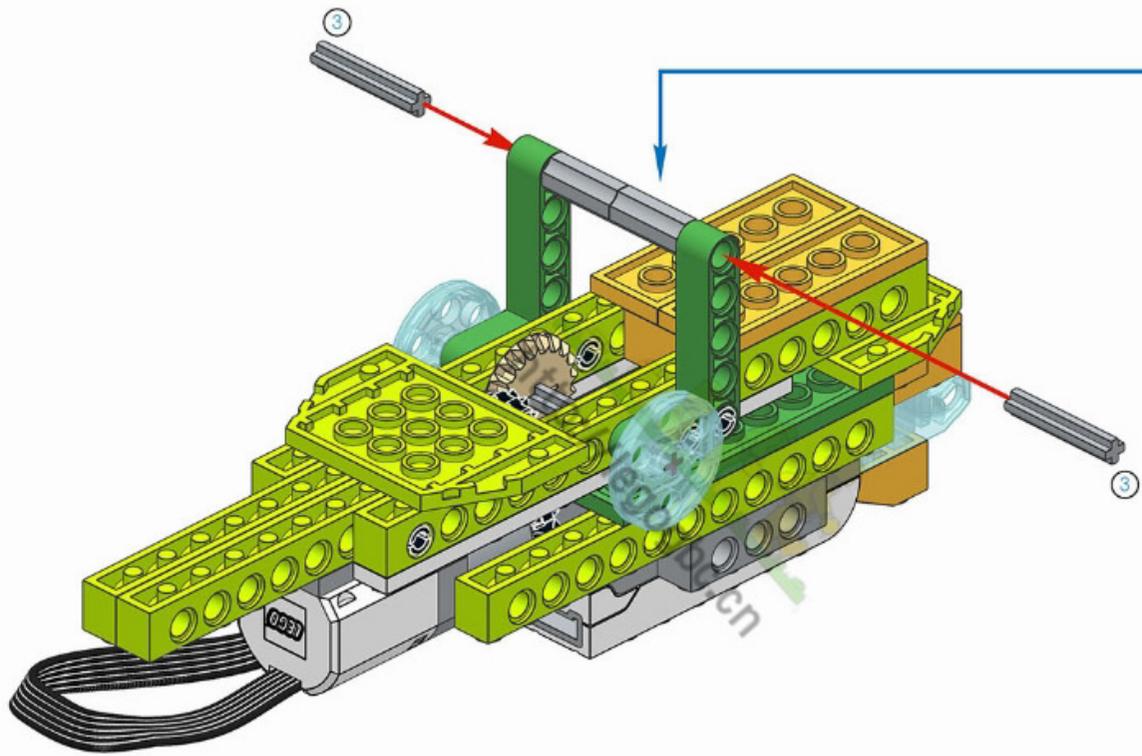




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30





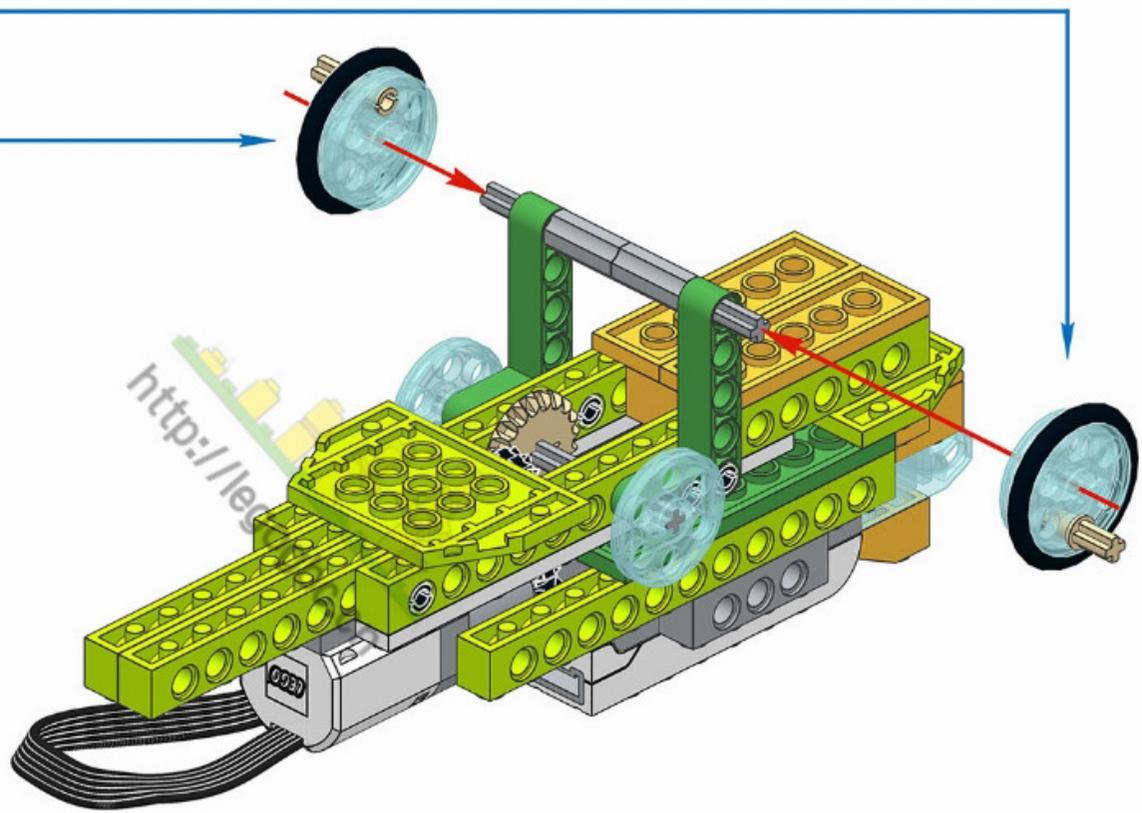
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1x 2x 1x

1

2

2x

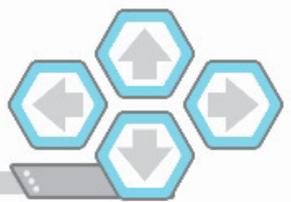
This block contains the parts list and assembly steps for step 1. The parts list shows one black O-ring, two light blue gears, and one tan axle pin. Step 1 shows the assembly of a gear onto the axle pin. Step 2 shows the assembly of a second gear onto the axle pin. The quantity '2x' is indicated for the second gear.

<http://lego.com>

1x 31/70

4

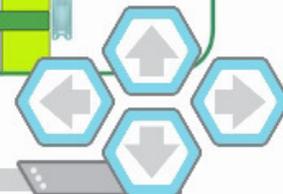
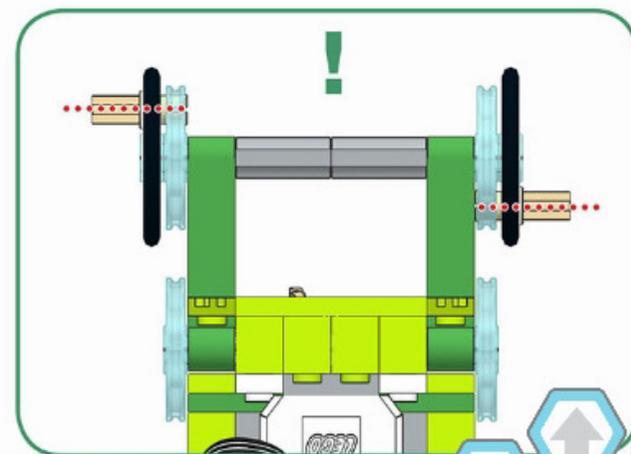
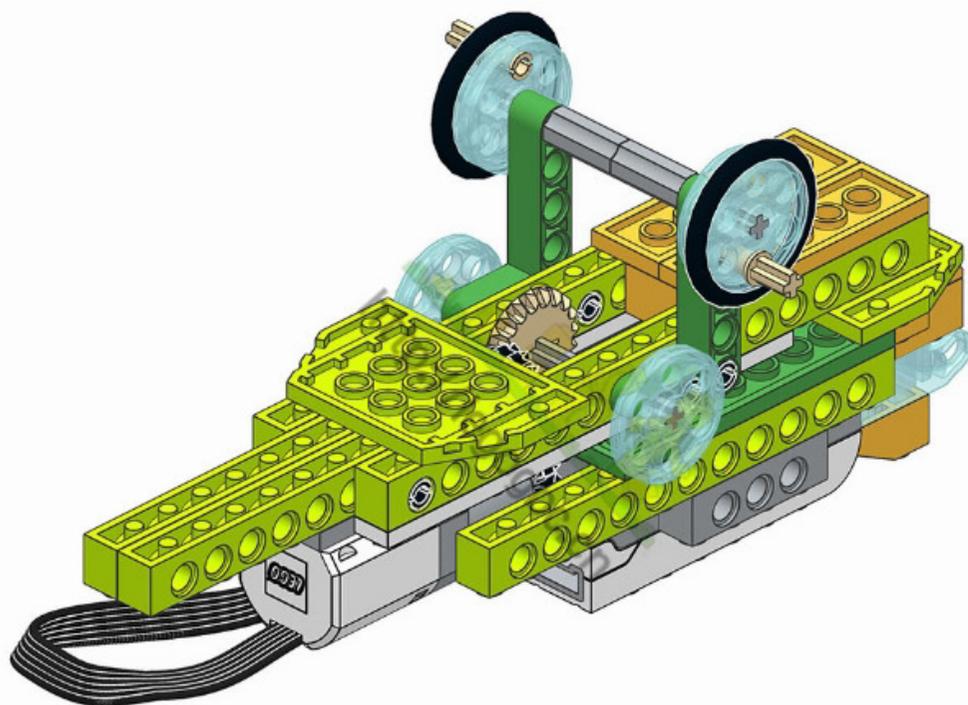
61

A set of navigation icons including a play button, a yellow gear icon with the number '4', and a hexagon with the number '61'. There are also four directional arrow icons (up, down, left, right) arranged in a cross pattern.

32



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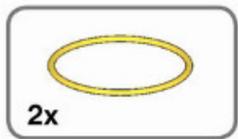
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4

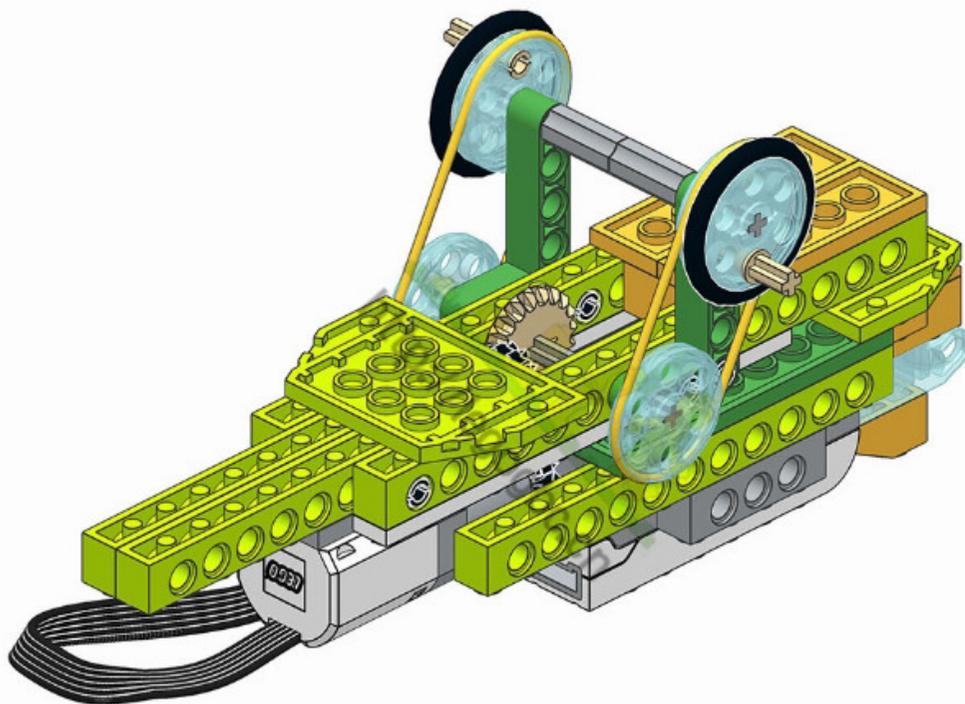
62



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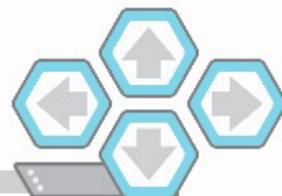
33



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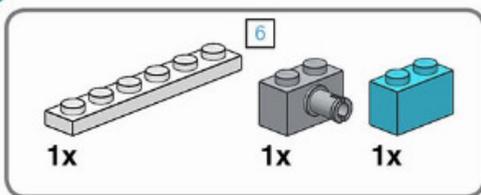


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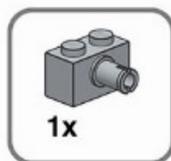
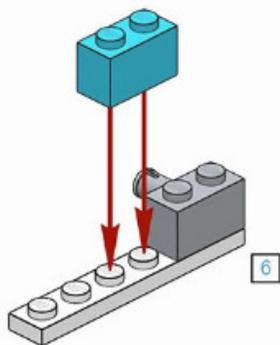




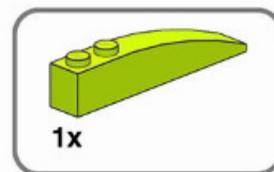
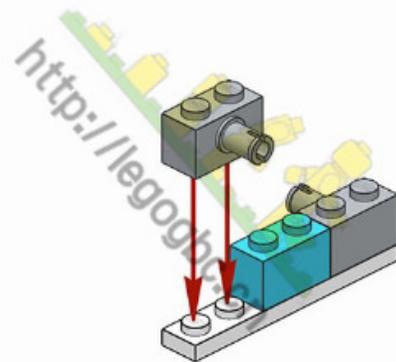
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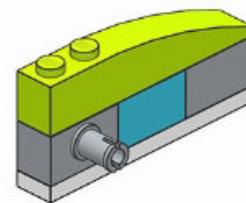
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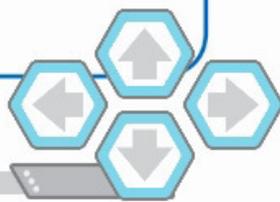
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4

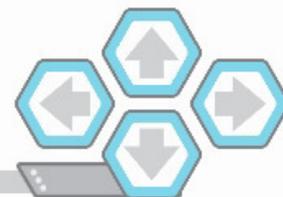
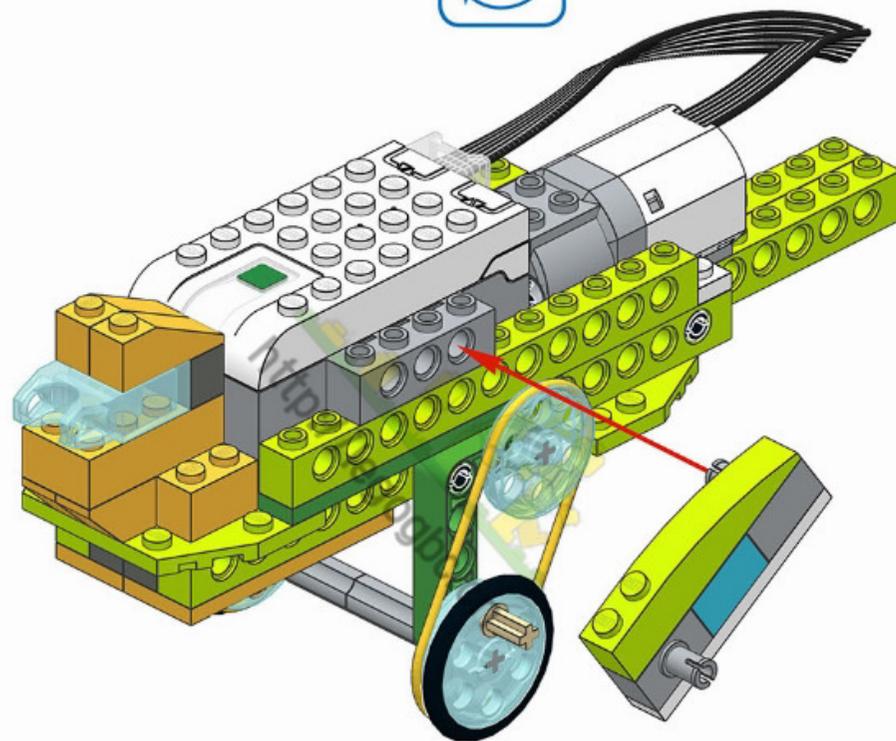
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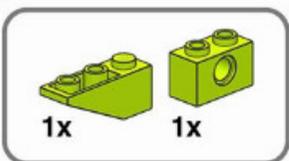


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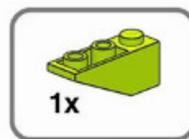
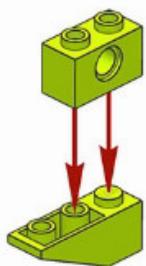




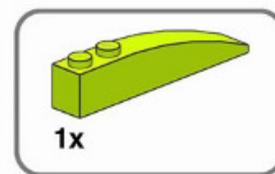
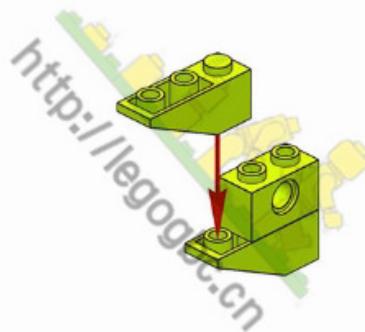
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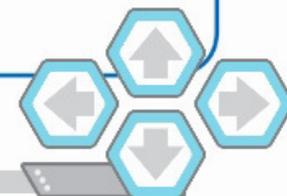
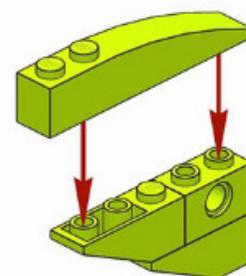
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2



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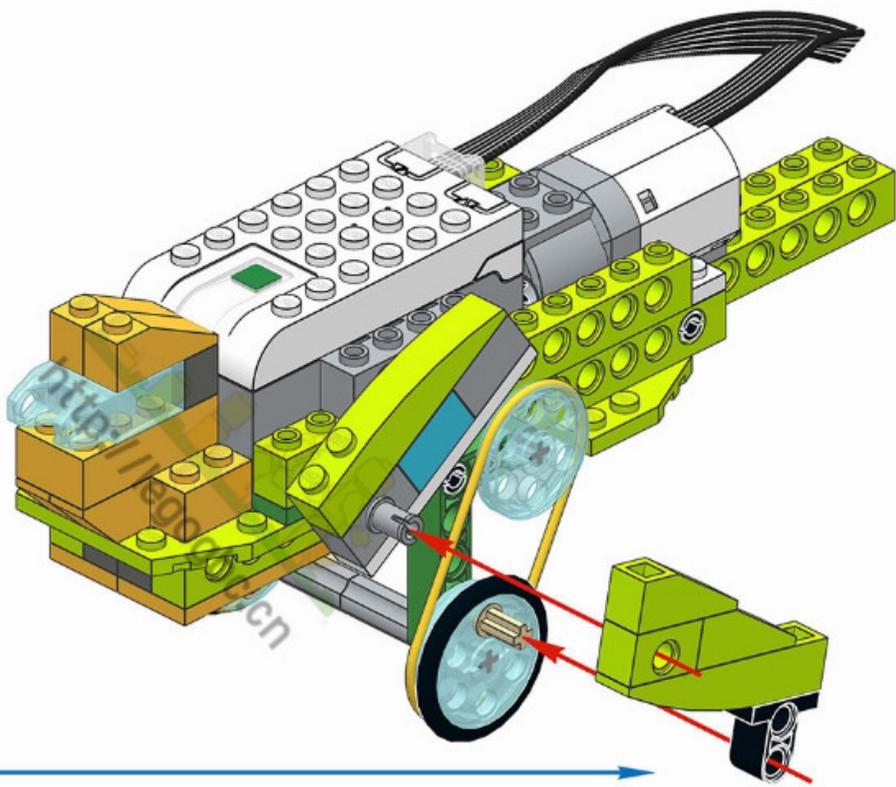
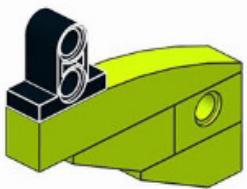




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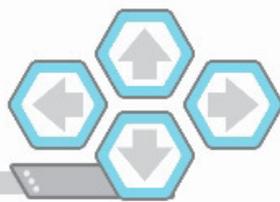
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4

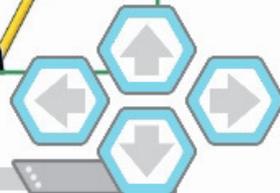
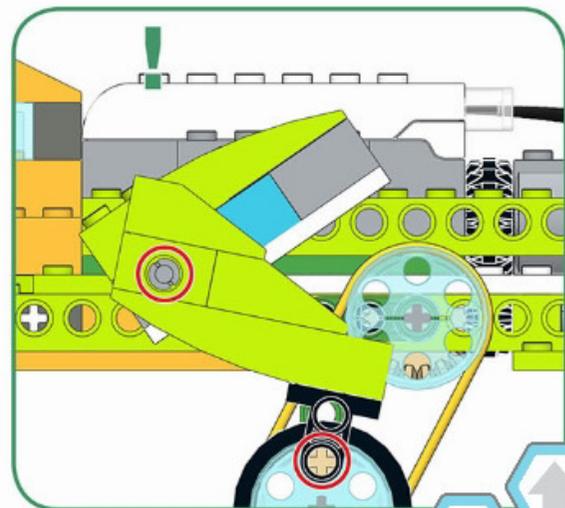
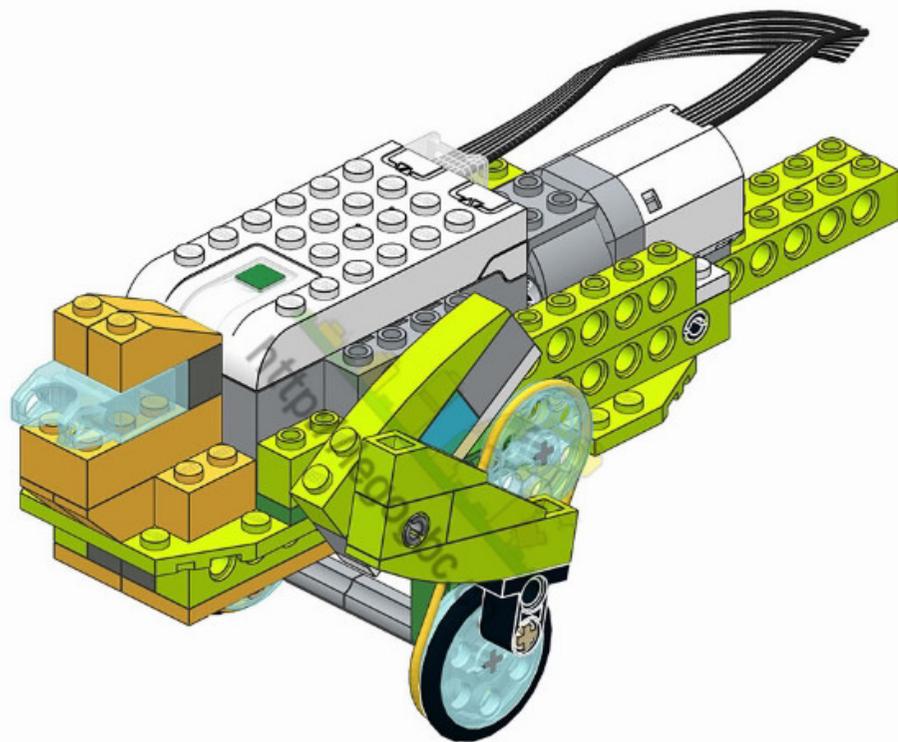
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38



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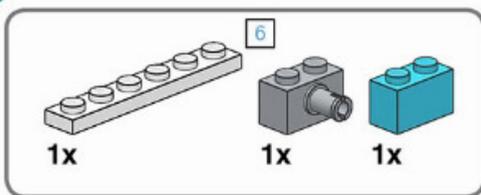
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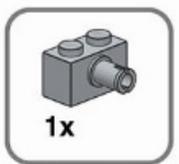
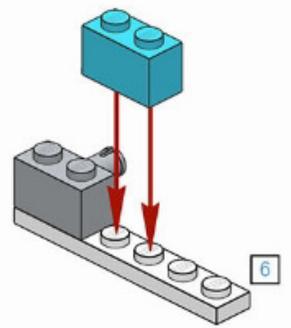
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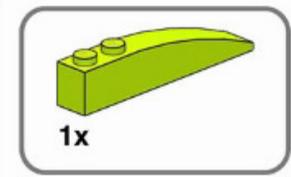
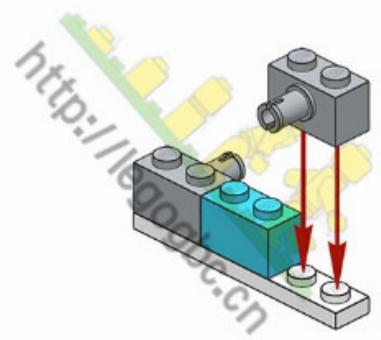
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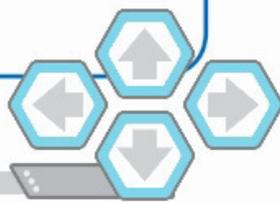
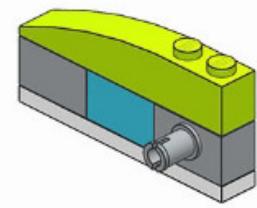
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2



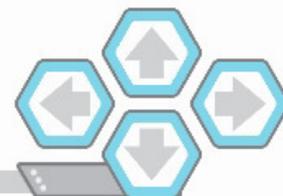
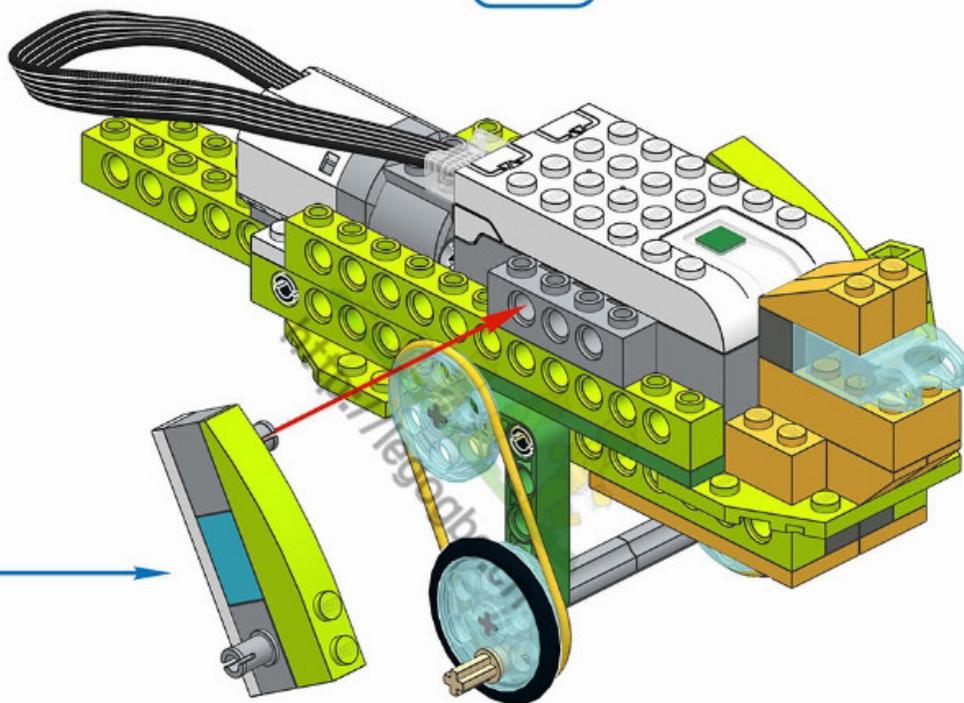
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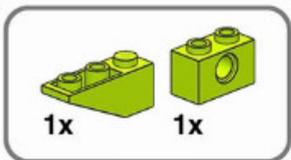


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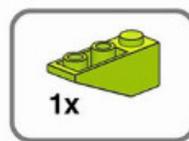
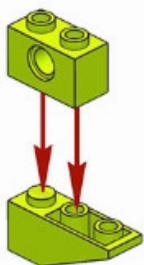




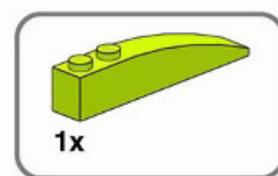
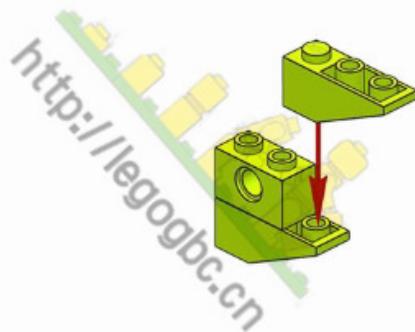
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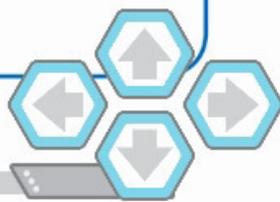
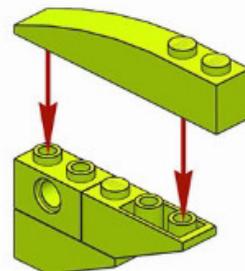
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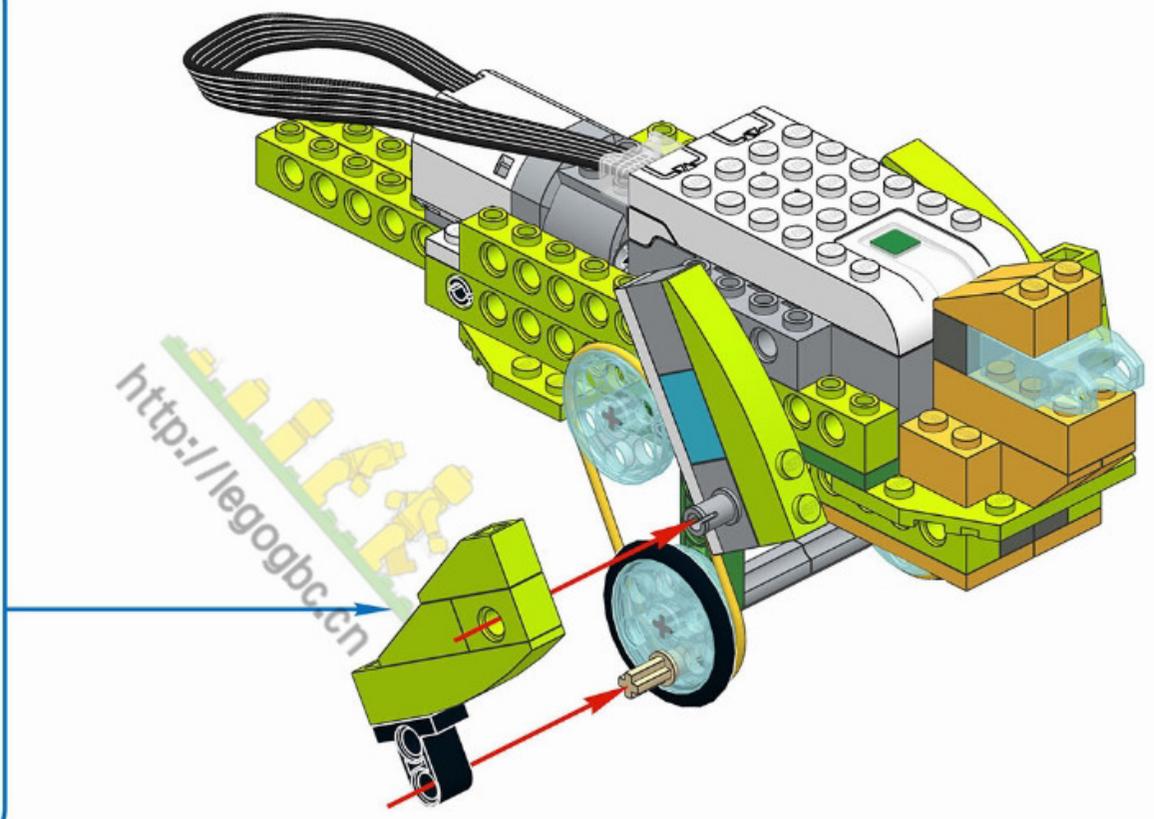
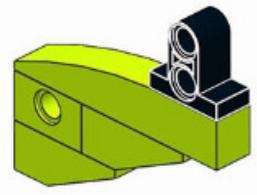




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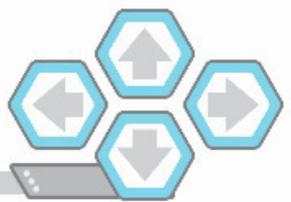
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4

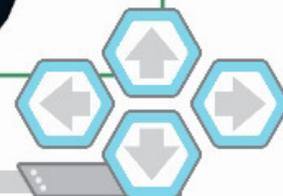
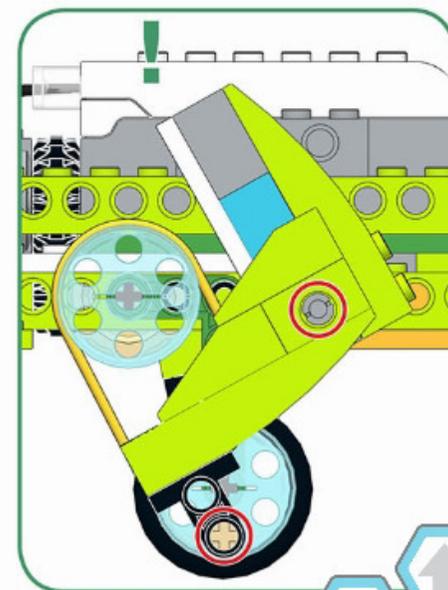
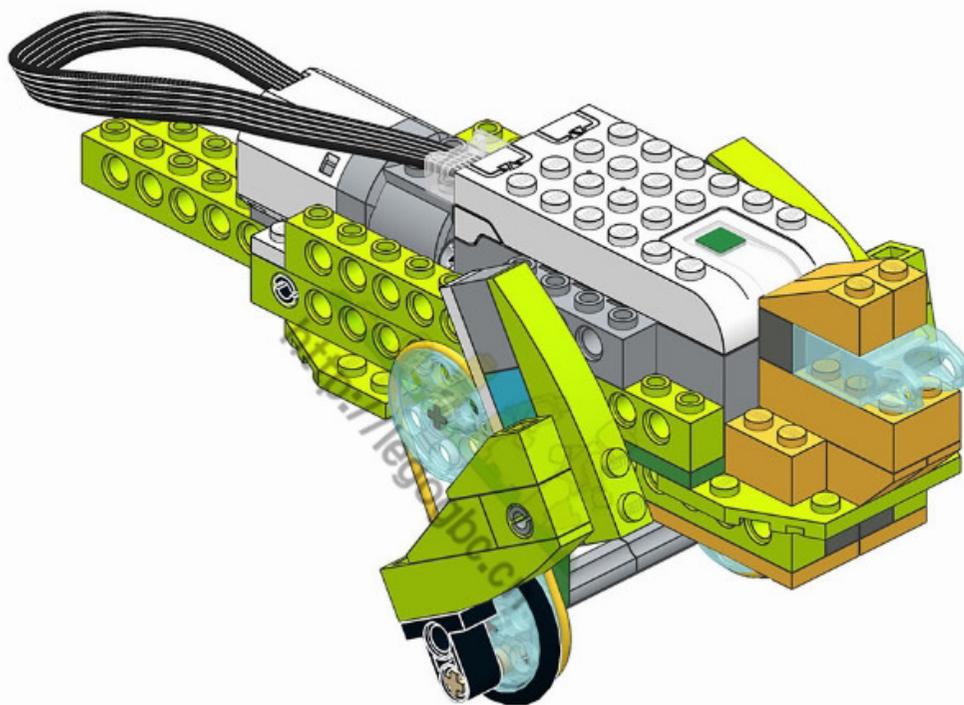
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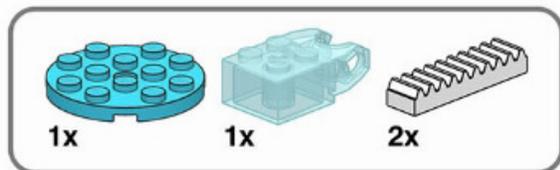
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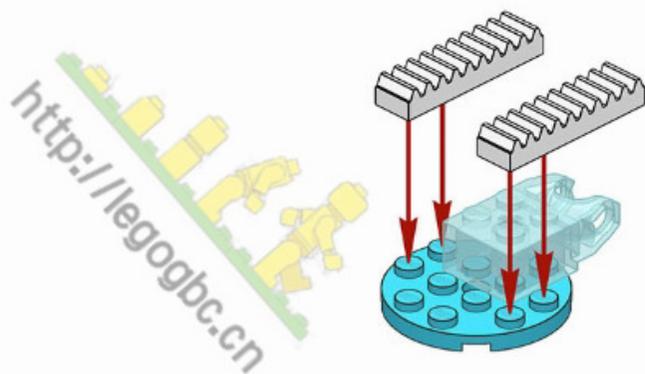
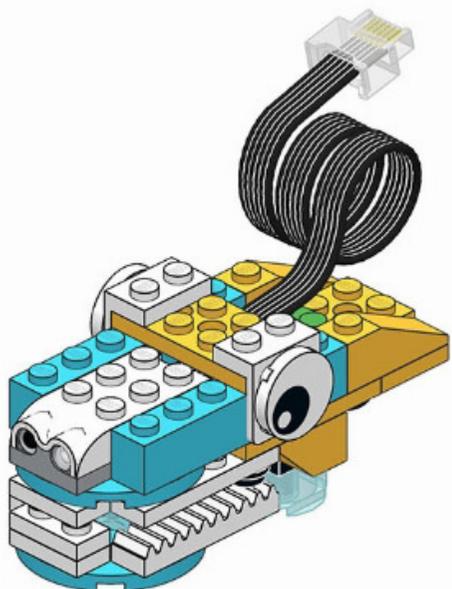
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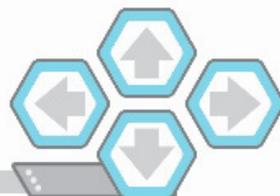
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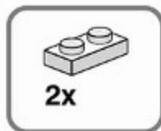
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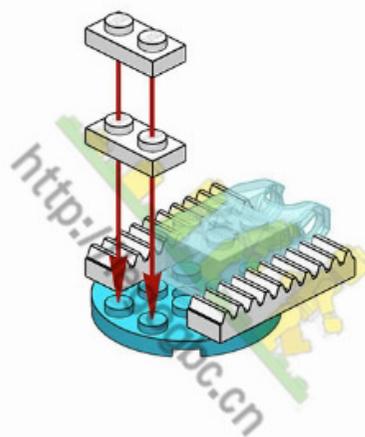




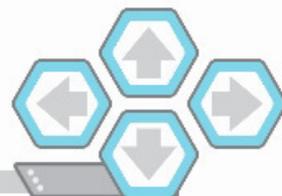
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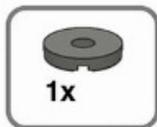


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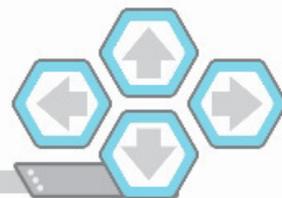
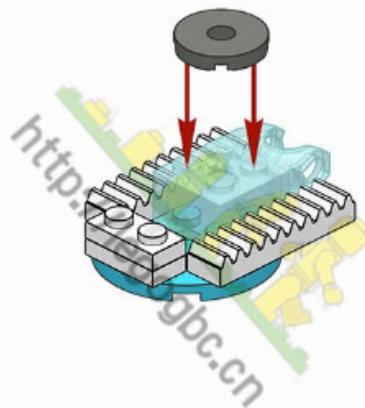




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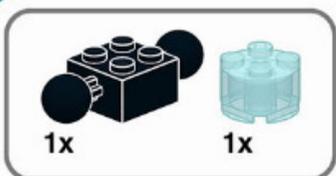


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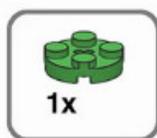
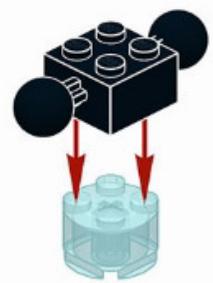




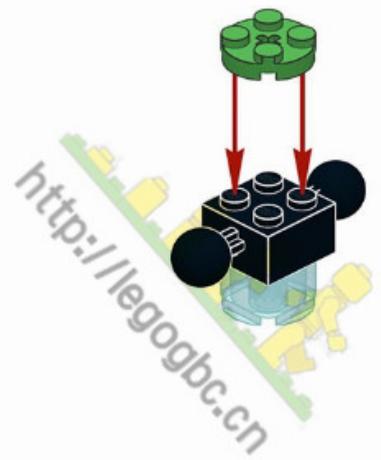
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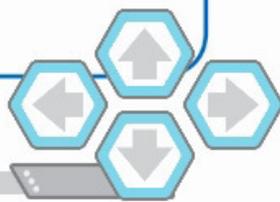
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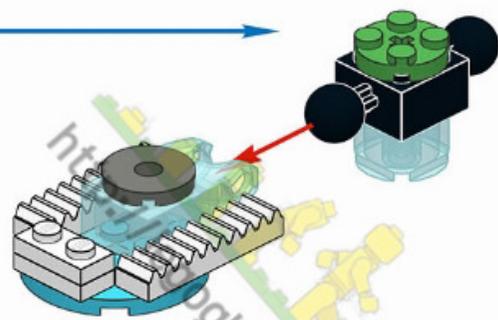
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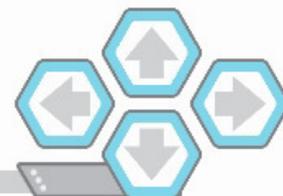
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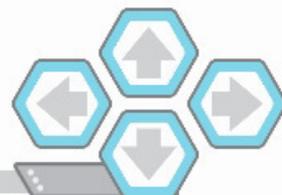
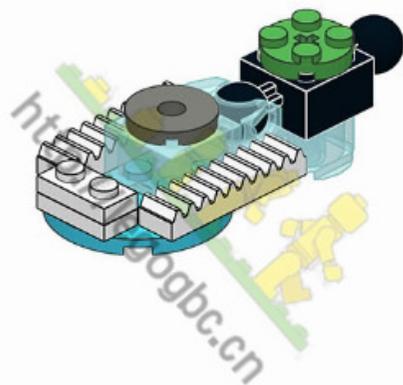
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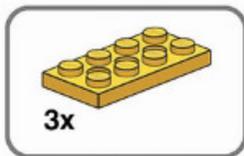


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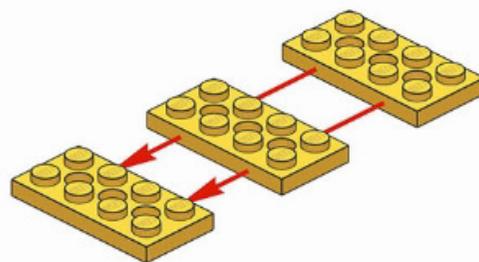
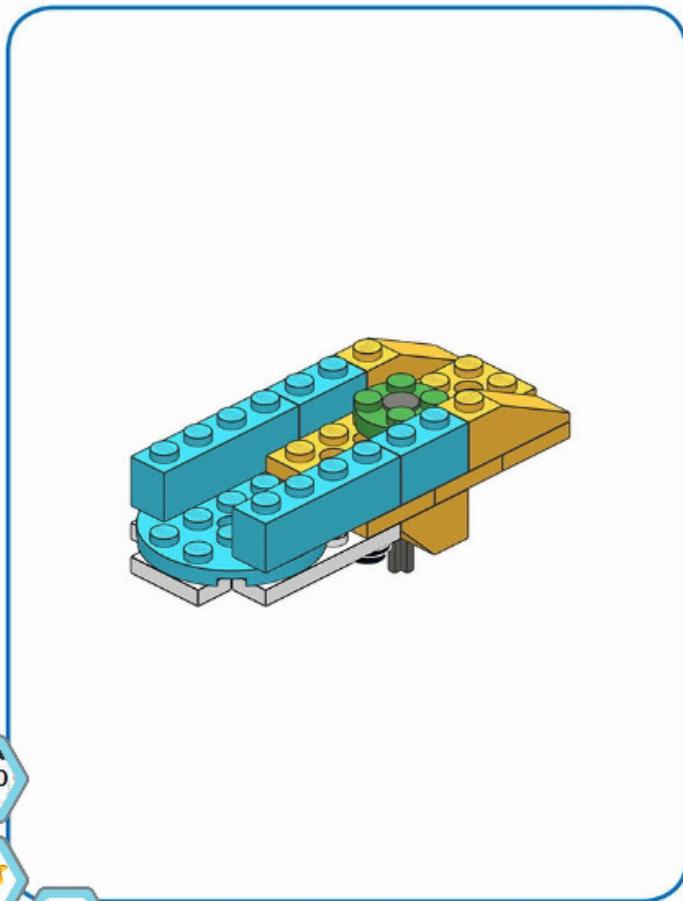




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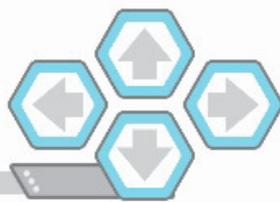


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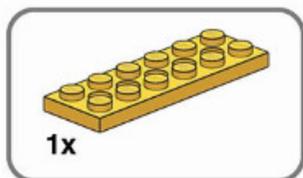
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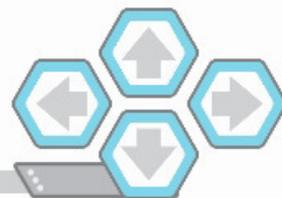
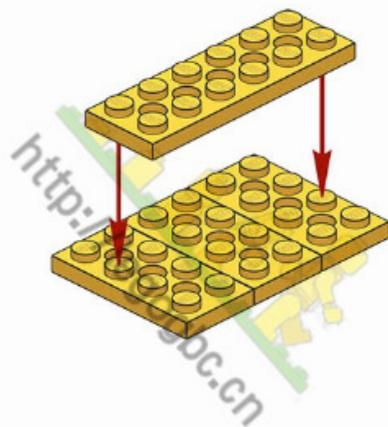




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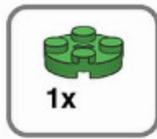


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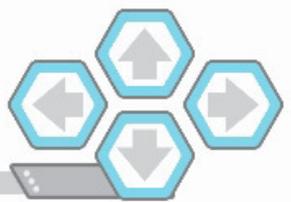
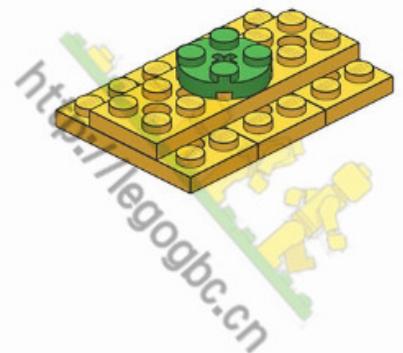




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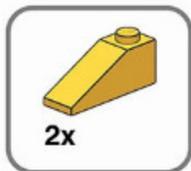


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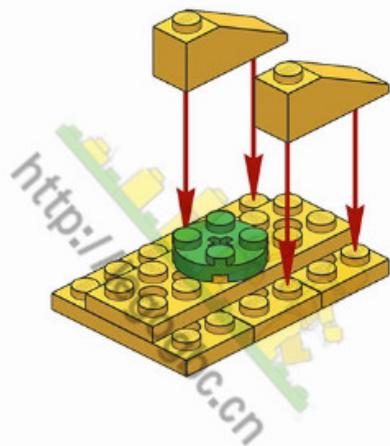


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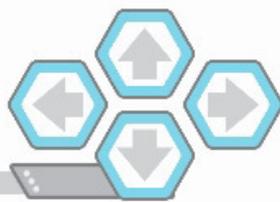
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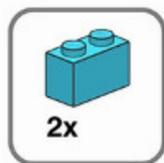
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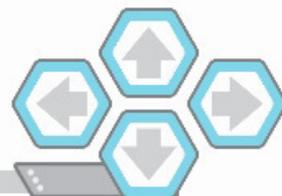
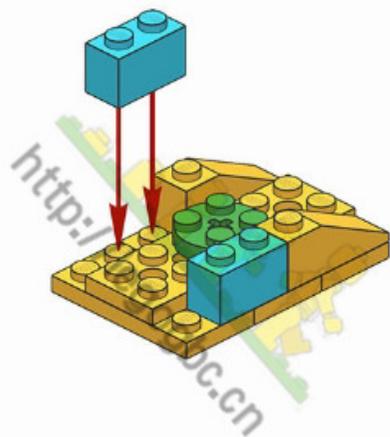




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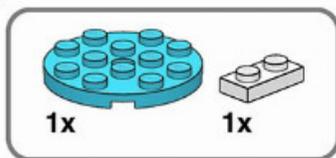


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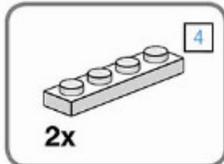
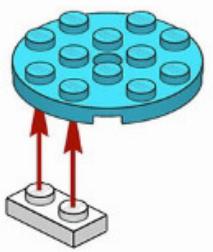




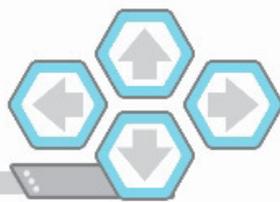
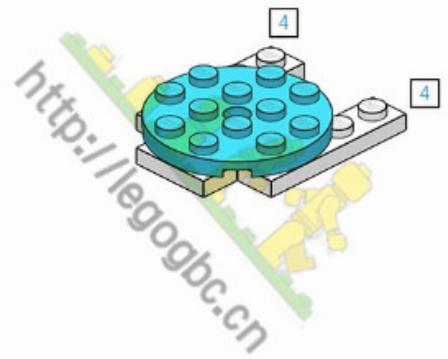
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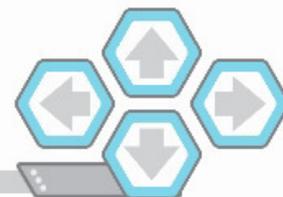
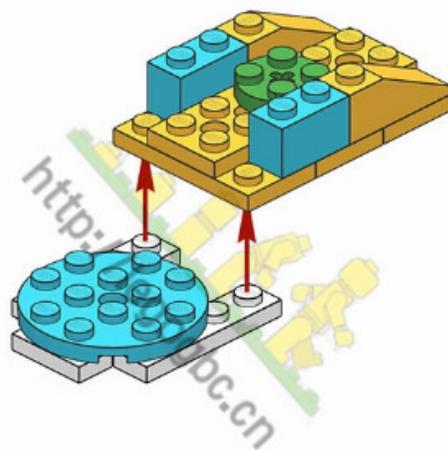
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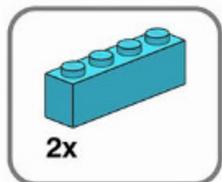


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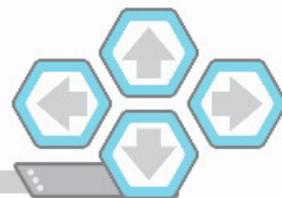
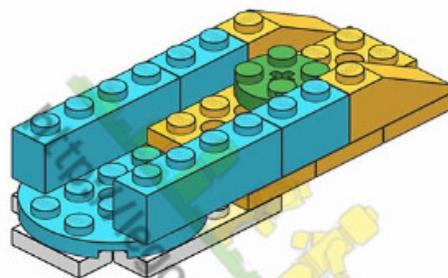




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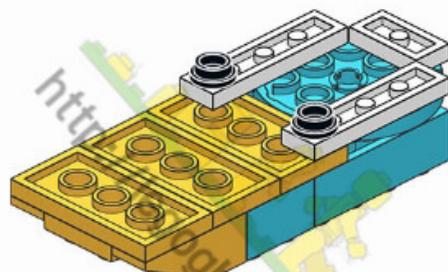




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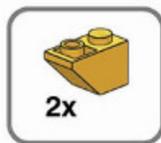


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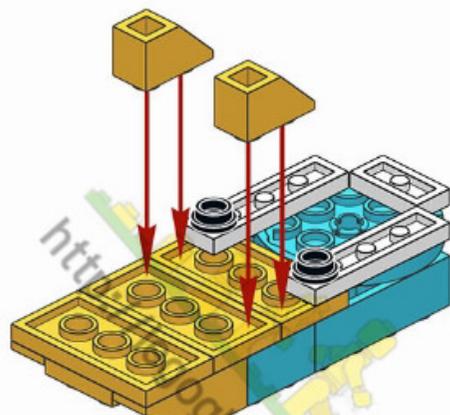




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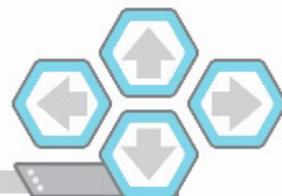
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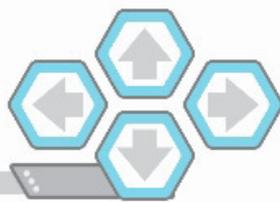
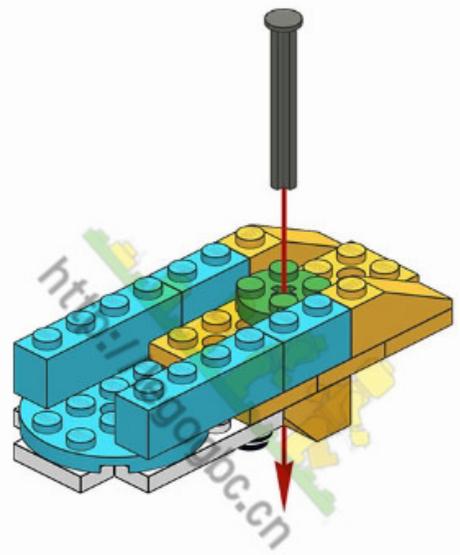




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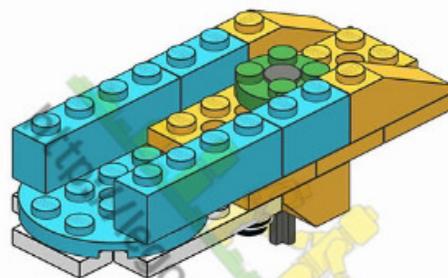
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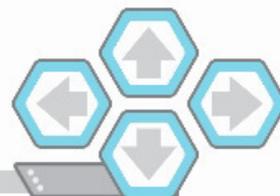


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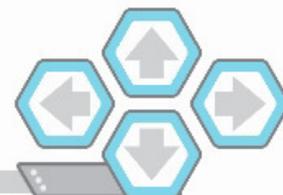
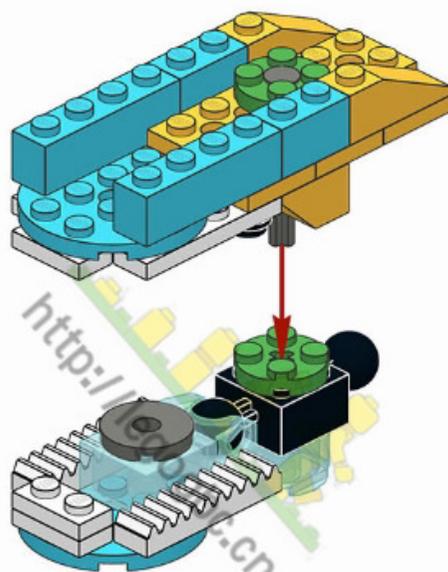
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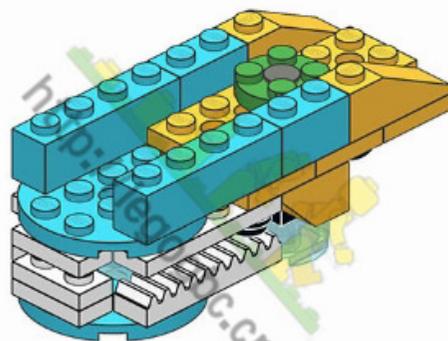
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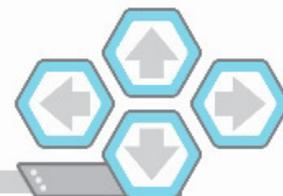
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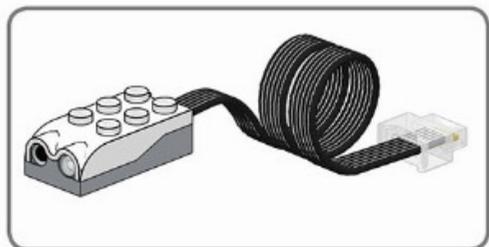
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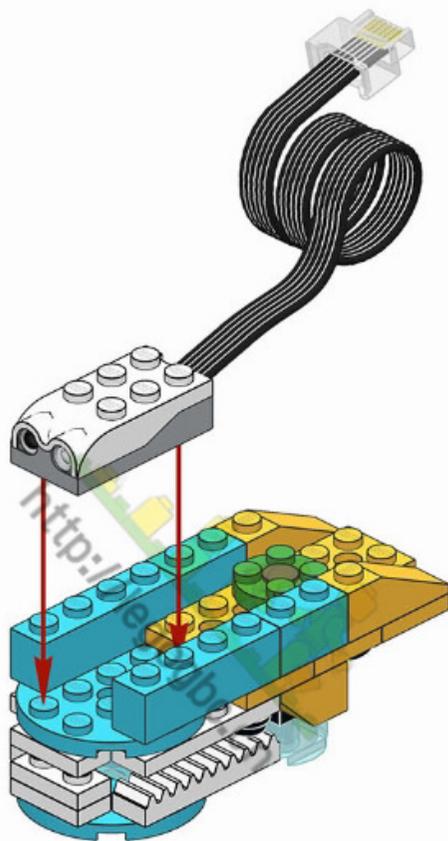




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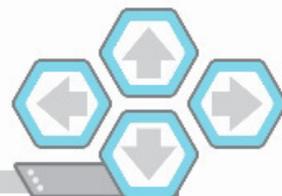
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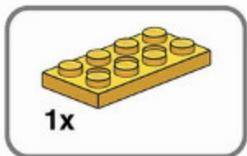
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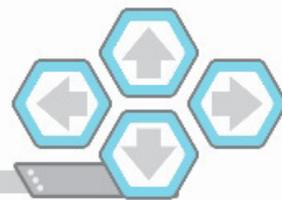
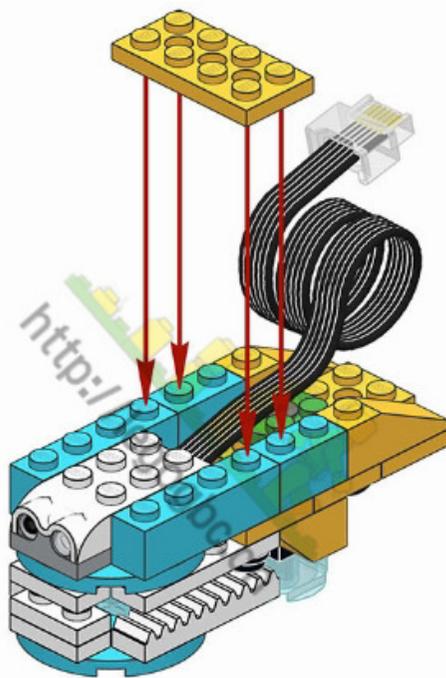




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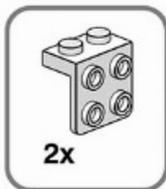


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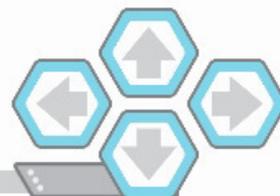
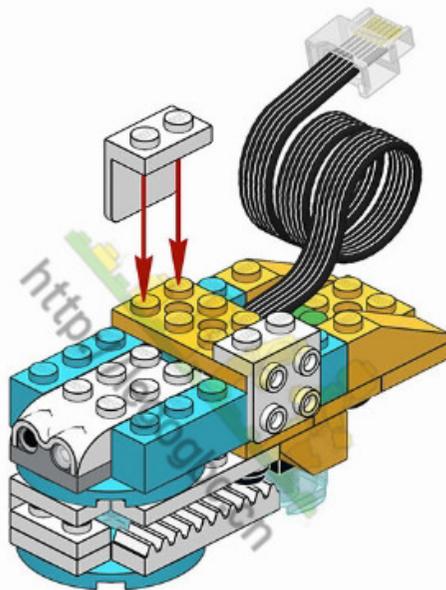




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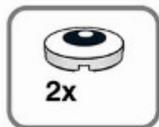


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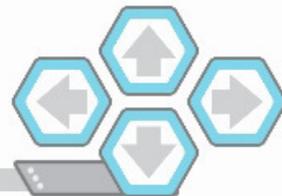
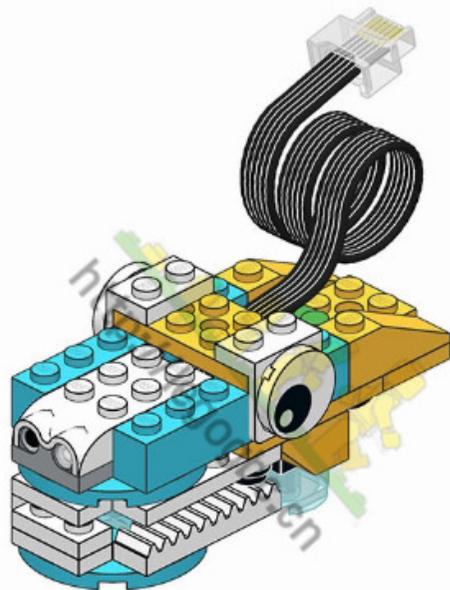




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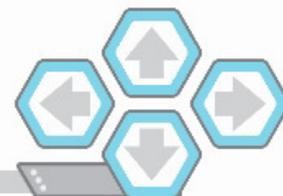
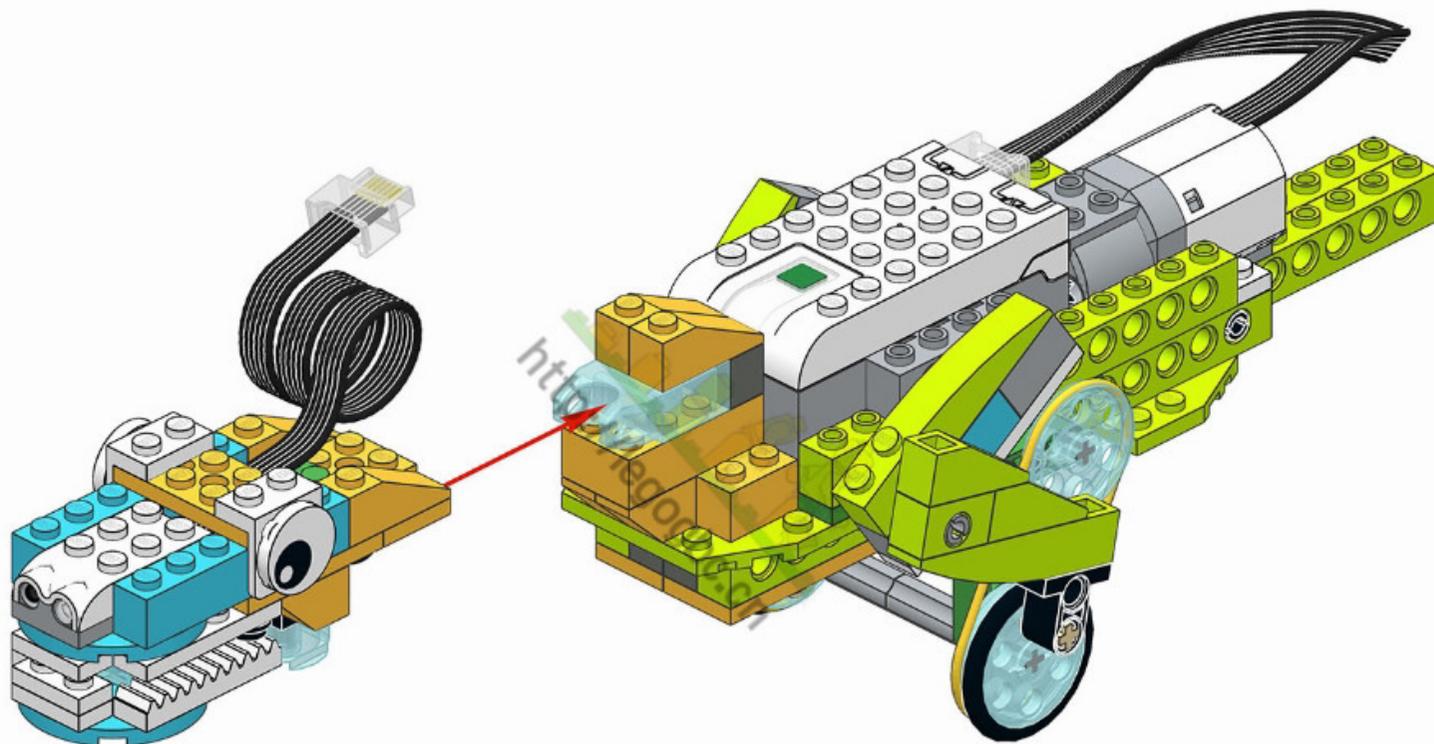
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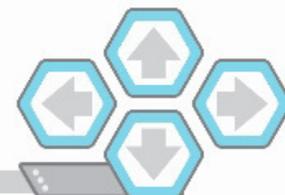
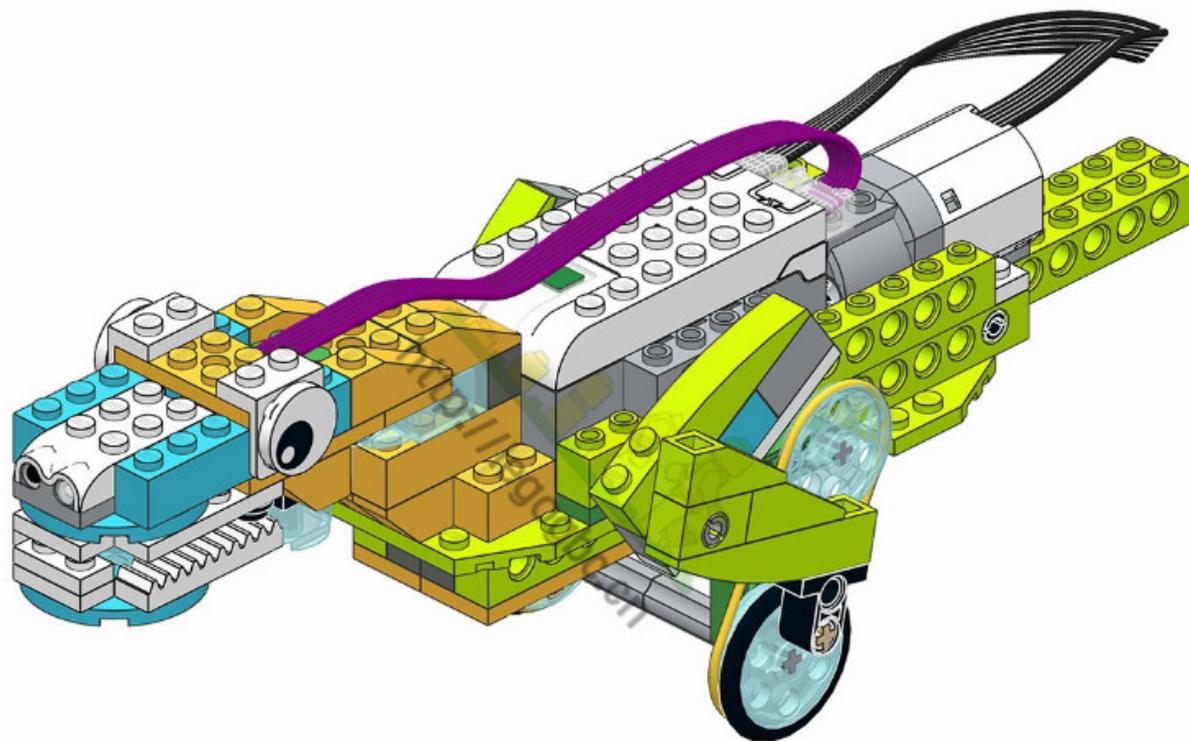
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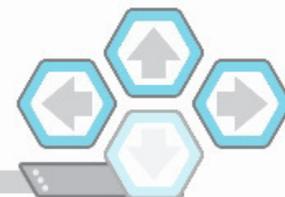
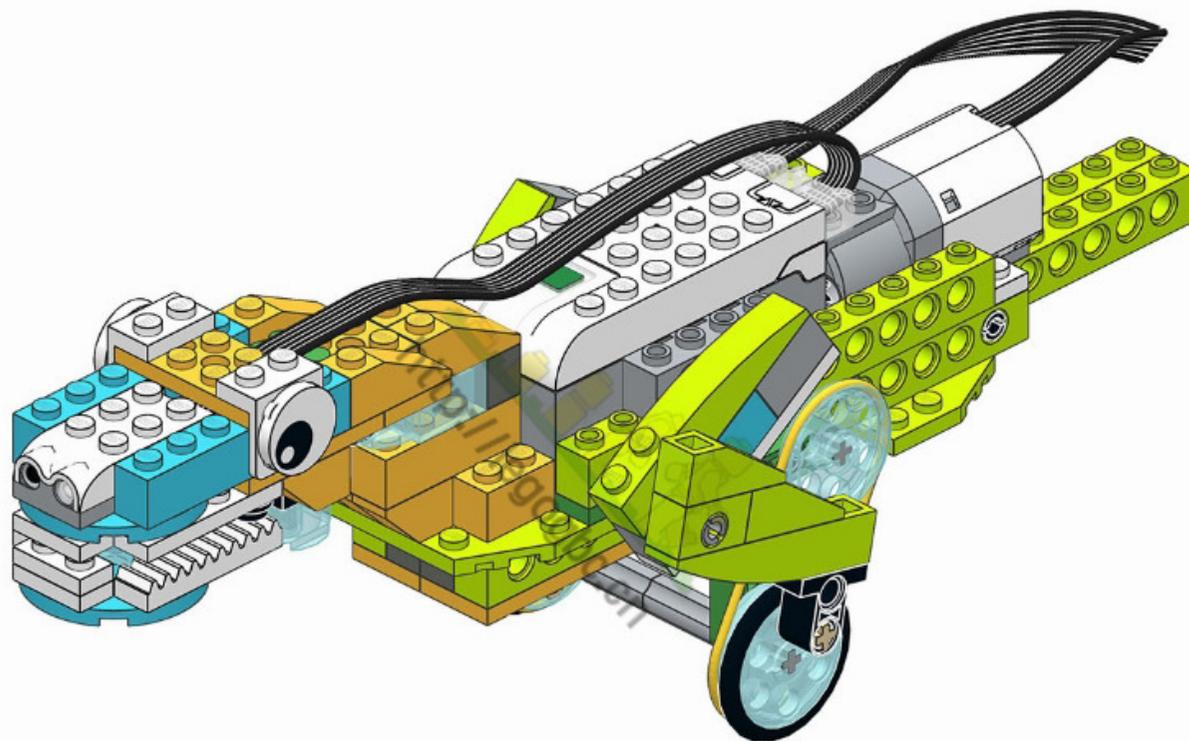
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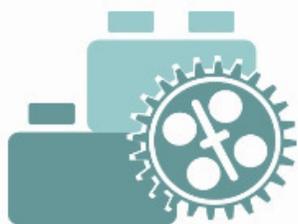
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Enhanced version

Add robot's short front paws and decorative elements of the head, tail and feet.



T-Rex



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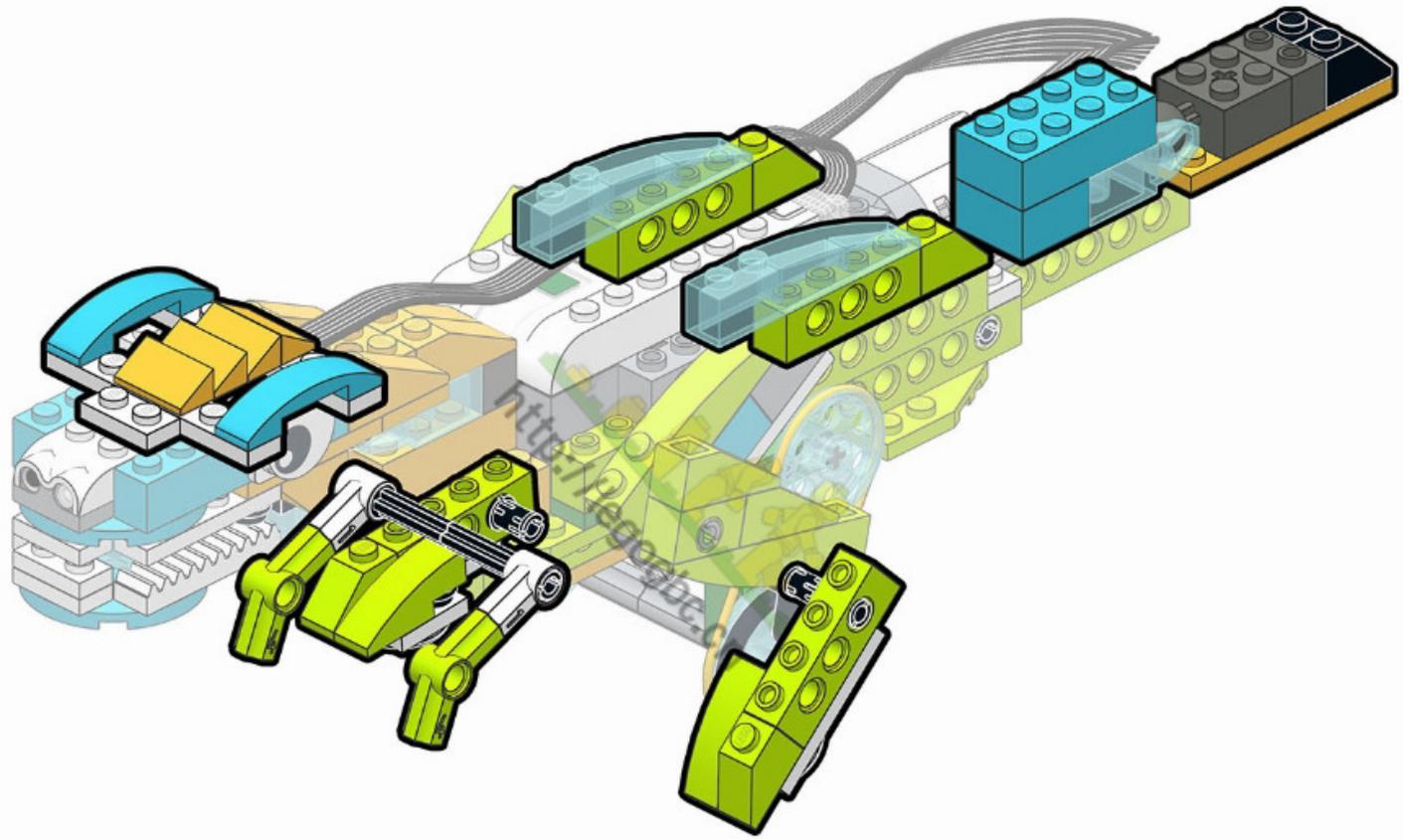


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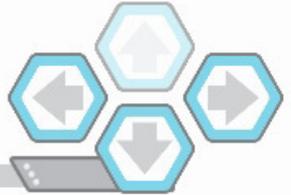
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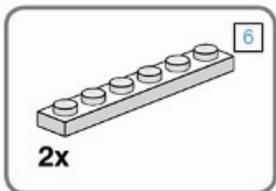
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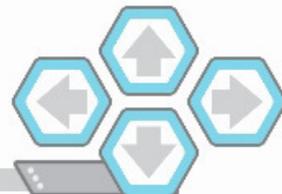
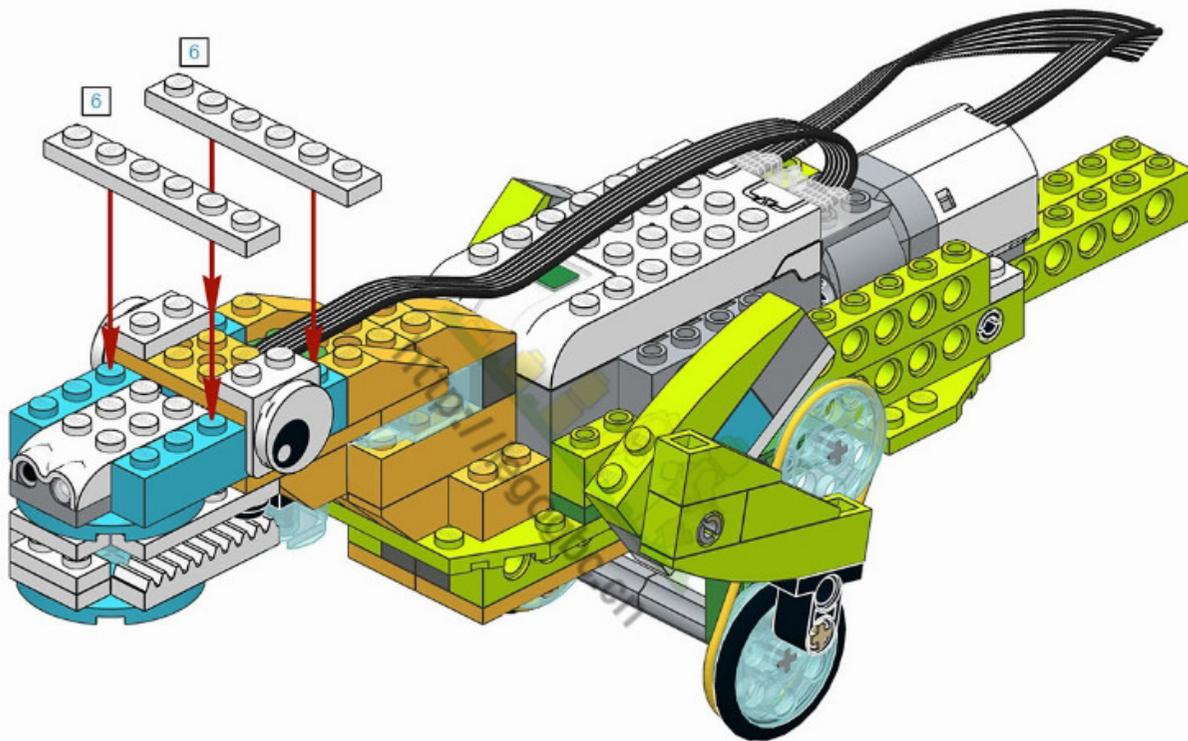




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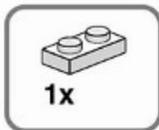


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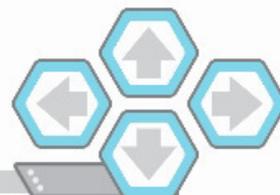
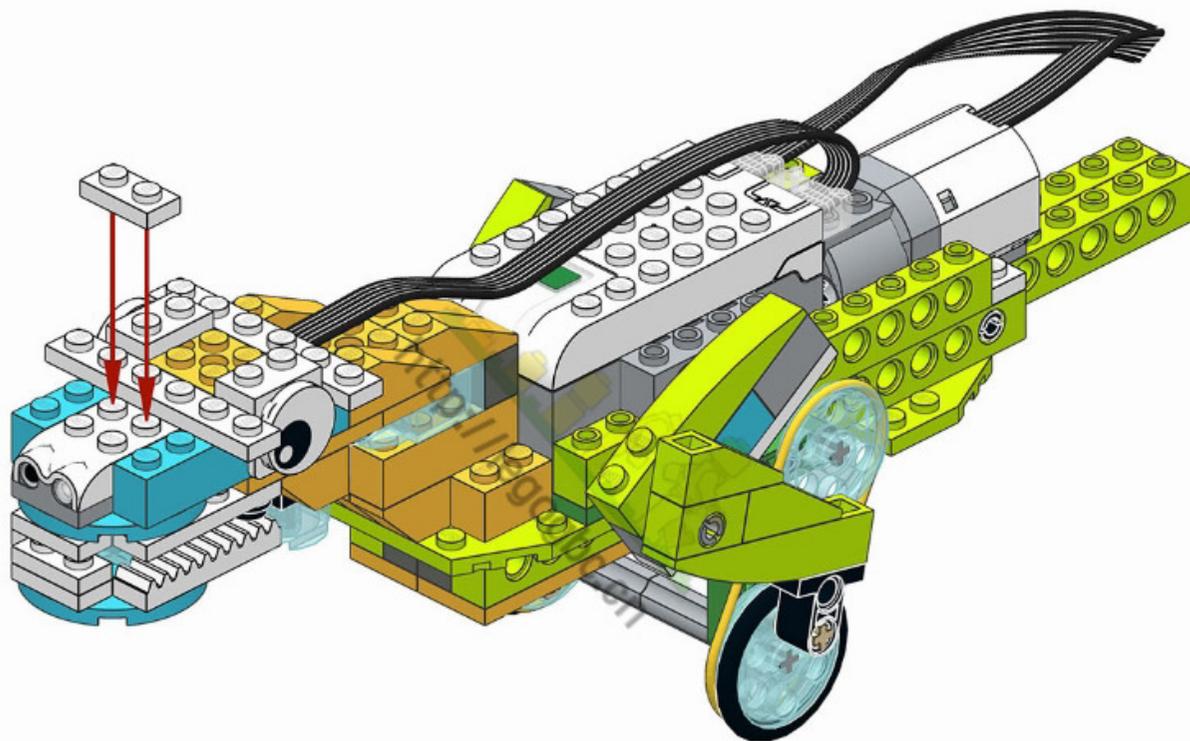


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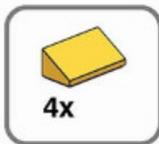
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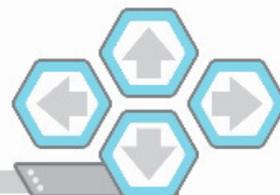
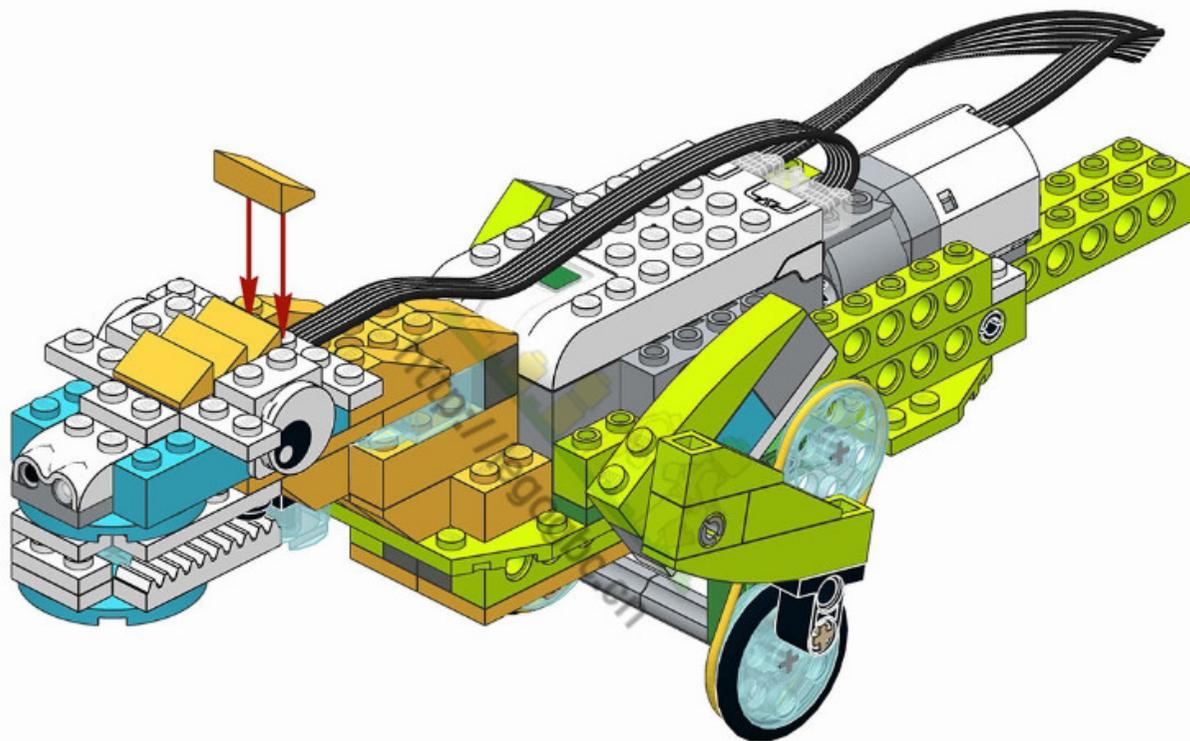




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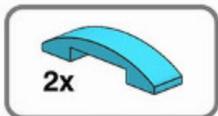


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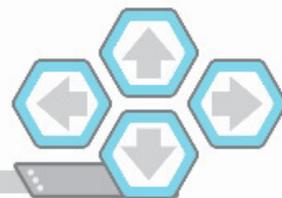
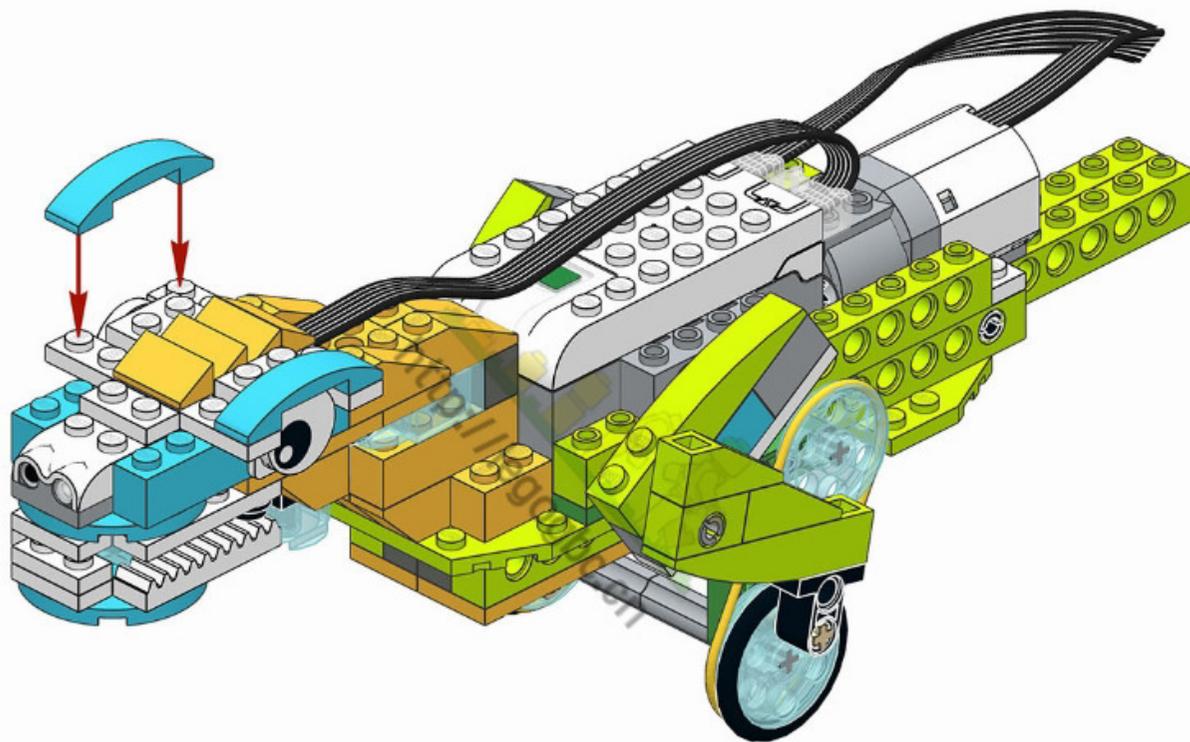


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2x

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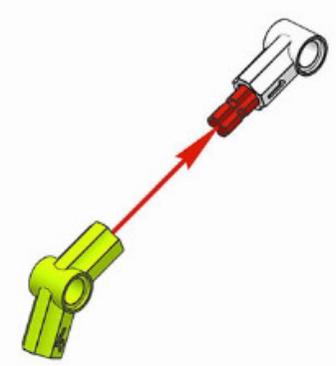




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1

1x
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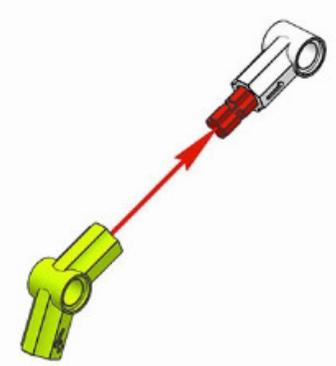
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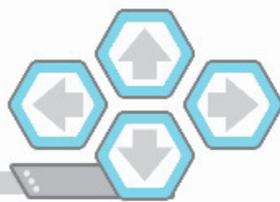
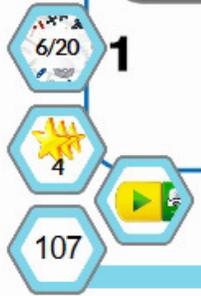
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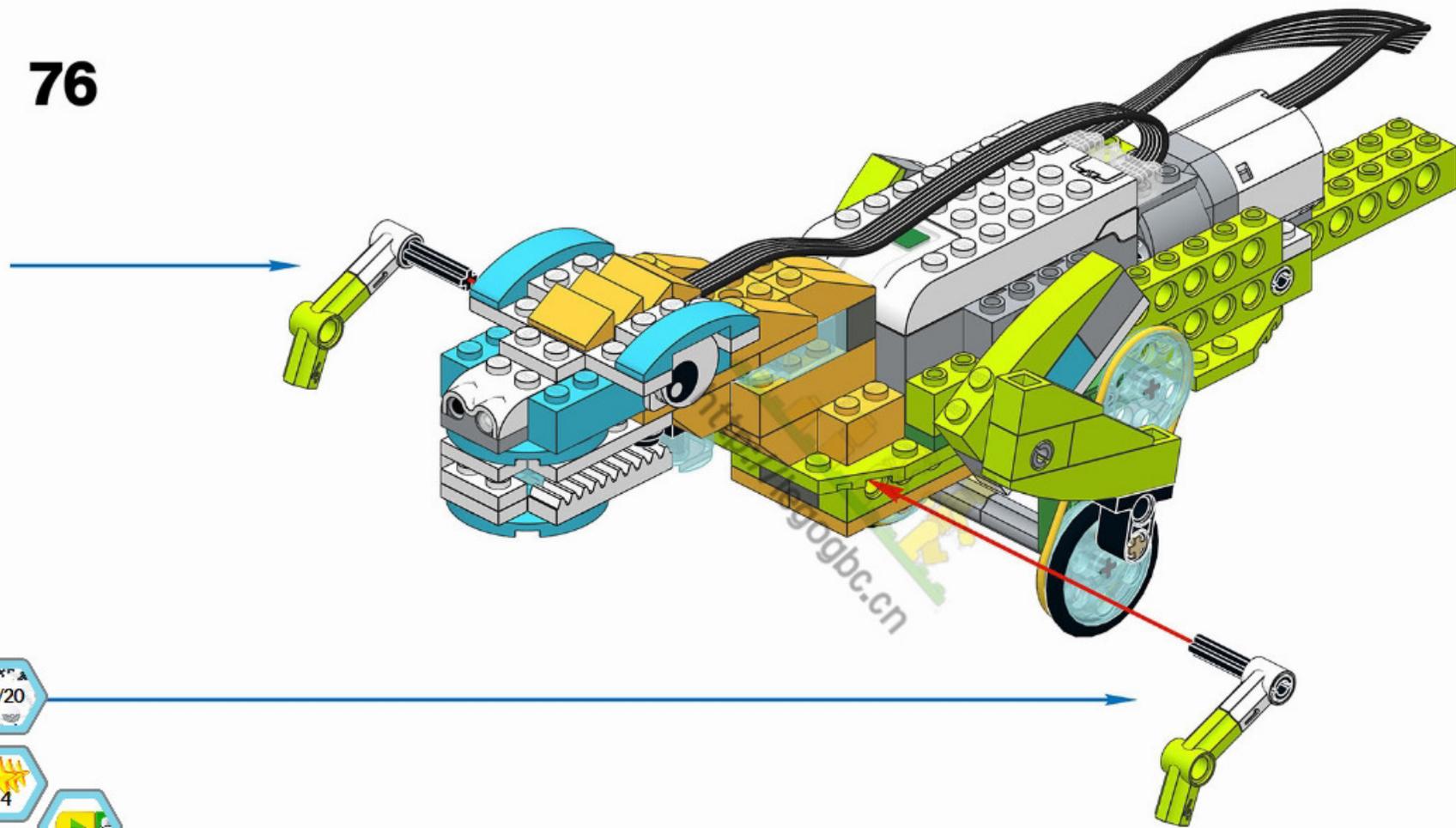
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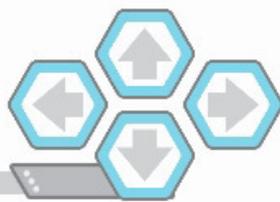
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4

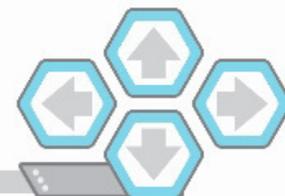
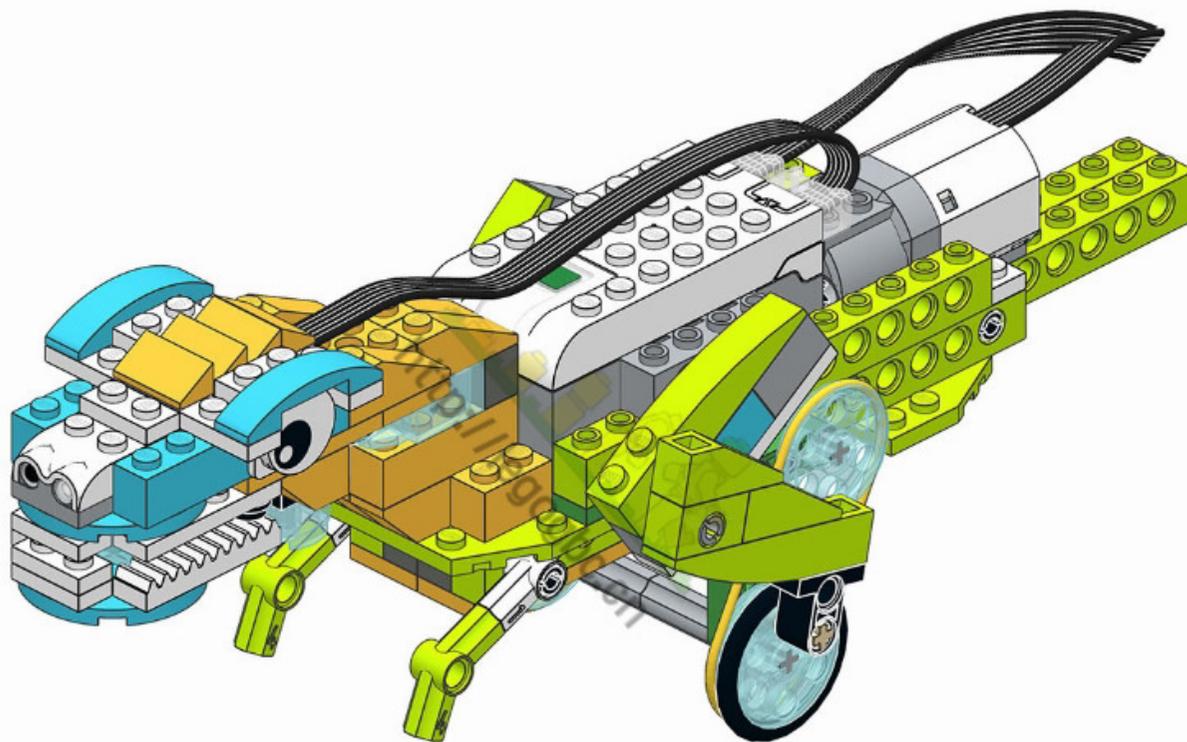
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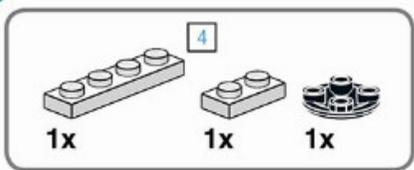


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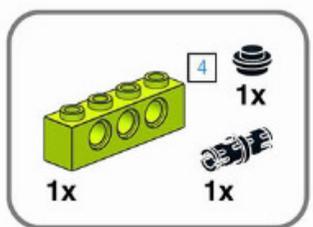
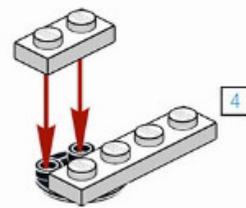




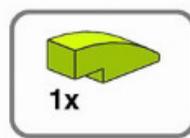
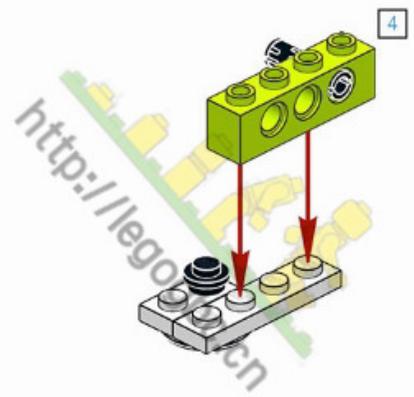
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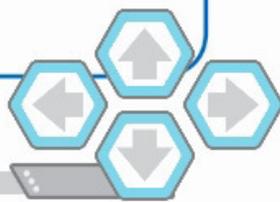
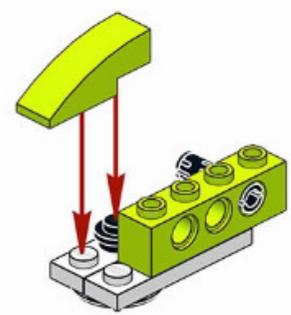
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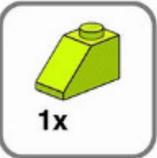


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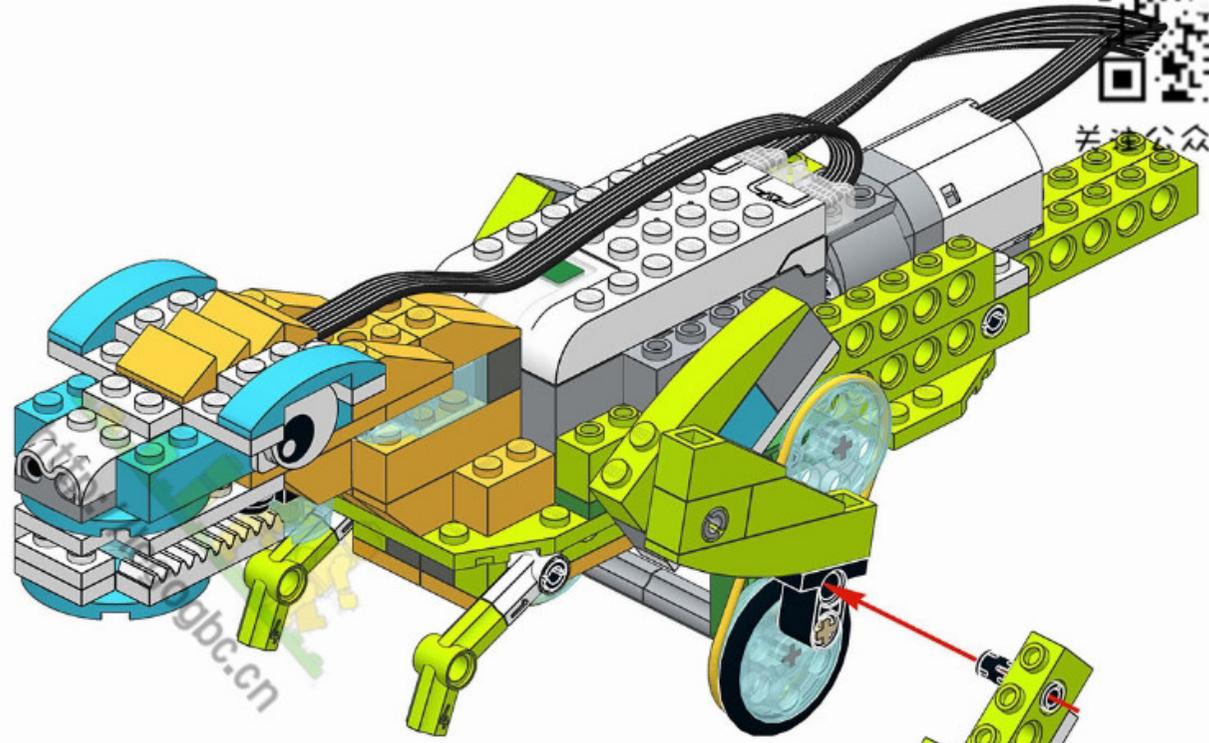
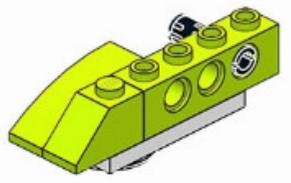


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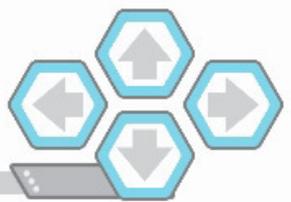


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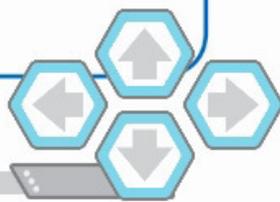
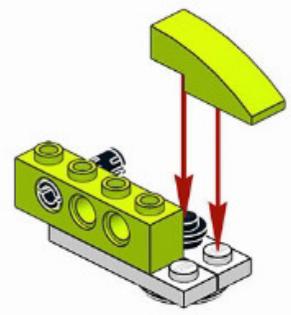
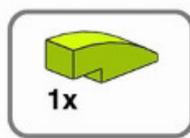
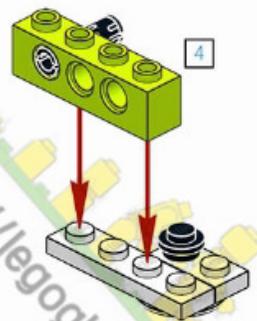
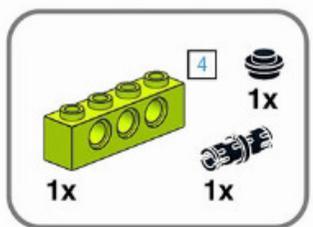
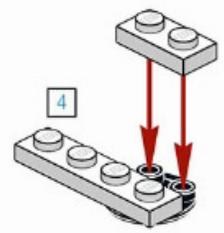
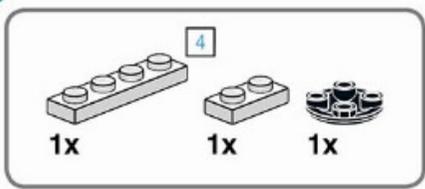
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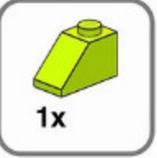


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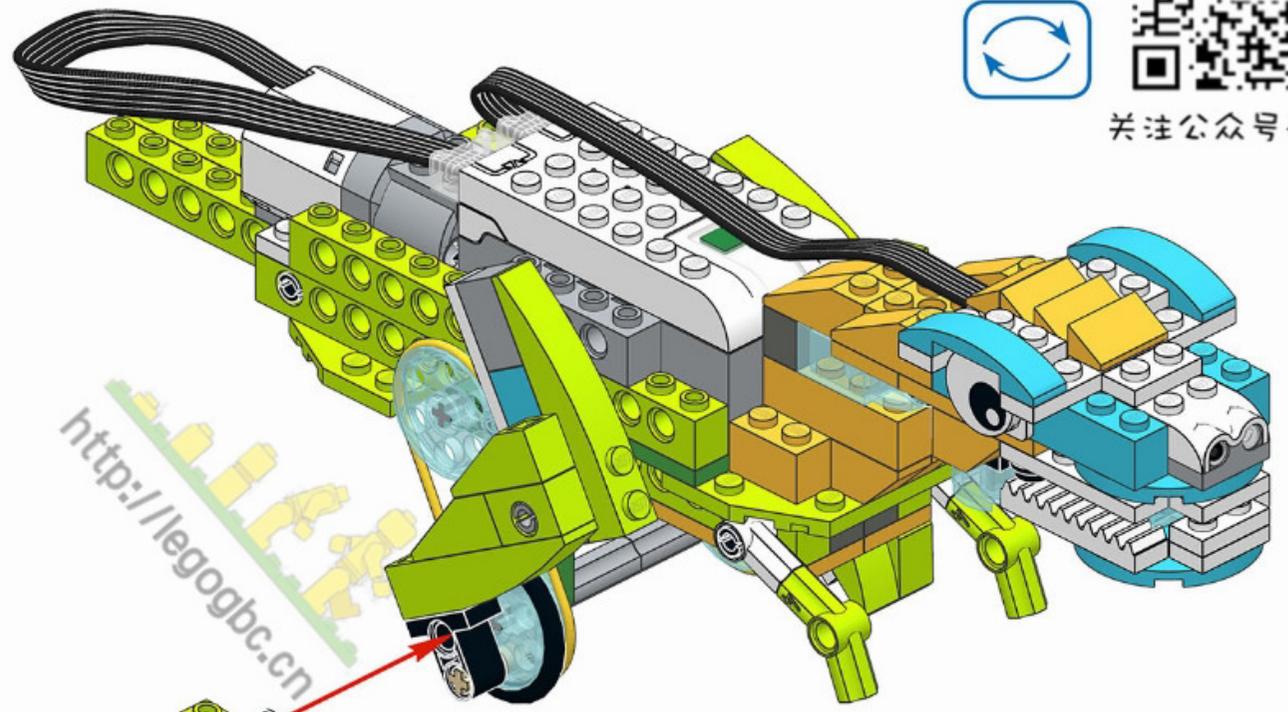
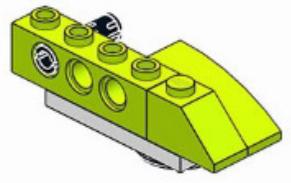




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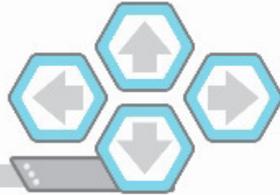


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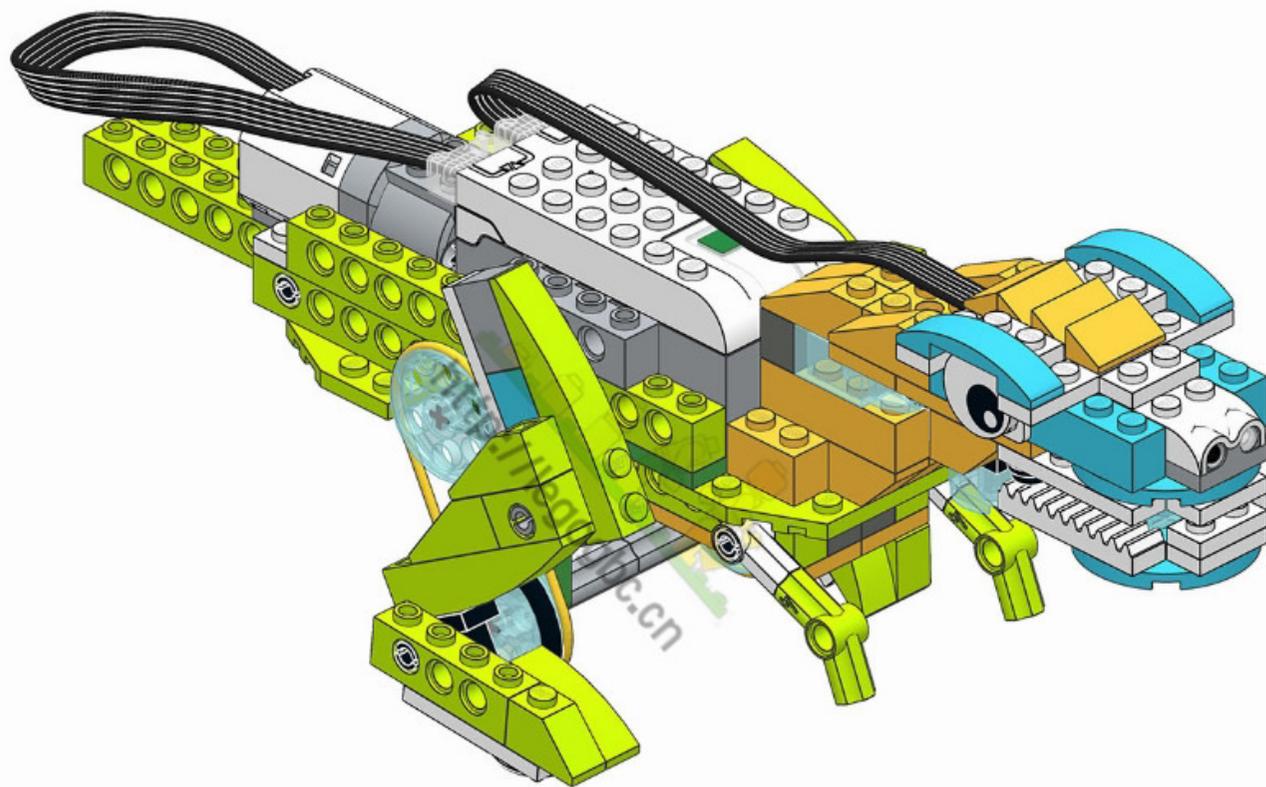
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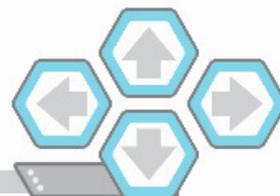
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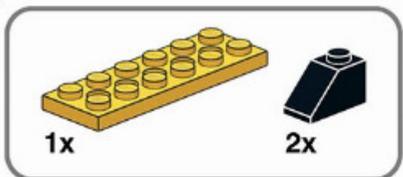
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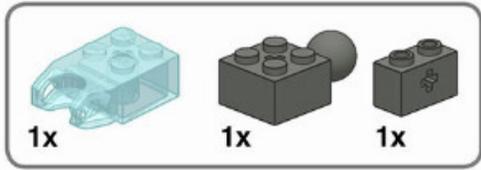
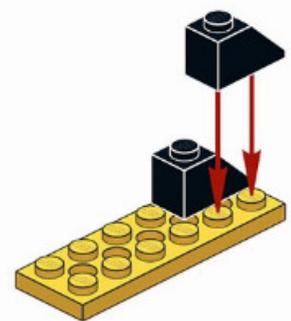




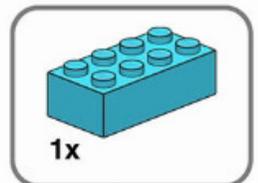
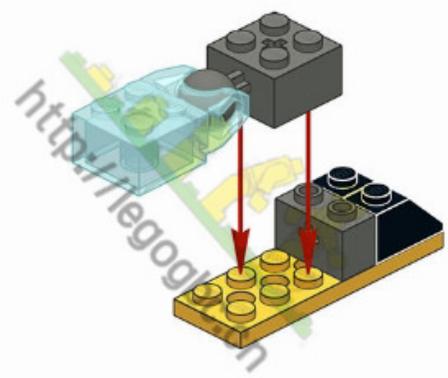
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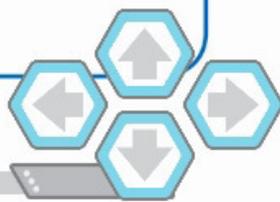
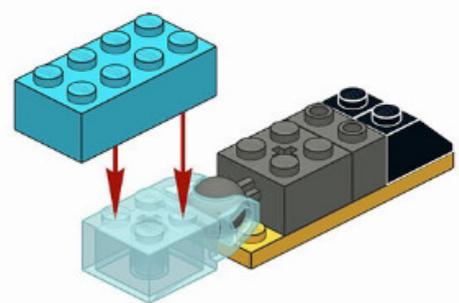
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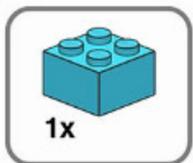


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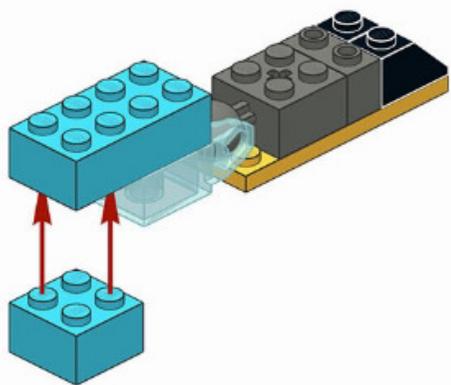




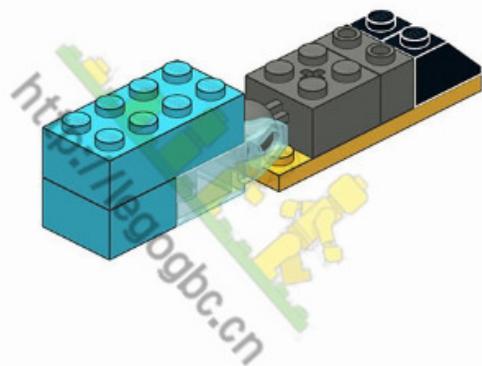
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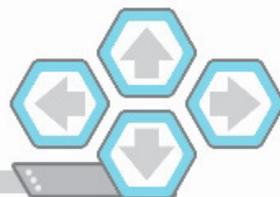
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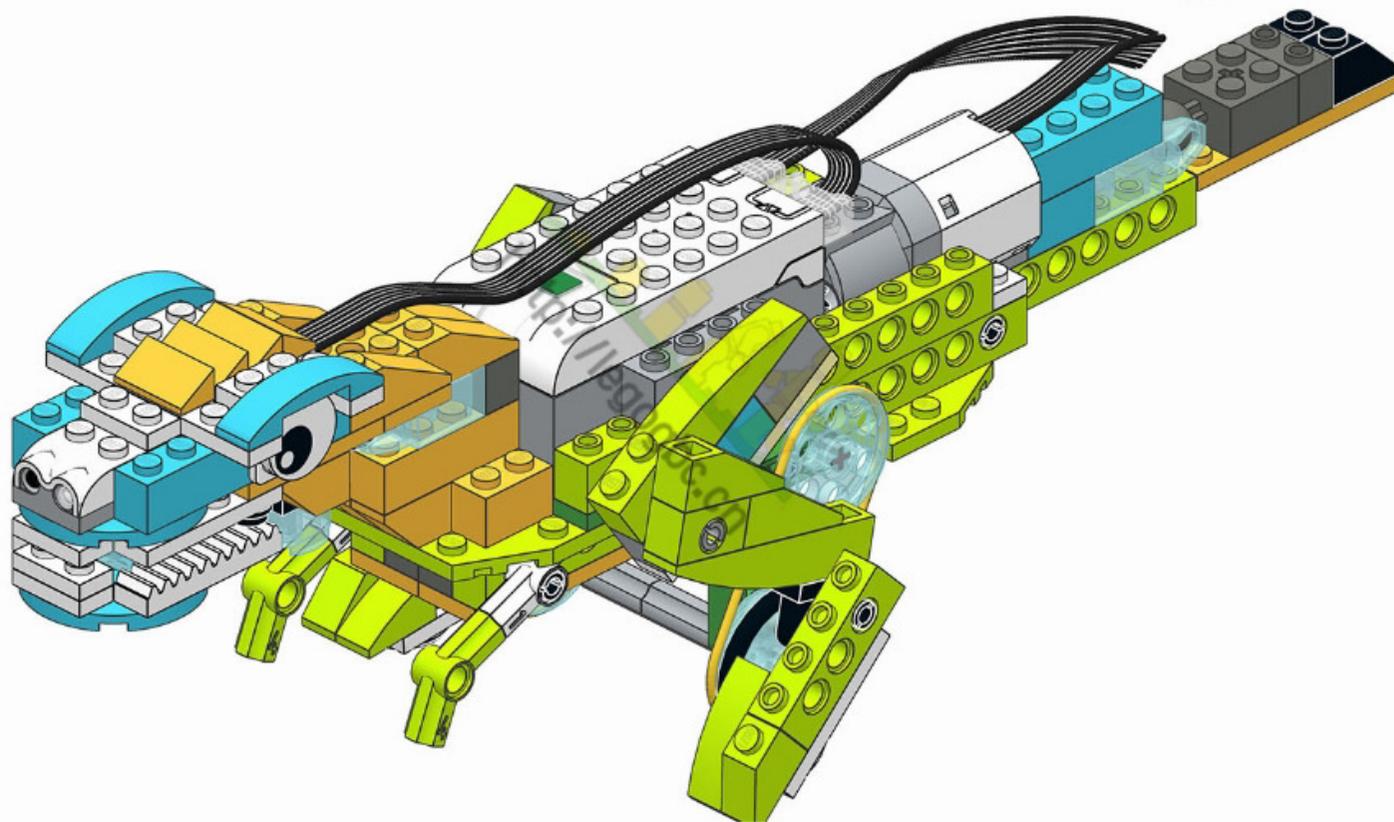
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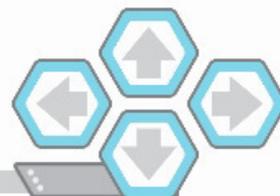
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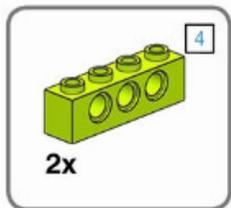
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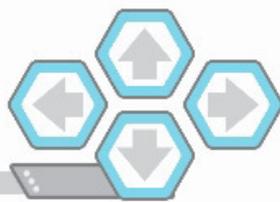
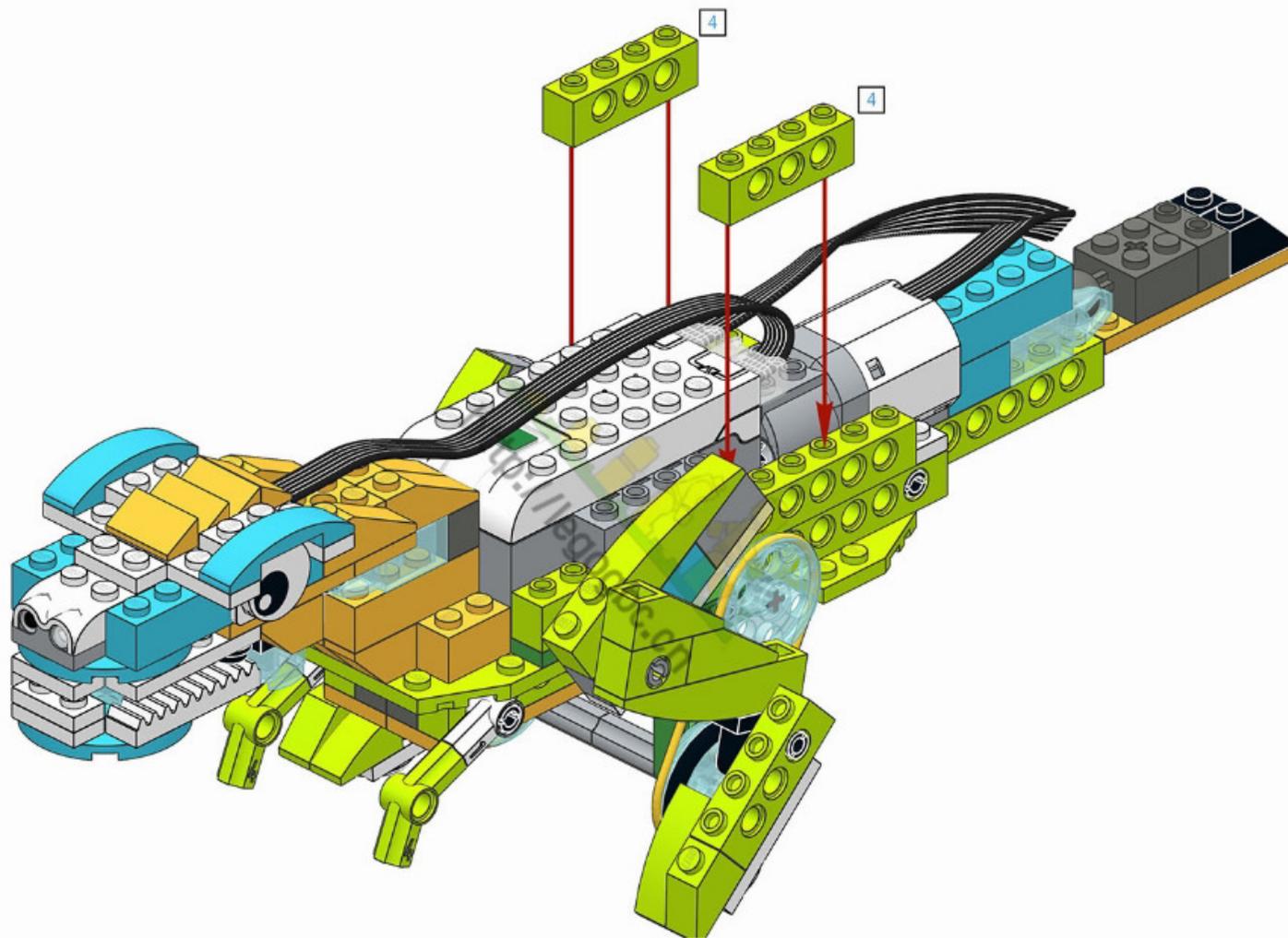




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86

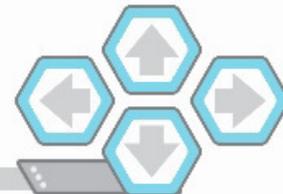
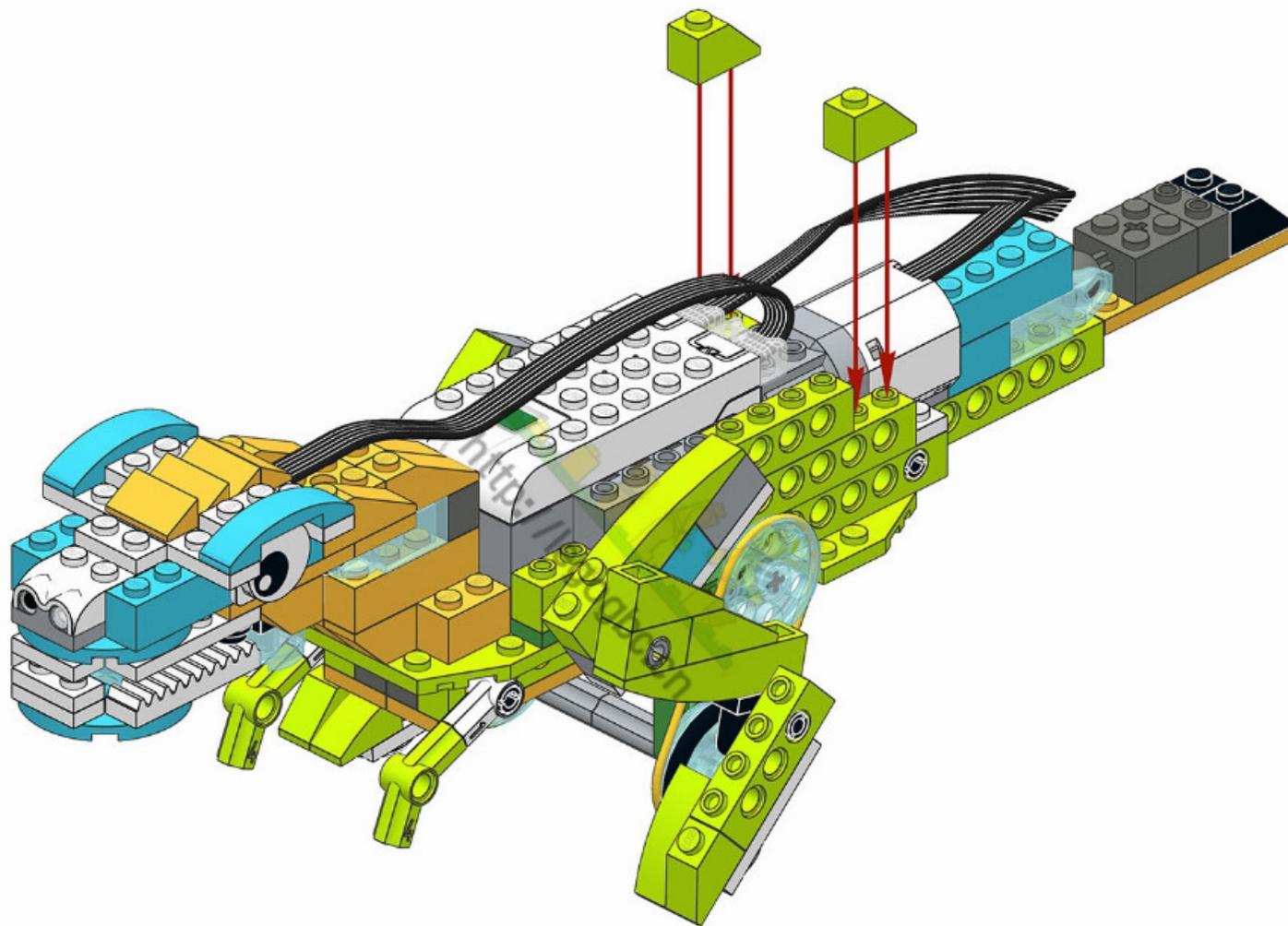




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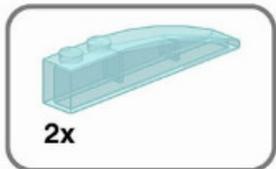


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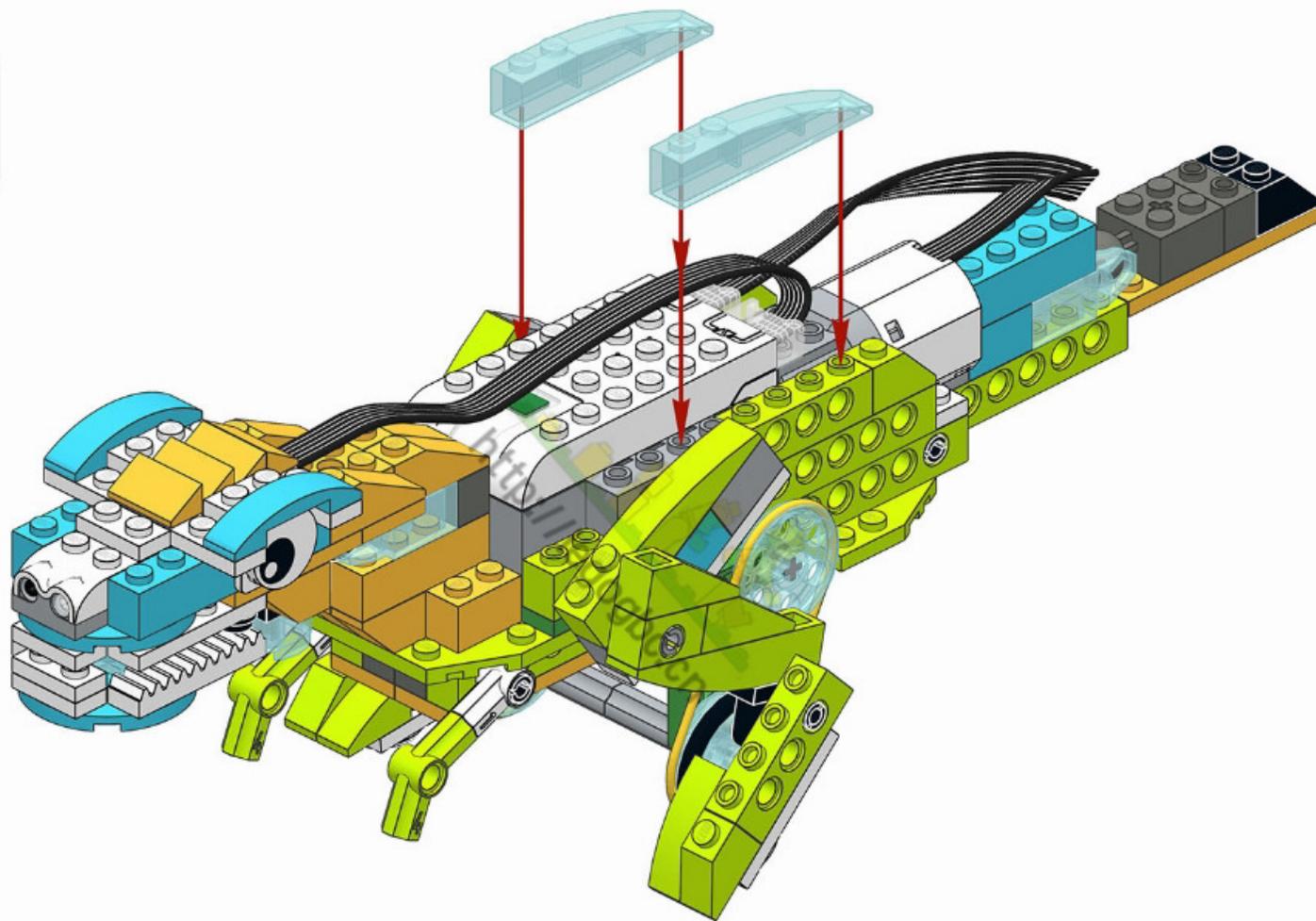




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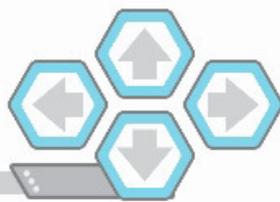
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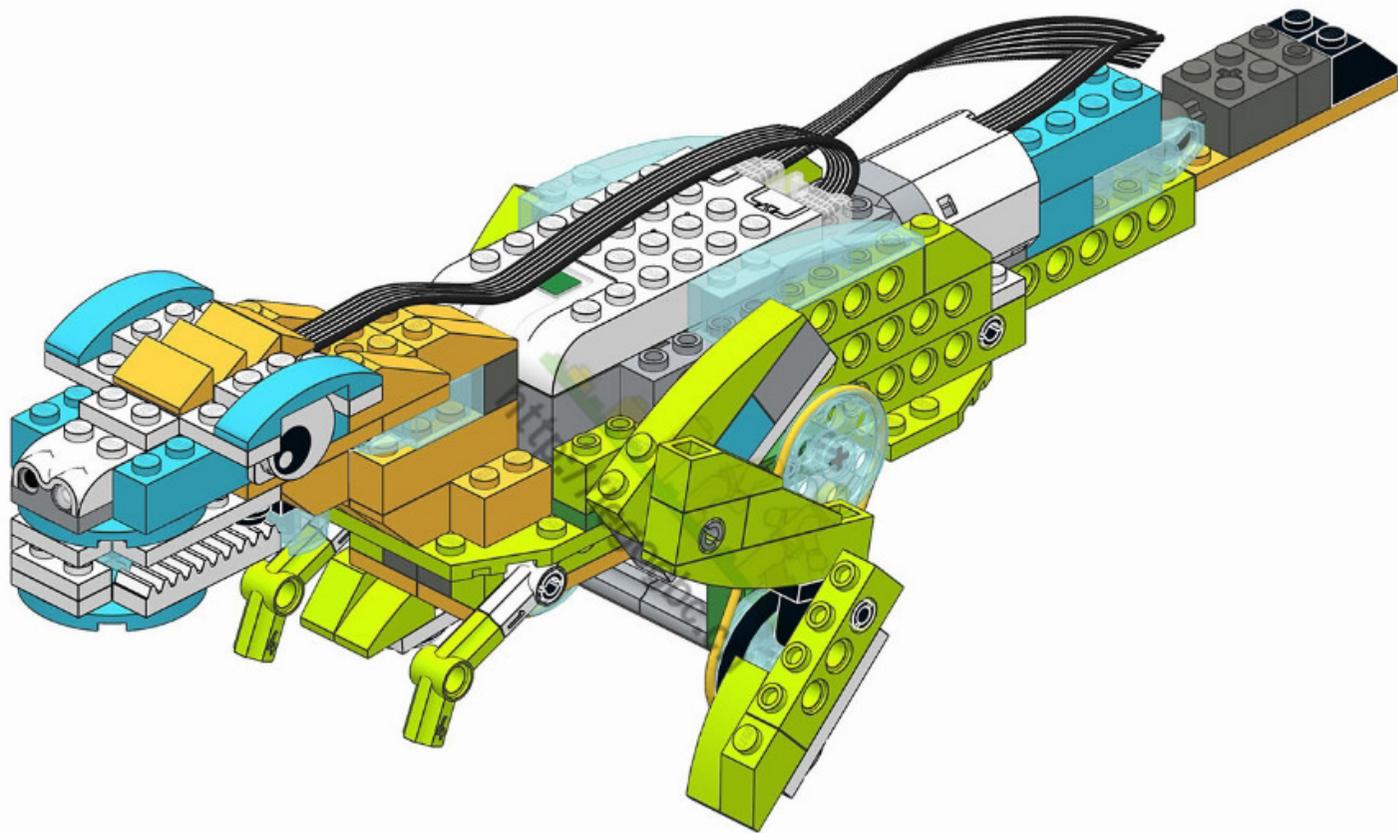
19/20

4

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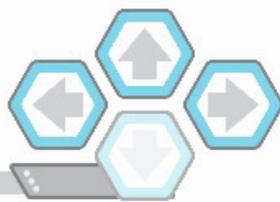


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4

121



Check it out!

Avoid any friction
between the cables
while robot is moving.



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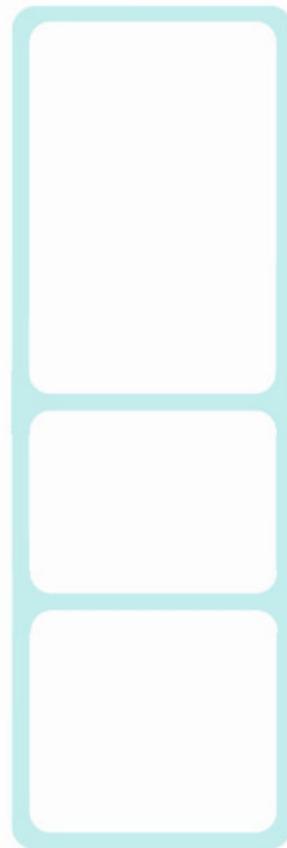
122





Task

Place parts of the robot on the right places



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7



123





Task 1

To test the work of the mechanism, program the robot's movement forward for two seconds.



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Task 2

Program the robot's movement at a maximum speed of 10 and stop in 2 seconds.
How does a robot do?

10 2

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Discuss!



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At a sudden stop robot falls forward by inertia. How to avoid this?

