STEAMCUP
Officially Certified Kit

OLLO Spark

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OLLO Spark

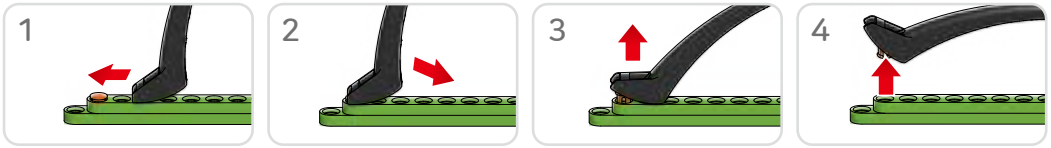
OLLO Spark

What is OLLO?

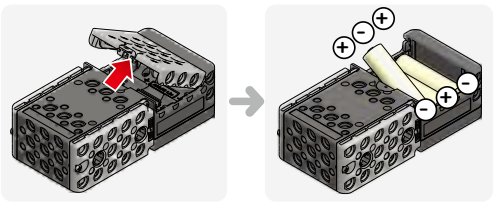
OLLO is an easy-to-assemble educational robotics kit that uses a simple block-based programming language for STEAM and AI education.

How to use the OLLO tool

Separate the assembled rivets and plates using the OLLO tool.



How to insert the batteries and when to replace them



· OLLO's RB-88 controller uses AA 1.5V batteries or rechargeable batteries (sold separately).

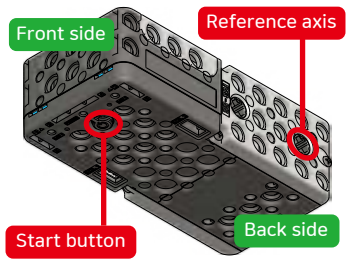
· Insert the batteries in the direction shown in the figure on the left.

· If the remaining battery power is low, the controller will beep 3 times when the power is turned on. In this case, replace or recharge the batteries before use.

How to operate RB-88 program

· Functions based on the number of times the start button is pressed.

How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.



When pressing the button once (do), the 'Move Forward' mode is activated.
When pressing the button twice (re), the 'Move Backward' mode is activated.
When pressing the button 3 times (mi), the 'Sensor' mode is activated.
When pressing the button 4 times (fa), the 'Sound Detection' mode is activated.
When pressing the button 5 times, the 'Controller' mode is activated.
Press and hold the button for 2 seconds (beep beep) to activate the 'Download' mode.
To turn off the power, press the power button once.

Safety Precautions

Appropriate safety precautions are required to prevent any injury or damage that may occur due to improper handling of batteries. Please read the following safety notices before use of your OLLO RB-88 controller.

- Do not short circuit, disassemble or modify the batteries.
- Do not charge the non chargeable batteries.
- Remove the rechargeable batteries from the controller before charging.
- Exhausted batteries are to be removed from the robot.
- Keep the batteries away from fire and water.
- Do not heat up the batteries or use them in wet surroundings.
- Do not use old batteries with new ones or use different types of batteries together.
- Insert the battery in the correct position according to its polarity and remove the discharged battery from the controller.
- Charge the rechargeable batteries under adult supervision.
- If the liquid leaked from the battery gets into your eyes, wash your eyes immediately with running water for at least 15 minutes and seek medical help If it comes in contact with your skin or clothes, wash the spot with running water.

Introducing STEAMCUP app

By installing the STEAMCUP app on mobile devices, users can experience fun activities such as controlling a wireless robot, coding with R+Block, sharing coding information, and participating in competitions.

How to Install the STEAMCUP app

① Scan the QR code on the right or search for STEAMCUP app in Google Play Store or App Store.
When using PC, access enjoy.steamcup.org in Chrome browser.

② Follow the instructions provided in the app to sign up.

How to control OLLO from your smartphone

① Press the start button of the controller 5 times (sol) to execute the 'Control' mode.

② On the bottom of the controller, check the 4-digit BLE address on the sticker.

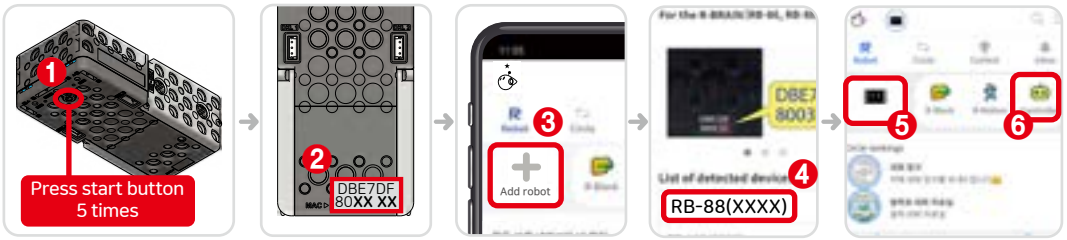
③ Find and select the (+) 'Add Robot' option on the STEAMCUP app.

④ From the list of options, select the option with the same BLE address.

⑤ The robot is connected to the app after a 'beeping' sound.

⑥ Select the 'Controller' icon on the STEAMCUP app.

⑦ When the control page opens, you can control the robot by pressing the buttons on the control page.



Coding with R+Block

R+Block is an easy and convenient block coding program supported by the STEAMCUP APP.
R+Block's artificial intelligence, smart features, and robot control functions make 'OLLO AI' fun and entertaining.

① Select the 'R+Block' option in the STEAMCUP app.

② When the R+Block is running, select 'OLLO AI (RB-88)' from the list.

③ Use the blocks in the left category to code.

④ Press the Bluetooth connection ( ) on the R+Block to connect the robot to the app, then download the code ( ).

⑤ Press the Play button on the R+Block or turn the controller off and on to execute the R+Block code.

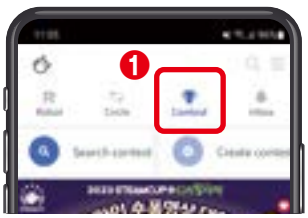
Join the STEAMCUP Contest

STEAMCUP frequently hosts on/offline robotic competitions. Participate in the competitions to show off your skills and receive various prizes.

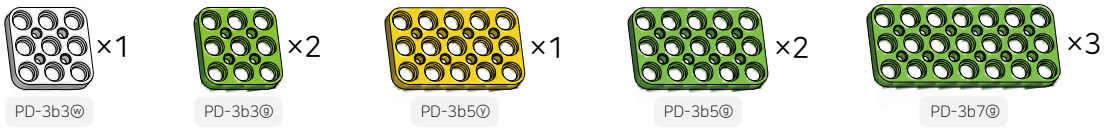
① Select the 'Contest' menu at the top of the screen.

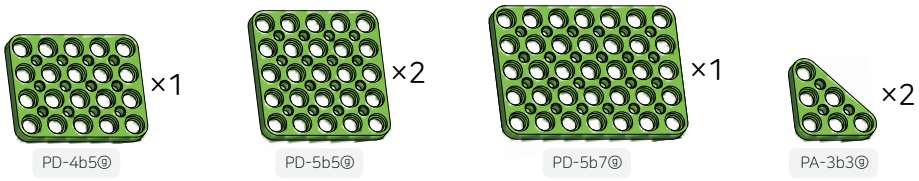
② Of the ongoing competitions, find the one that suits you best and join.

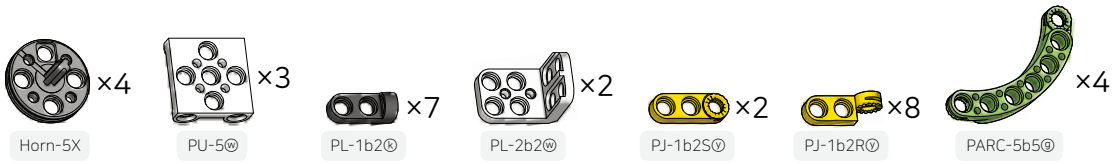
③ You can even create and host a contest yourself.

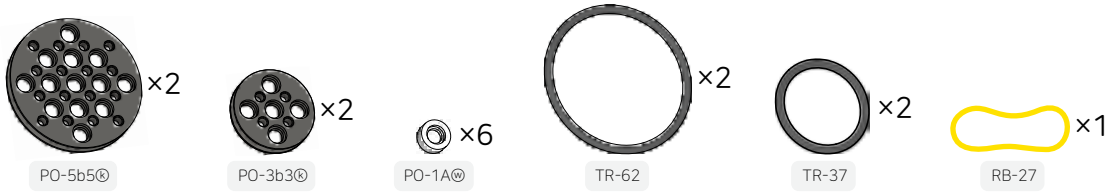


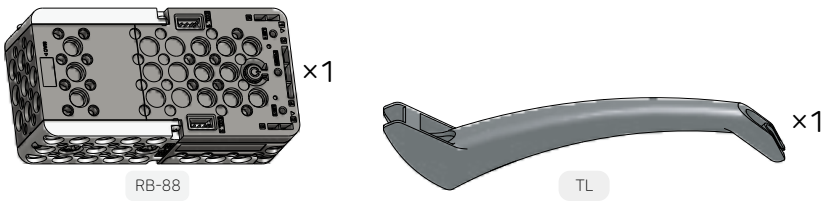
PARTS LIST











* Parts and colors of products may differ from the images in the assembly manual.

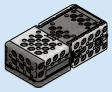
1 What is elasticity?

Let's learn about elasticity.

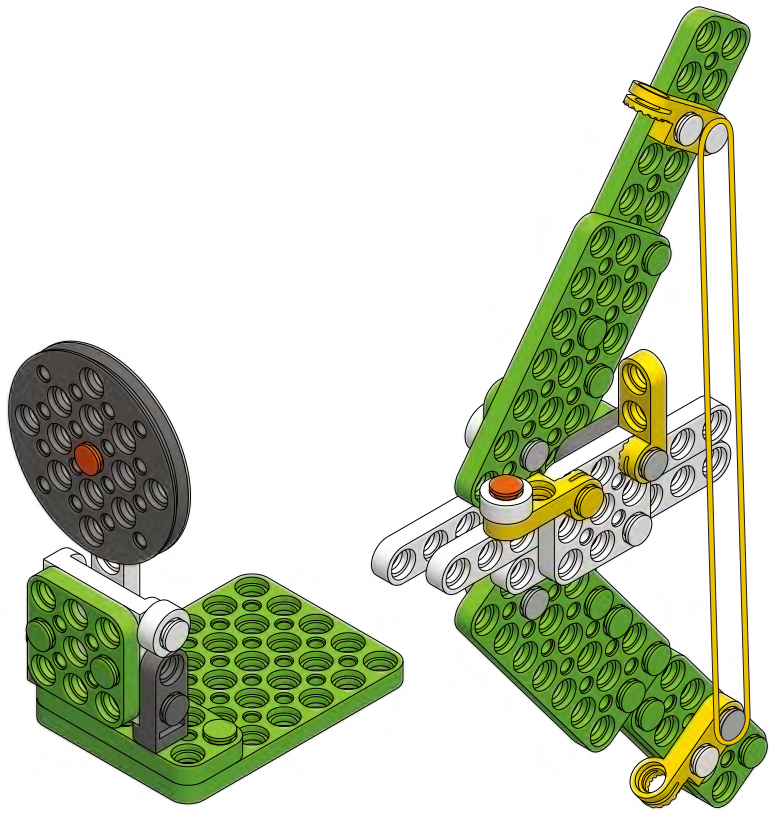
Elasticity is the ability of an object to return to its original shape after being subjected to a force. Rubber bands, springs, and trampolines are some examples of elastic objects.

A bow is an object that uses elasticity, and it shoots arrows with the elastic force that is generated when the bowstring that is attached to a metal or wooden bow is pulled and released.

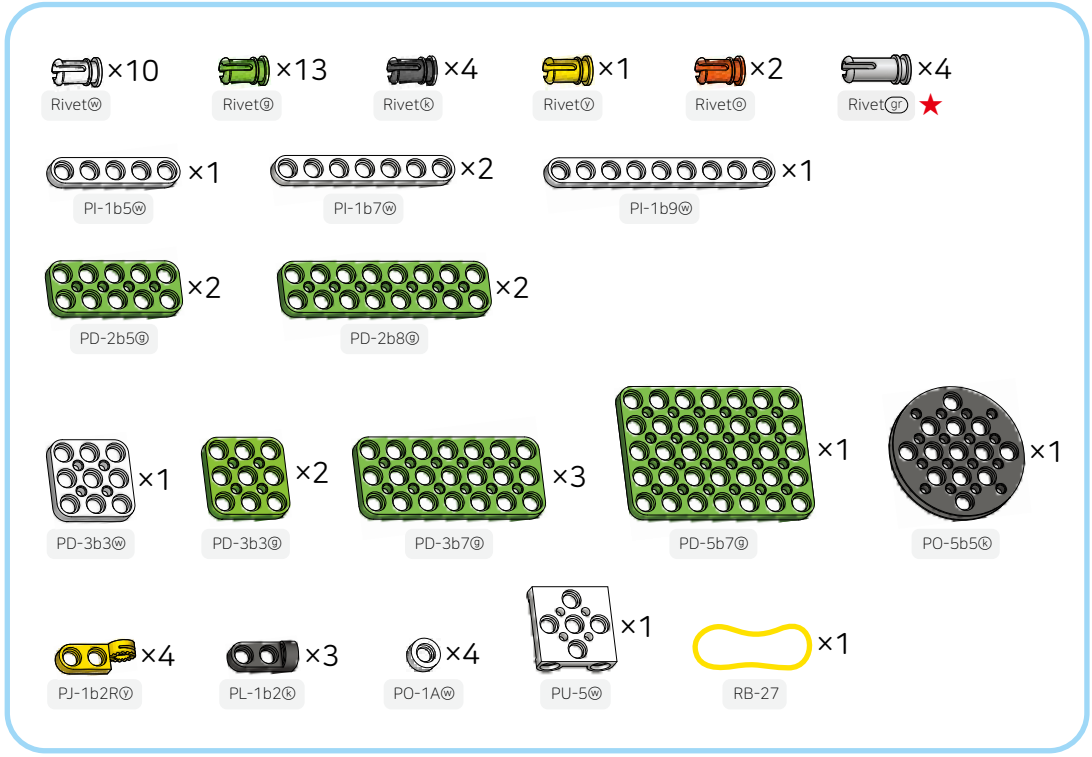
Let's find out about the terms used in OLLO.

STEAM	STEAM	STEAM is a term that combines the first letters of Science, Technology, Engineering, Art and Mathematics to foster critical thinking and practical problem solving skills.
	R+Block	R+Block is a block-type coding program that makes it easy for anyone to code and operate a robot.
	Download	Download means transferring (saving) a file (program) to a device, and is a term that refers to saving the code written in R+Block to a robot.
	RB-88 Controller	As a part that corresponds to the brain of the robot, the RB-88 controller is an all-in-one controller that includes a battery, sensor, and motor.
	Plate	A part in the shape of a square, triangle, or circle that is used to assemble robots.
	Rivet Tool	A tool used to remove rivets and separate parts by inserting it into the upper part of the rivet and lifting it.
	Rivet	A part that is inserted in the holes of integral plates, controller, and other parts to connect them.
	Cross Horn	A part inserted into the motor shaft of the controller to transmit force outwards.

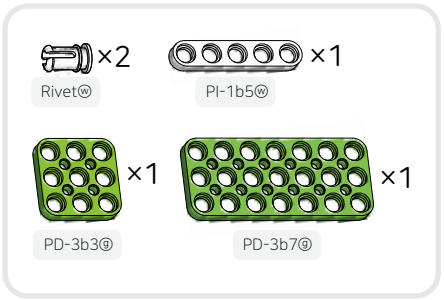
Assemble a bow and play a game of hitting the target and knocking it down.

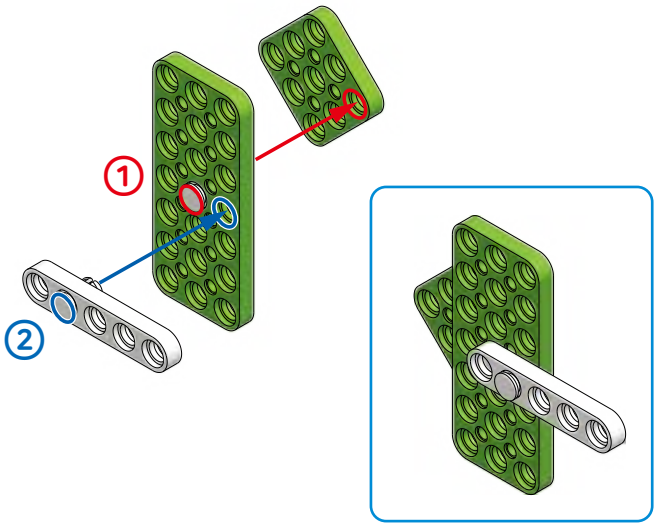


Bow


×10
Rivetⓦ
×13
Rivetⓖ
×4
Rivetⓚ
×1
Rivetⓨ
×2
Rivetⓞ
×4
Rivetgr ★
×1
Pl-1b5ⓦ
×2
Pl-1b7ⓦ
×1
Pl-1b9ⓦ
×2
PD-2b5ⓖ
×2
PD-2b8ⓖ
×1
PD-3b3ⓦ
×2
PD-3b3ⓖ
×3
PD-3b7ⓖ
×1
PD-5b7ⓖ
×1
PO-5b5ⓚ
×4
PJ-1b2Rⓨ
×3
PL-1b2ⓚ
×4
PO-1Aⓦ
×1
PU-5ⓦ
×1
RB-27

1





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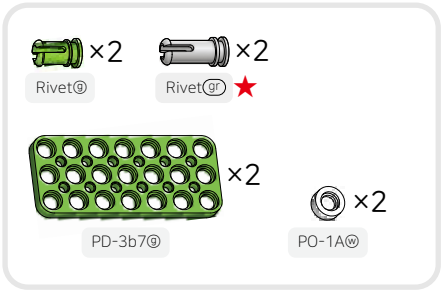
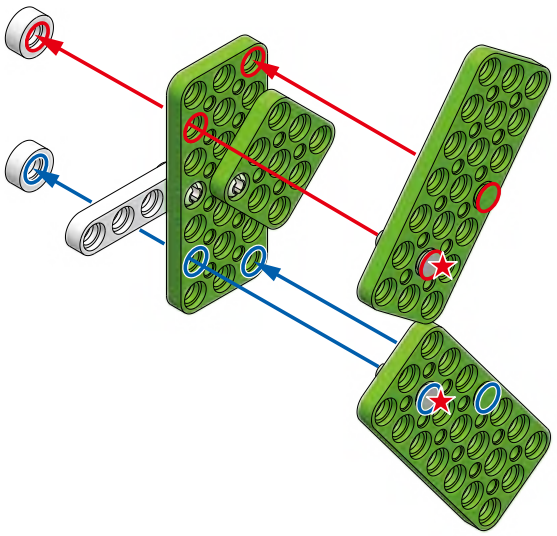
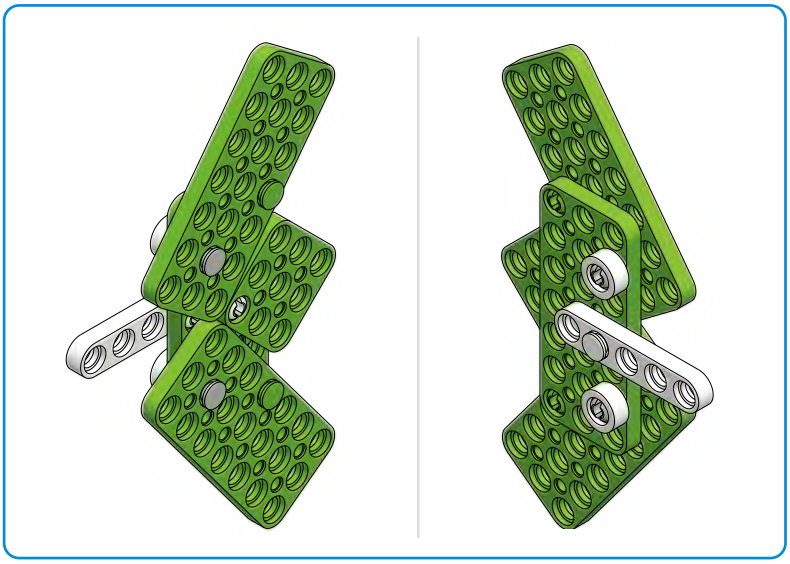


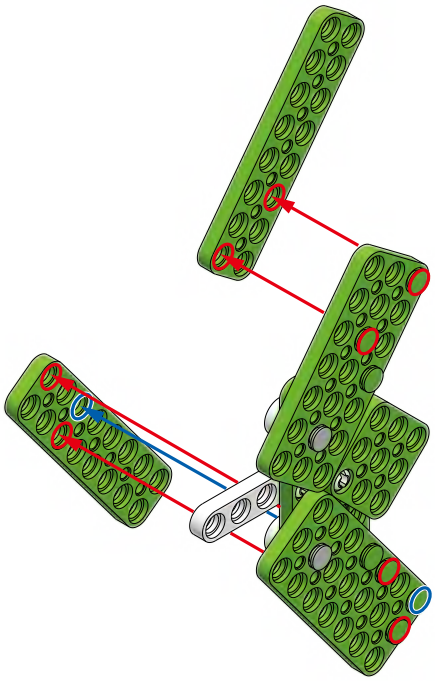


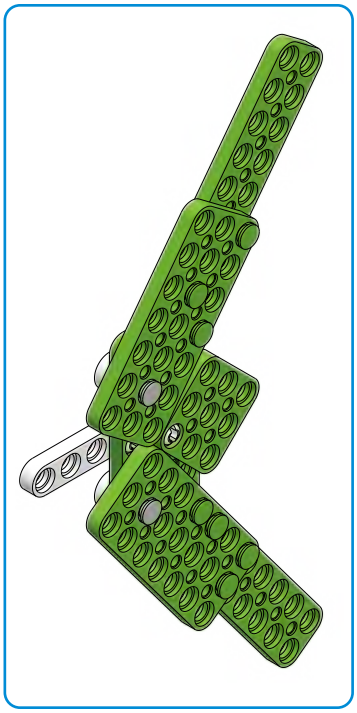


3

×5
Rivet⓰

×2
PD-2b8⓰





4

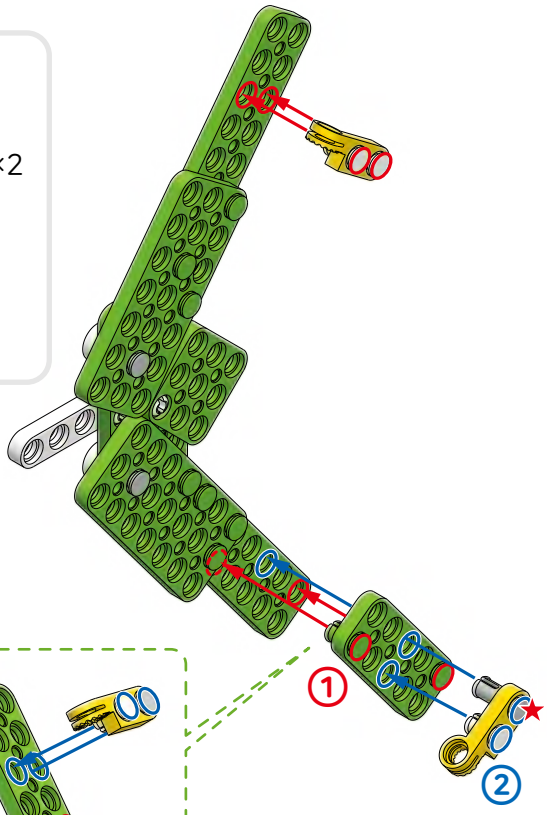
×3
Rivetⓦ

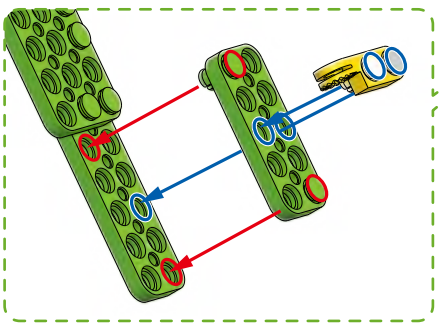
×2
Rivet⓰

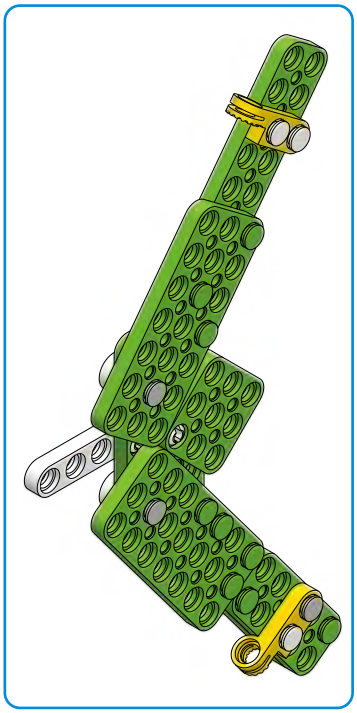
×1
Rivetⓖ★

×2
PJ-1b2Rⓨ

×1
PD-2b5⓰







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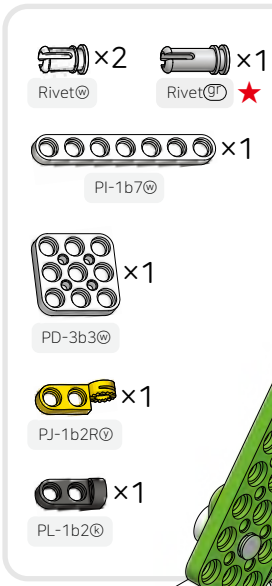
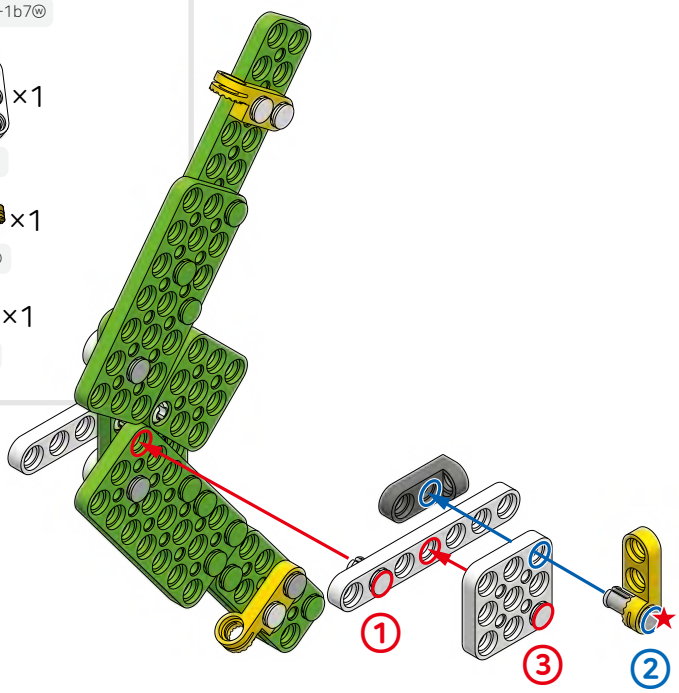
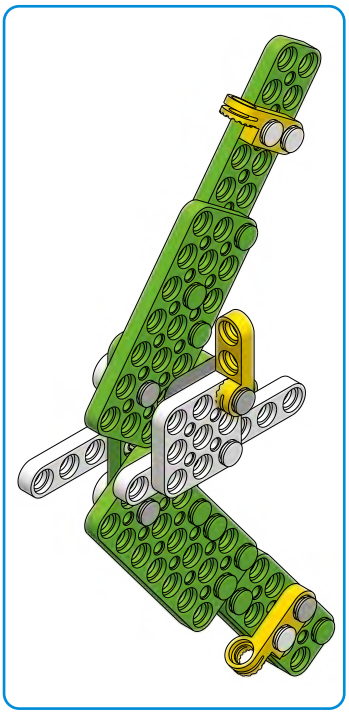

×2
Rivetⓦ
×1
Rivetⓖ
×1
Pl-1b7ⓦ
×1
PD-3b3ⓦ
×1
PJ-1b2Rⓨ
×1
PL-1b2ⓚ


1
3
2



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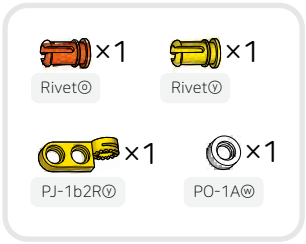
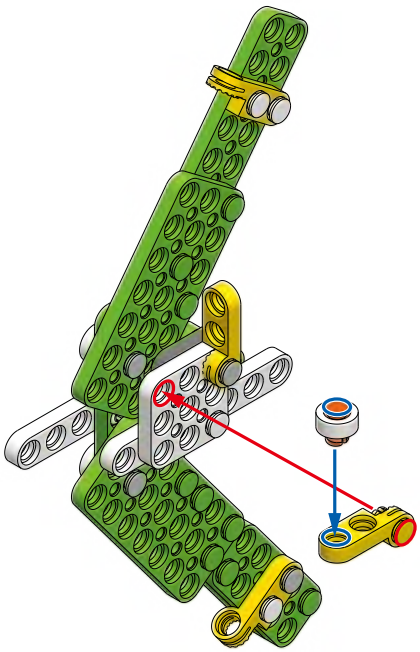

×1
Rivetⓞ
×1
Rivetⓨ
×1
PJ-1b2Rⓨ
×1
PO-1Aⓦ



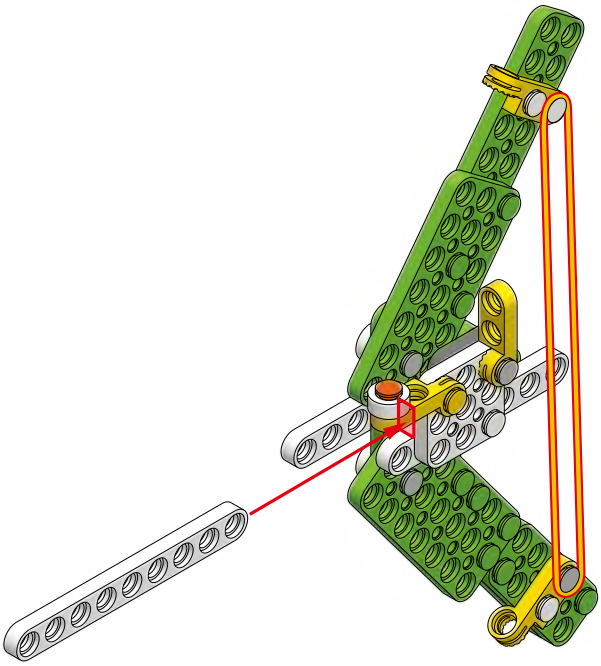
7

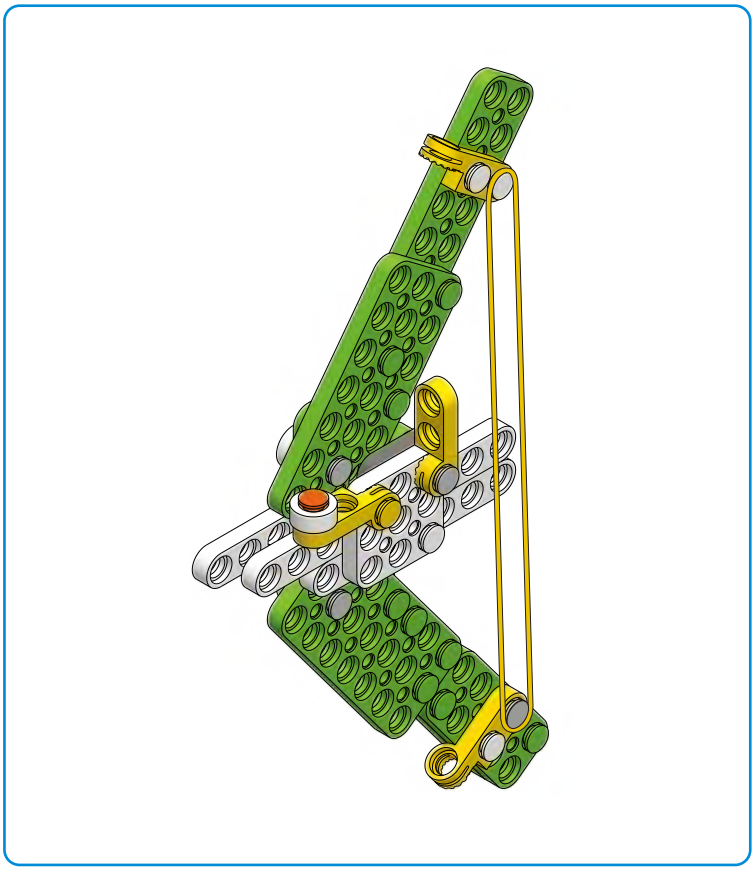

×1

Pl-1b9ⓦ

×1

RB-27





8

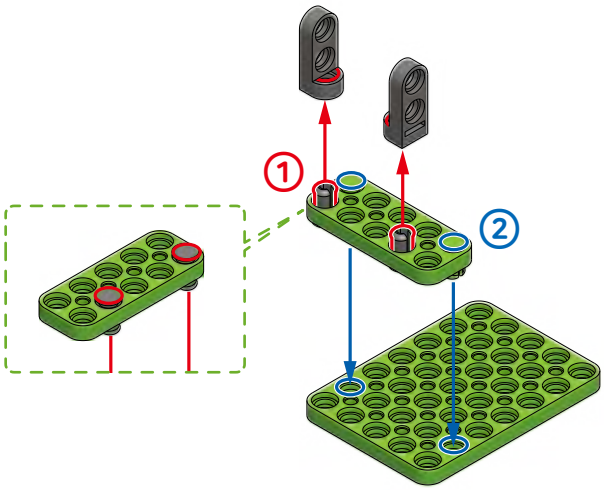
×2 Rivetⓖ

×2 Rivetⓚ

×1 PD-2b5ⓖ

×1 PD-5b7ⓖ

×2 PL-1b2ⓚ



9

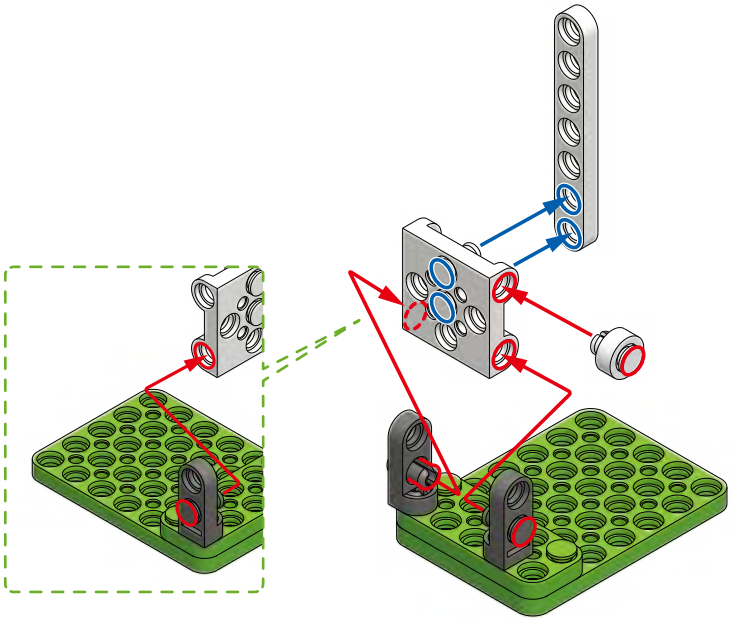
×3 Rivetⓦ

×2 Rivetⓚ

×1 PU-5ⓦ

×1 PO-1Aⓦ

×1 Pl-1b7ⓦ



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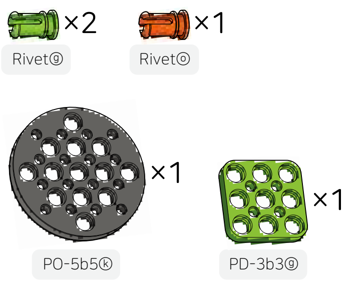
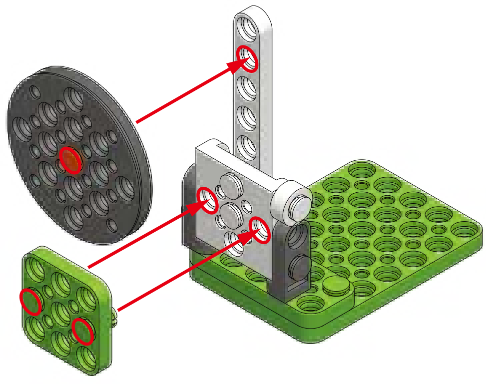
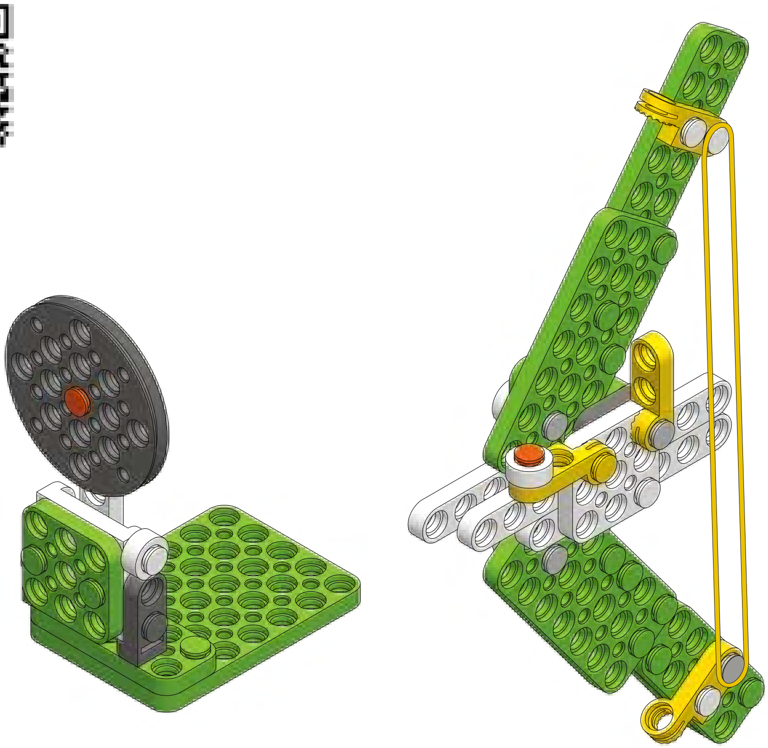




See Video



2 What will happen if you change the length of the tumbling bot's arms?

What role does the arm of a tumbling bot play?

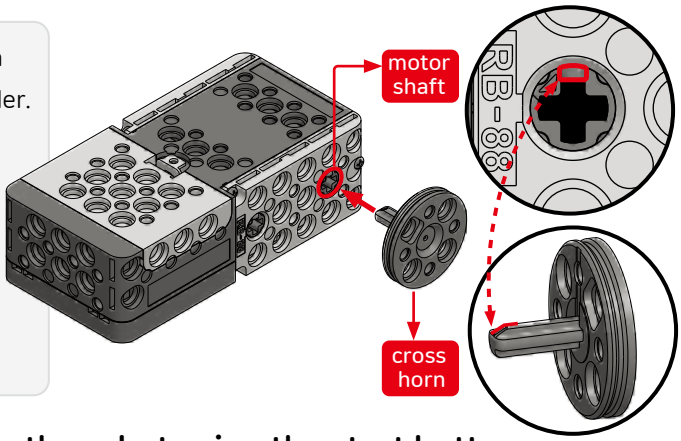
The tumbling bot can make fun moves with both arms. When it encounters an obstacle, it rolls (tumbles) forward, and even if it falls sideways, it can turn its arm and get up immediately.

When the length of the arms is increased, the robot's movement becomes greater, but the rotational force of the arms becomes weaker.
When the length of the arms is shortened, the robot's movement becomes smaller, but the rotational force becomes stronger.

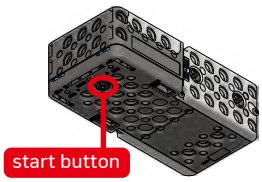
Let's learn how to connect the cross horn to the motor shaft.

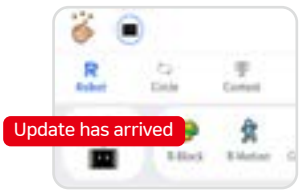
Be sure to check the method below to connect the cross horn to the controller.

① Check the part protruding from the 'motor shaft' of the controller.
② Check the indented part at the end of the 'cross horn' shaft.
③ Align the shaft and the horn and insert the indented part of the horn into the protruding part of the shaft.



Let's learn how to operate the robot using the start button.





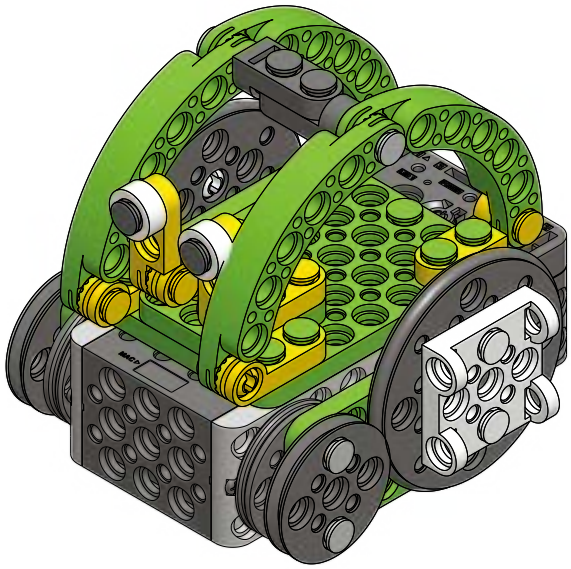
◎ Operate the 'Move Forward' mode

· Press the start button 2 times (re) and the robot will move forward.
· The robot will get up when it is knocked over and will roll when its path is blocked.

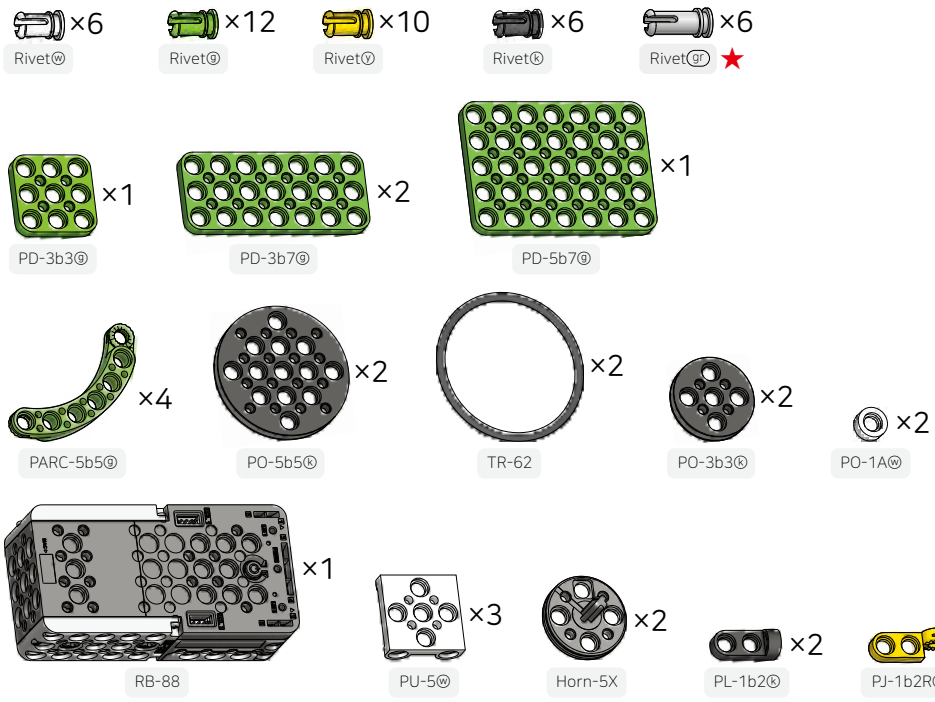
◎ How to update firmware

· You need to update the robot's firmware if the message 'Update has arrived' pops up on the left side of the screen after the robot is connected to the STEAMCUP app.
· After selecting the 'Update has arrived' icon, press 'Start Update' to initiate the robot's firmware update.

Let's stretch or shorten the arm to see how the movement changes.



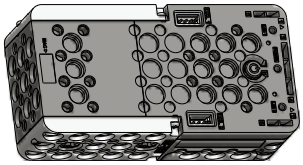
Tumbling Bot

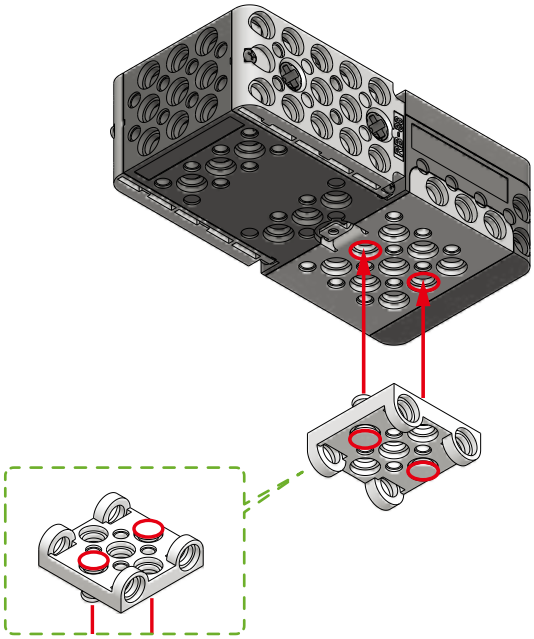


1

×2
Rivetⓦ


×1
PU-5ⓦ

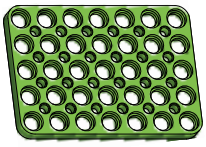

×1
RB-88

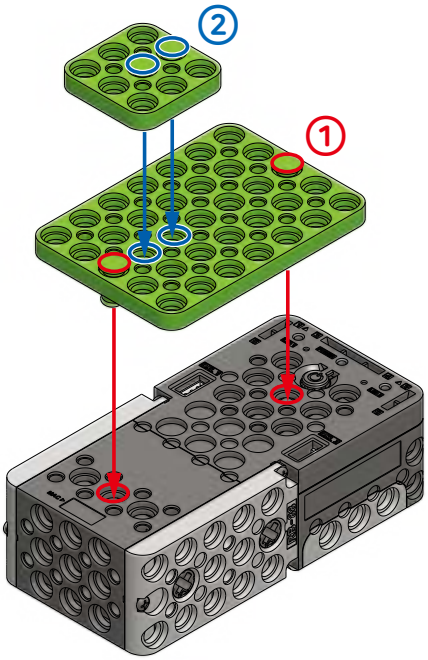


2

×4
Rivetⓖ


×1
PD-3b3ⓖ

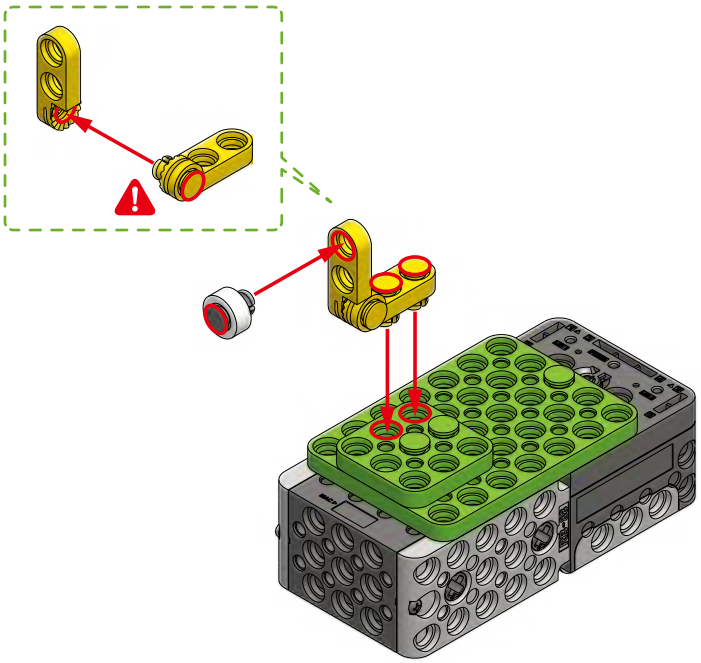

×1
PD-5b7ⓖ



3

×3 Rivetⓨ　×1 Rivetⓚ

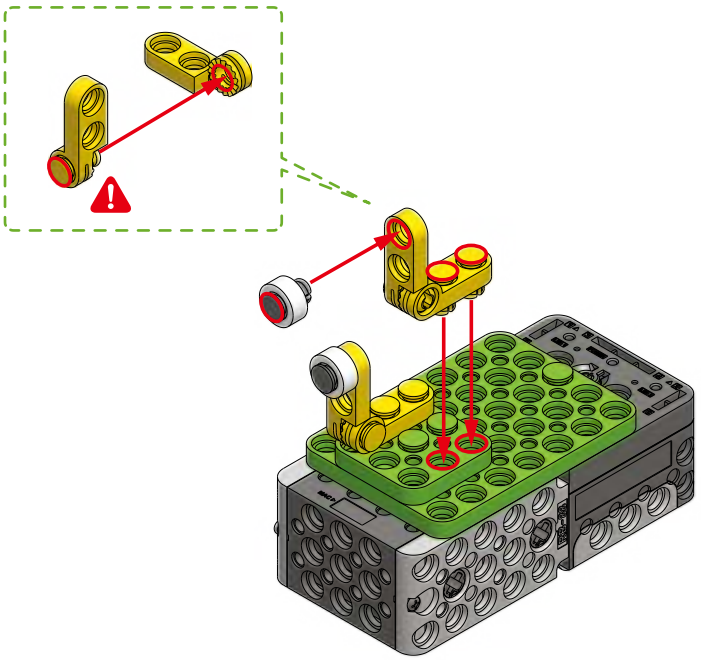
×2 PJ-1b2Rⓨ　×1 PO-1Aⓦ



4

×3 Rivetⓨ　×1 Rivetⓚ

×2 PJ-1b2Rⓨ　×1 PO-1Aⓦ



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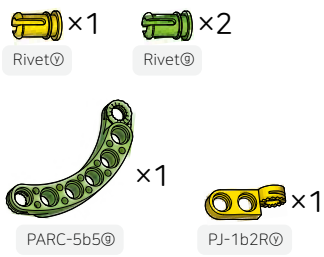
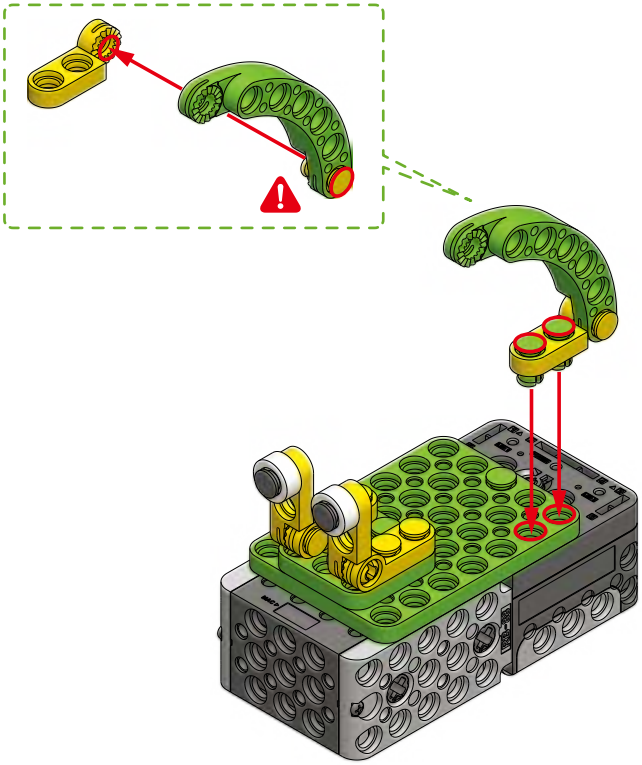
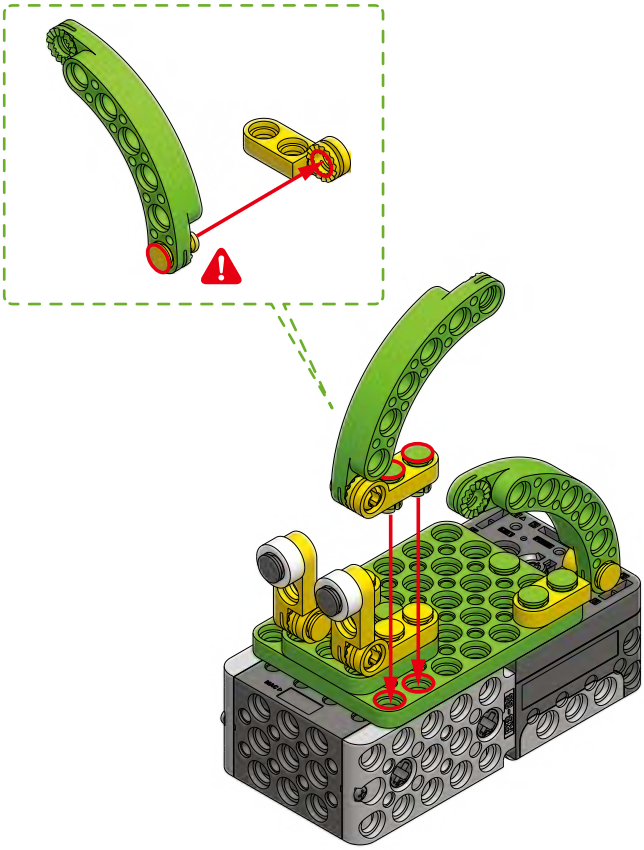

×1
Rivetⓨ
×2
Rivetⓖ
×1
PARC-5b5ⓖ
×1
PJ-1b2Rⓨ



6


×1
Rivetⓨ
×2
Rivetⓖ
×1
PARC-5b5ⓖ
×1
PJ-1b2Rⓨ



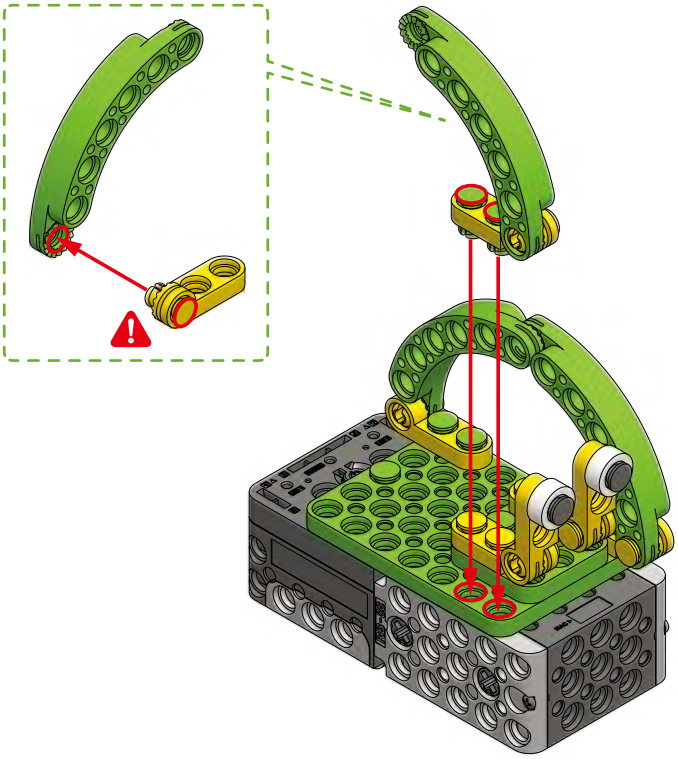
7

×1 Rivetⓥ

×2 Rivetⓖ

×1 PARC-5b5ⓖ

×1 PJ-1b2Rⓥ



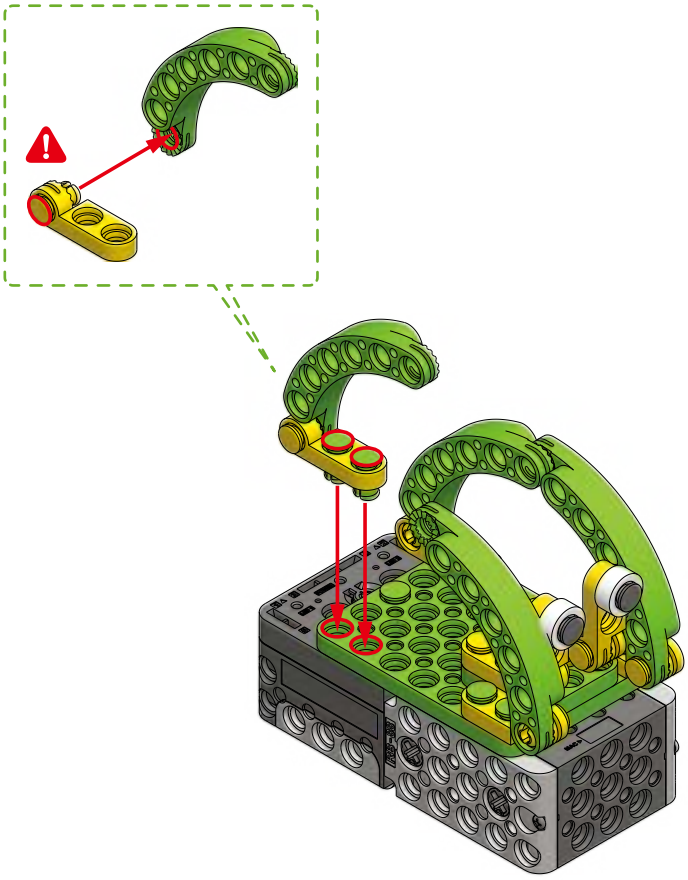
8

×1 Rivetⓥ

×2 Rivetⓖ

×1 PARC-5b5ⓖ

×1 PJ-1b2Rⓥ

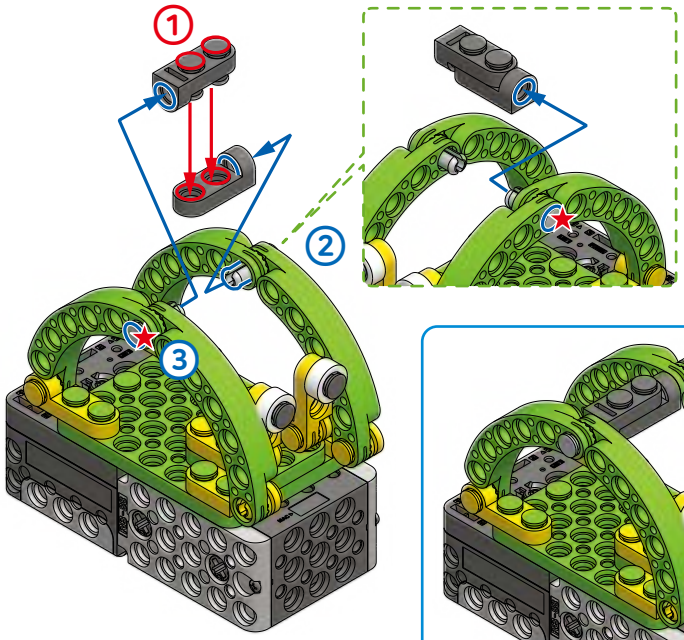


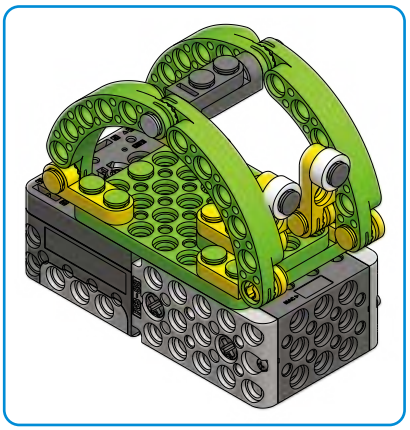
9

×2 Rivet(k)

×2 Rivet(gr) ★

×2 PL-1b2(k)



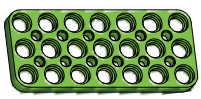


10

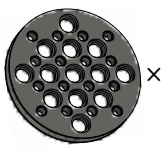
×2 Rivet(w)

×1 Rivet(k)

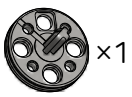
×2 Rivet(gr) ★


×1 PD-3b7(g)

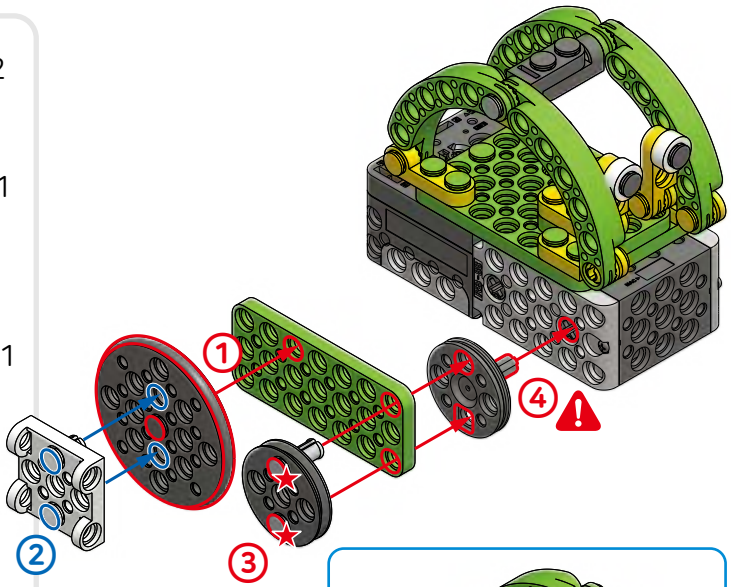

×1 PU-5(w)

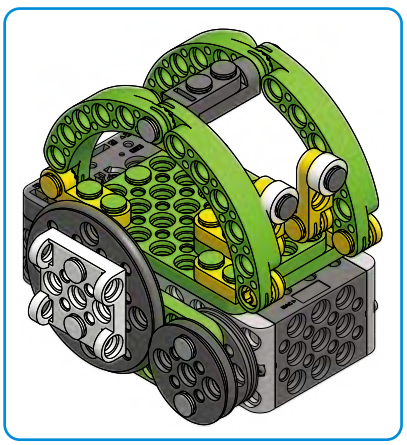

×1 PO-5b5(k)


×1 TR-62


×1 Horn-5X


×1 PO-3b3(k)

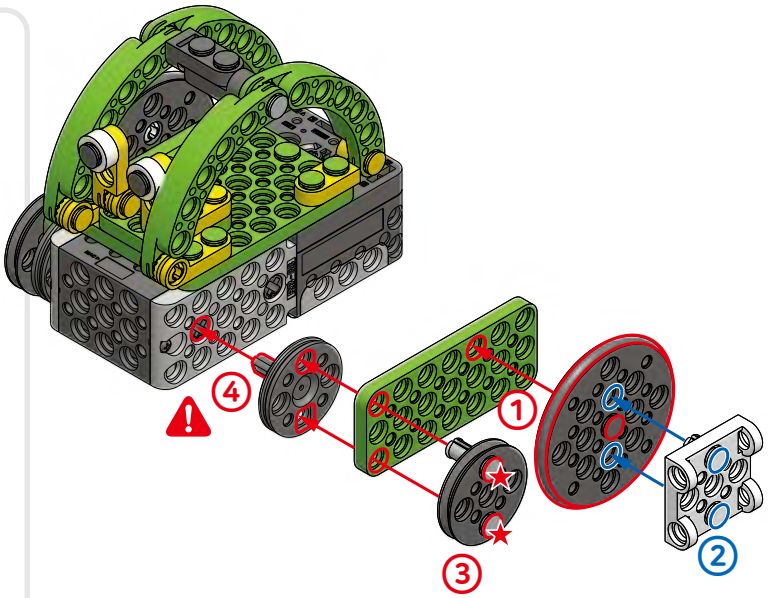




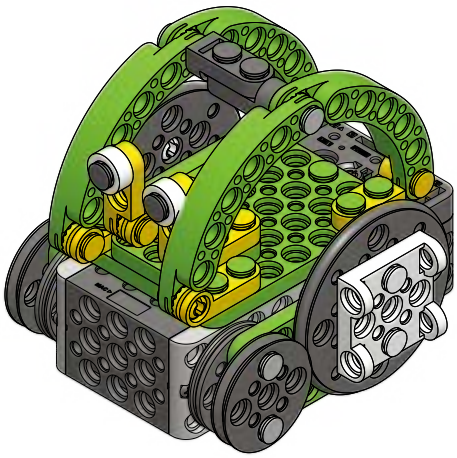
My Own Robot

Personalize the robot arm to your liking.

11



See Video



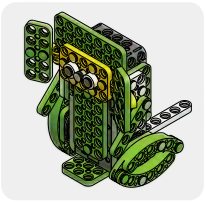
How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

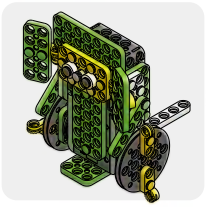
3 Why are wheels round?

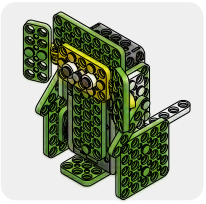
Let's learn about wheels!

Wheels make it much easier for objects to move quickly without exerting much force on the flat ground. Since wheels do not roll well on rough and bumpy surfaces, roads were built so that cars could move around easily.

After assembling the frilled lizard, change the shape of the wheels and operate it.
Observe how its movement changes depending on the shape of the wheels.

❶ 

❷ 

❸ 

Which robot is the fastest and most stable?

Which robot rattles the most?

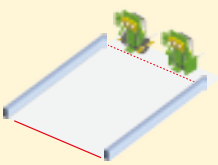
Let's play the 'Lizard Race' game by controlling the robot using a smartphone.

① Press the start button of the controller 5 times (sol) to execute the 'Control' mode.
② After connecting the robot to the smartphone, select the 'Controller' icon in the app.

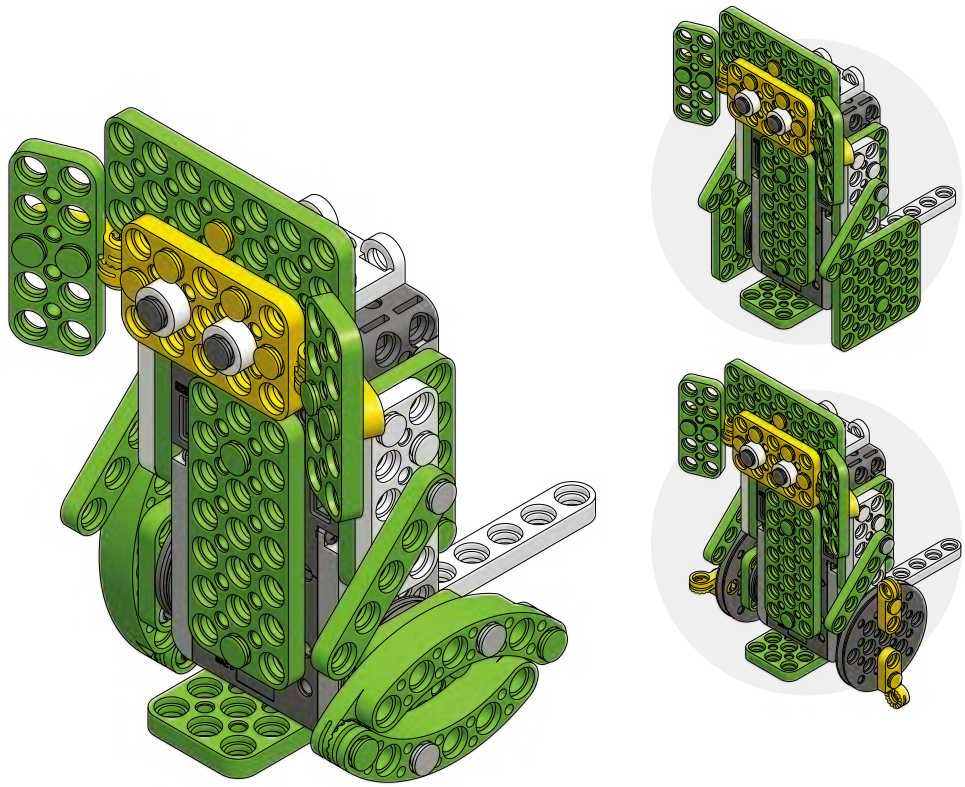
[U]	The robot moves forward.
[D]	The robot moves backward.
[L]	The robot turns to the left.
[R]	The robot turns to the right.
[1]	Moves at a slow pace.
[2]	Moves at a medium pace.
[3]	Moves at a fast pace.
[5]	Button to change the forward/backward direction.
[6]	Button to change the left/right turn direction.

How to Play

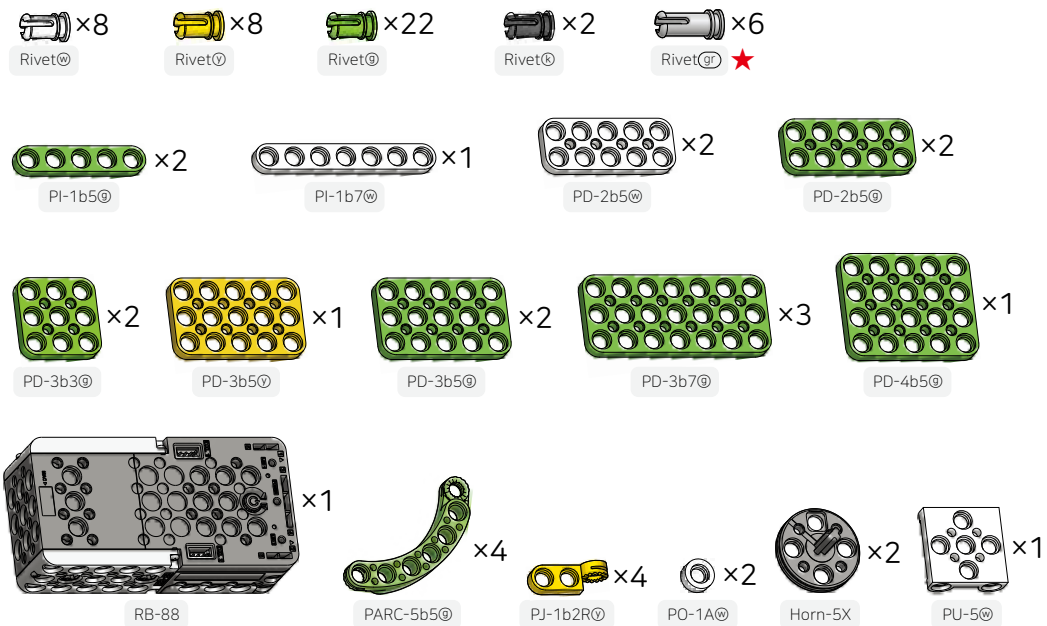
❶ Create a track using the objects around you.
❷ Set two robots on the starting line and start the race.
The first of the two robots to reach the finish line wins.
❸ It is possible to change the shape of the robot by assembling it differently.



Change the shape of the wheels and observe how the movement changes.



Frilled Lizard



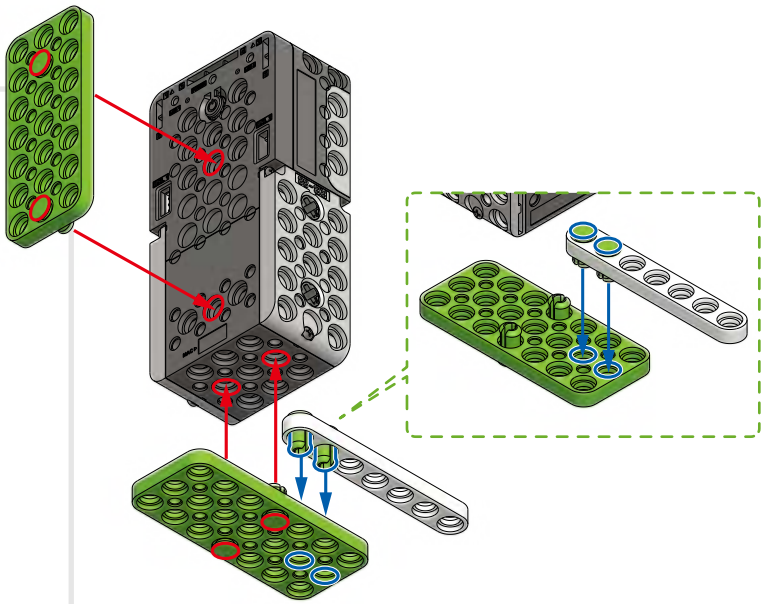
1

×6
Rivet

×1
Pl-1b7

×2
PD-3b7

×1
RB-88



2

×2
Rivet

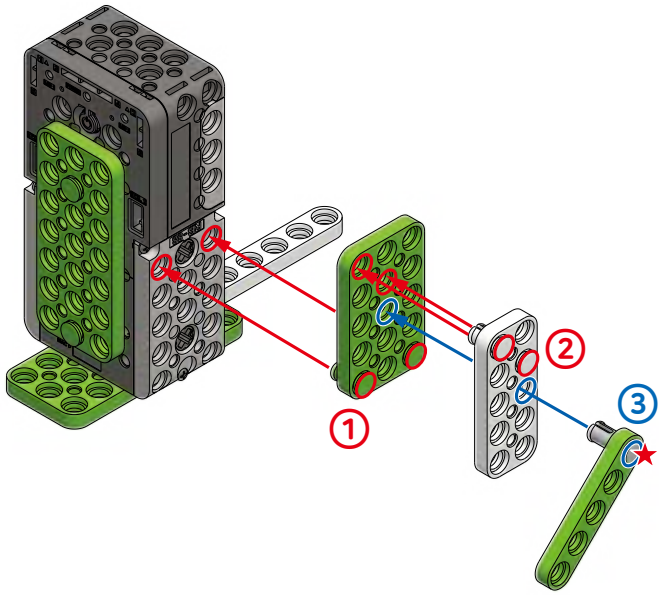
×2
Rivet

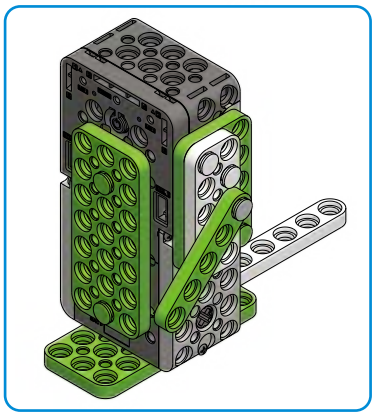
×1
Rivet ★

×1
Pl-1b5

×1
PD-2b5

×1
PD-3b5





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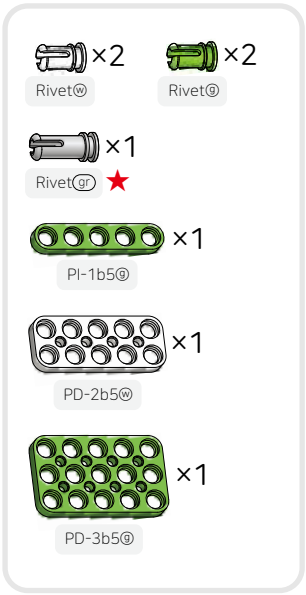
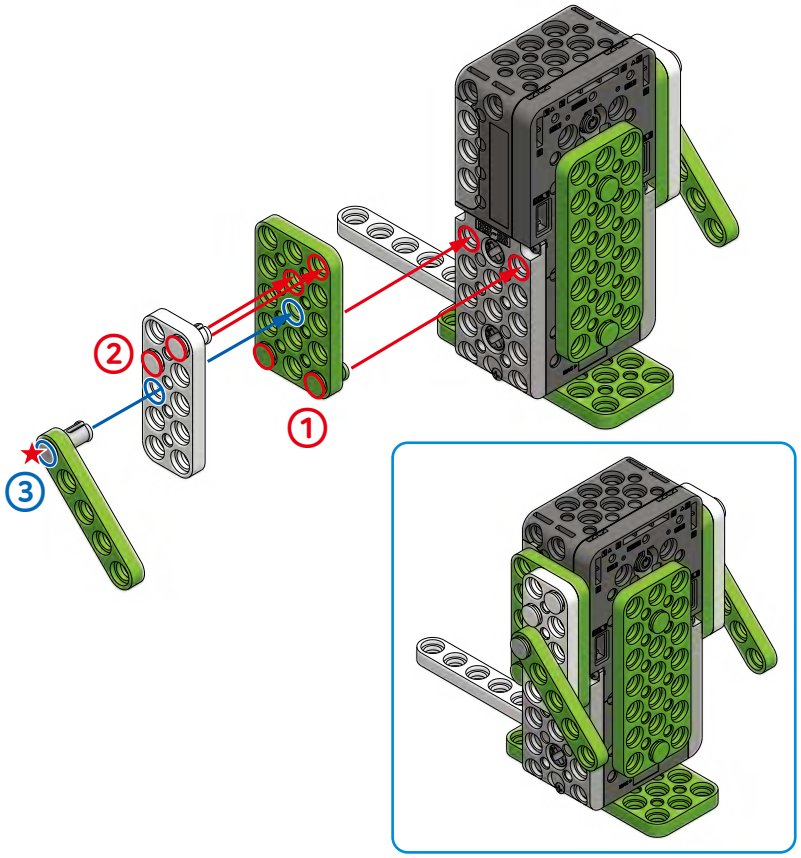
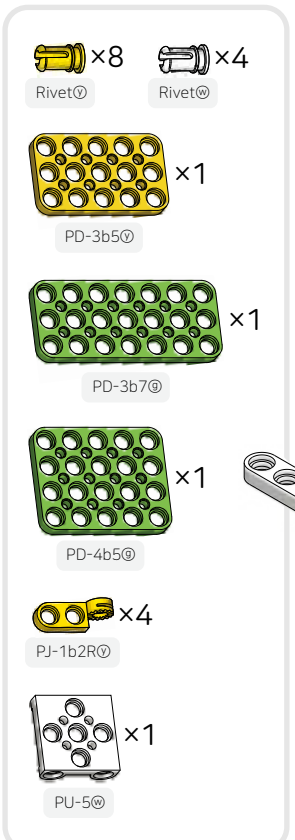
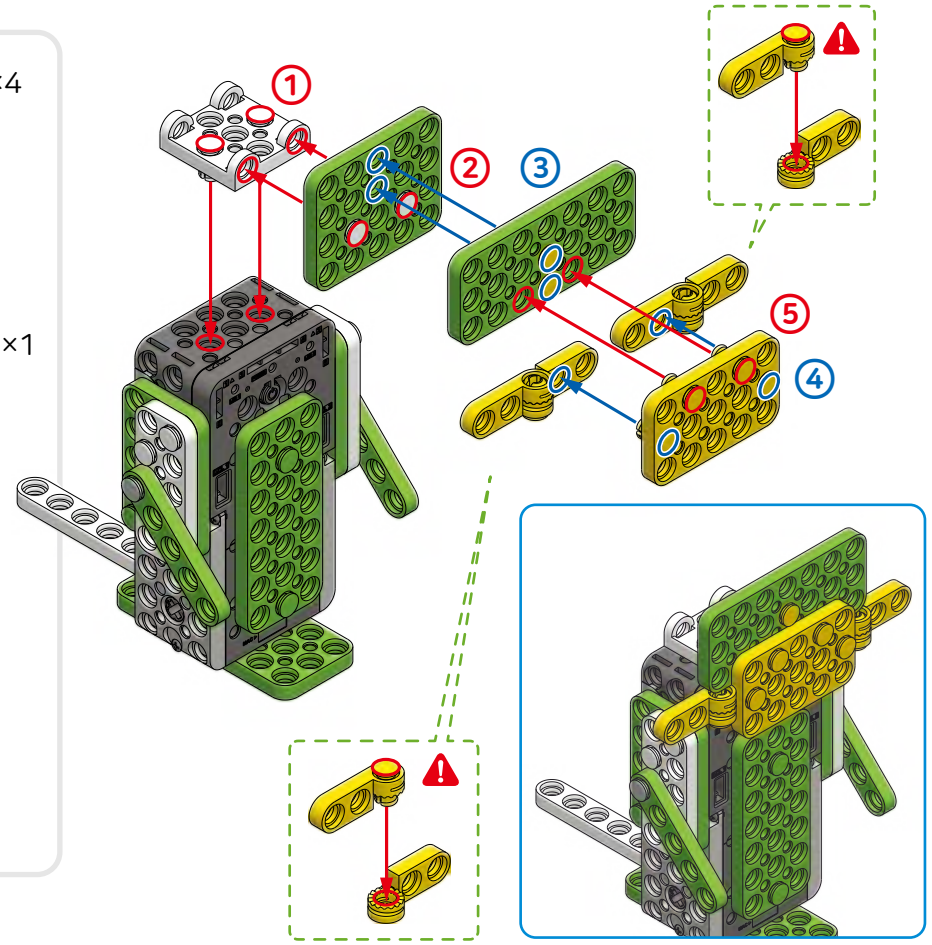

×2
Rivetⓦ
×2
Rivetⓖ
×1
Rivetⓖⓡ ★
×1
Pl-1b5ⓖ
×1
PD-2b5ⓦ
×1
PD-3b5ⓖ

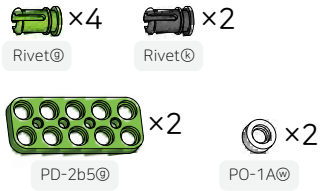

①
②
③
★

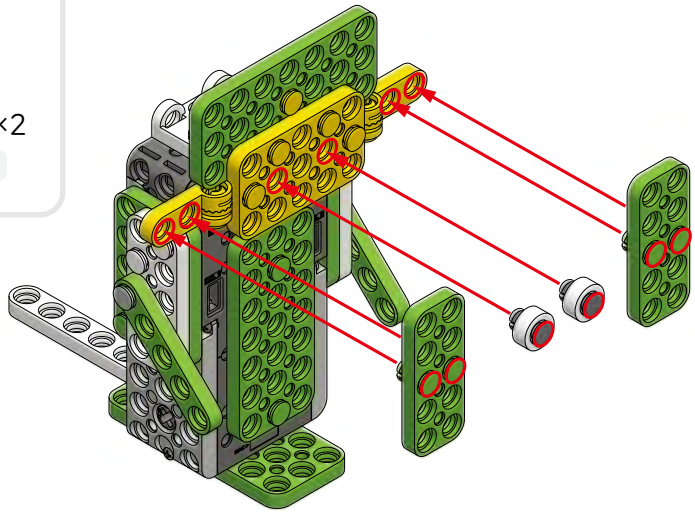
4


×8
Rivetⓨ
×4
Rivetⓦ
×1
PD-3b5ⓨ
×1
PD-3b7ⓖ
×1
PD-4b5ⓖ
×4
PJ-1b2Rⓨ
×1
PU-5ⓦ


①
②
③
④
⑤

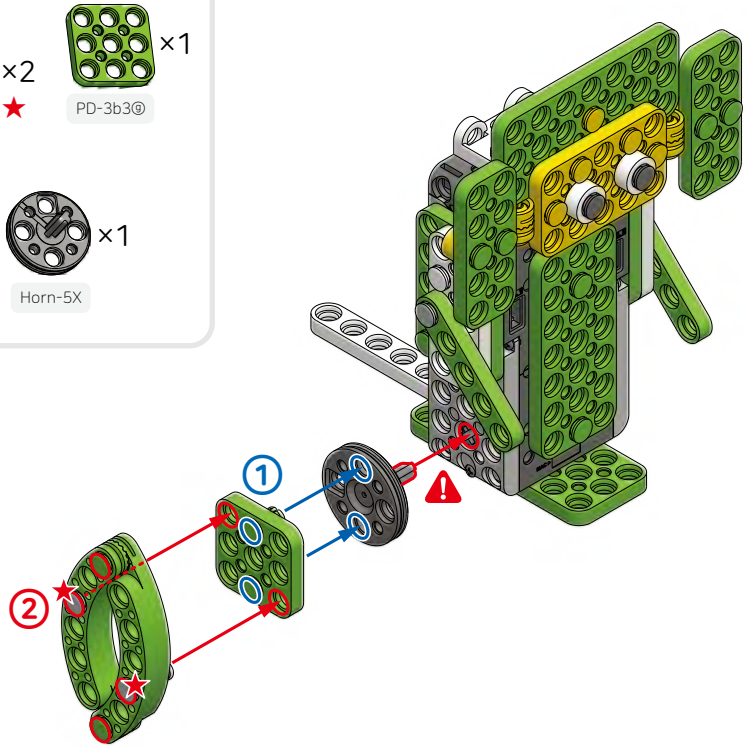
5


×4
Rivet⓰
×2
Rivet⓴
×2
PD-2b5⓰
×2
PO-1Aⓦ

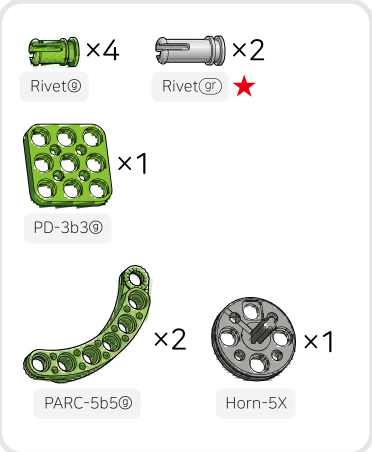


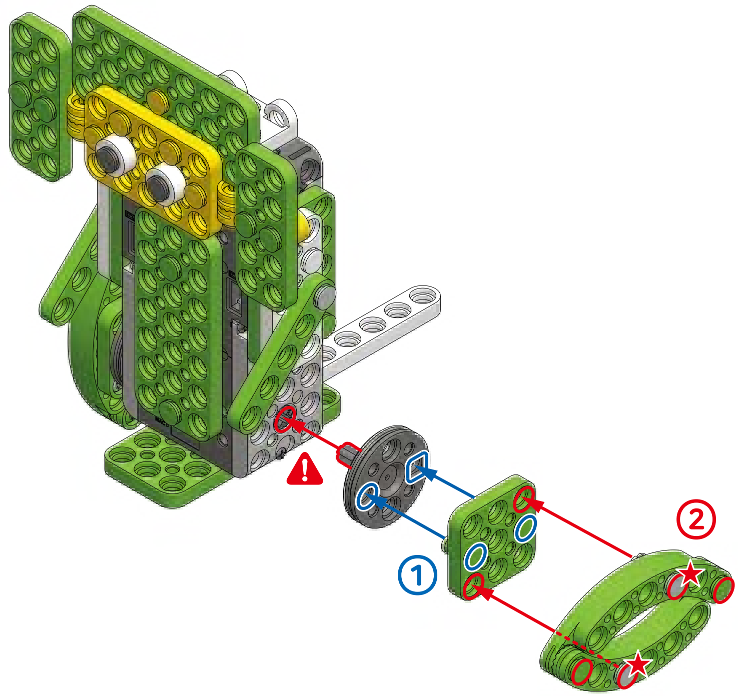
6


×4
Rivet⓰
×2
Rivetⓖⓡ ★
×1
PD-3b3⓰
×2
PARC-5b5⓰
×1
Horn-5X

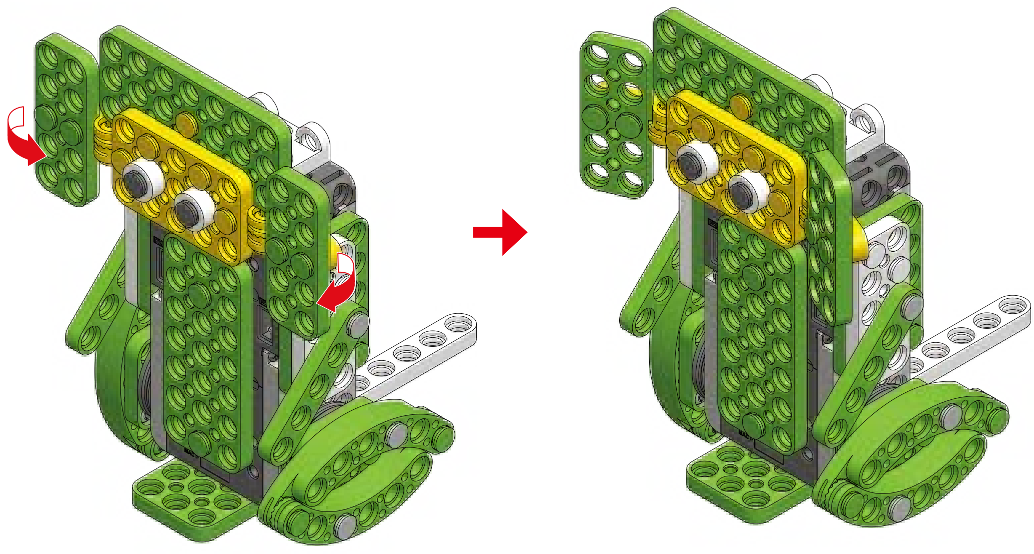

1
2

7

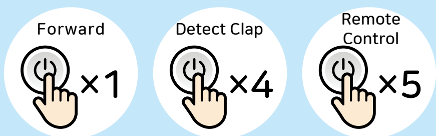




See Video

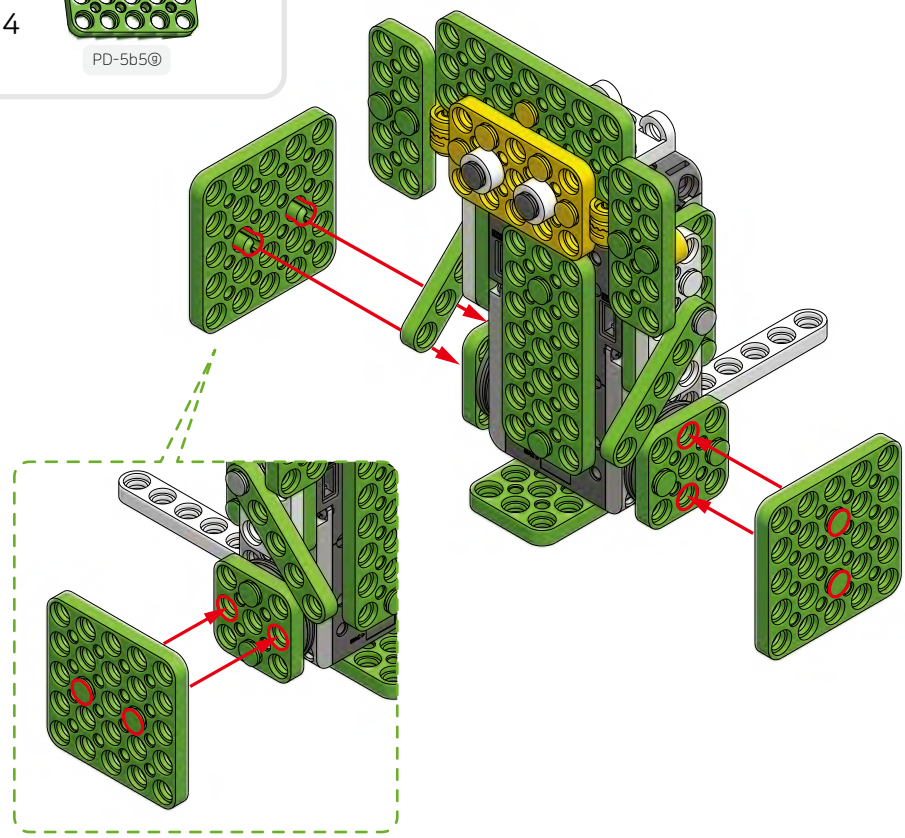


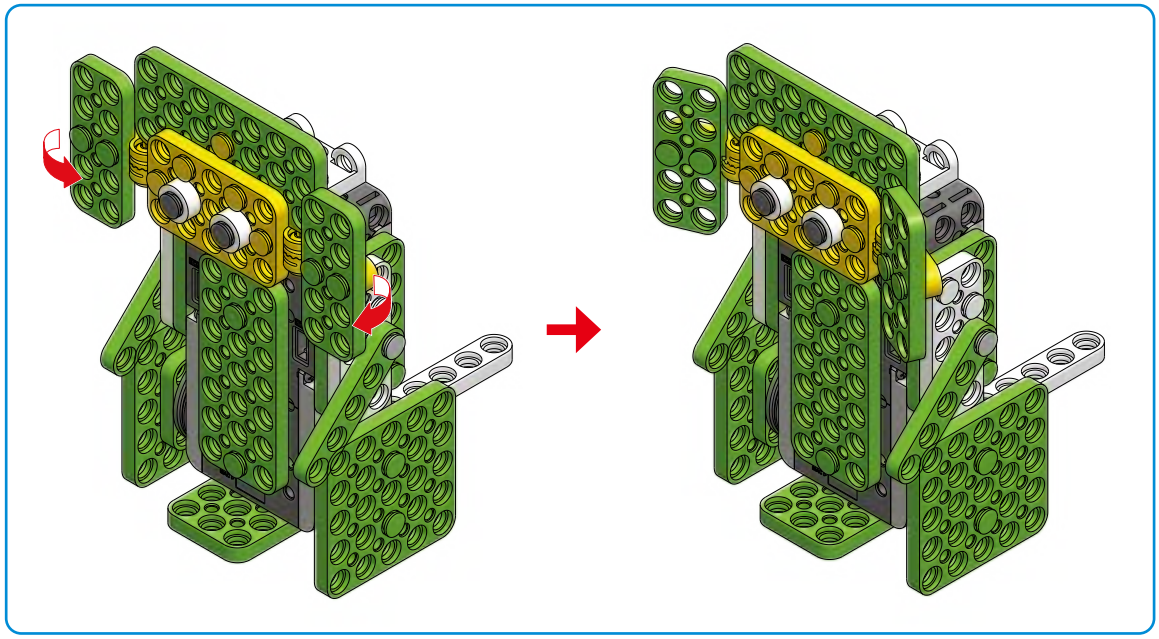
How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

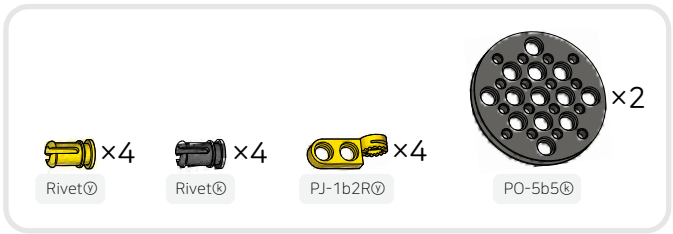


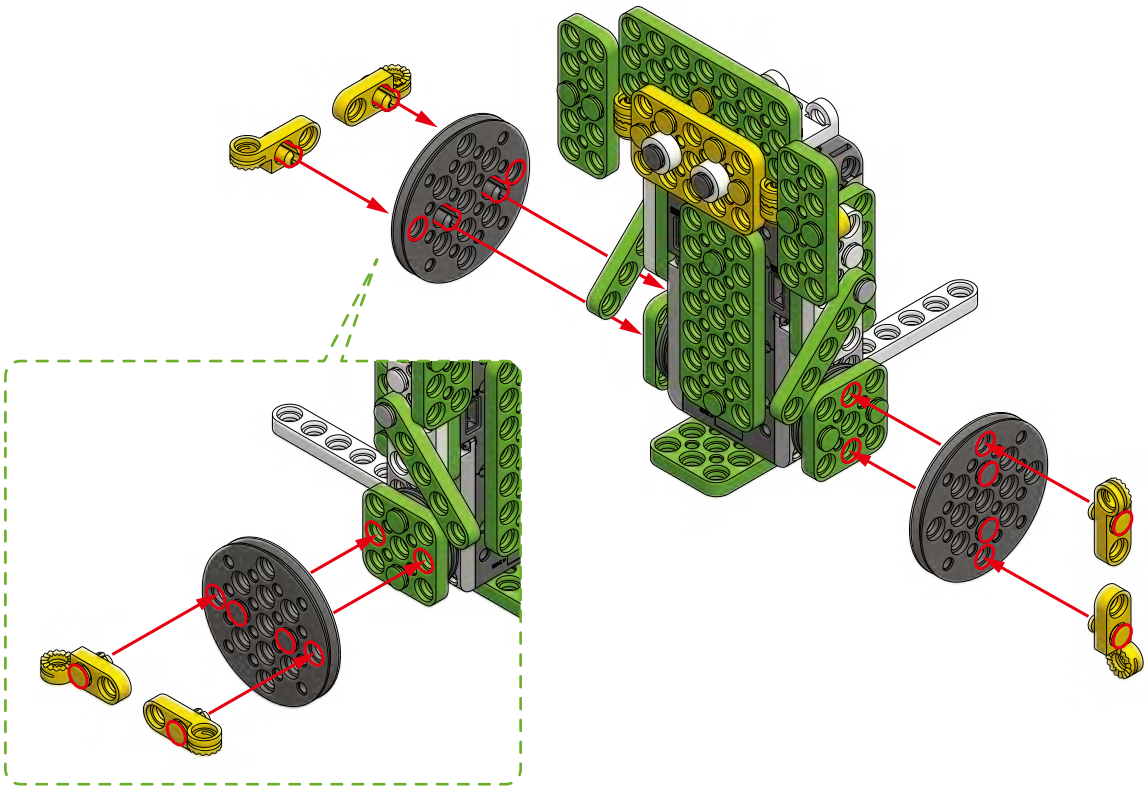
My Own Robot

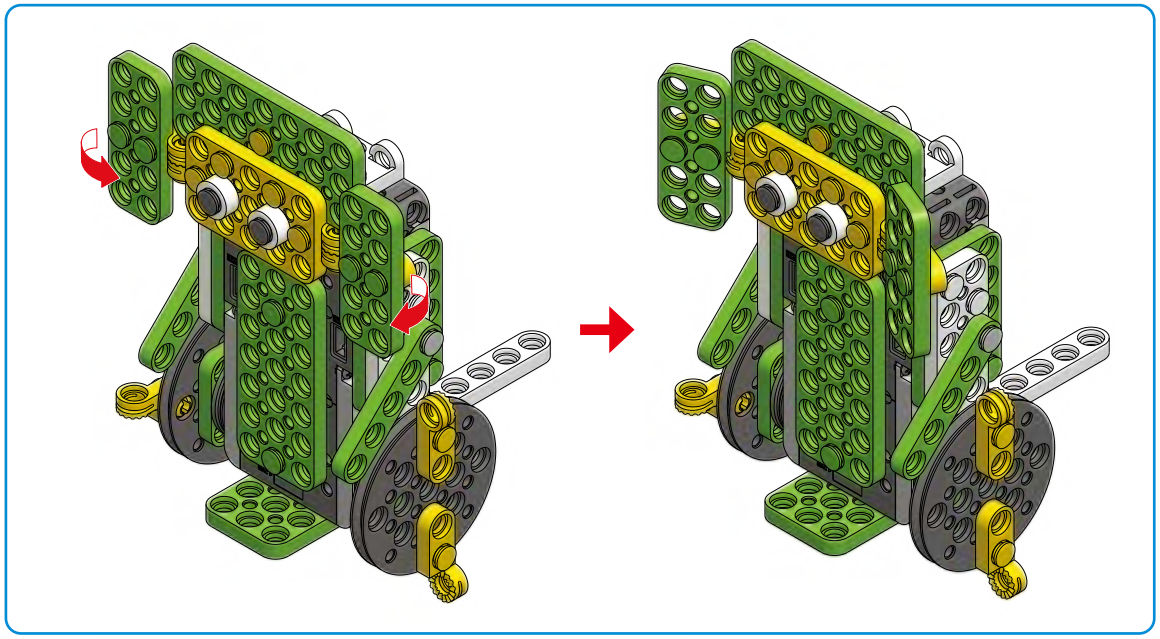
Let's change the robot's appearance and the shape of the wheels.






×4
×4
×4
×2
Rivetⓥ
Rivetⓚ
PJ-1b2Rⓥ
PO-5b5ⓚ





4 What tools are needed to move objects quickly?

Let's think about how to move objects conveniently.

Your mission is to move the parts stacked on the left to the right side.
See the examples below and find the best method to move the stack of parts quickly.

Flying the objects in the air with elasticity	Shoving the objects with a wide shovel	Picking up the objects with a tong

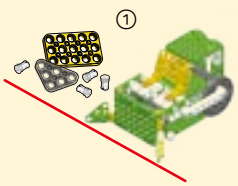
A bulldozer or snowplow has a wide plate-shaped device in front used for easily removing gravel or piled-up snow.

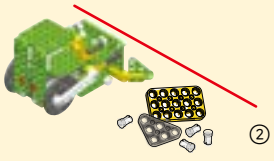
Let's assemble a bulldozer robot and play a game of 'Moving parts'.

Let's play a game of moving objects to the opponent's side.

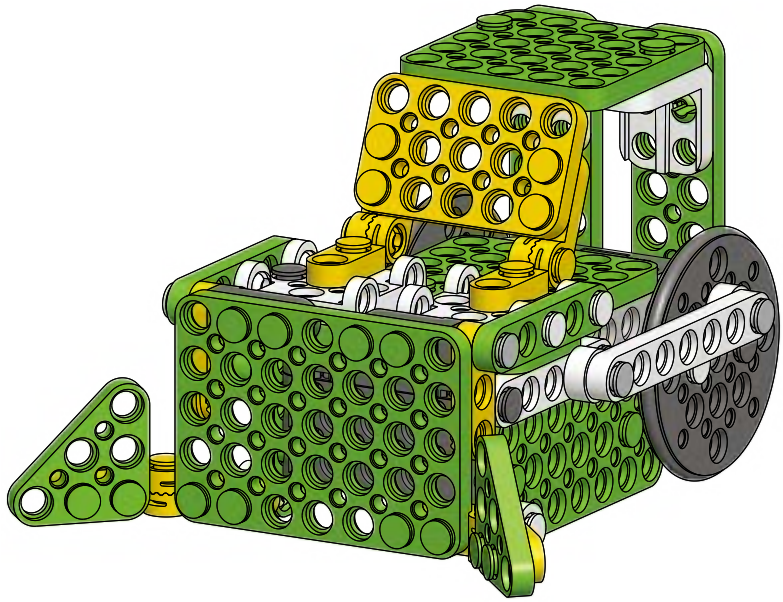
How to Play

❶ Create a border line as shown in the picture.
❷ Gather the same number of rivets or parts and place them in the areas marked as ① and ②.
❸ When the match starts, use the bulldozer to move the parts to the opponent's side.
❹ When the opponent's robot crosses over to your side, collect the parts and send them back to the opponent's side.
❺ The match lasts for 1 minute.
The person who has fewer parts within his or her boundary wins the game.

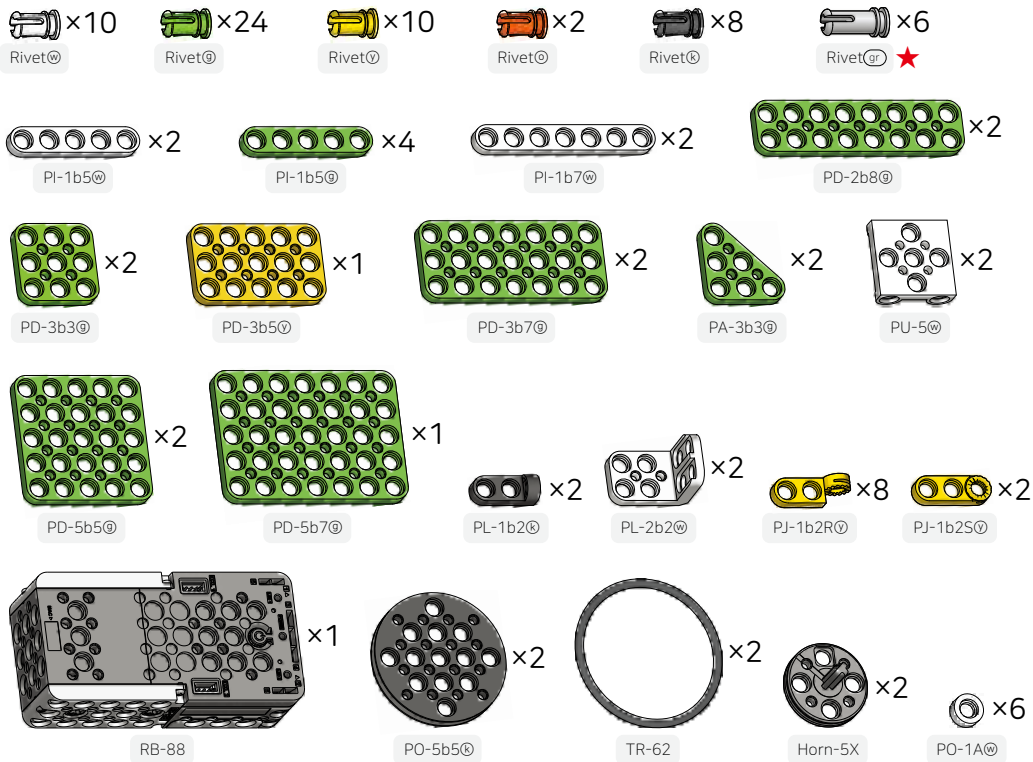




Play the 'Moving Parts' game on your smartphone.



Bulldozer


×10
Rivetⓦ
×24
Rivetⓖ
×10
Rivetⓨ
×2
Rivetⓞ
×8
Rivetⓚ
×6
Rivetgr
×2
Pl-1b5ⓦ
×4
Pl-1b5ⓖ
×2
Pl-1b7ⓦ
×2
PD-2b8ⓖ
×2
PD-3b3ⓖ
×1
PD-3b5ⓨ
×2
PD-3b7ⓖ
×2
PA-3b3ⓖ
×2
PU-5ⓦ
×2
PD-5b5ⓖ
×1
PD-5b7ⓖ
×2
PL-1b2ⓚ
×2
PL-2b2ⓦ
×8
PJ-1b2Rⓨ
×2
PJ-1b2Sⓨ
×1
RB-88
×2
PO-5b5ⓚ
×2
TR-62
×2
Horn-5X
×6
PO-1Aⓦ

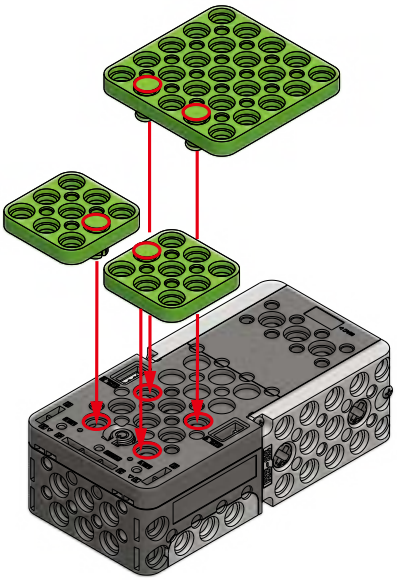
1

×4
Rivetⓖ

×2
PD-3b3ⓖ

×1
PD-5b5ⓖ

×1
RB-88



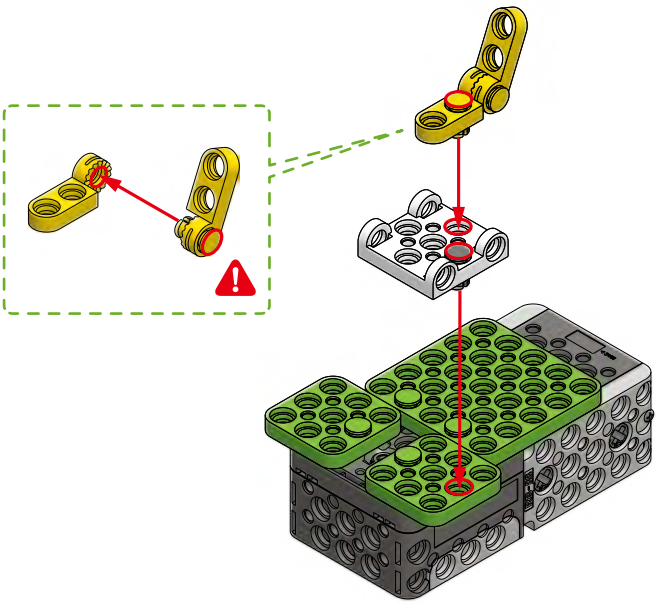
2

×2
Rivetⓨ

×1
Rivetⓚ

×1
PU-5ⓦ

×2
PJ-1b2Rⓨ



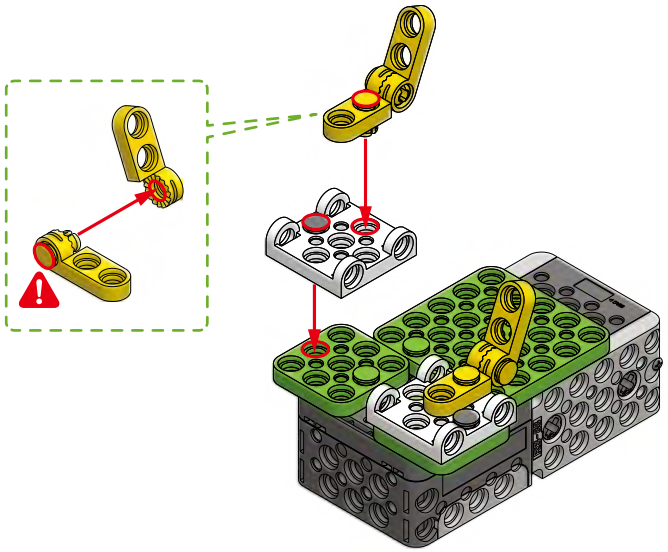
3

×2 Rivetⓨ

×1 Rivetⓚ

×1 PU-5ⓦ

×2 PJ-1b2Rⓨ



4

×4 Rivetⓖ

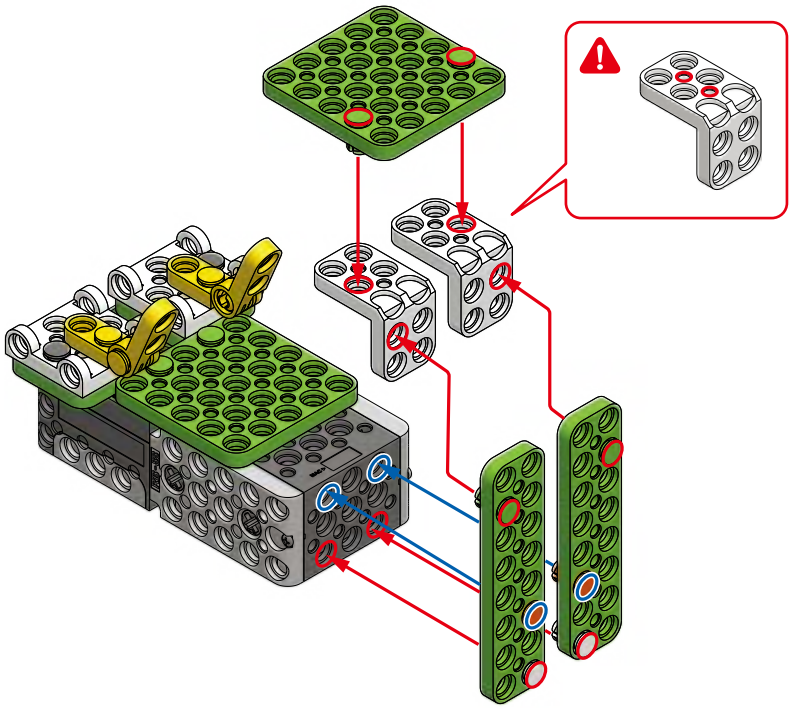
×2 Rivetⓦ

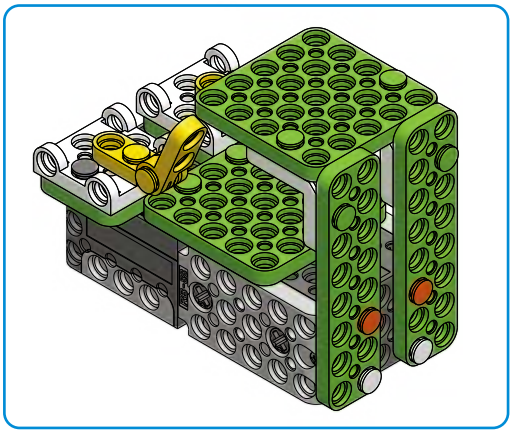
×2 Rivetⓞ

×2 PD-2b8ⓖ

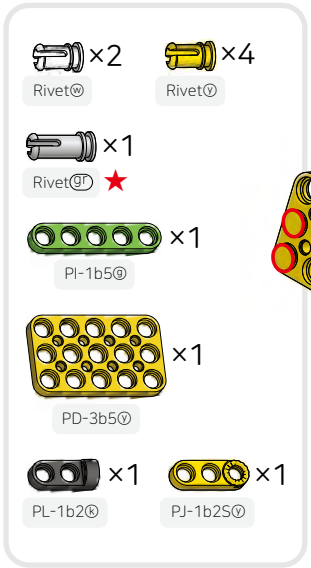
×1 PD-5b5ⓖ

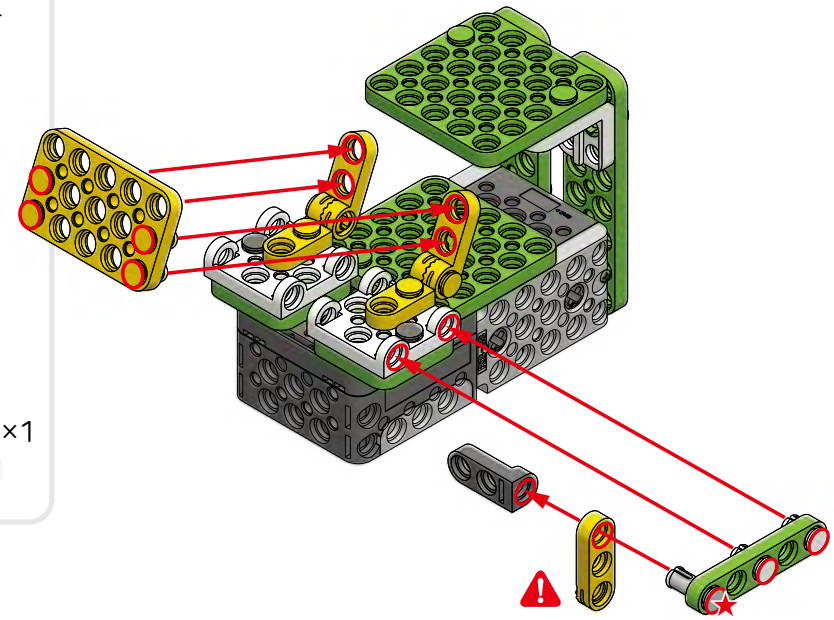
×2 PL-2b2ⓦ





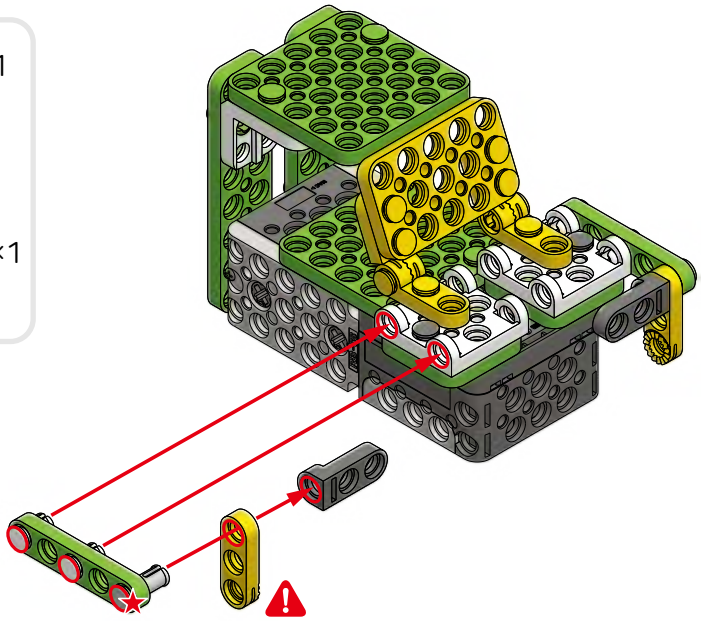
5


×2
Rivetⓦ
×4
Rivetⓨ
×1
Rivetⓖⓡ
×1
Pl-1b5ⓖ
×1
PD-3b5ⓨ
×1
PL-1b2ⓚ
×1
PJ-1b2Sⓨ



6

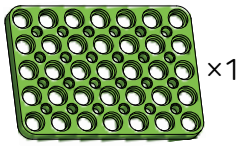

×2
Rivetⓦ
×1
Rivetⓖⓡ
×1
Pl-1b5ⓖ
×1
PL-1b2ⓚ
×1
PJ-1b2Sⓨ



7

×12 Rivetⓖ

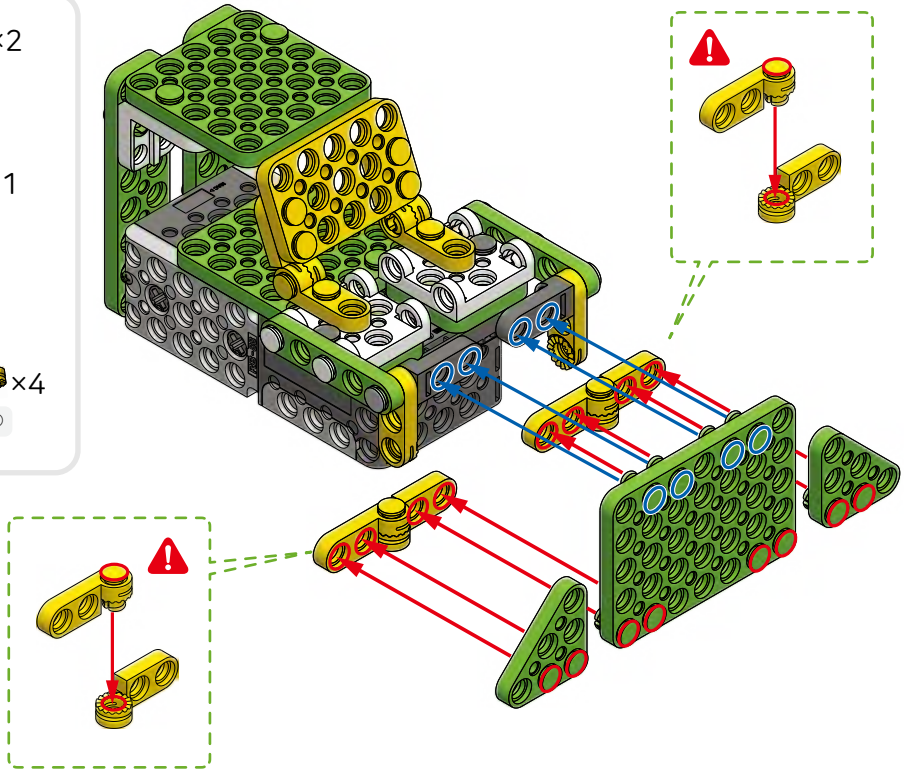
×2 Rivetⓥ



×1 PD-5b7ⓖ

×2 PA-3b3ⓖ

×4 PJ-1b2Rⓥ

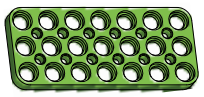


8

×2 Rivetⓦ

×2 Rivetⓖ

×1 Rivetⓚ



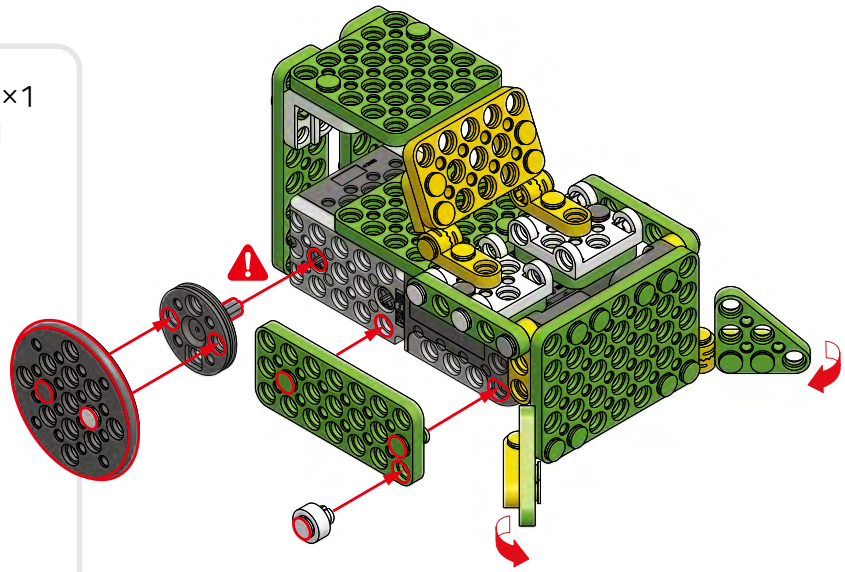
×1 PD-3b7ⓖ

×1 PO-5b5ⓚ

×1 PO-1Aⓦ

×1 TR-62

×1 Horn-5X



9

×2 Rivetⓚ

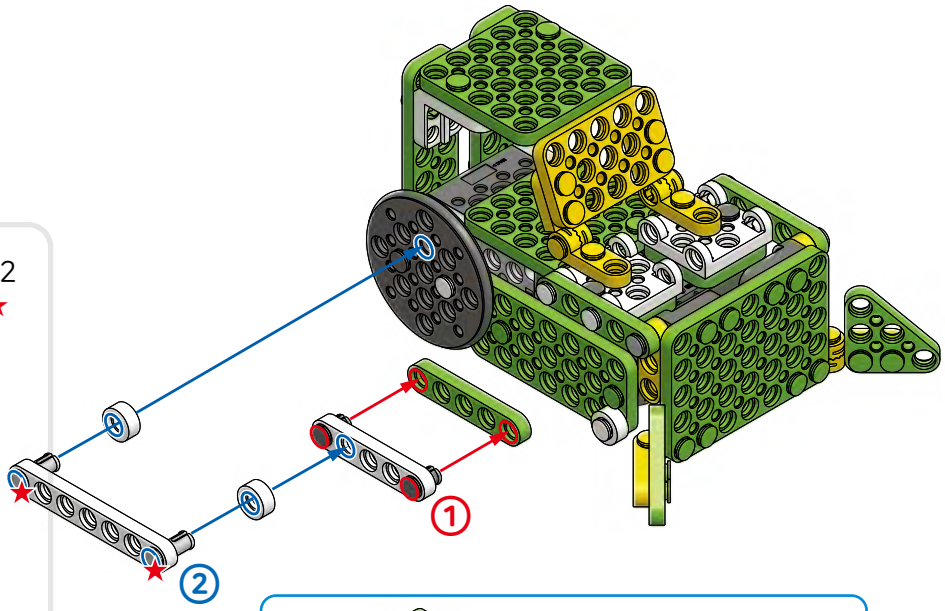
×2 Rivetⓖⓡ ★

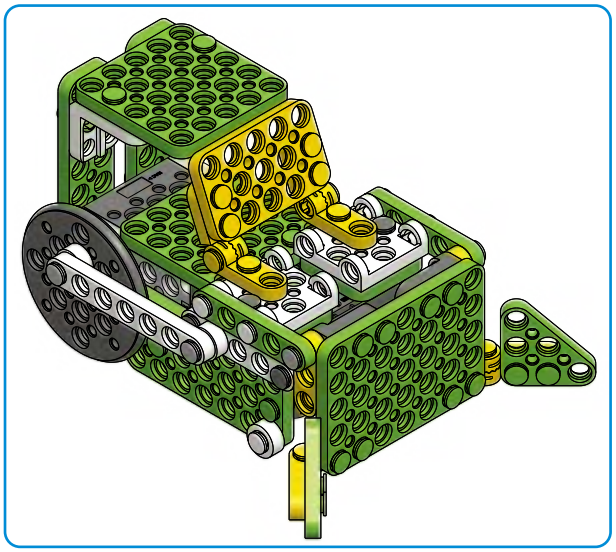
×1 Pl-1b5ⓦ

×1 Pl-1b5ⓖ

×1 Pl-1b7ⓦ

×2 PO-1Aⓦ





10

×2 Rivetⓦ

×2 Rivetⓖ

×1 Rivetⓚ

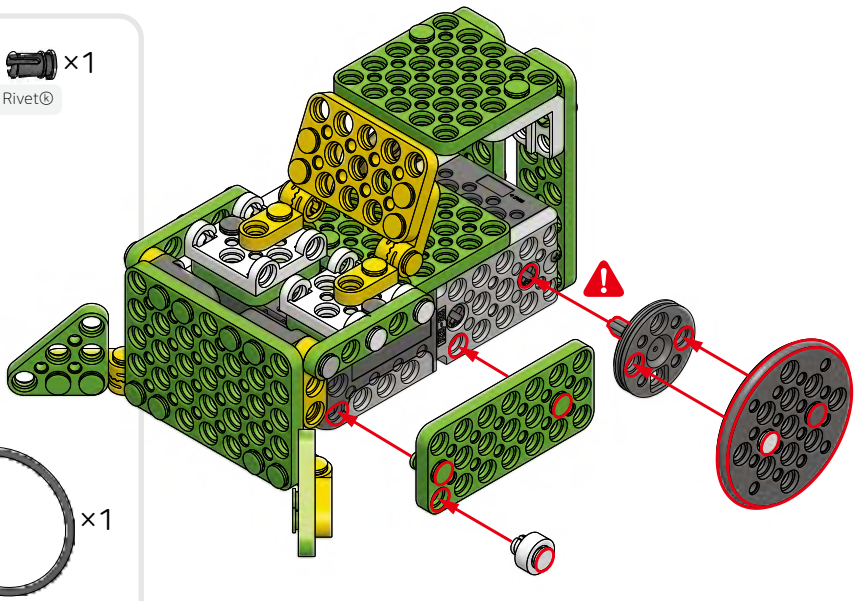
×1 PD-3b7ⓖ

×1 Horn-5X

×1 PO-1Aⓦ

×1 PO-5b5ⓚ

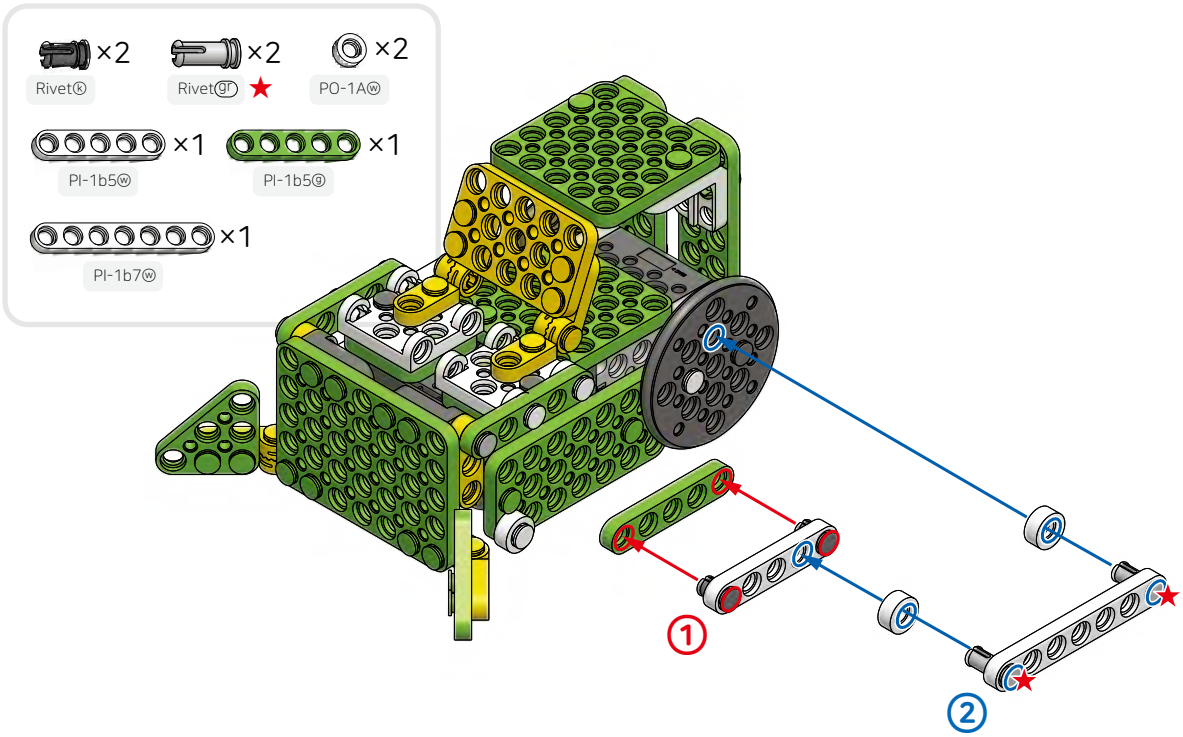
×1 TR-62



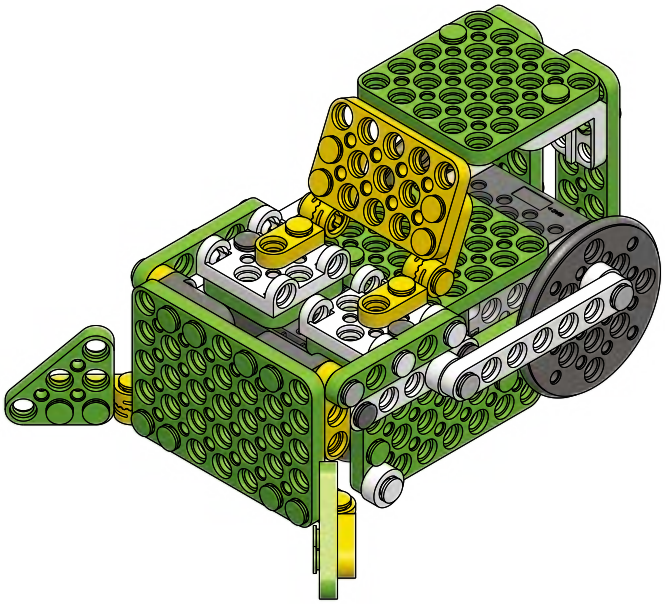
My Own Robot

Make your own unique robot by changing its appearance to your liking.

11



See Video



How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

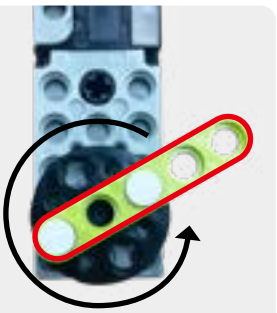
5 Is it possible to use the rotation of the motor to create a wing-flapping motion?

Let's think about how to convert the rotation of the motor into another motion.

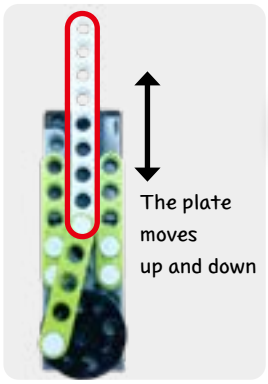
The electric motor rotates round and round, and this motion is called rotary motion.
By attaching parts to the rotating motor, you can change the motion into a different one.
Let's change the rotary motion to a wing-flapping motion by following the instructions below.

Rotary Motion

First, assemble the robot as shown in the picture on the right, and press the start button once (Do sound) to operate it.
You can see the green plate attached to the motor spin round and round.



The green plate rotates with the motor.



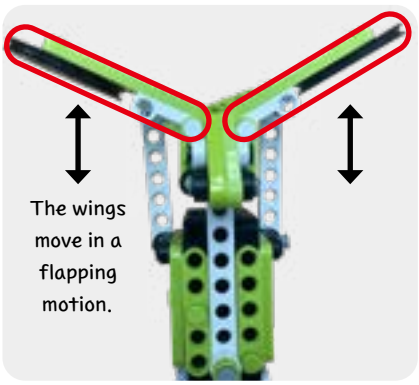
The plate moves up and down

Linear Reciprocating Motion

After assembling up to number 3 in the assembly manual, press the start button twice (Re sound) to start the robot.
You can see that the plate reciprocates in a repetitive up-and-down linear motion.

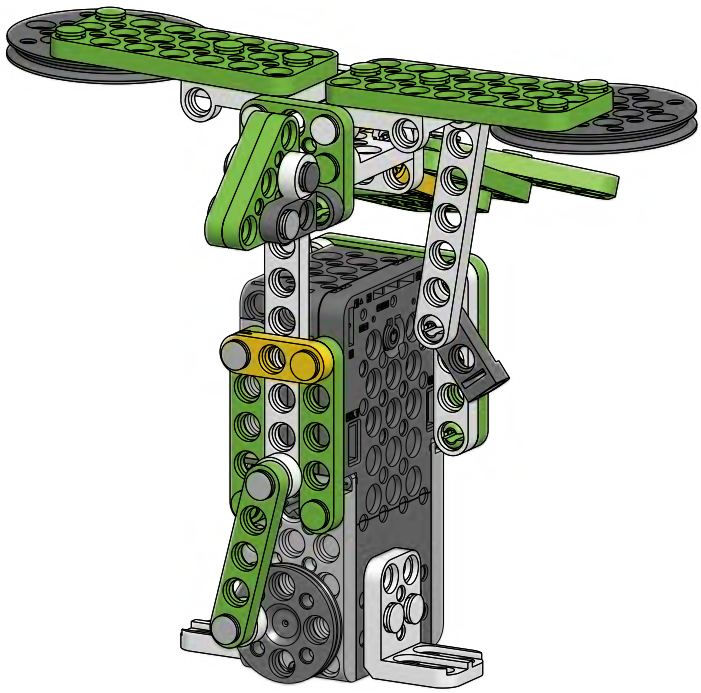
Reciprocating motion

After you finish assembling the bird, press the start button twice (Re sound) to activate the robot.
You can see the wings of the robot bird connected to the motor flap in a wing-flapping motion.



The wings move in a flapping motion.

Use the remaining parts to decorate the robot and make it look fancier.

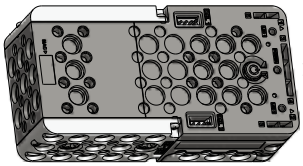


Bird

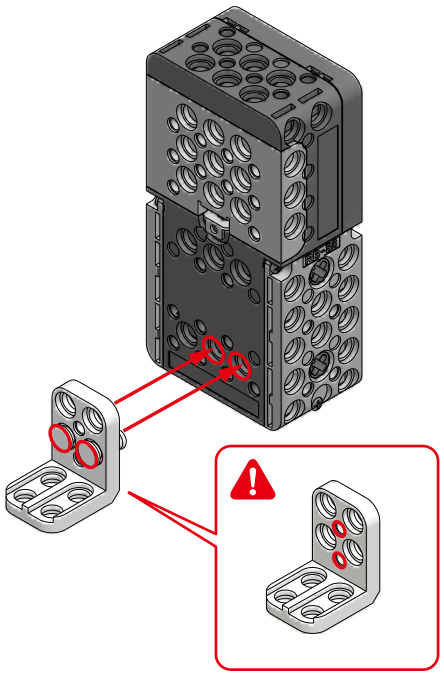
×12 Rivetⓦ
×4 Rivetⓨ
×25 Rivetⓖ
×2 Rivetⓚ
×8 Rivetⓖr ★
×2 Pl-1b5ⓦ
×3 Pl-1b5ⓖ
×2 Pl-1b7ⓦ
×1 Pl-1b9ⓦ
×2 PD-2b5ⓖ
×1 PD-3b5ⓖ
×2 PD-3b7ⓖ
×1 PD-3b3ⓖ
×1 PD-3b3ⓦ
×2 PA-3b3ⓖ
×1 PD-5b5ⓖ
×2 PO-5b5ⓚ
×1 Horn-5X
×4 PO-1Aⓦ
×3 PU-5ⓦ
×2 PL-2b2ⓦ
×1 RB-88
×1 PJ-1b2Sⓨ
×2 PJ-1b2Rⓨ
×4 PL-1b2ⓚ

1

Rivetⓦ PL-2b2ⓦ

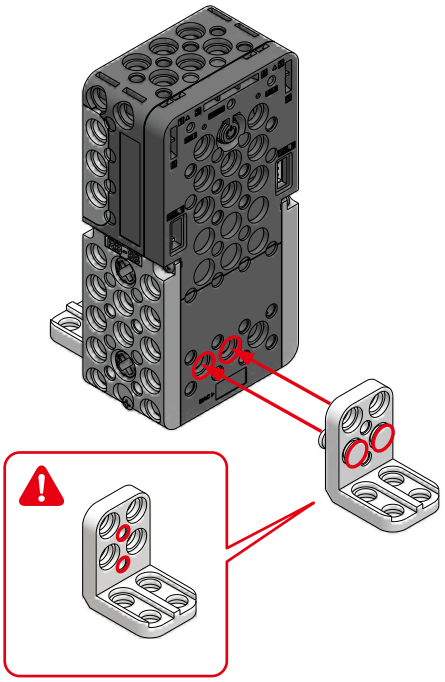


RB-88



2

Rivetⓦ PL-2b2ⓦ



3

×1 Rivet(y)

×2 Rivet(g)

×3 Rivet(gr) ★

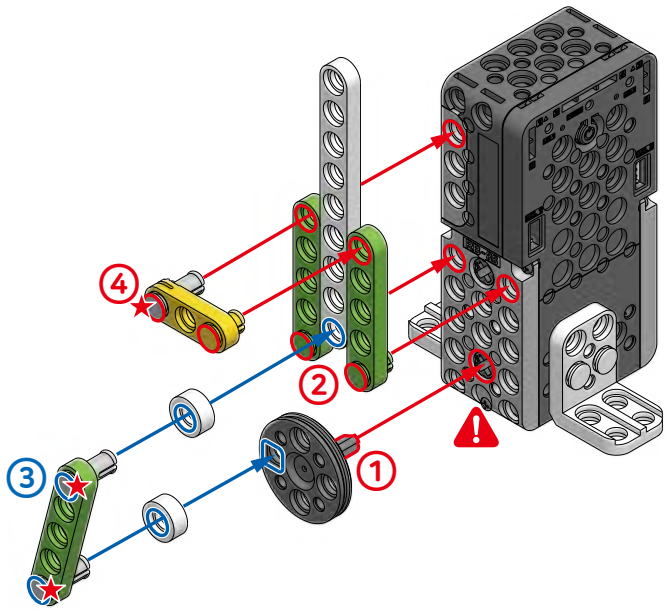
×3 Pl-1b5(g)

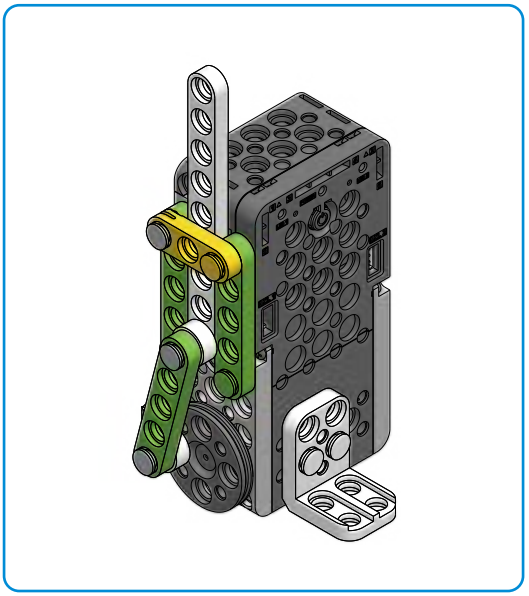
×1 Pl-1b9(w)

×1 Horn-5X

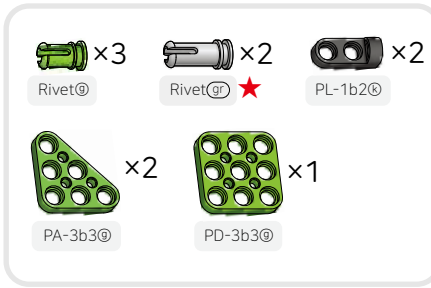
×2 PO-1A(w)

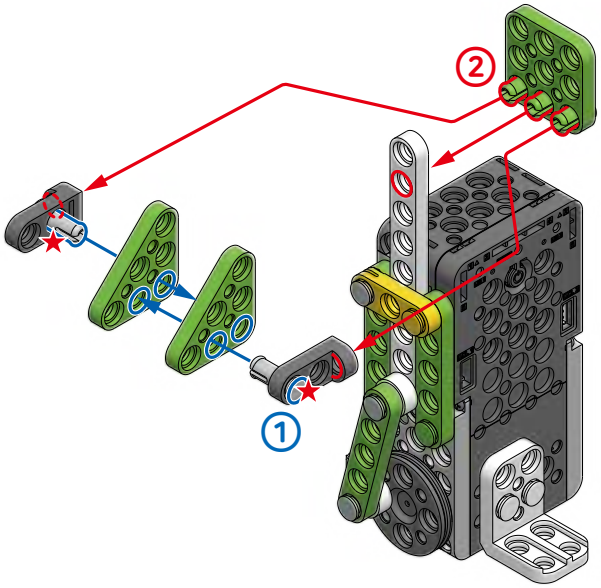
×1 PJ-1b2S(y)

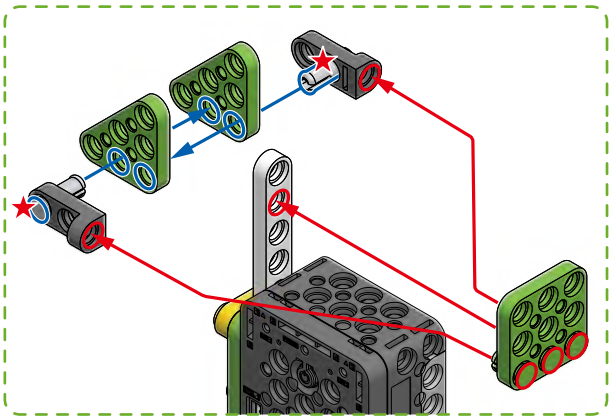


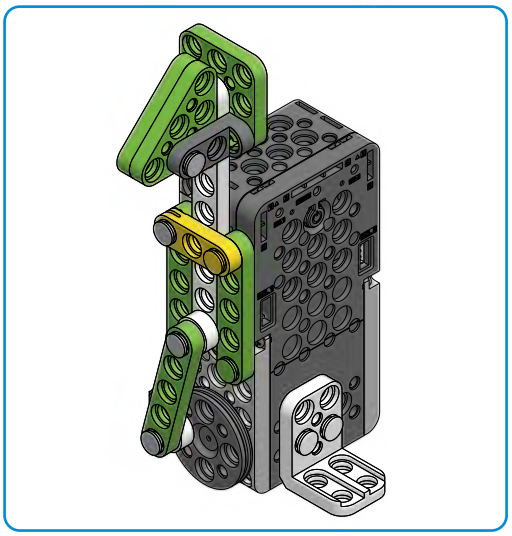


4

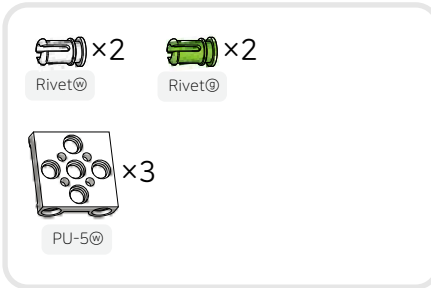

×3
Rivet g
×2
Rivet gr
×2
PL-1b2 k
×2
PA-3b3 g
×1
PD-3b3 g

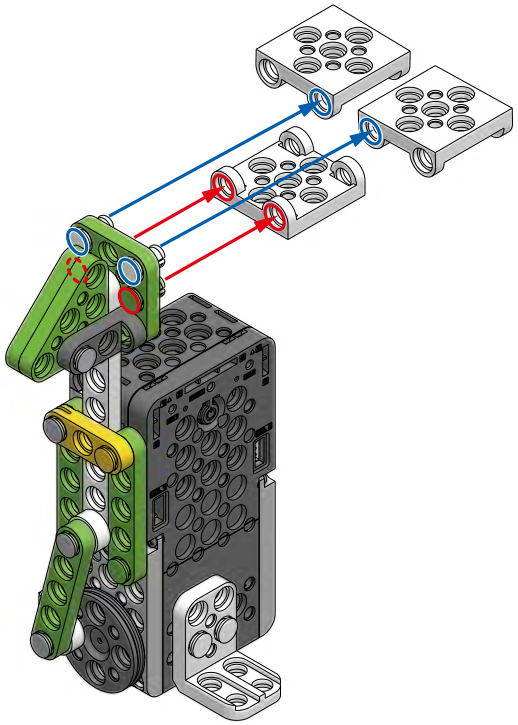

2
1



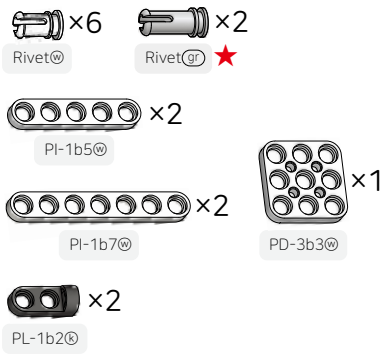


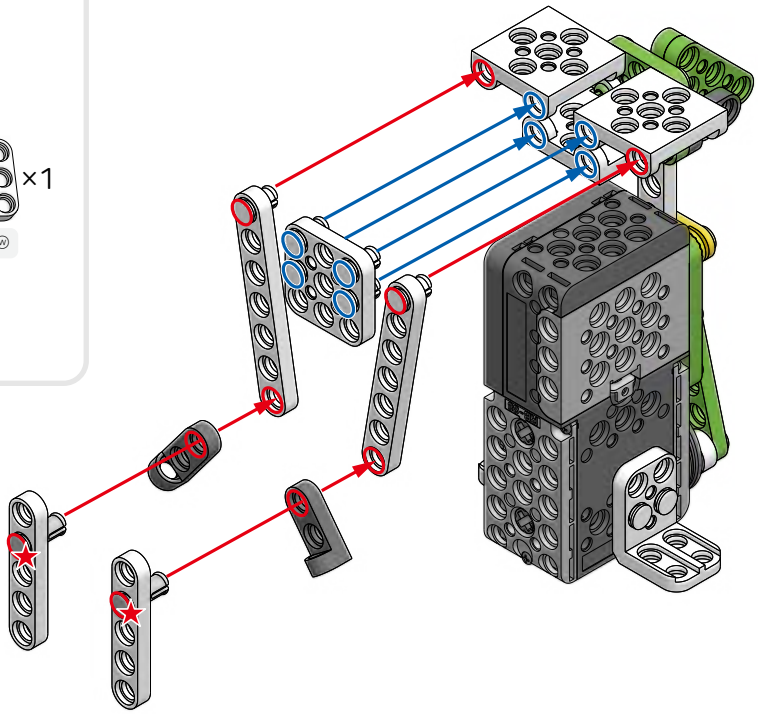
5

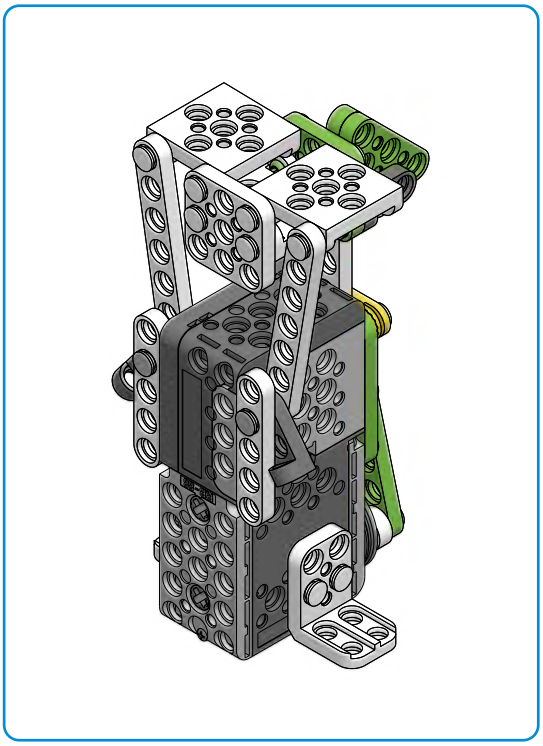

×2
Rivet w
×2
Rivet g
×3
PU-5 w



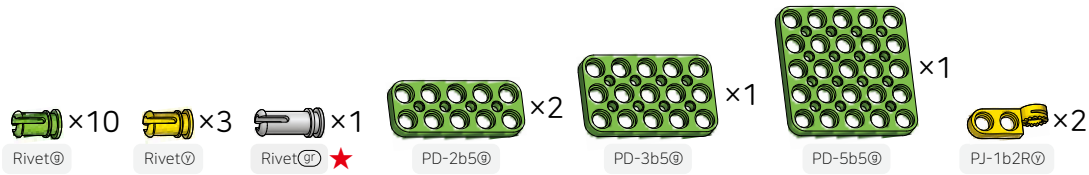
6

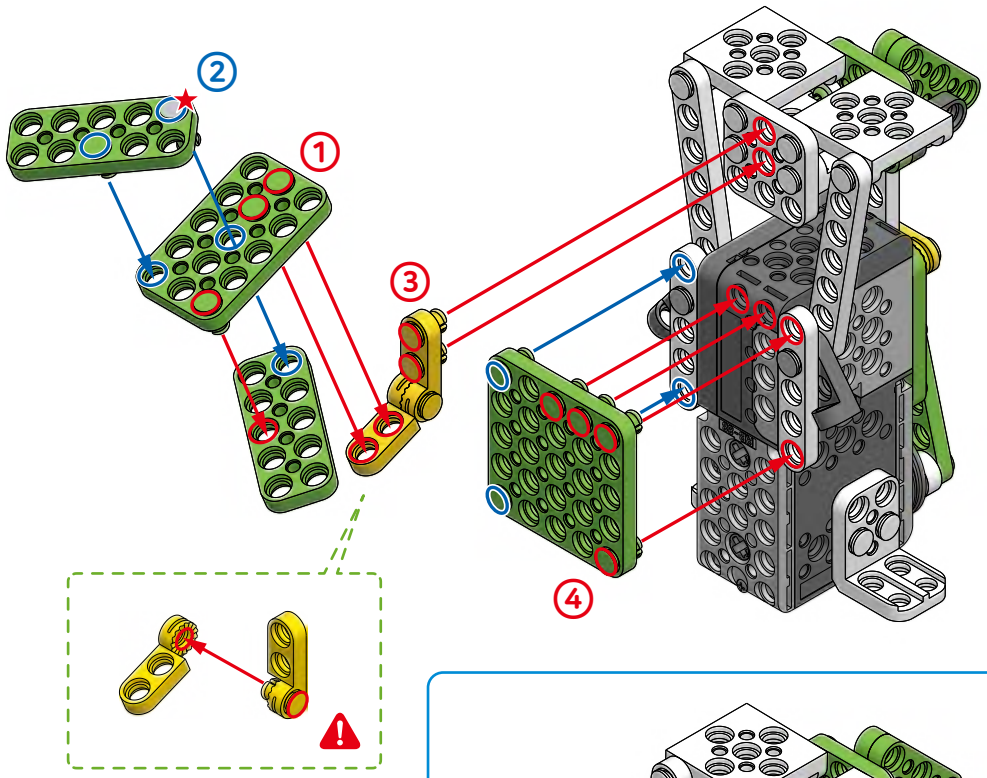


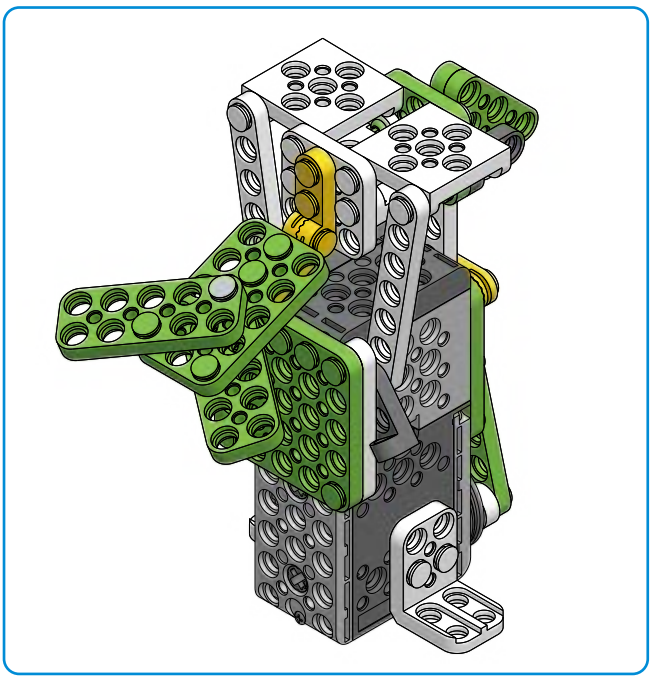




7



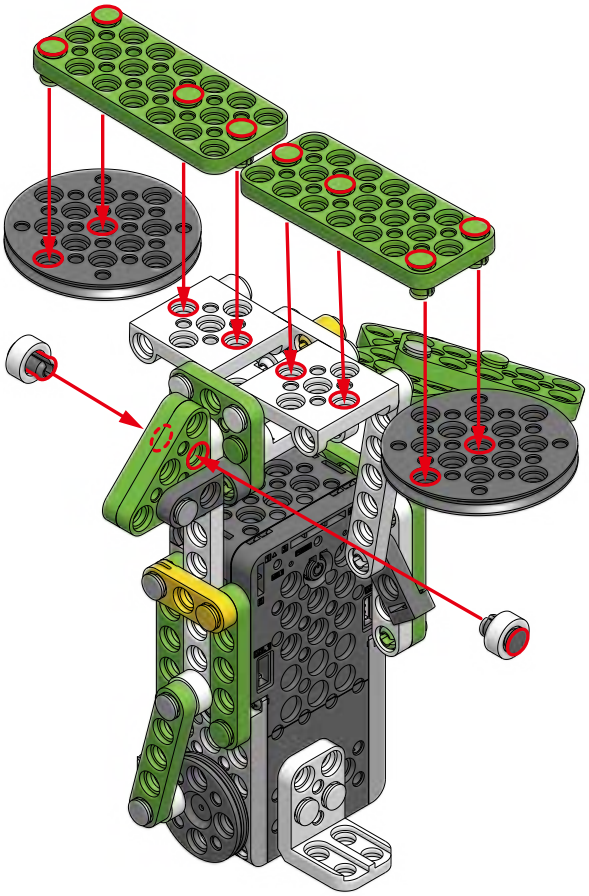




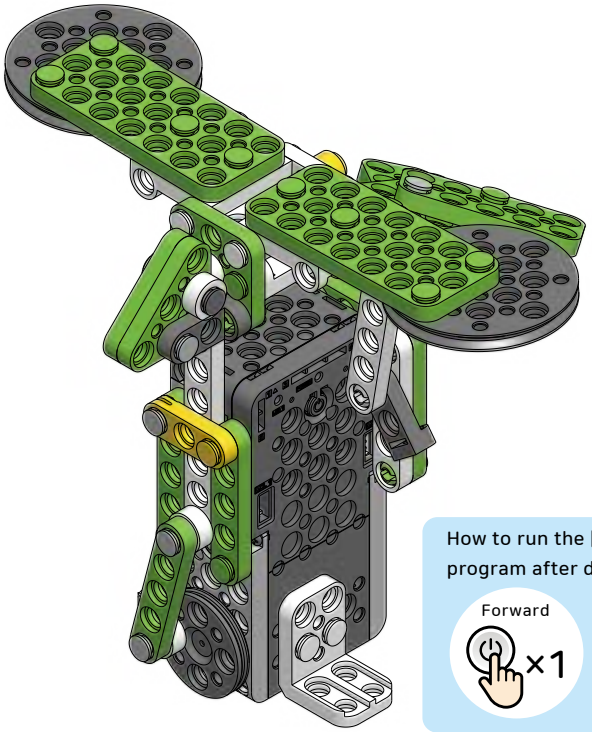
My Own Robot

Let's decorate the robot bird and upgrade its appearance.

8



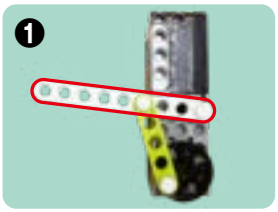
See Video



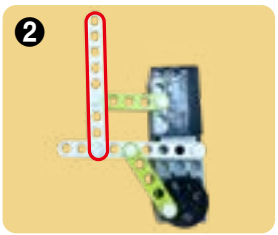
How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

Let's make a punching robot!

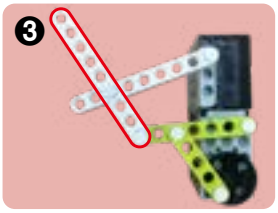
Convert the rotary motion into a punching motion.



Attach the plate to the controller and assemble as shown in ①. After pressing the start button once (Do sound), let's observe how the plate marked in red moves.



After connecting the plate as shown in ②, press the start button once (Do sound) to operate it.
Let's observe how the movement of the plate marked in red differs from that of ①.

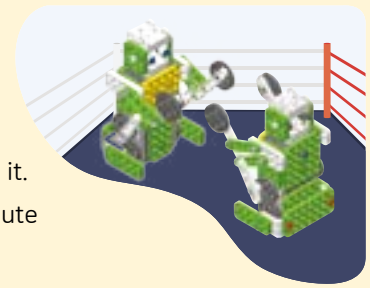


Now assemble as shown in ③ and operate the motion.
Let's observe how the movement of the plate marked in red differs from that of ②.

As shown in the different examples above, the movement changed depending on the number of plates used and the position of the rivet. Using the same method, the rotary motion can be converted into a punching motion.

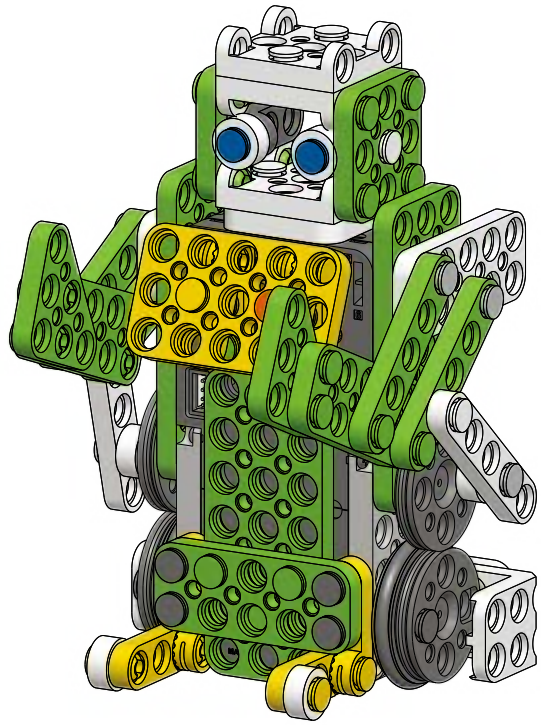
Let's play fun 'Robot Boxing' games using robot boxers.

How to Play

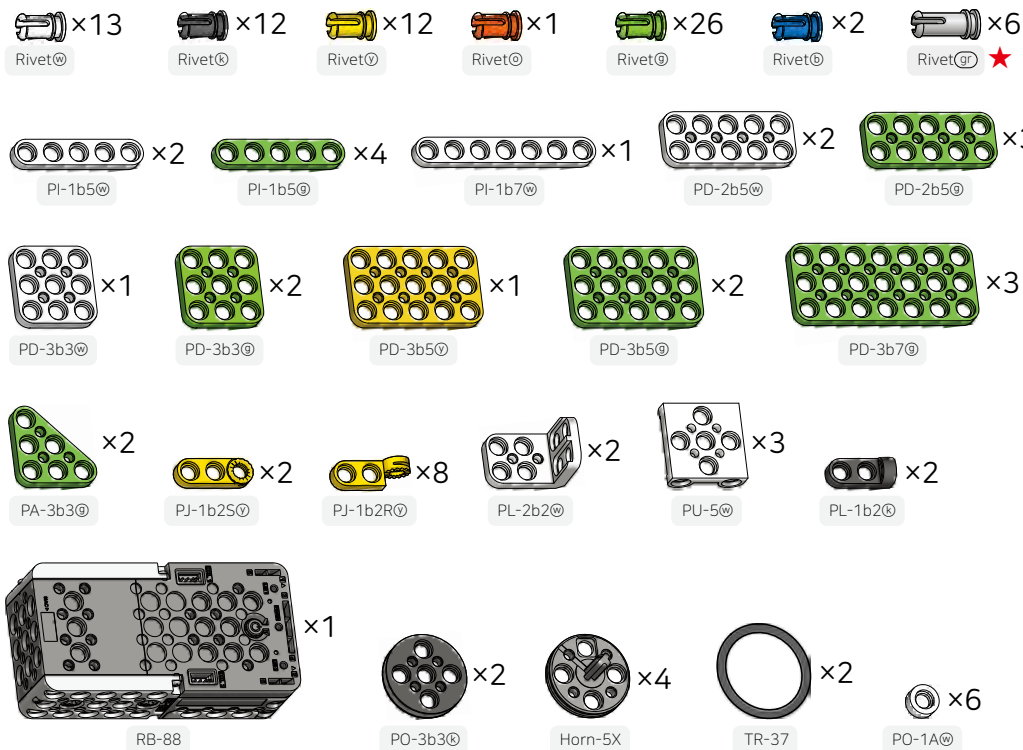


❶ Complete assembling the robot boxer.
❷ Create a boxing ring using the objects around you.
❸ Connect the boxer to your smartphone and control it.
❹ Control your robot in the arena during the one-minute 1:1 boxing match.
❺ The first one to knock down the opponent's robot wins the match.

Now let's make the stadium bigger and play a team boxing game. You can even create your weapon for the game.



Boxer


×13
Rivetⓦ
×12
Rivetⓚ
×12
Rivetⓨ
×1
Rivetⓞ
×26
Rivetⓖ
×2
Rivetⓑ
×6
Rivetⓖr
★
×2
Pl-1b5ⓦ
×4
Pl-1b5ⓖ
×1
Pl-1b7ⓦ
×2
PD-2b5ⓦ
×3
PD-2b5ⓖ
×1
PD-3b3ⓦ
×2
PD-3b3ⓖ
×1
PD-3b5ⓨ
×2
PD-3b5ⓖ
×3
PD-3b7ⓖ
×2
PA-3b3ⓖ
×2
PJ-1b2Sⓨ
×8
PJ-1b2Rⓨ
×2
PL-2b2ⓦ
×3
PU-5ⓦ
×2
PL-1b2ⓚ
×1
RB-88
×2
PO-3b3ⓚ
×4
Horn-5X
×2
TR-37
×6
PO-1Aⓦ

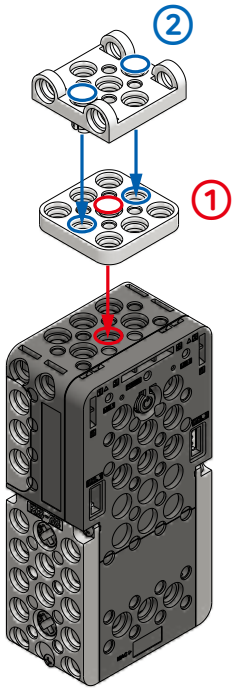
1

×3
Rivetⓦ

×1
PD-3b3ⓦ

×1
PU-5ⓦ

×1
RB-88



2

×2
Rivetⓑ

×4
Rivetⓦ

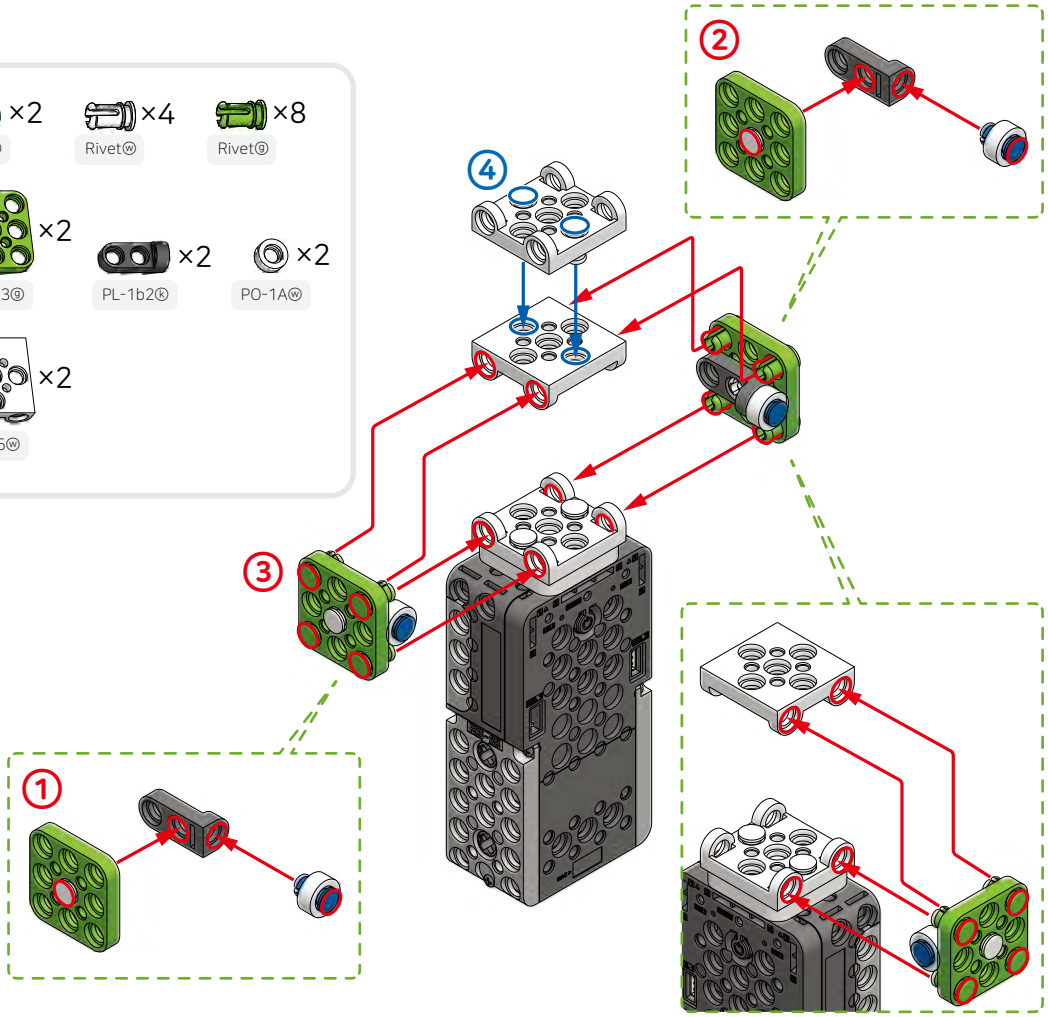
×8
Rivetⓖ

×2
PD-3b3ⓖ

×2
PL-1b2ⓚ

×2
PO-1Aⓦ

×2
PU-5ⓦ



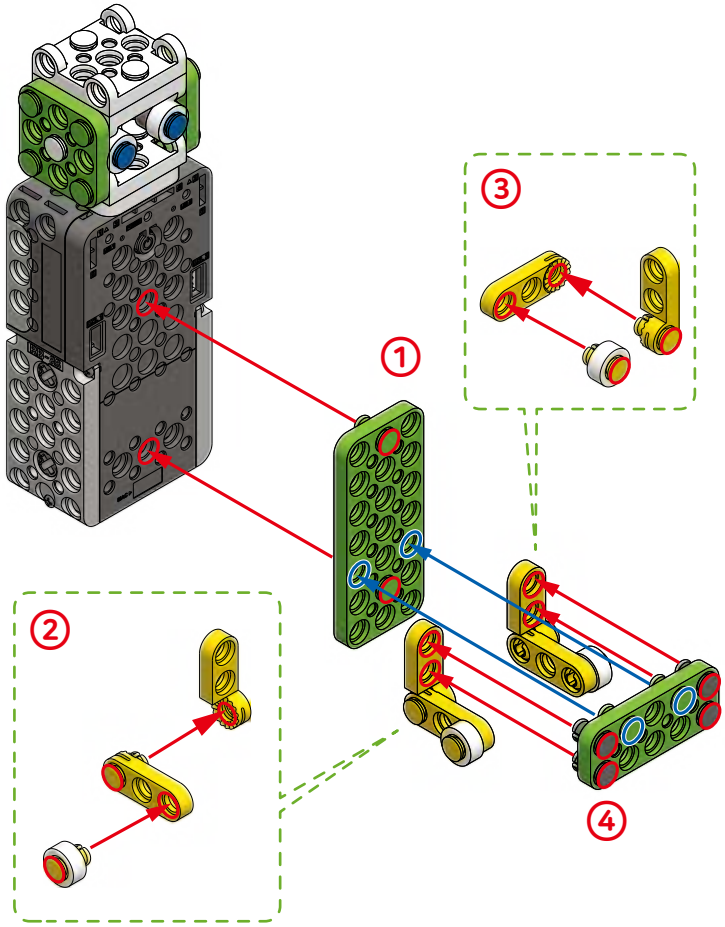
3

×4 Rivetⓚ ×4 Rivetⓨ ×4 Rivetⓖ

×1 PD-2b5ⓖ

×1 PD-3b7ⓖ ×2 PO-1Aⓦ

×2 PJ-1b2Sⓨ ×2 PJ-1b2Rⓨ

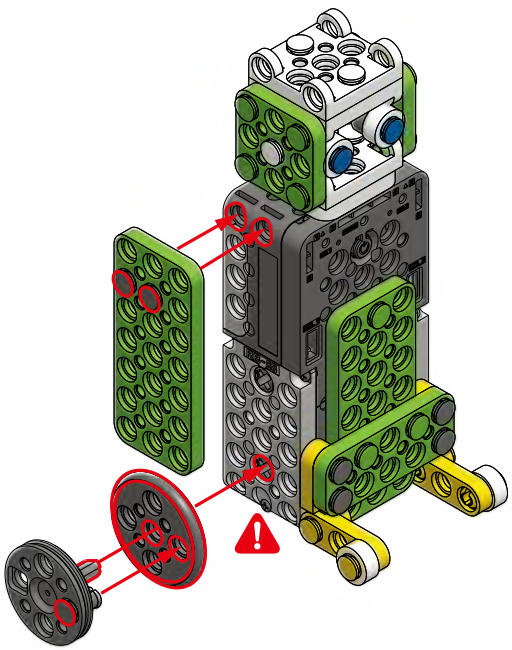


4

×3 Rivetⓚ

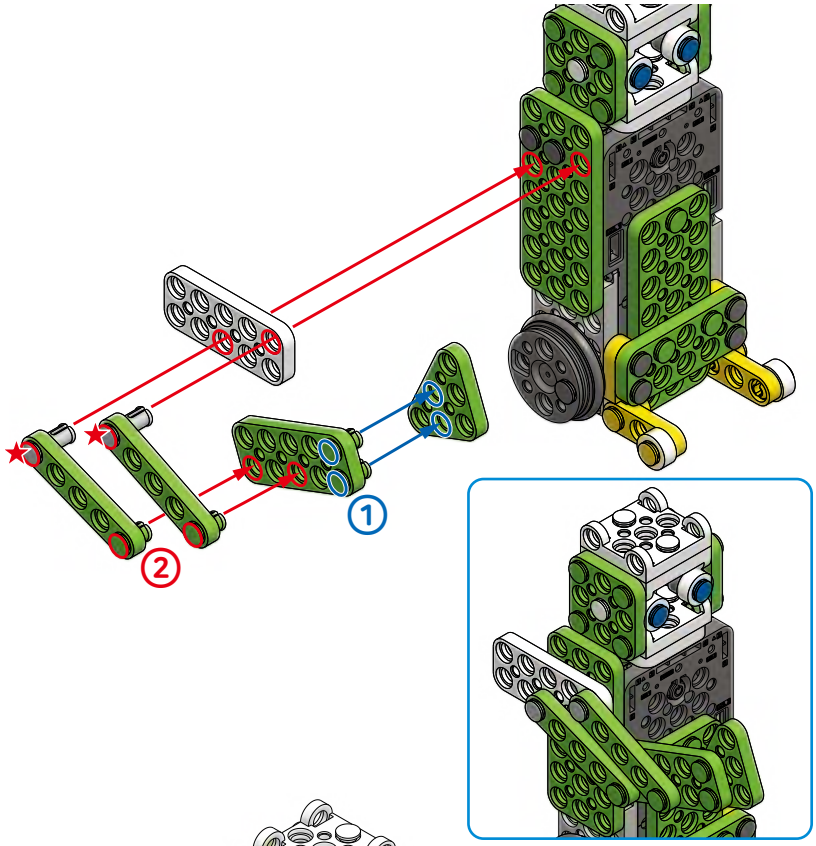
×1 PD-3b7ⓖ ×1 Horn-5X

×1 PO-3b3ⓚ ×1 TR-37



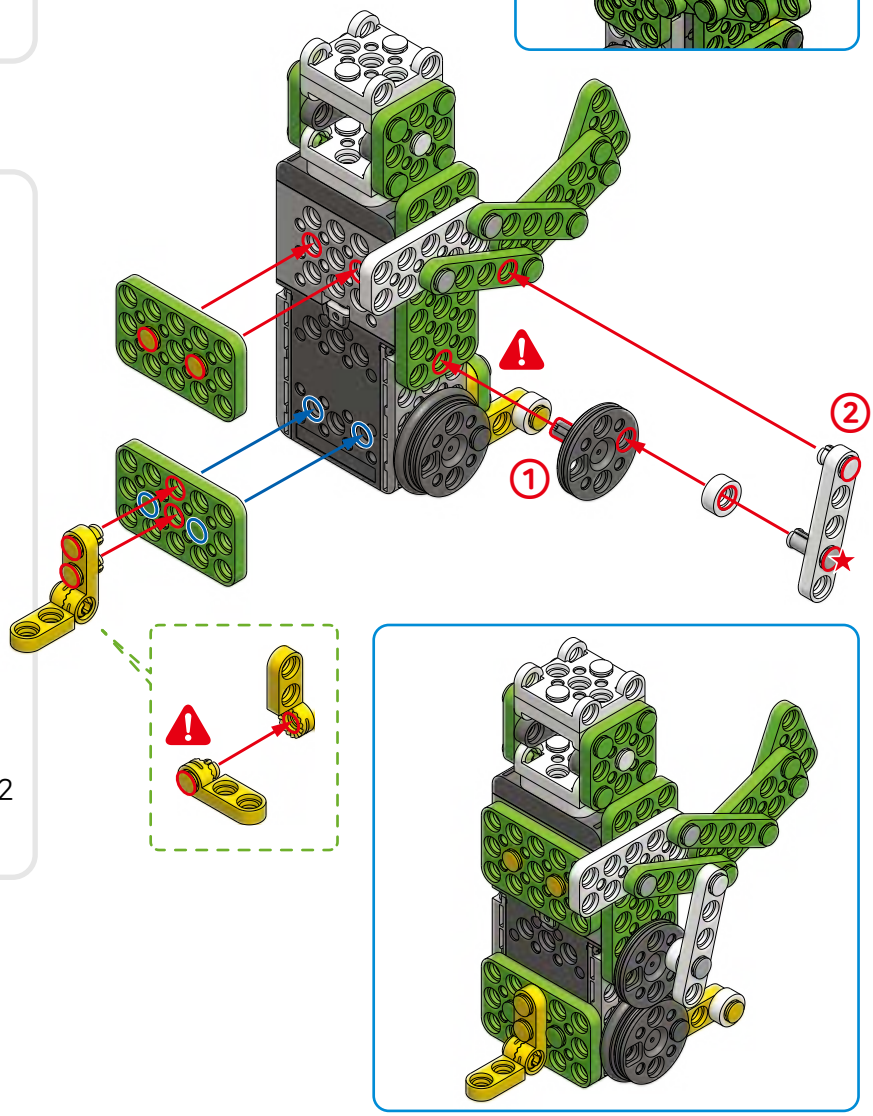
5

×4 Rivet ⓖ
×2 Rivet ⓖⓡ ★
×2 Pl-1b5 ⓖ
×1 PD-2b5 ⓦ
×1 PD-2b5 ⓖ
×1 PA-3b3 ⓖ



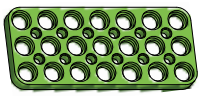
6

×1 Rivet ⓦ
×2 Rivet ⓖ
×5 Rivet ⓨ
×1 Rivet ⓖⓡ ★
×1 Pl-1b5 ⓦ
×2 PD-3b5 ⓖ
×1 Horn-5X
×1 PO-1A ⓦ
×2 PJ-1b2R ⓨ



7

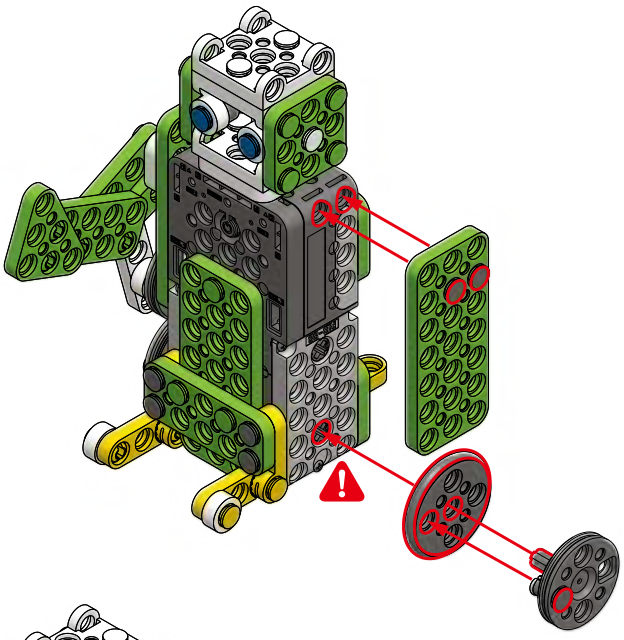
×3
Rivet ⓚ


×1
PD-3b7ⓖ


×1
Horn-5X


×1
PO-3b3ⓚ


×1
TR-37



8

×4
Rivet ⓖ

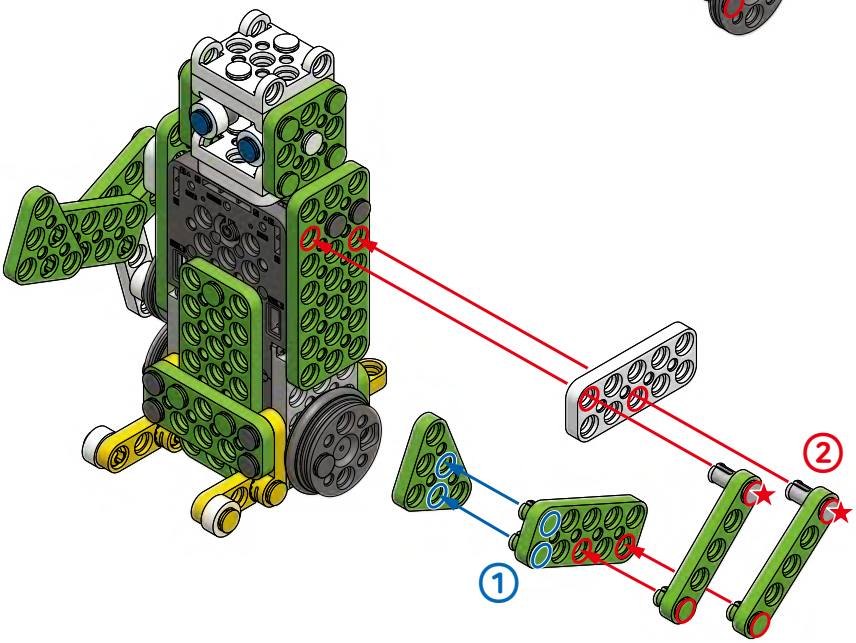
×2
Rivet ⓖr ★

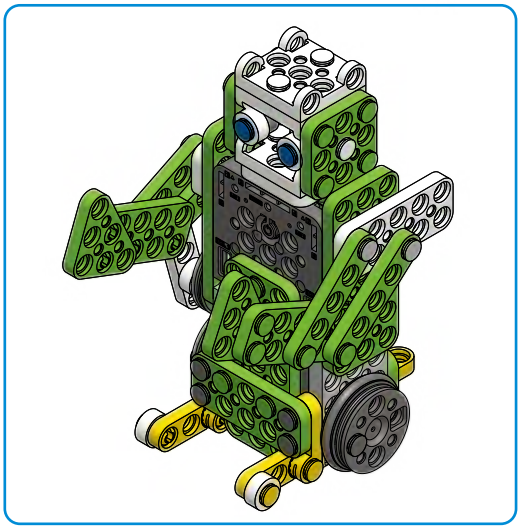

×2
Pl-1b5ⓖ


×1
PD-2b5ⓦ

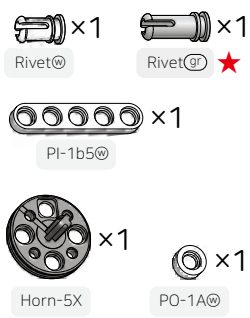

×1
PD-2b5ⓖ

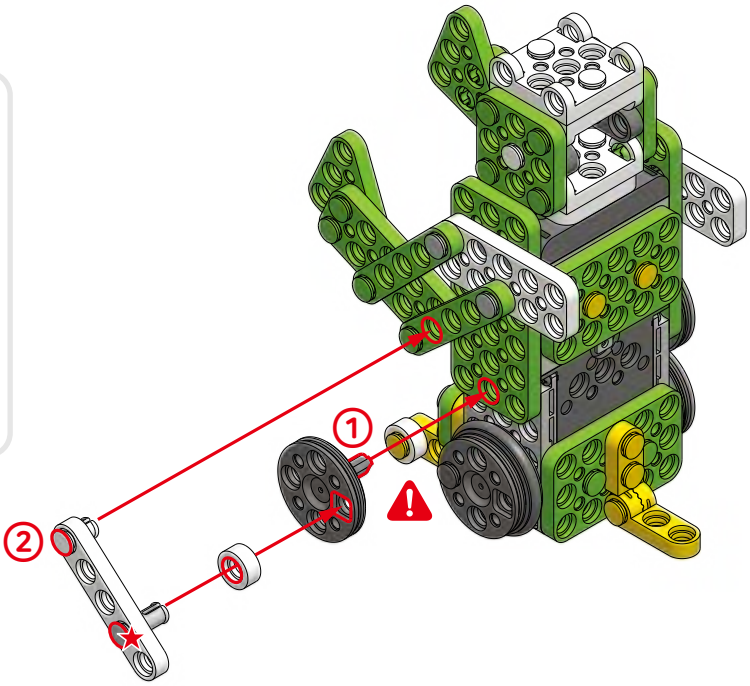

×1
PA-3b3ⓖ



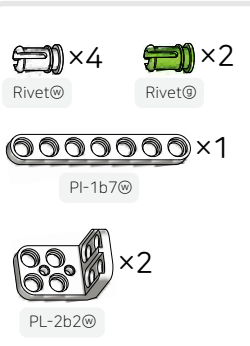


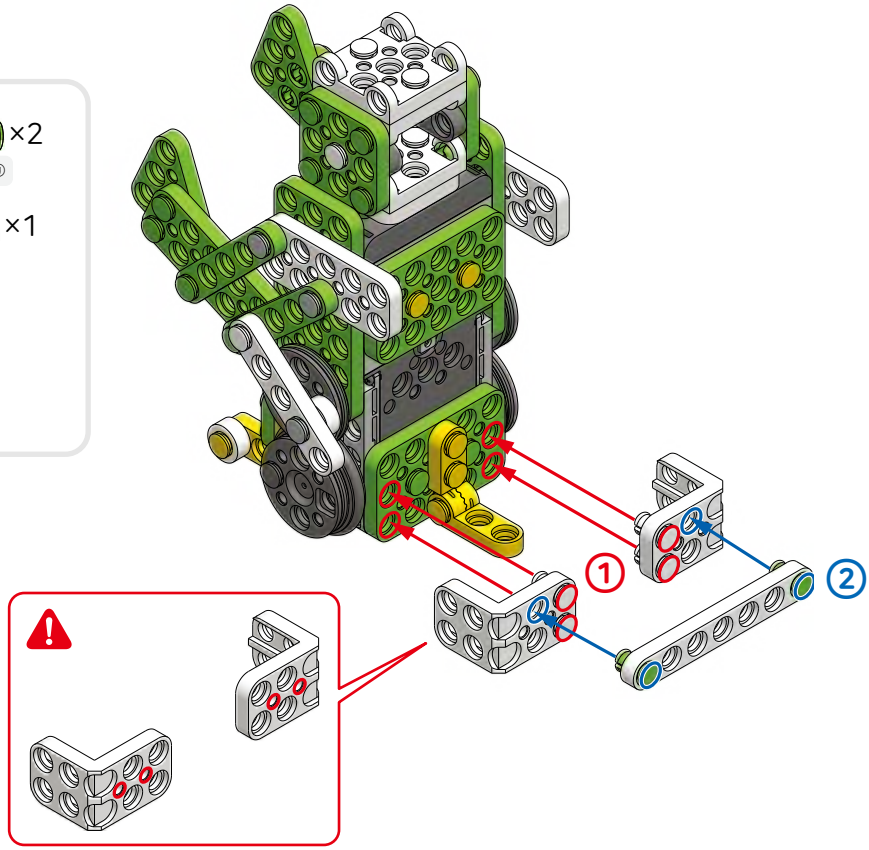
9


×1
Rivet
×1
Rivet
×1
Pl-1b5
×1
Horn-5X
×1
PO-1A


1
2

10

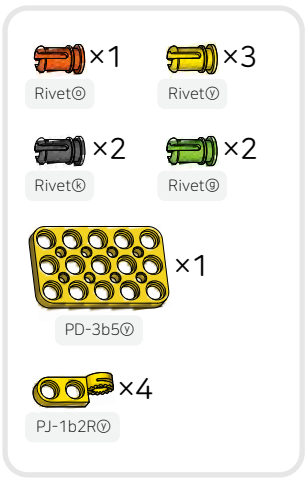

×4
Rivet
×2
Rivet
×1
Pl-1b7
×2
PL-2b2

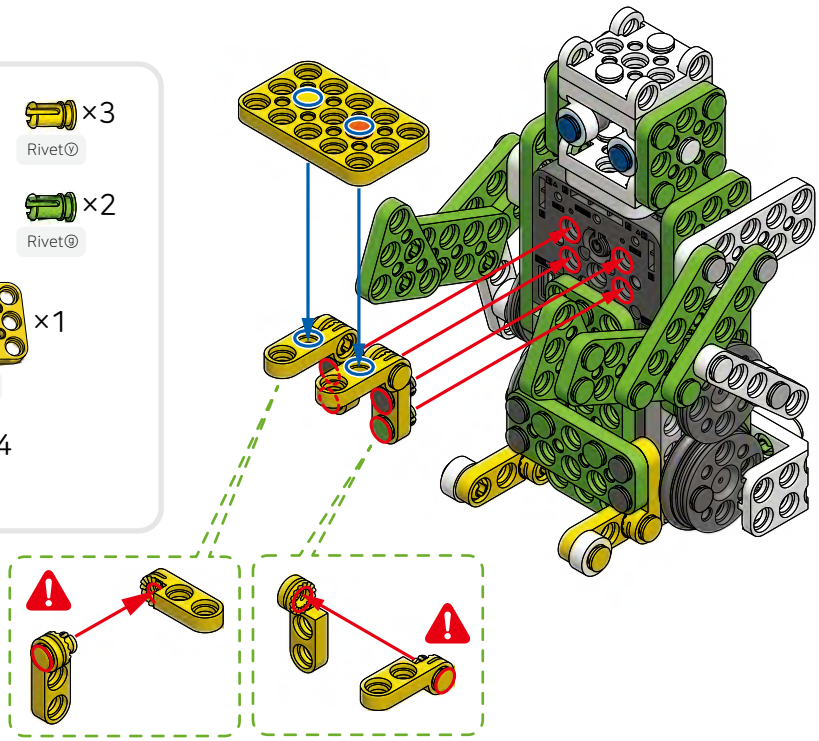

1
2

My Own Robot

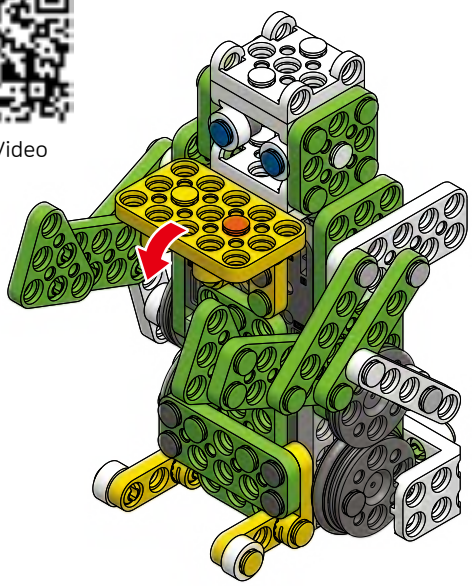
Let's personalize the robot boxer and change its appearance and arms.

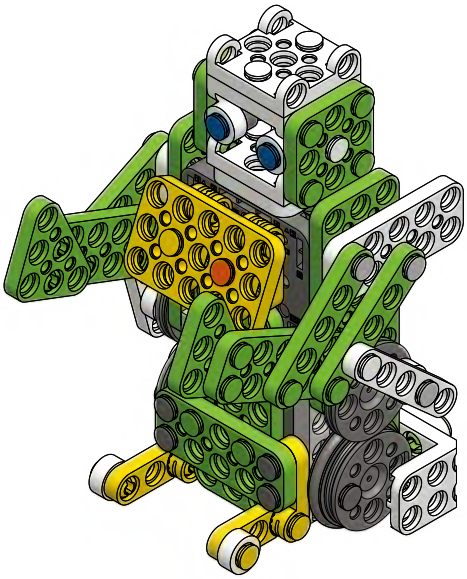
11



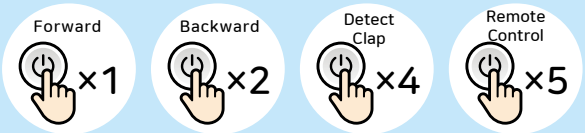


See Video





How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.



7 What is an Angle?

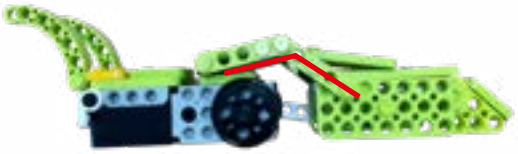
Let's learn about angles.

An angle is formed when two straight lines or surfaces intersect at a common endpoint. The angle formed by the intersection of a horizontal and a vertical line or surface is called a right angle and measures 90 degrees. In addition, the terms acute angle, flat angle, and obtuse angle are used depending on the degree to which two lines meet.

Right Angle is 90˚ Acute Angle is 45˚ Flat Angle is 180˚ Obtuse angle is 135˚

The larva robot widens and narrows the angles of the parts marked in red to wriggle and move, mimicking the motion of a larva.

When the angle narrows – the body becomes shorter

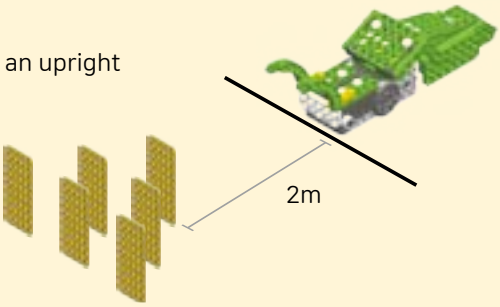


When the angle widens - the body becomes longer

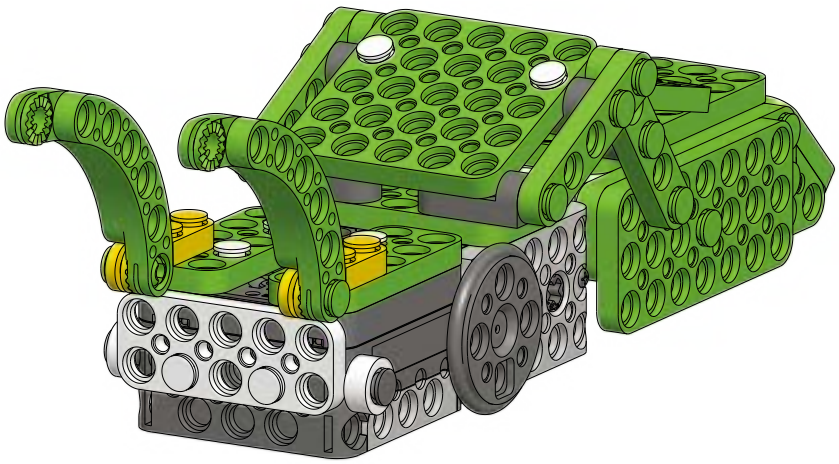
Let's play a fun 'Larva Bowling' game with the larva robot.

How to Play

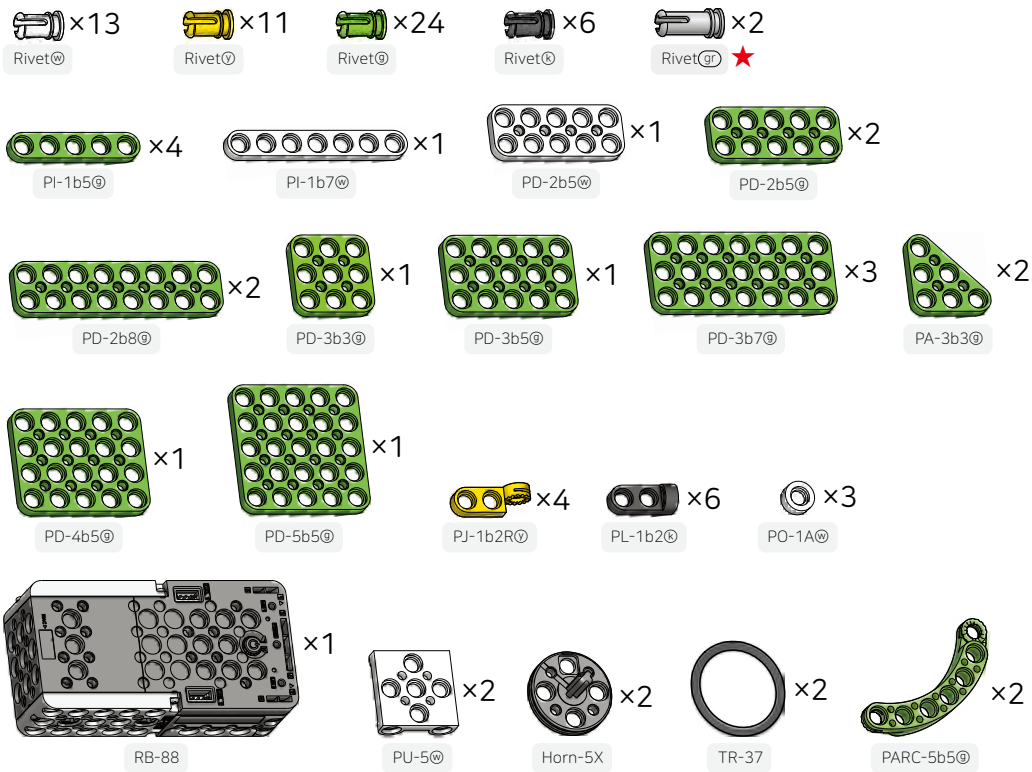
❶ Assemble the larva robot.
❷ Make a starting line and place 6 plates in an upright position about 2 meters away from the starting line.
❸ Place the robot on the starting line and press the start button once to start it.
❹ The robot that knocks down the most number of plates wins the game.



Now let's play a game where you control the robot to knock down the plates on your opponent's side. The robot that knocks down all of the opponent's plates first wins the game.



Larva


×13
Rivetⓦ
×11
Rivetⓨ
×24
Rivetⓖ
×6
Rivetⓚ
×2
Rivetⓖr ★
×4
Pl-1b5ⓖ
×1
Pl-1b7ⓦ
×1
PD-2b5ⓦ
×2
PD-2b5ⓖ
×2
PD-2b8ⓖ
×1
PD-3b3ⓖ
×1
PD-3b5ⓖ
×3
PD-3b7ⓖ
×2
PA-3b3ⓖ
×1
PD-4b5ⓖ
×1
PD-5b5ⓖ
×4
PJ-1b2Rⓨ
×6
PL-1b2ⓚ
×3
PO-1Aⓦ
×1
RB-88
×2
PU-5ⓦ
×2
Horn-5X
×2
TR-37
×2
PARC-5b5ⓖ

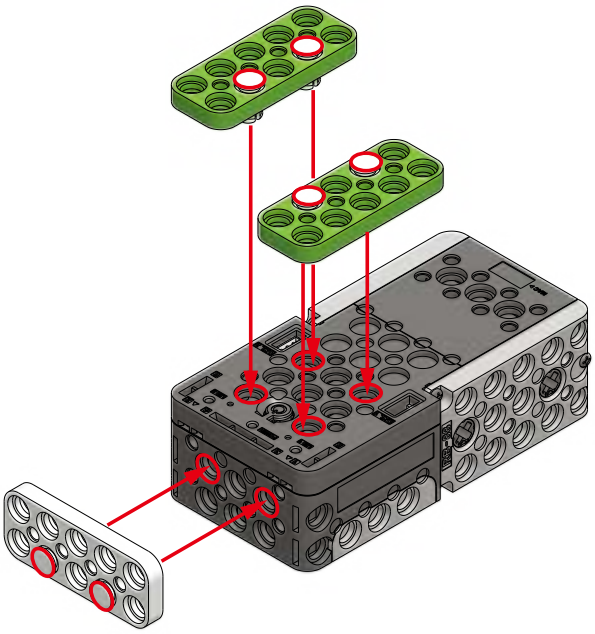
1

×6
Rivetⓦ

×1
PD-2b5ⓦ

×2
PD-2b5ⓖ

×1
RB-88



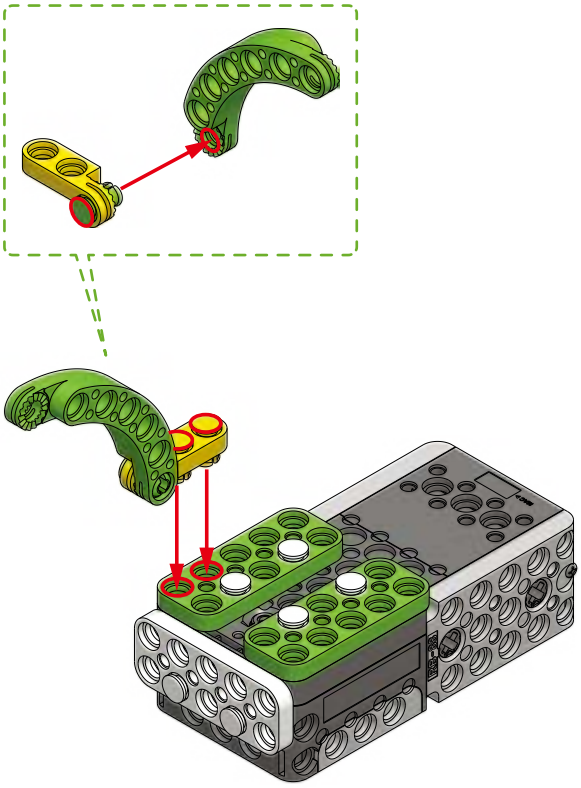
2

×2
Rivetⓨ

×1
Rivetⓖ

×1
PARC-5b5ⓖ

×1
PJ-1b2Rⓨ



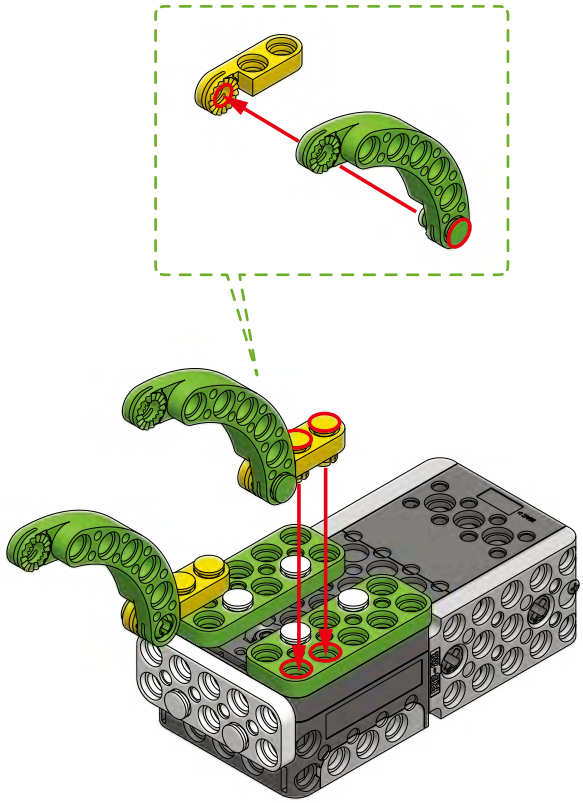
3

×2 Rivetⓨ

×1 Rivetⓖ

×1 PARC-5b5ⓖ

×1 PJ-1b2Rⓨ



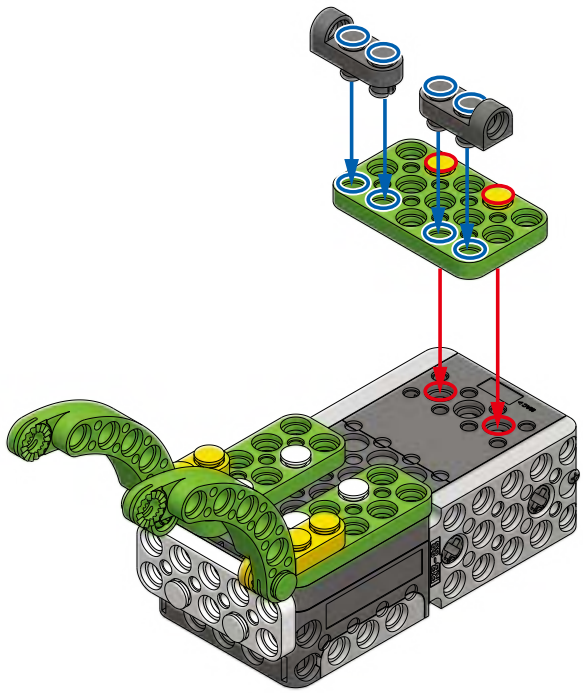
4

×2 Rivetⓨ

×4 Rivetⓚ

×1 PD-3b5ⓖ

×2 PL-1b2ⓚ



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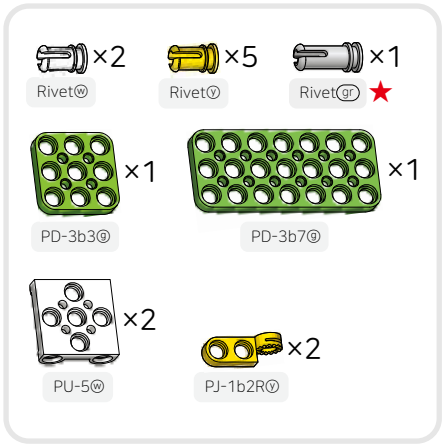
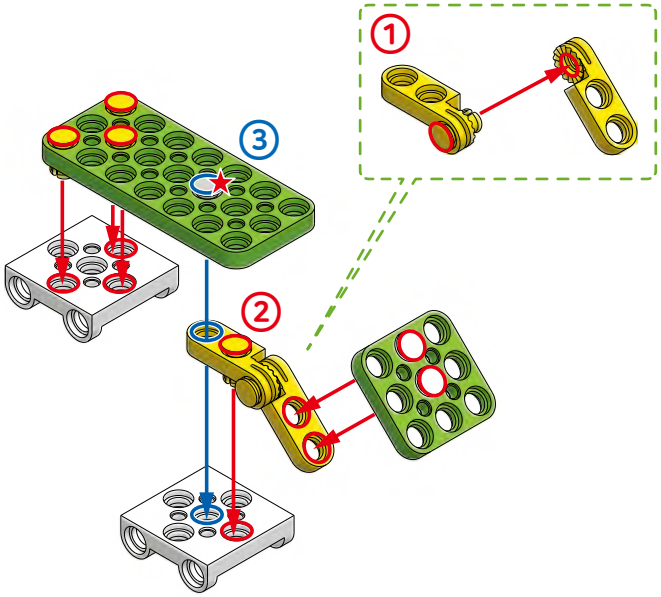
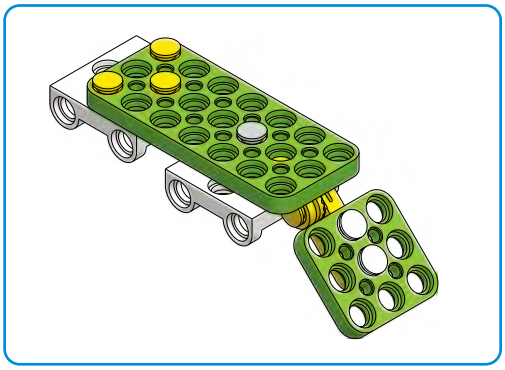
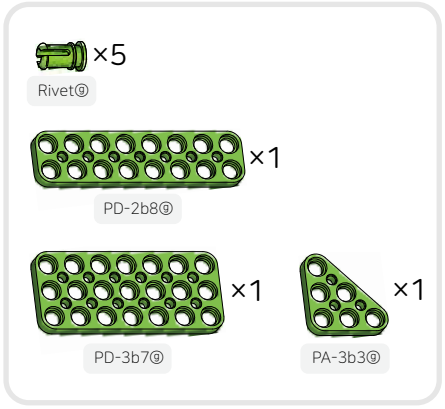
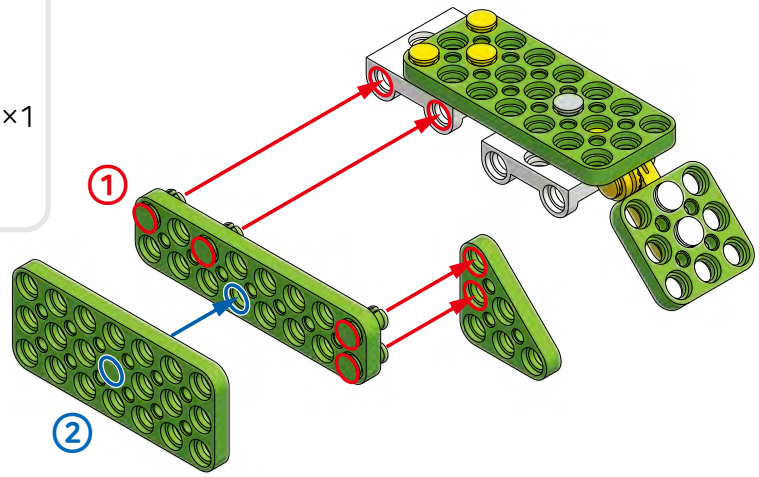

×2
Rivetⓦ
×5
Rivetⓨ
×1
Rivetⓖr
×1
PD-3b3ⓖ
×1
PD-3b7ⓖ
×2
PU-5ⓦ
×2
PJ-1b2RⓎ


1
3
2

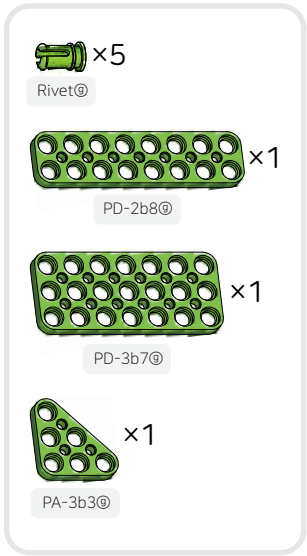


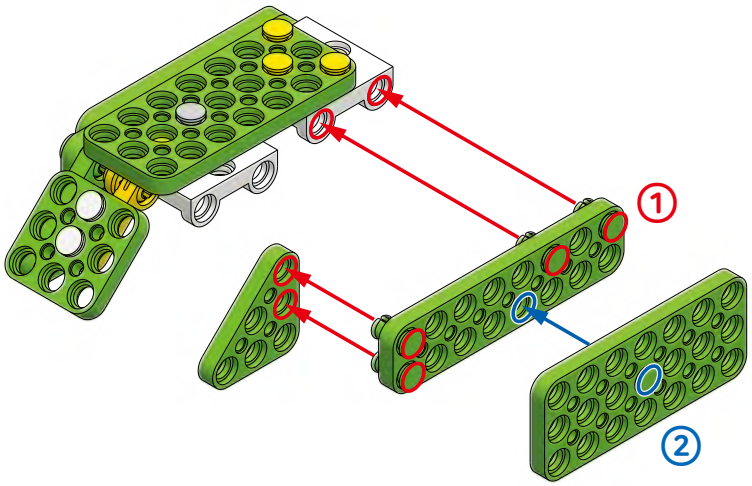
6


×5
Rivetⓖ
×1
PD-2b8ⓖ
×1
PD-3b7ⓖ
×1
PA-3b3ⓖ

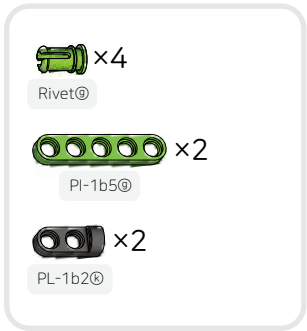

1
2

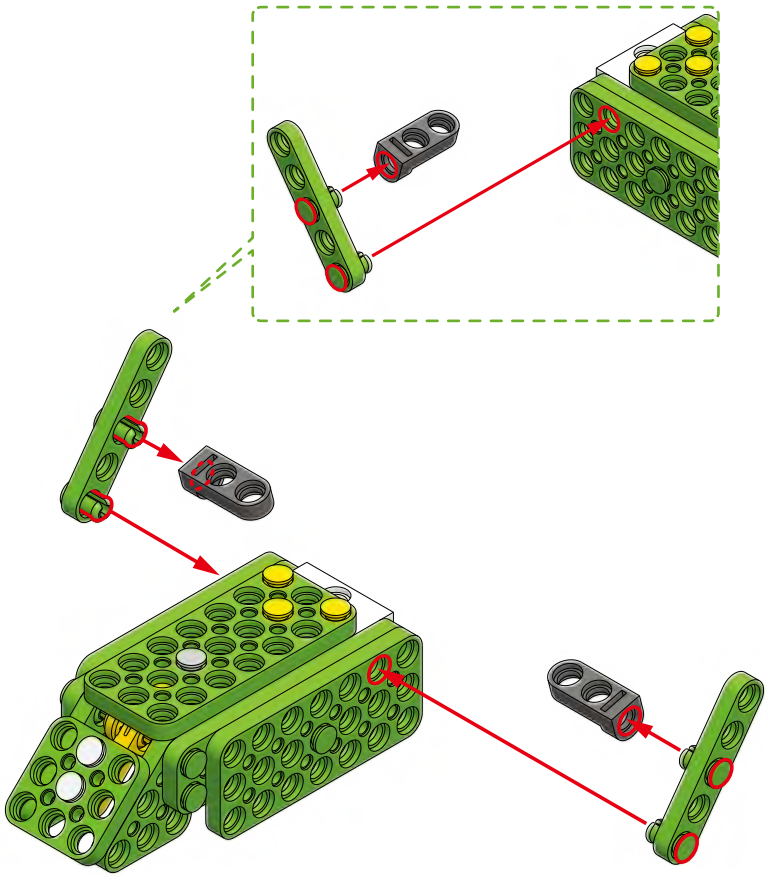
7





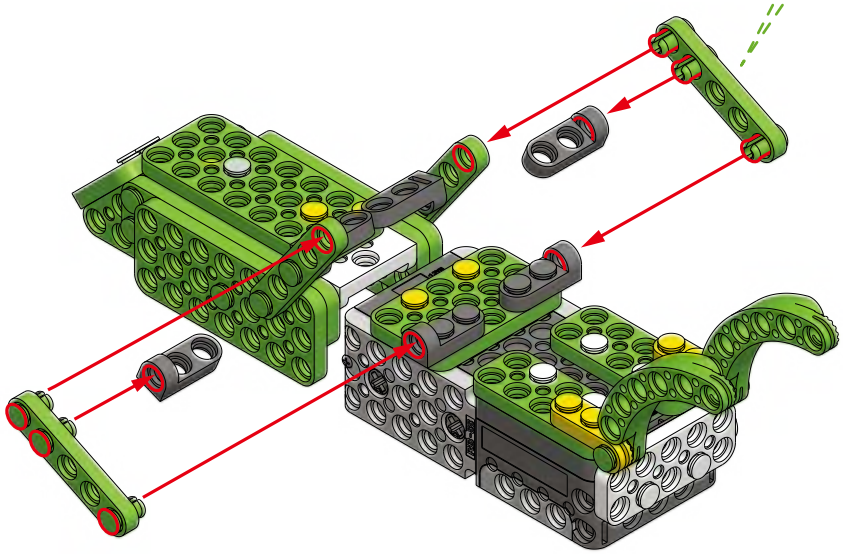
8



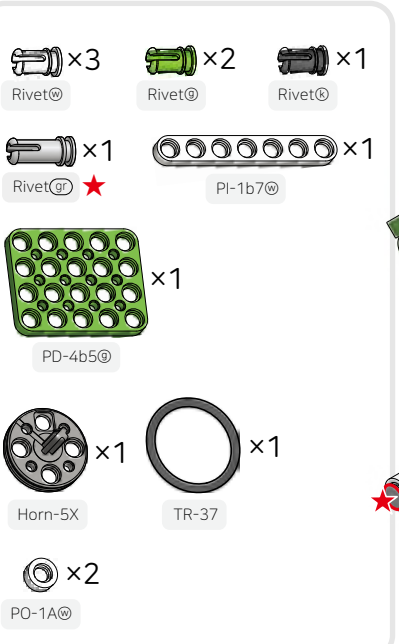


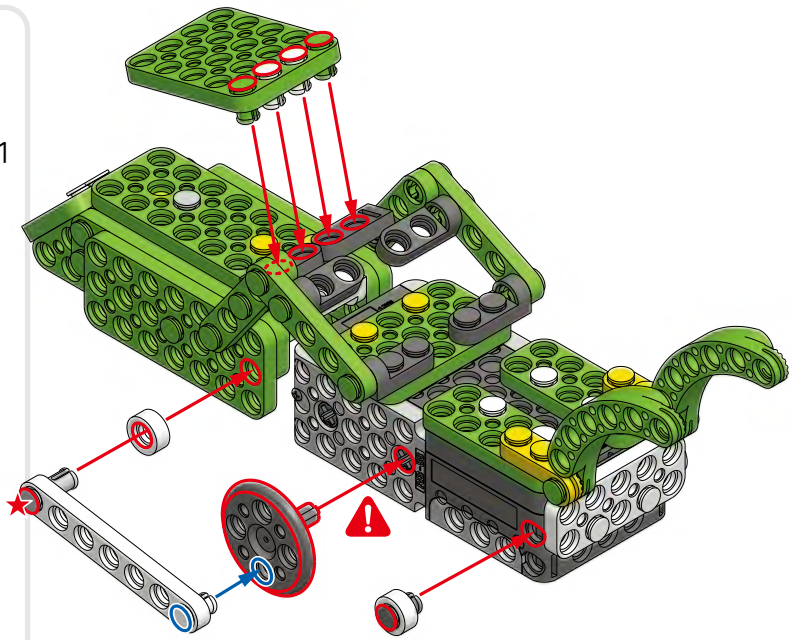
9


×6
Rivet
×2
PL-1b2
×2
Pl-1b5



10

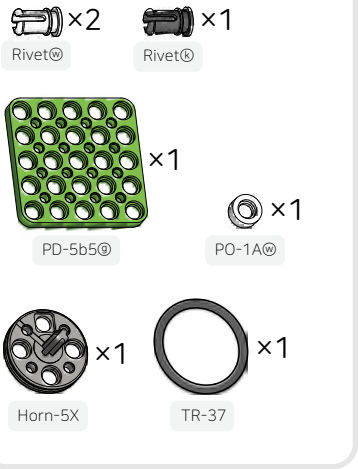

×3
Rivet
×2
Rivet
×1
Rivet
×1
Rivet
×1
Pl-1b7
×1
PD-4b5
×1
Horn-5X
×1
TR-37
×2
PO-1A

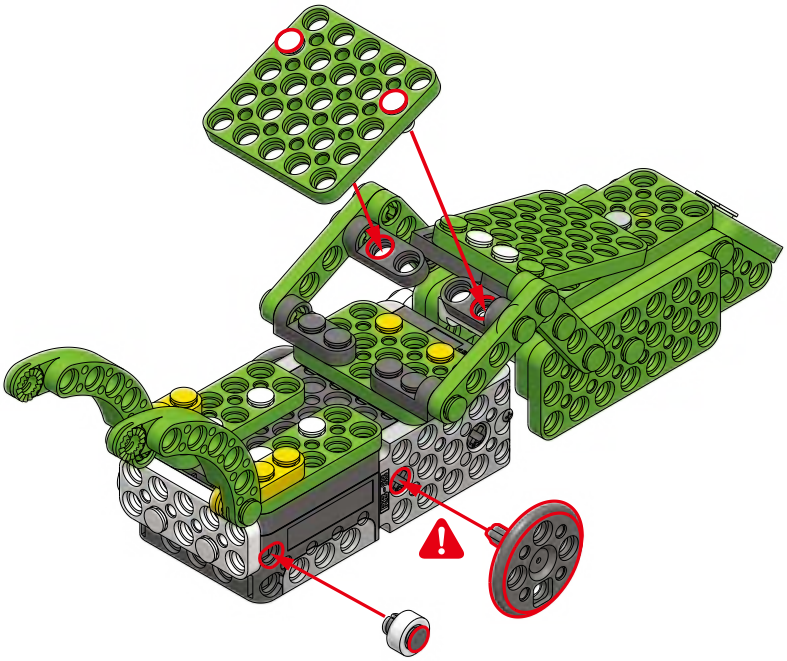


My Own Robot

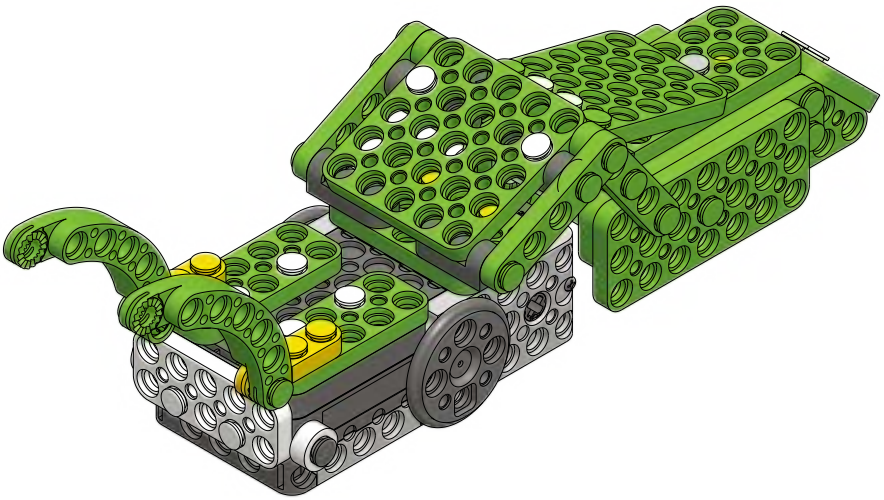
Let's decorate the larva robot and change its appearance.

11

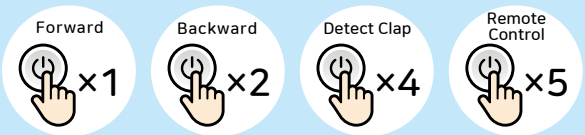




See Video



How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.



8 Let's build an energetic and lively robot!

What does an energetic and lively robot look like? Imagine what it would look like and draw it below.

The robot I will make today…

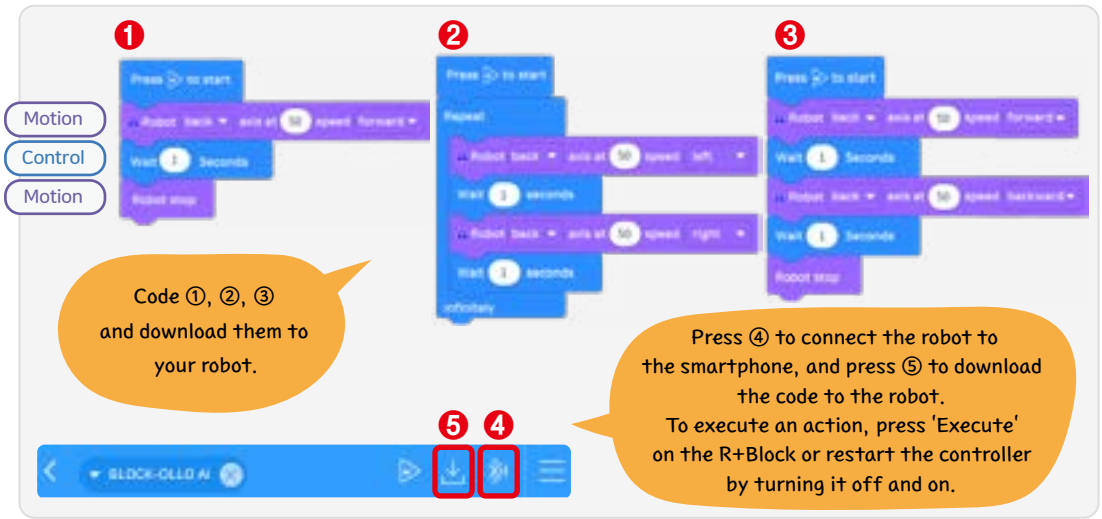
Example) will be very powerful.

Feel free to transform your robot to match your ideas written above.

Let's operate the bull robot by coding with R+Block.

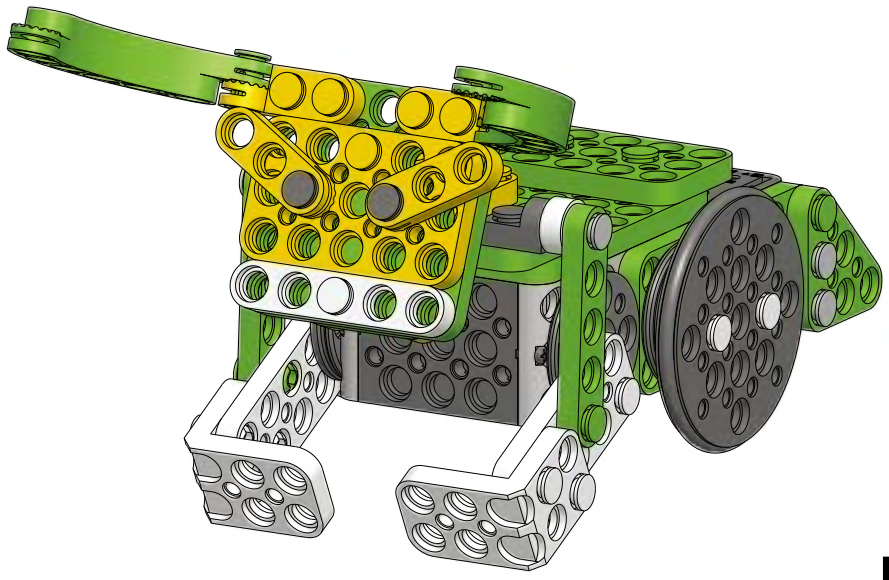
※ Please refer to 'Coding with R+Block' on page 4 for instructions on how to run R+Block.

Select and execute 'OLLO' in R+Block, then write the code below.
Command blocks, such as control, detect, and execute, are placed on the left.



If you download the code after writing it in R+Block, the basic programs stored in the robot will be erased. After coding, please download [OLLO Spark_For All Examples] from R+Block to the robot once again.

Let's make an arena and play a 'Match Game' by controlling your robot to push the opponent's robot out of the ring.



Bull


×11
Rivetⓦ


×12
Rivetⓨ


×21
Rivetⓖ


×8
Rivetⓚ


×8
Rivetⓖⓡ ★

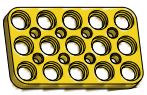

×1
Pl-1b5ⓦ

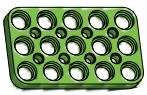

×3
Pl-1b5ⓖ

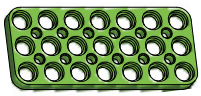

×2
PD-2b5ⓦ

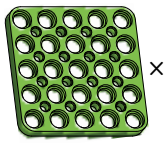

×2
PA-3b3ⓖ


×1
PD-3b3ⓖ

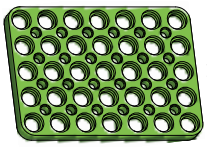

×1
PD-3b5ⓨ


×2
PD-3b5ⓖ


×2
PD-3b7ⓖ


×1
PD-5b5ⓖ


×2
PARC-5b5ⓖ


×1
PD-5b7ⓖ

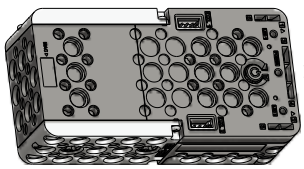

×2
PO-5b5ⓚ


×2
TR-62


×4
Horn-5X


×2
PO-3b3ⓚ


×2
PO-1Aⓦ


×1
RB-88

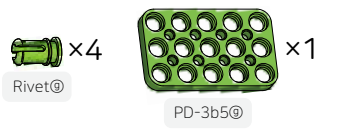

×2
PL-1b2ⓚ


×8
PJ-1b2Rⓨ

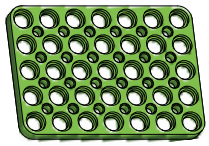

×2
PJ-1b2Sⓨ


×2
PL-2b2ⓦ

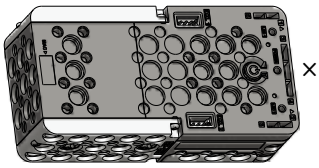
1



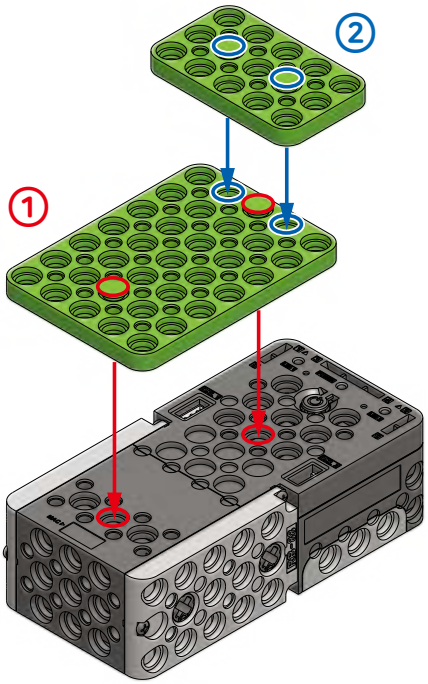
Rivet⑨ PD-3b5⑨



PD-5b7⑨



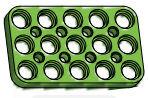
RB-88



2

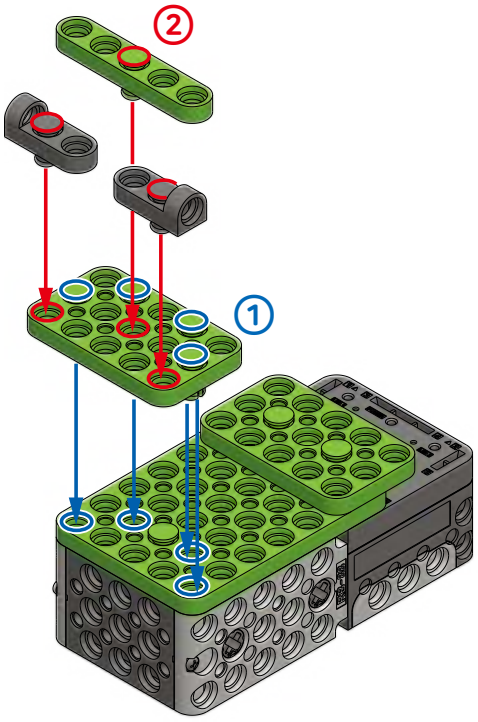
Rivet⑨ Rivet⑥

Pl-1b5⑨



PD-3b5⑨

PL-1b2⑥

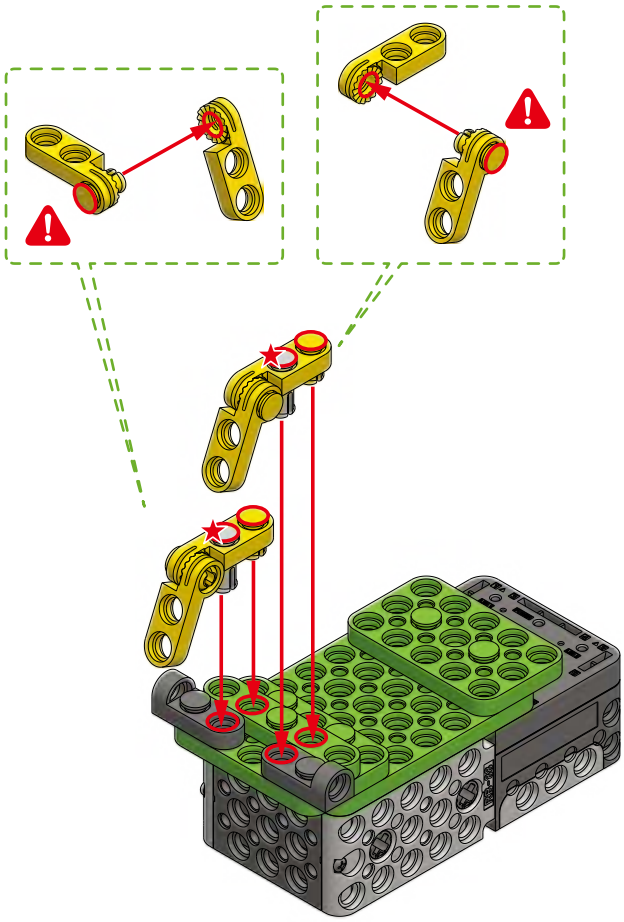


3

×4 Rivetⓨ

×2 Rivetgr ★

×4 PJ-1b2Rⓨ



4

×1 Rivetⓦ

×1 Rivetⓨ

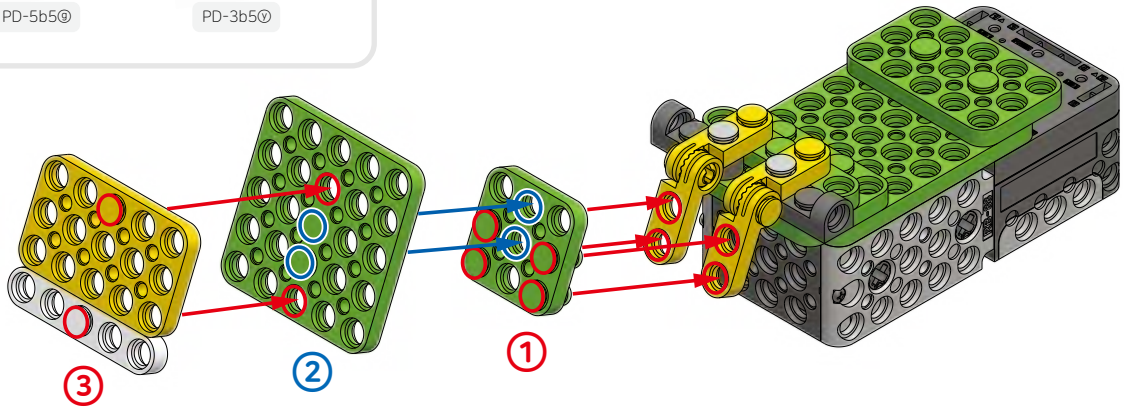
×6 Rivetⓖ

×1 Pl-1b5ⓦ

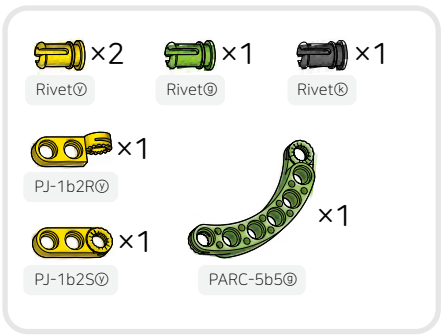
×1 PD-3b3ⓖ

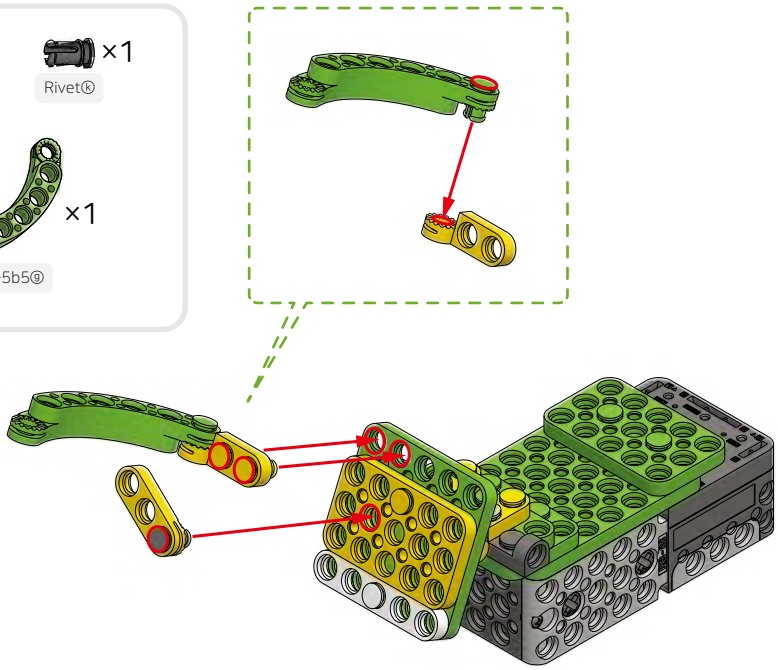
×1 PD-5b5ⓖ

×1 PD-3b5ⓨ



5


×2
Rivetⓨ
×1
Rivetⓖ
×1
Rivetⓚ
×1
PJ-1b2Rⓨ
×1
PJ-1b2Sⓨ
×1
PARC-5b5ⓖ



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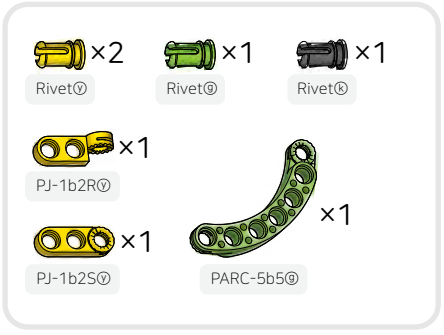
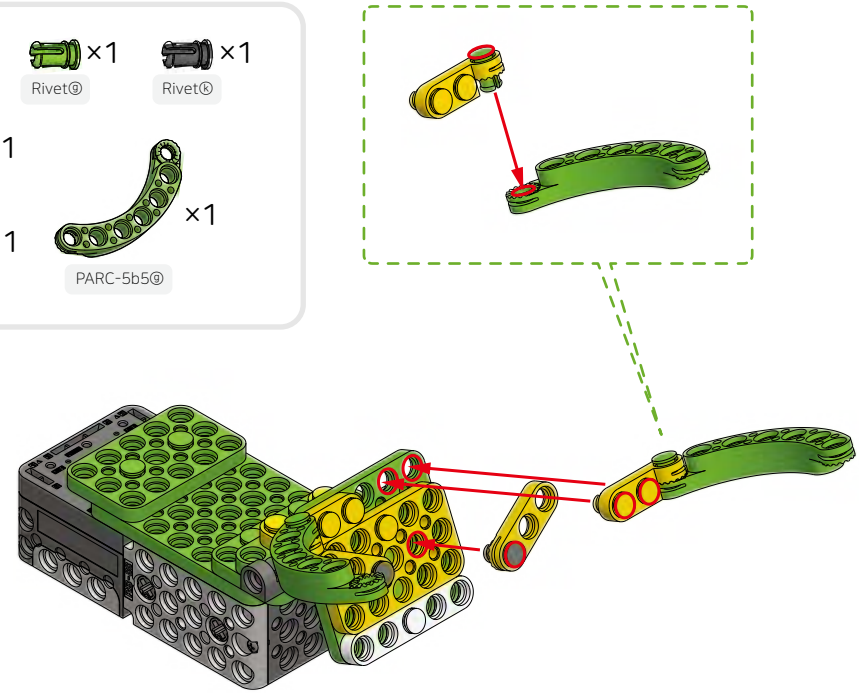

×2
Rivetⓨ
×1
Rivetⓖ
×1
Rivetⓚ
×1
PJ-1b2Rⓨ
×1
PJ-1b2Sⓨ
×1
PARC-5b5ⓖ

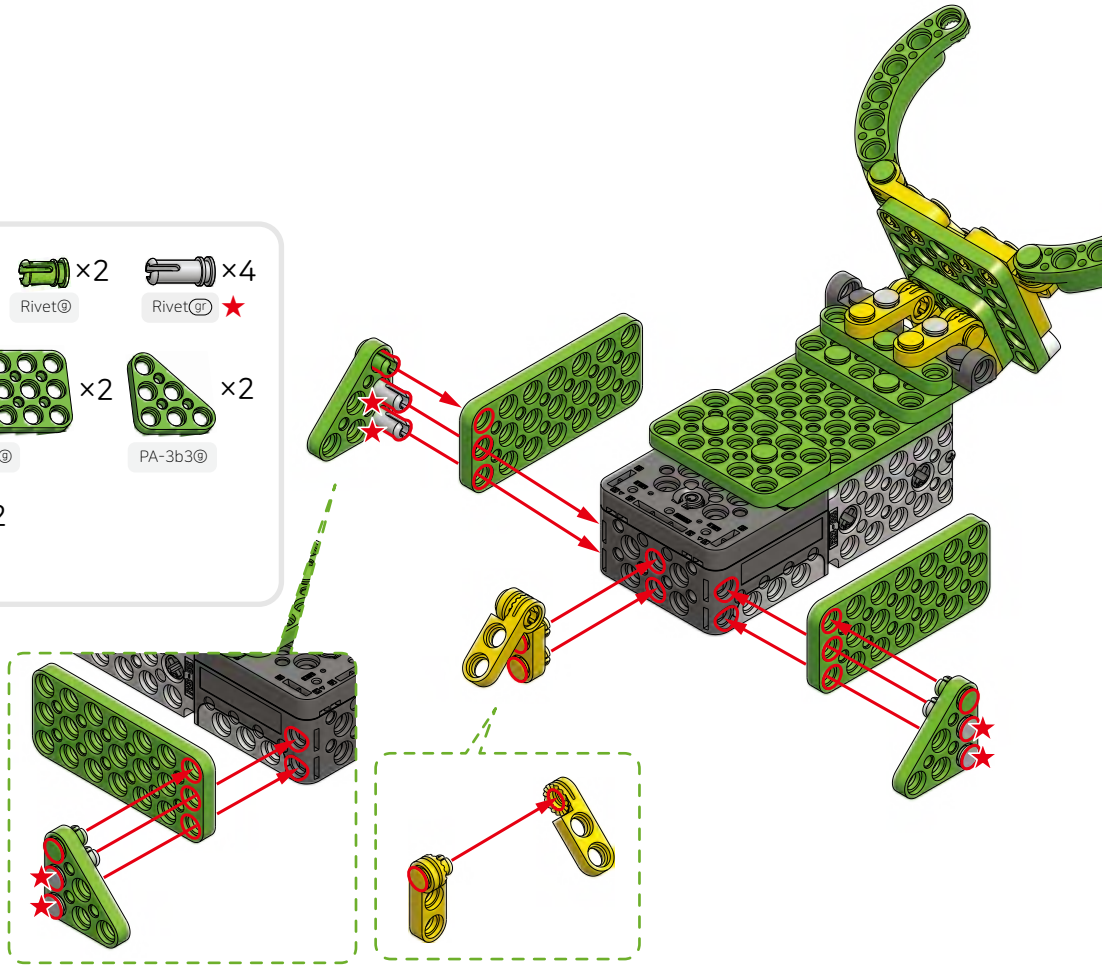


7

×3 Rivet Ⓨ ×2 Rivet Ⓖ ×4 Rivet Ⓖr ★

×2 PD-3b7Ⓖ ×2 PA-3b3Ⓖ

×2 PJ-1b2RⓎ



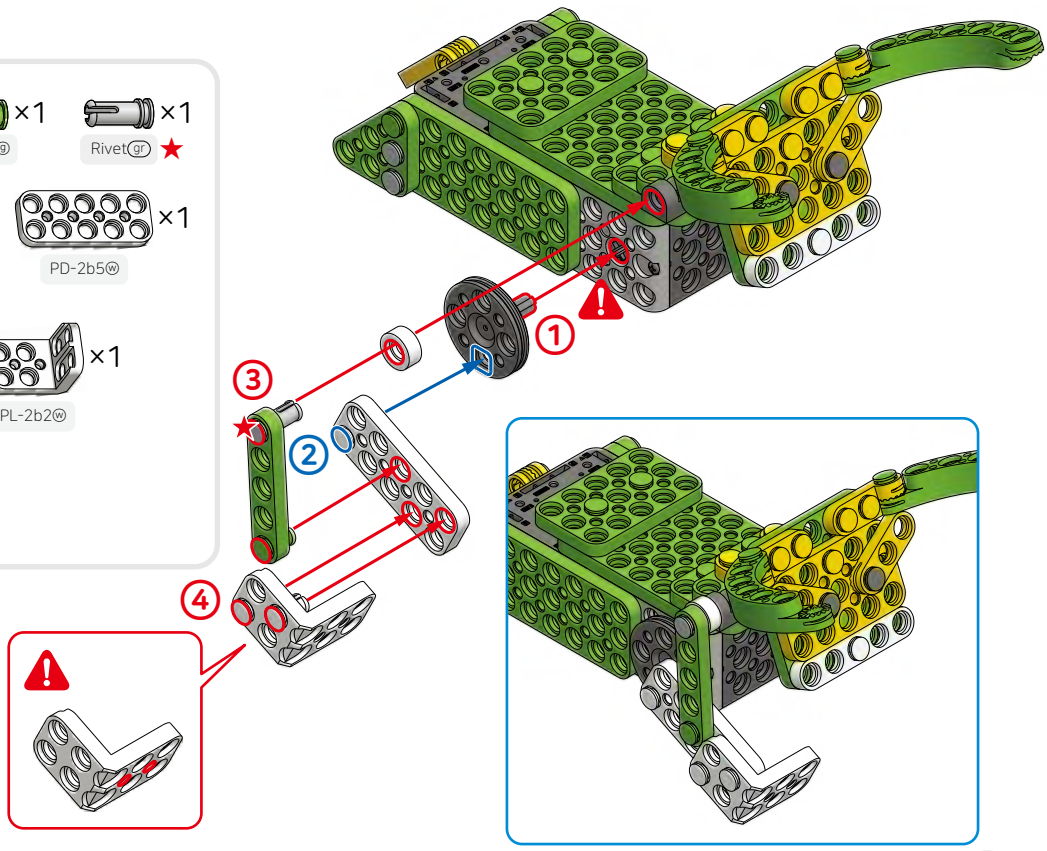
8

×3 Rivet Ⓦ ×1 Rivet Ⓖ ×1 Rivet Ⓖr ★

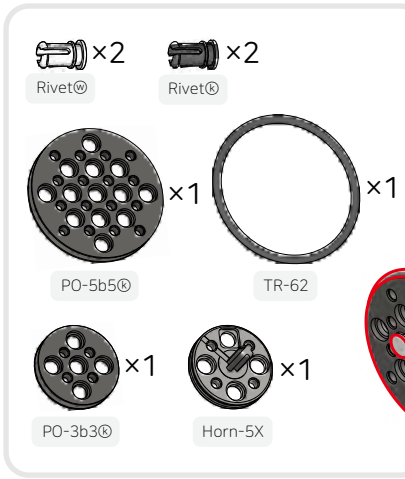
×1 Pl-1b5Ⓖ ×1 PD-2b5Ⓦ

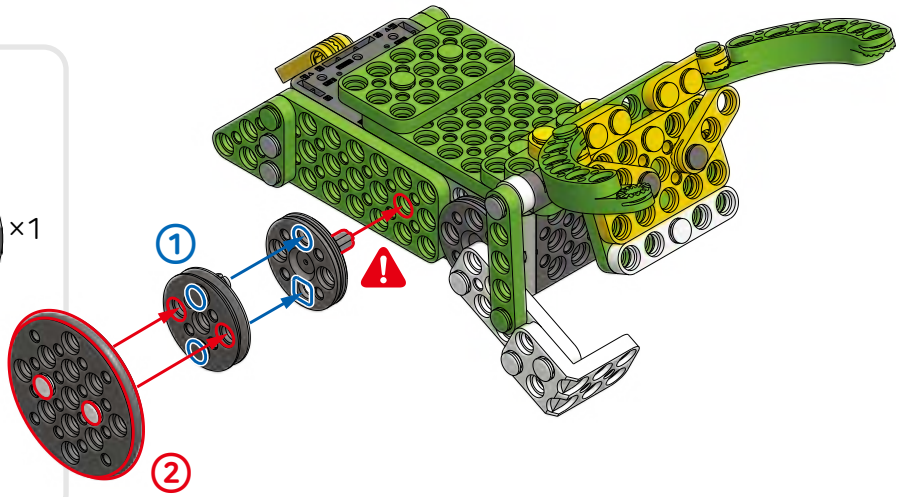
×1 Horn-5X ×1 PL-2b2Ⓦ

×1 PO-1AⓌ

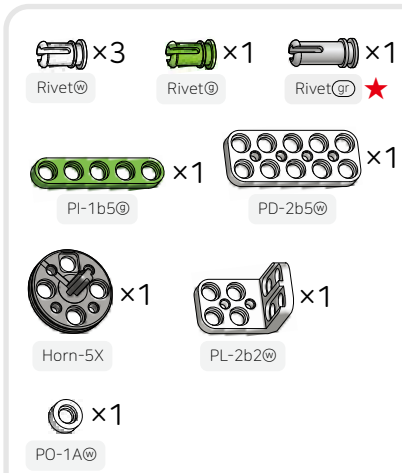


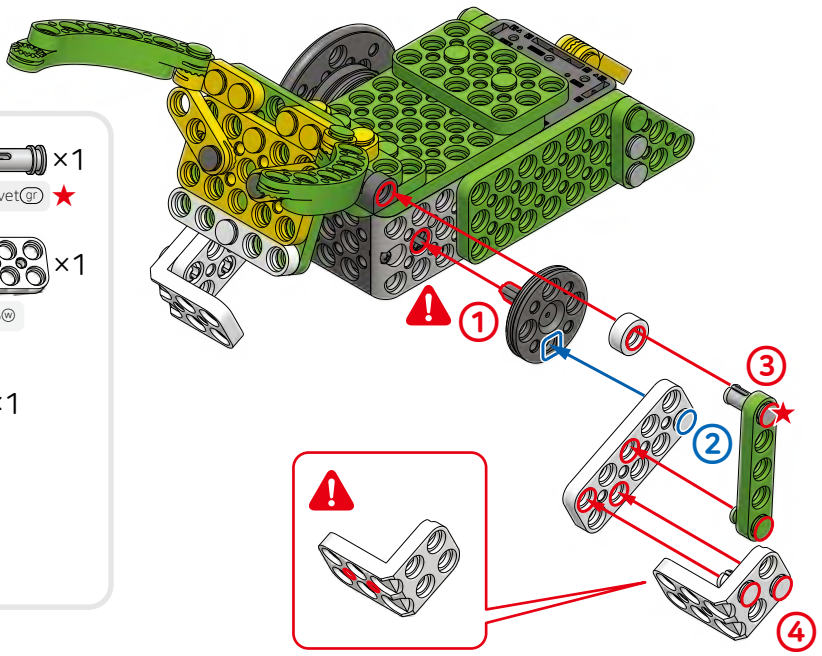
9

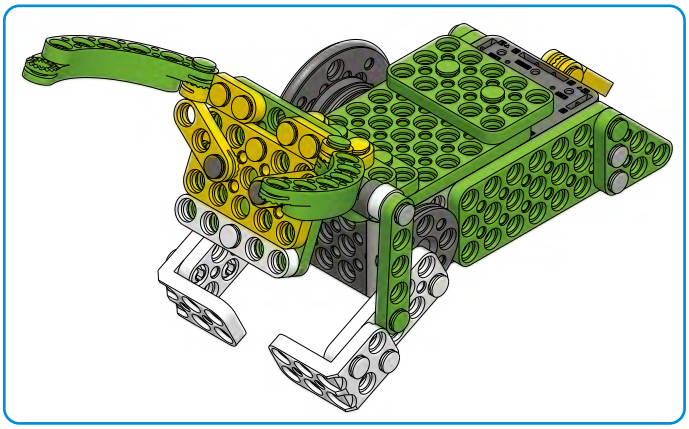

×2
Rivetⓦ
×2
Rivetⓚ
×1
PO-5b5ⓚ
×1
TR-62
×1
PO-3b3ⓚ
×1
Horn-5X


1
2

10


×3
Rivetⓦ
×1
Rivetⓖ
×1
Rivetⓖr
×1
Pl-1b5ⓖ
×1
PD-2b5ⓦ
×1
Horn-5X
×1
PL-2b2ⓦ
×1
PO-1Aⓦ

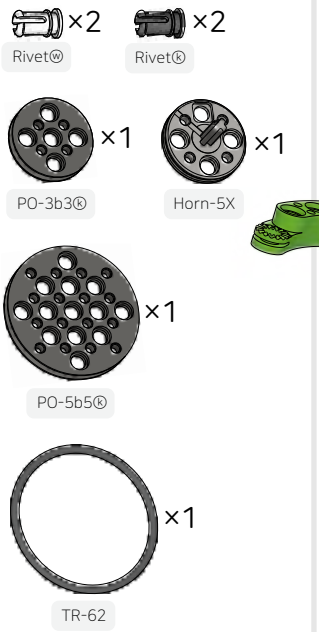

1
2
3
4

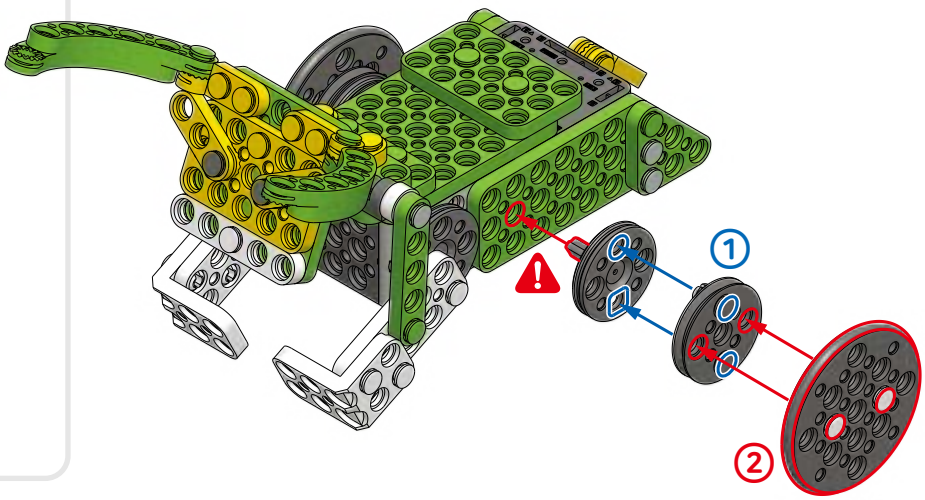


My Own Robot

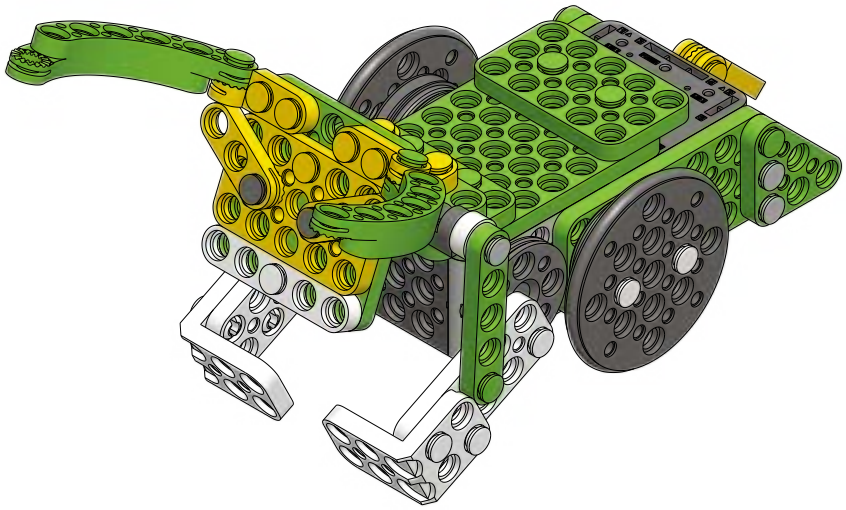
Personalize your robot by changing its shape and horns.

11





See Video



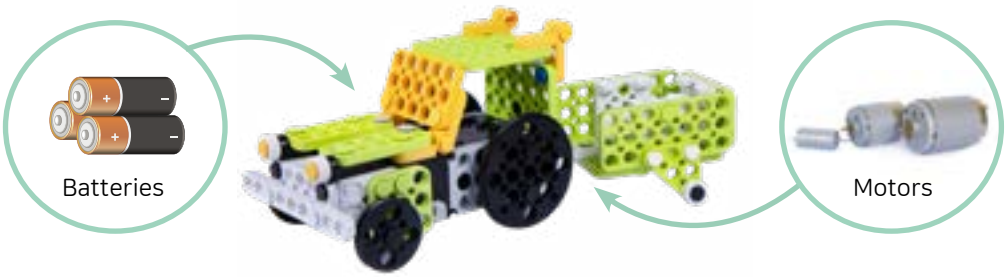
How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

9 How do robots generate power?

Let's learn about power.

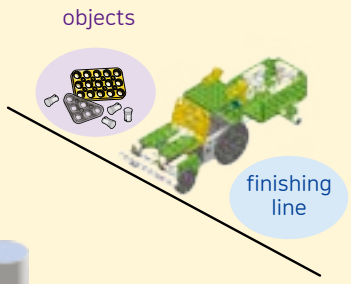
Power can be expressed as the product of the force applied to perform work.
Cars use fuels to power their engines, and robots use electricity to power their motors.

OLLO's RB-88 controller is equipped with a built-in motor and power supply for generating power. The robot is powered by batteries or rechargeable batteries that allow it to move.



Let's play the game of 'Moving Objects' using the trailer robot.

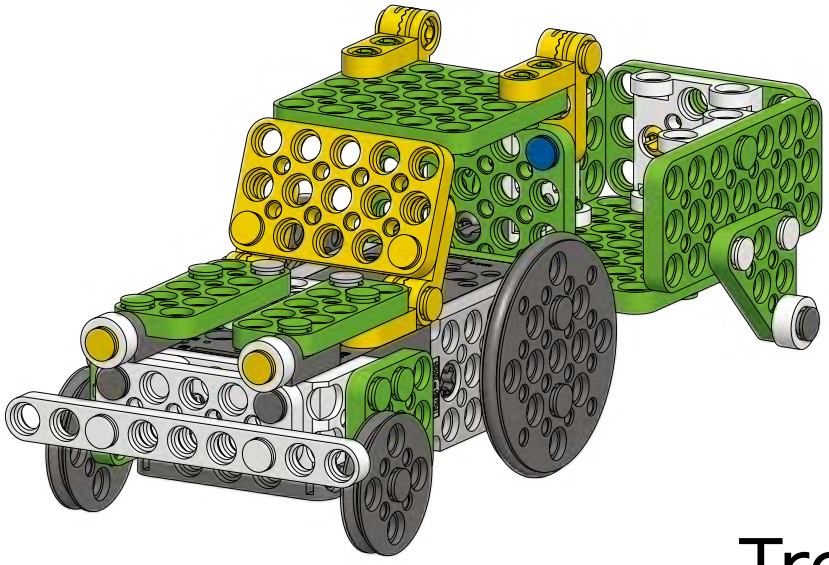
How to Play



❶ Assemble the trailer robot.
❷ After connecting the robot to the smartphone, select the control mode (No. 5).
❸ Make a starting line, a turning point, and a finishing line, and prepare in advance the objects (robot parts, etc.) that will be moved by the robot.

❹ After loading the objects onto the robot and placing it at the starting line, control your robot to go around the turning point and unload the goods at the finishing line.
❺ The person who moves the most objects within the given two minutes wins the game.

Change the shape of the trunk to carry more stuff.



Trailer


×14
Rivet ⓦ


×2
Rivet ⓞ


×12
Rivet ⓨ


×2
Rivet ⓑ


×26
Rivet ⓖ


×12
Rivet ⓚ


×3
Rivet ⓖⓡ ★


×2
Pl-1b5 ⓦ

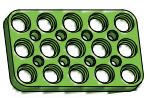

×1
Pl-1b9 ⓦ

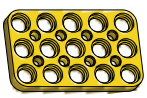

×3
PD-2b5 ⓖ

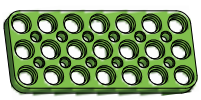

×2
PD-2b5 ⓦ


×1
PD-3b3 ⓦ

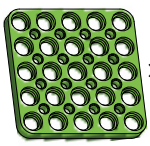

×2
PD-3b3 ⓖ

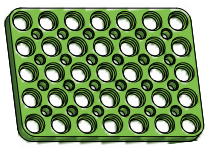

×1
PD-3b5 ⓖ


×1
PD-3b5 ⓨ


×2
PD-3b7 ⓖ

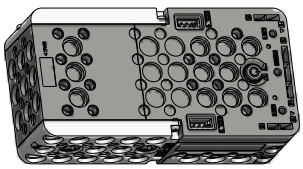

×2
PA-3b3 ⓖ


×2
PD-5b5 ⓖ


×1
PD-5b7 ⓖ


×2
PO-5b5 ⓚ

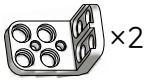

×2
TR-62


×1
RB-88


×2
PO-3b3 ⓚ


×2
Horn-5X


×3
PU-5 ⓦ


×2
PL-2b2 ⓦ


×8
PJ-1b2R ⓨ


×4
PO-1A ⓦ


×3
PL-1b2 ⓚ

1

×2 Rivetⓦ

×2 Rivetⓞ

×2 Rivetⓨ

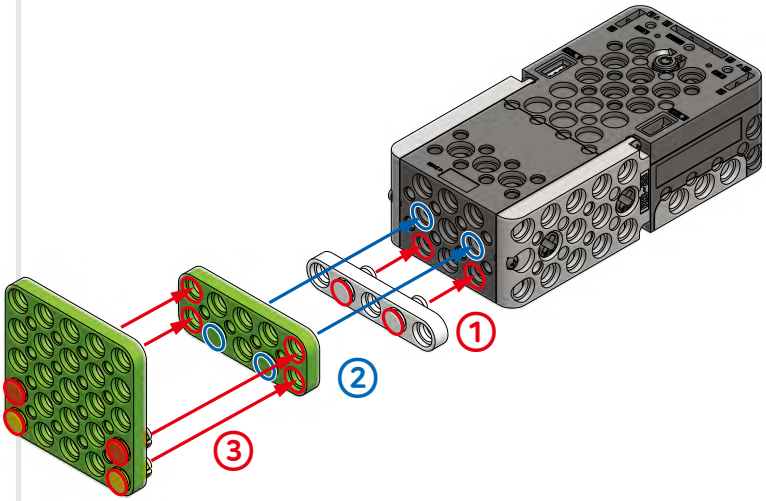
×2 Rivetⓖ

×1 Pl-1b5ⓦ

×1 PD-2b5ⓖ

×1 PD-5b5ⓖ

×1 RB-88



2

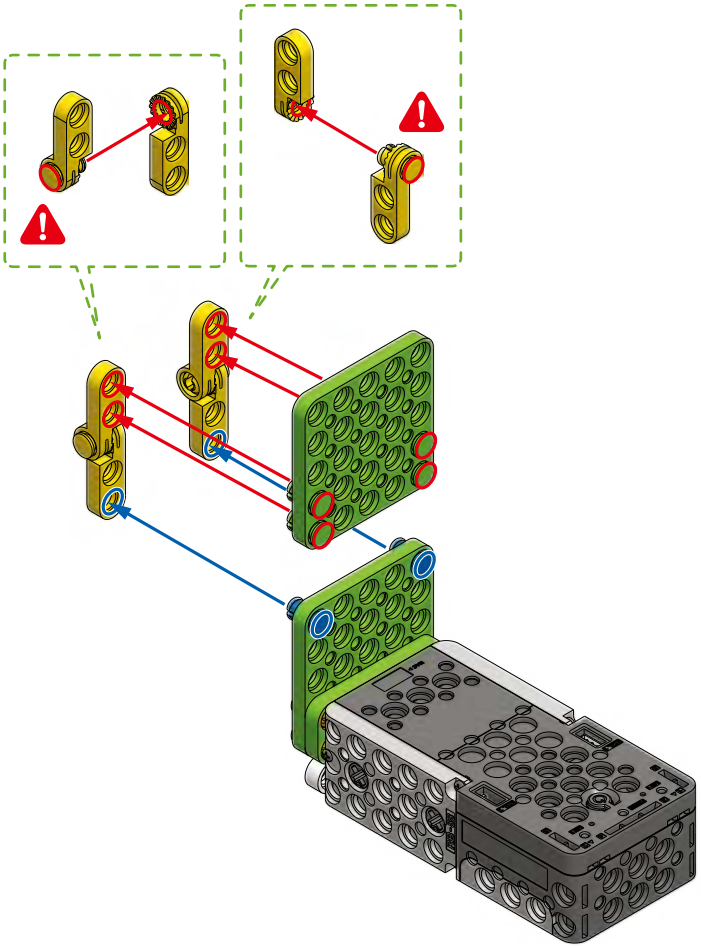
×2 Rivetⓑ

×4 Rivetⓖ

×2 Rivetⓨ

×1 PD-5b5ⓖ

×4 PJ-1b2Rⓨ



3

×2 Rivetⓦ

×4 Rivetⓖ

×2 Rivetⓨ

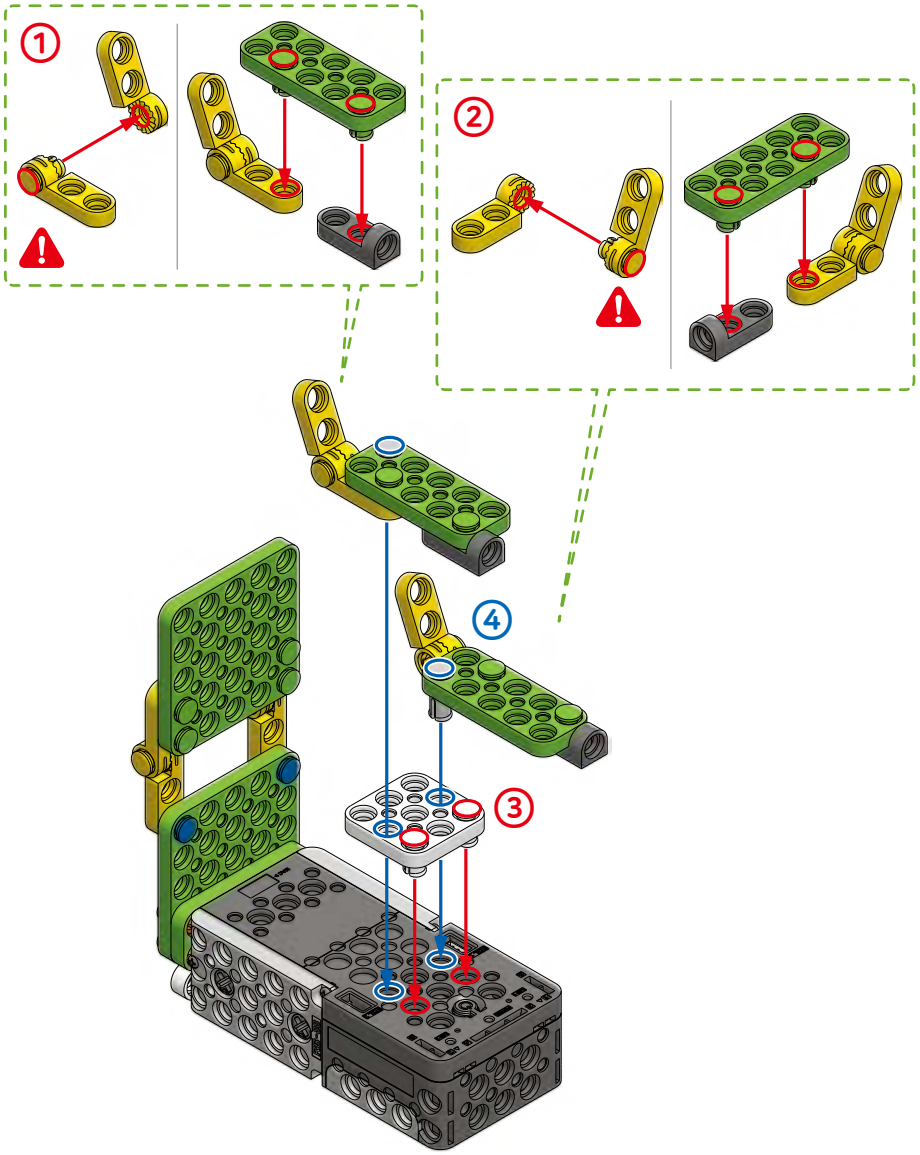
×2 Rivetⓖr ★

×2 PL-1b2ⓚ

×4 PJ-1b2Rⓨ

×2 PD-2b5ⓖ

×1 PD-3b3ⓦ



4

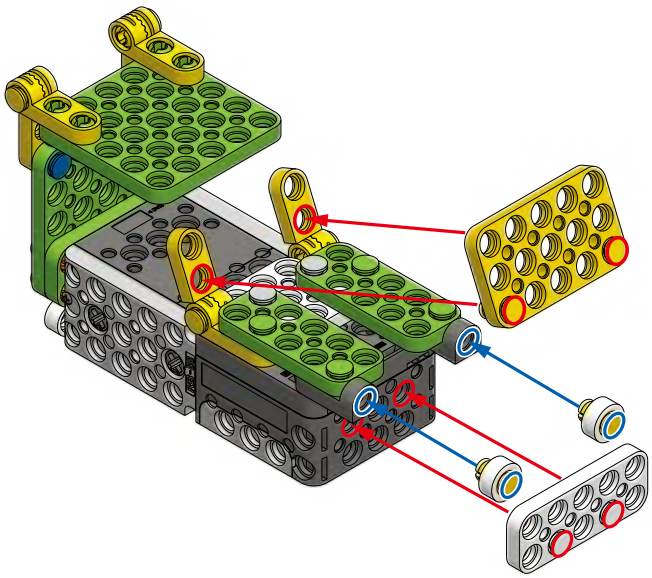
×2 Rivetⓦ

×4 Rivetⓨ

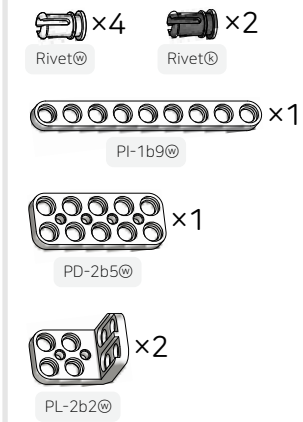
×1 PD-2b5ⓦ

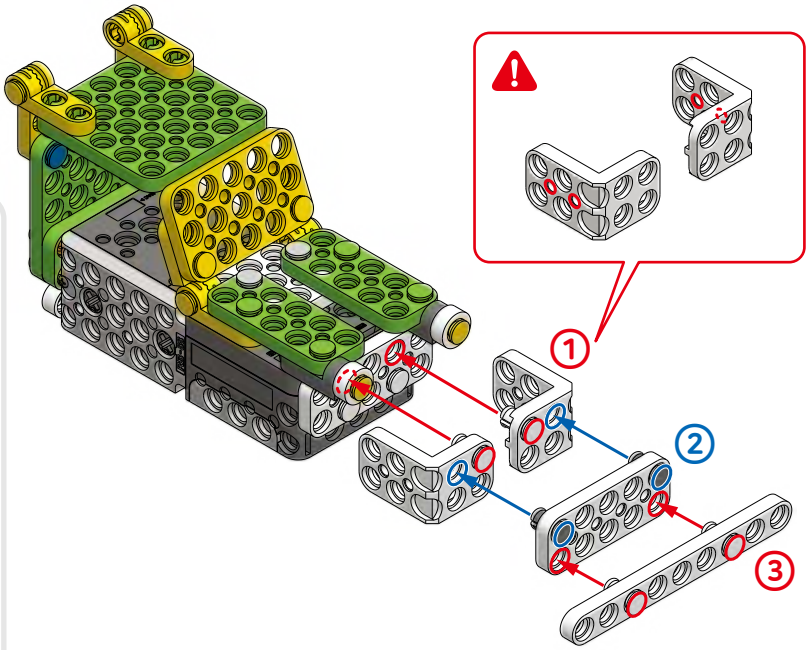
×1 PD-3b5ⓨ

×2 PO-1Aⓦ

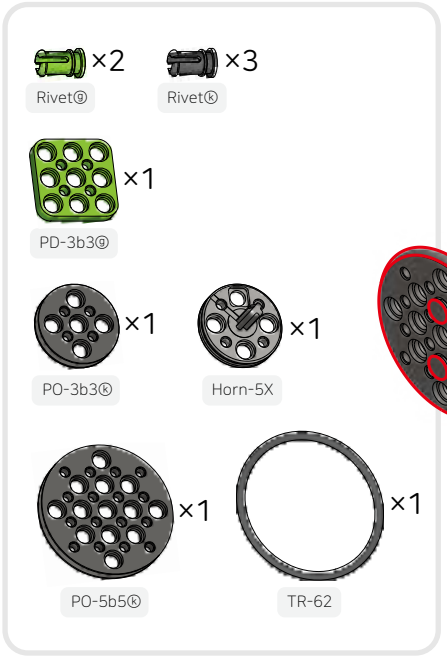


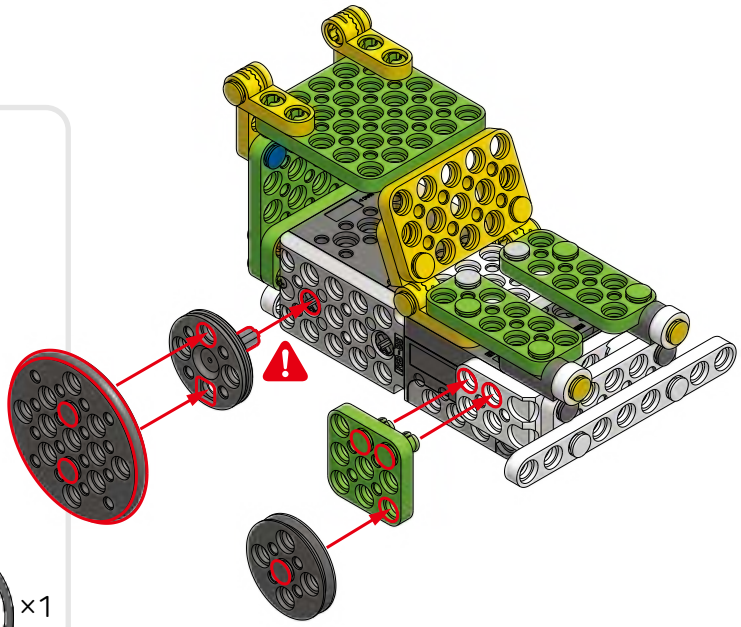
5

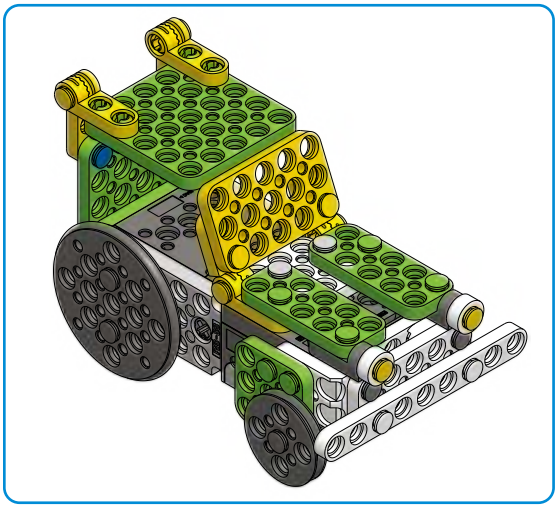

×4
Rivet⓪
×2
Rivet⑥
×1
Pl-1b9⓪
×1
PD-2b5⓪
×2
PL-2b2⓪


1
2
3

6


×2
Rivet⑨
×3
Rivet⑥
×1
PD-3b3⑨
×1
PO-3b3⑥
×1
Horn-5X
×1
PO-5b5⑥
×1
TR-62





7

×2 Rivet⓰

×3 Rivet⓴

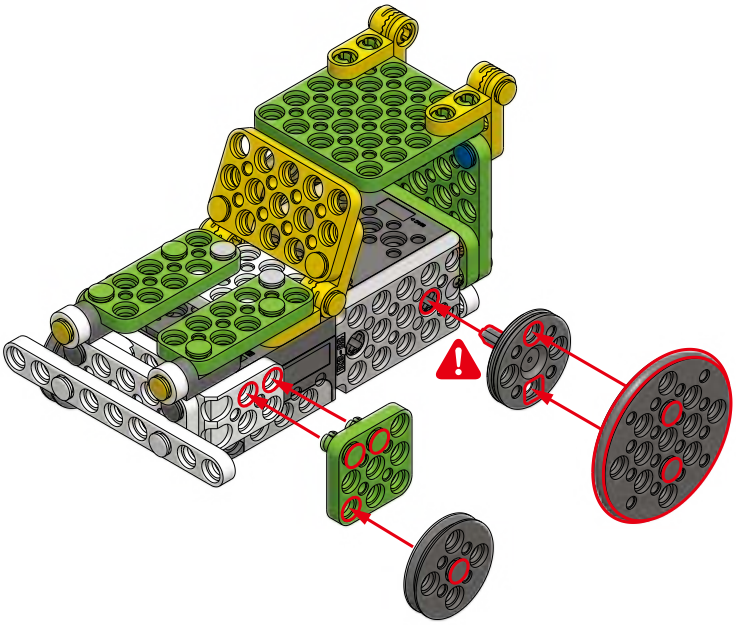
×1 PD-3b3⓰

×1 PO-3b3⓴

×1 Horn-5X

×1 PO-5b5⓴

×1 TR-62



8

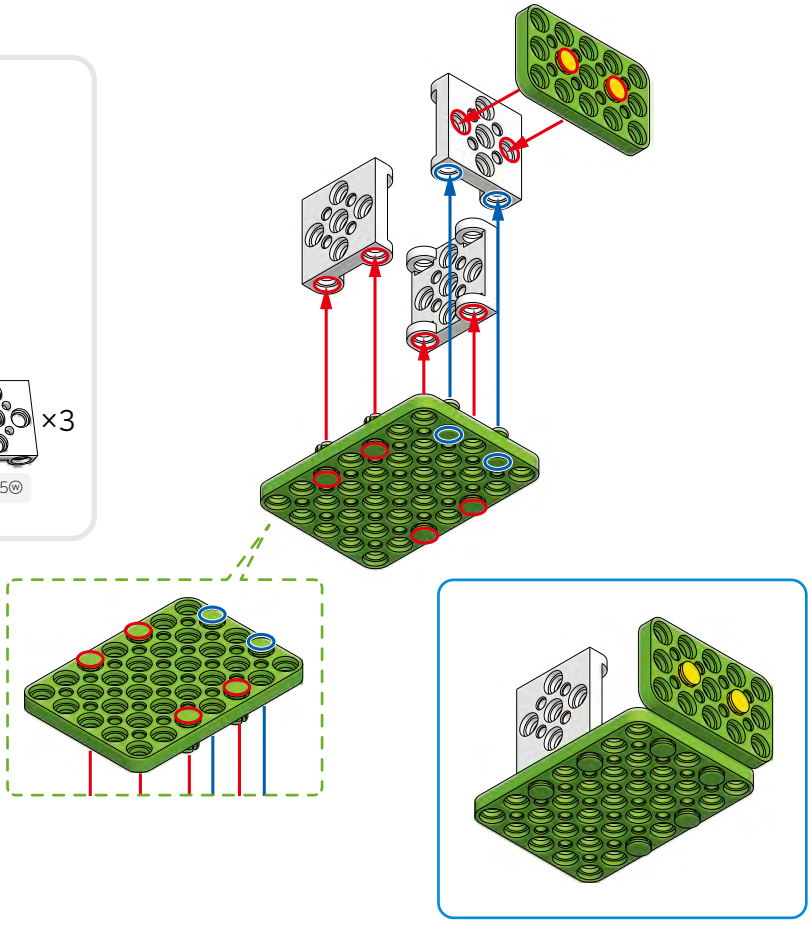
×2 Rivetⓨ

×6 Rivet⓰

×1 PD-3b5⓰

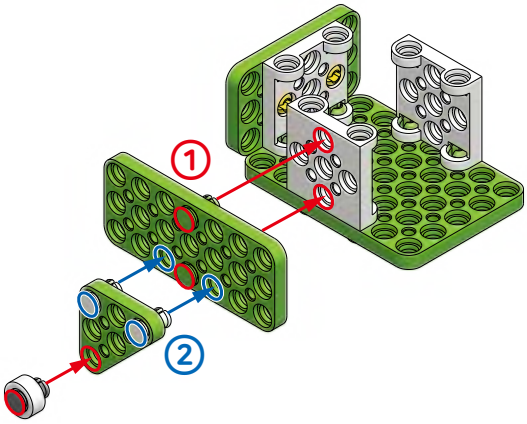
×1 PD-5b7⓰

×3 PU-5ⓦ

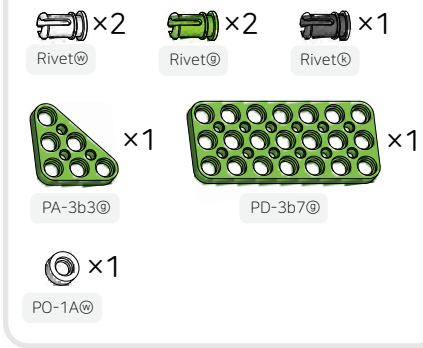


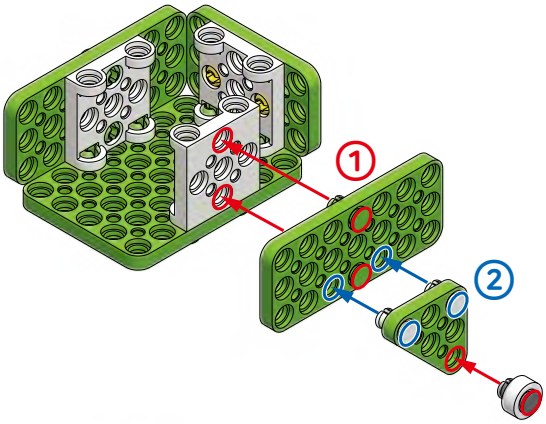
9


×2
Rivetⓦ
×2
Rivetⓖ
×1
Rivetⓚ
×1
PA-3b3ⓖ
×1
PD-3b7ⓖ
×1
PO-1Aⓦ

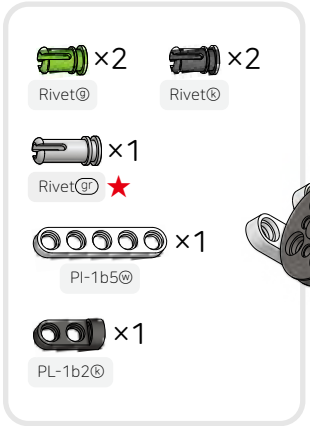

1
2

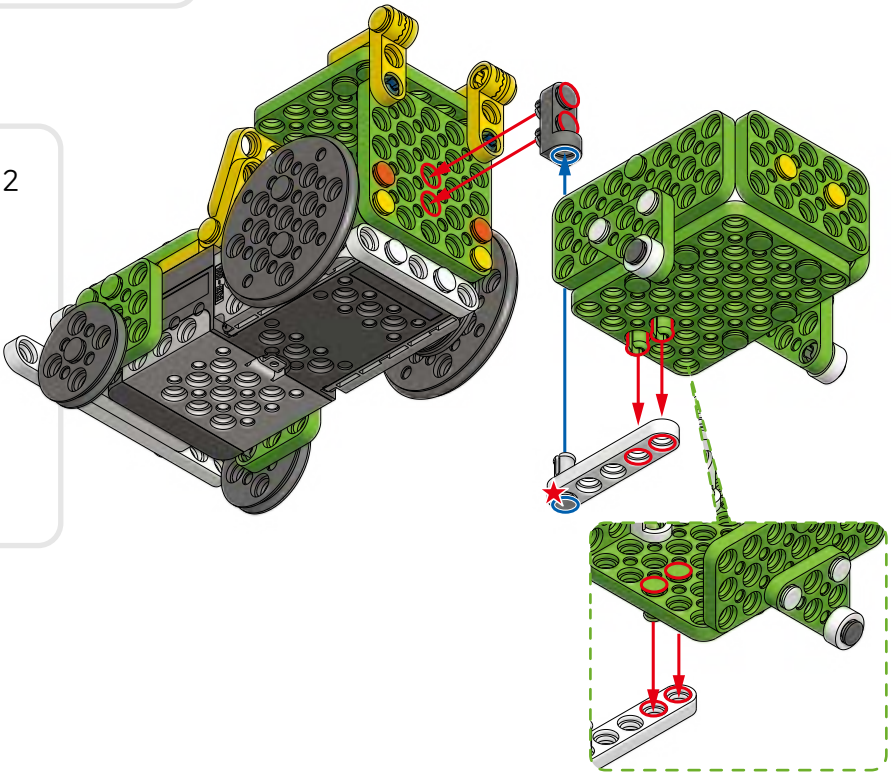
10


×2
Rivetⓦ
×2
Rivetⓖ
×1
Rivetⓚ
×1
PA-3b3ⓖ
×1
PD-3b7ⓖ
×1
PO-1Aⓦ


1
2

11

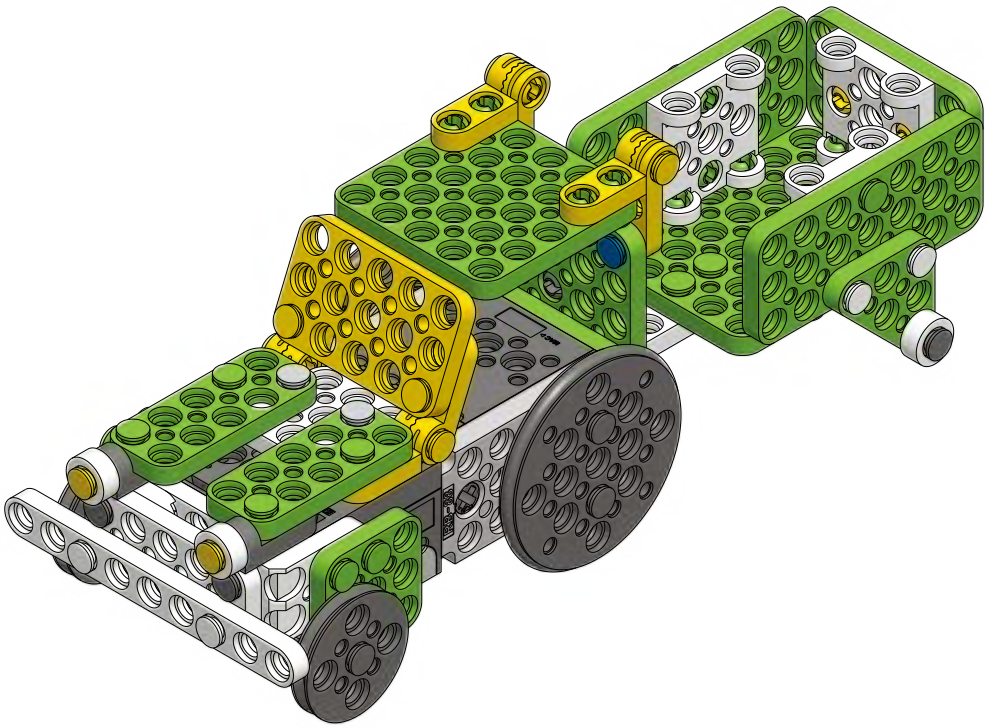

×2
Rivetⓖ
×2
Rivetⓚ
×1
Rivetⓖr
×1
Pl-1b5ⓦ
×1
PL-1b2ⓚ



My Own Robot

Use the remaining parts to personalize your robot by changing its appearance.

See Video



How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

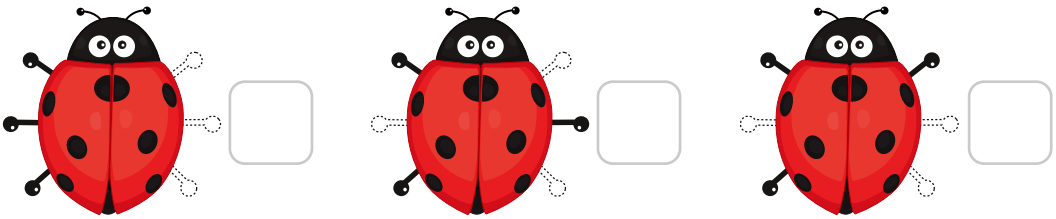
10 What are the benefits of having 6 legs?

Let's compare the way humans and insects walk.

People walk by alternately moving their left and right feet. When walking, one leg supports the body while the other leaves the ground, making it challenging at times to maintain balance and avoid falling.

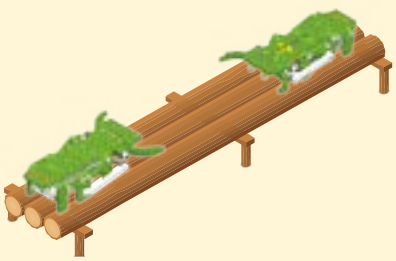
Insects walk by alternately moving three legs at a time while the other three remain stationary.
Thanks to the support of their legs, they can move quickly and steadily without falling.

Here is a top-down view of the ladybug. The legs shown in black are touching the ground, and the legs drawn in dotted lines are raised in the air.
Circle the ladybug that has the steadiest balance.



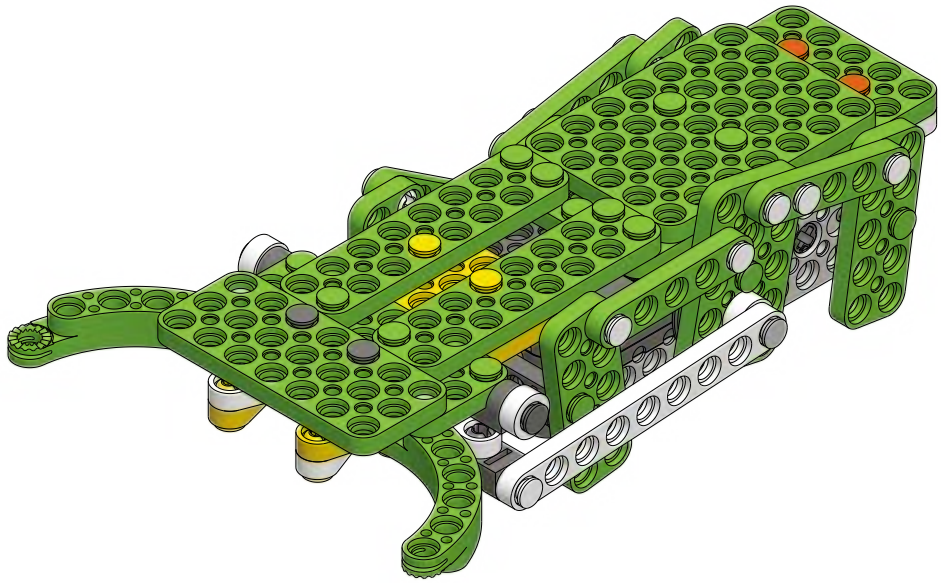
Let's play a game called "Bridge Duel' using the stag beetle robot to push the opponent's robot off the bridge.

How to Play

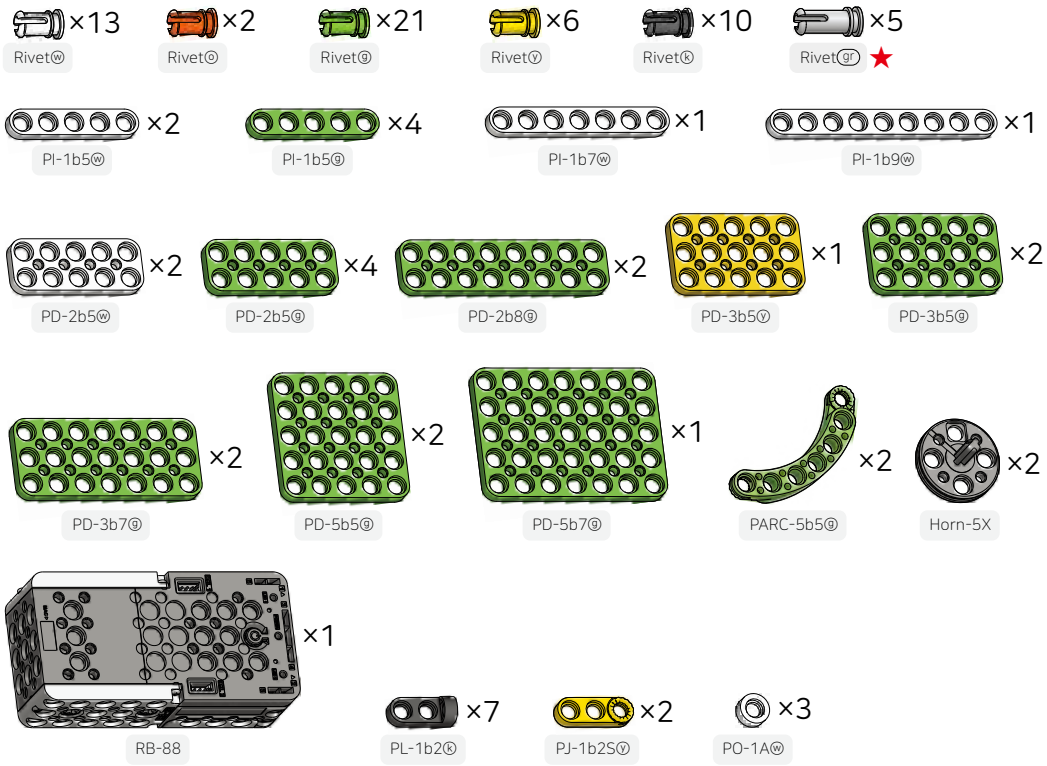


❶ Assemble the stag beetle robot.
❷ After connecting the robot to the smartphone, run the control mode (No. 5).
❸ Use the surface of a book or desk to create a bridge that is at least 2 cm away from the floor.
❹ This game consists of a 1:1 match where the players control their robots to push the opponent's robot off the bridge to win.

Let's add antlers to gain advantage in the match.



Stag Beetle

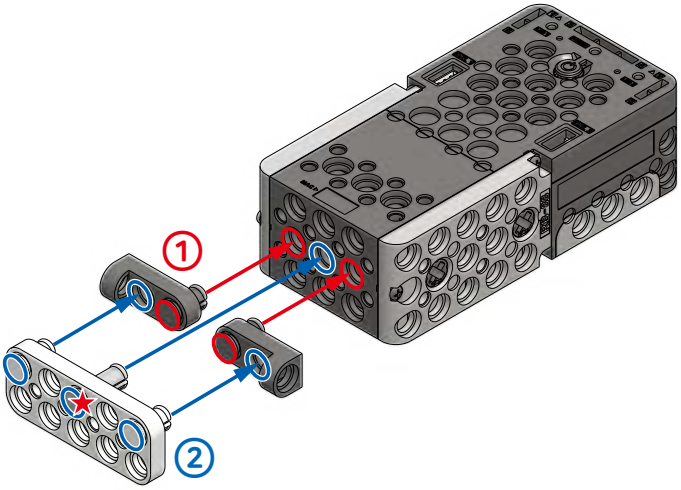

×13
Rivet
×2
Rivet
×21
Rivet
×6
Rivet
×10
Rivet
×5
Rivet
×2
Pl-1b5
×4
Pl-1b5
×1
Pl-1b7
×1
Pl-1b9
×2
PD-2b5
×4
PD-2b5
×2
PD-2b8
×1
PD-3b5
×2
PD-3b5
×2
PD-3b7
×2
PD-5b5
×1
PD-5b7
×2
PARC-5b5
×2
Horn-5X
×1
RB-88
×7
PL-1b2
×2
PJ-1b2S
×3
PO-1A

1

×2 Rivetⓦ ×2 Rivetⓚ ×1 Rivetⓖⓡ ★

×1 PD-2b5ⓦ ×2 PL-1b2ⓚ

×1 RB-88

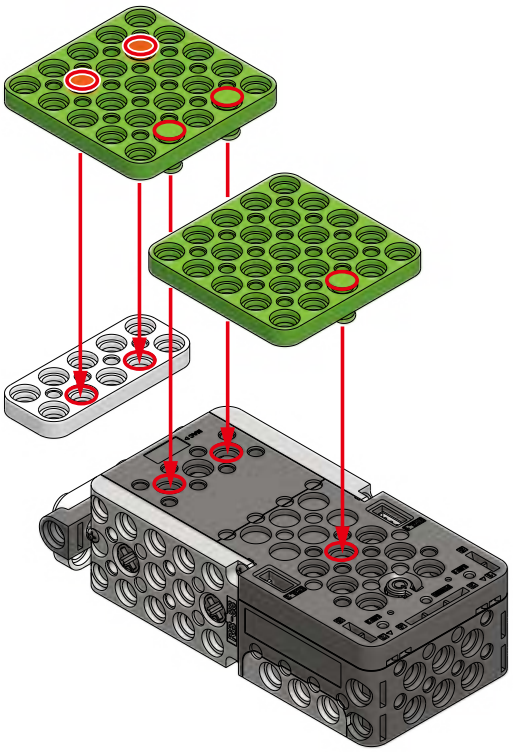


2

×2 Rivetⓞ ×3 Rivetⓖ

×1 PD-2b5ⓦ

×2 PD-5b5ⓖ



3

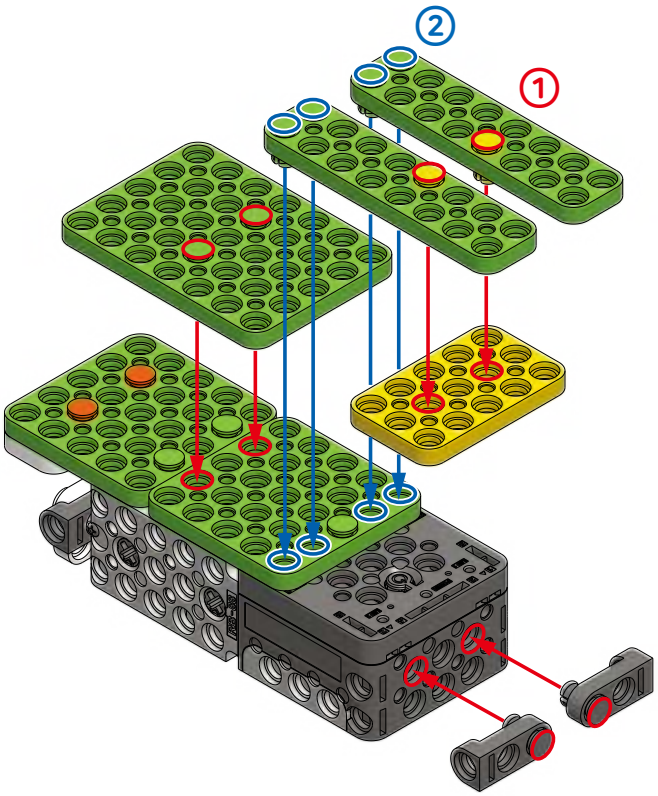
×6 Rivet⓽ ×2 Rivet⓴ ×2 Rivetⓨ

×2 PD-2b8⓽

×1 PD-3b5ⓨ

×1 PD-5b7⓽

×2 PL-1b2⓴

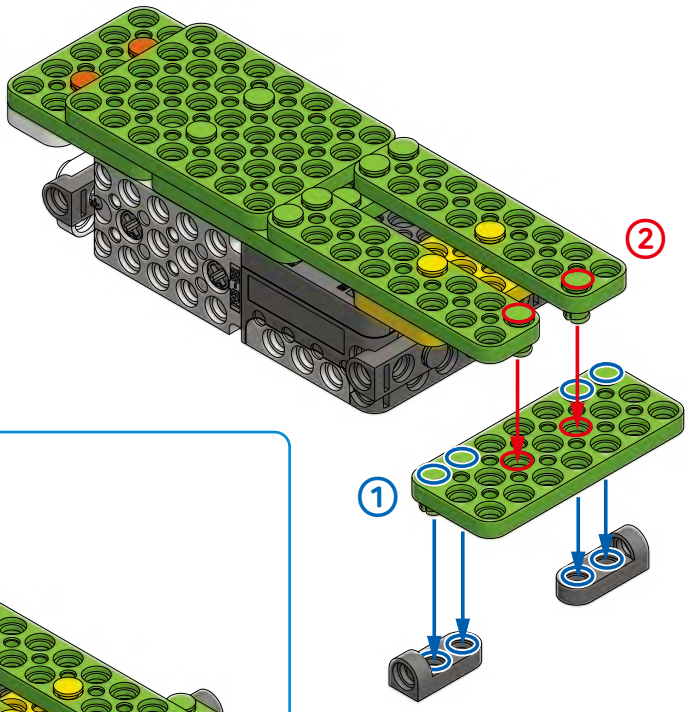


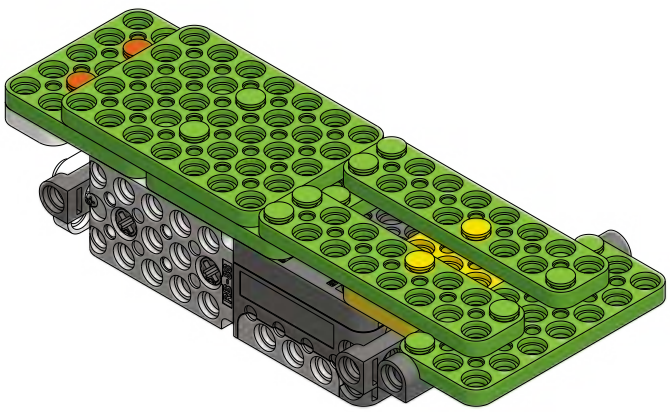
4

×6 Rivet⓽

×1 PD-3b7⓽

×2 PL-1b2⓴





5

×1 Rivet(y)

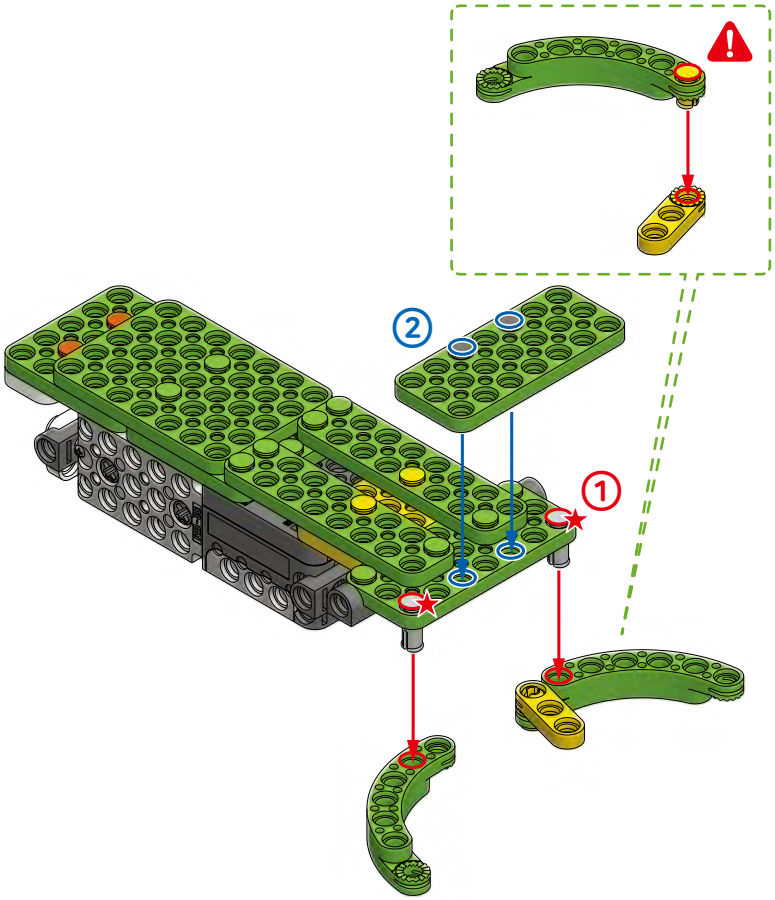
×2 Rivet(k)

×2 Rivet(gr) ★

×1 PD-3b7(g)

×2 PARC-5b5(g)

×1 PJ-1b2S(y)

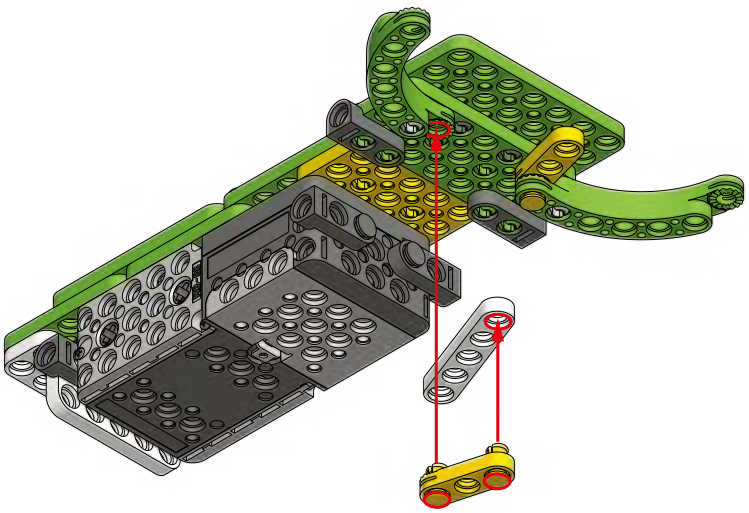


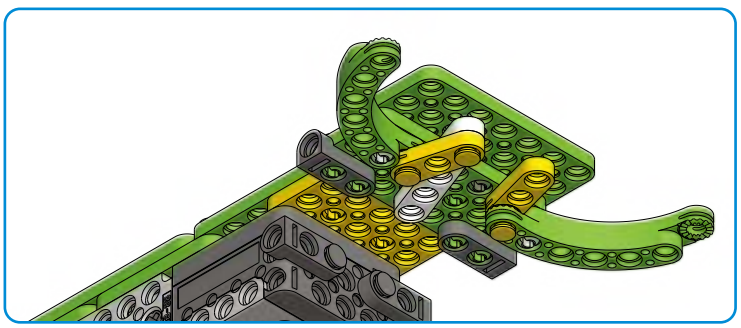
6

×2 Rivet(y)

×1 PI-1b5(w)

×1 PJ-1b2S(y)





7

×1 Rivetⓨ

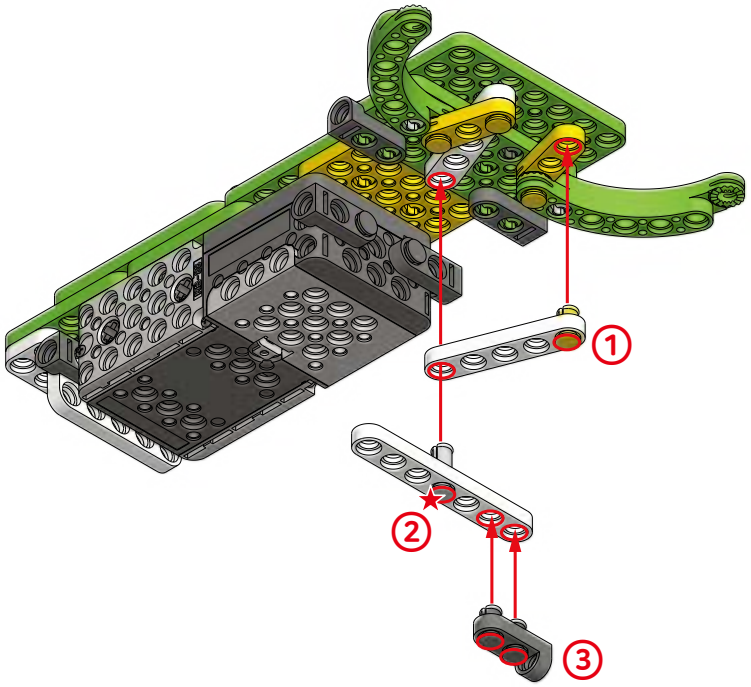
×2 Rivetⓚ

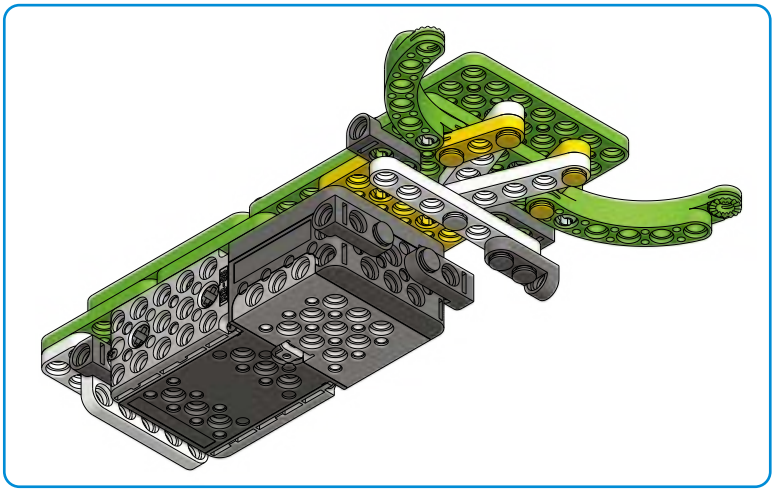
×1 Rivetⓖⓡ ★

×1 Pl-1b5ⓦ

×1 Pl-1b7ⓦ

×1 PL-1b2ⓚ





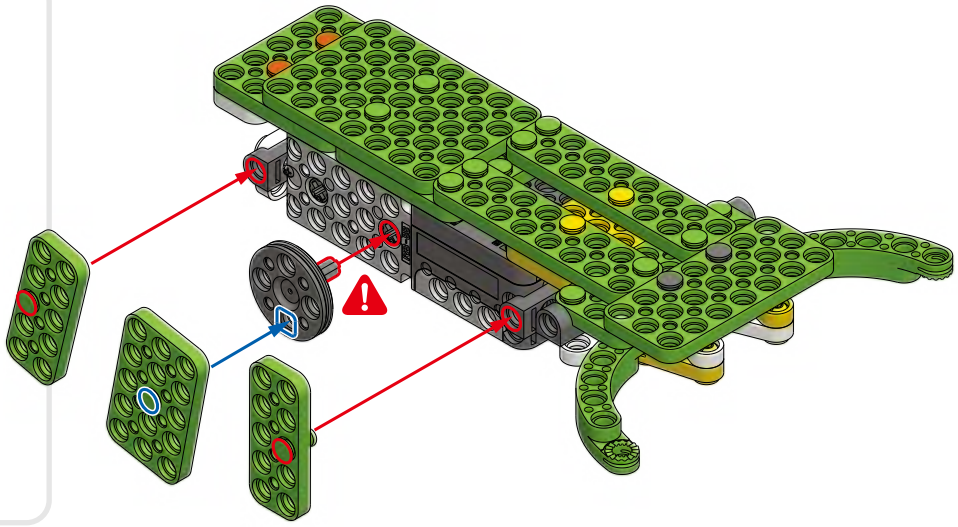
8

×3 Rivetⓖ

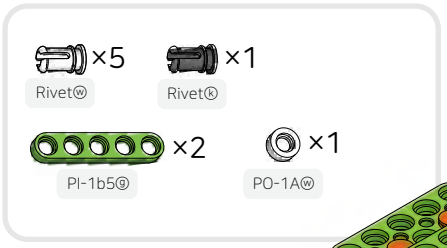
×2 PD-2b5ⓖ

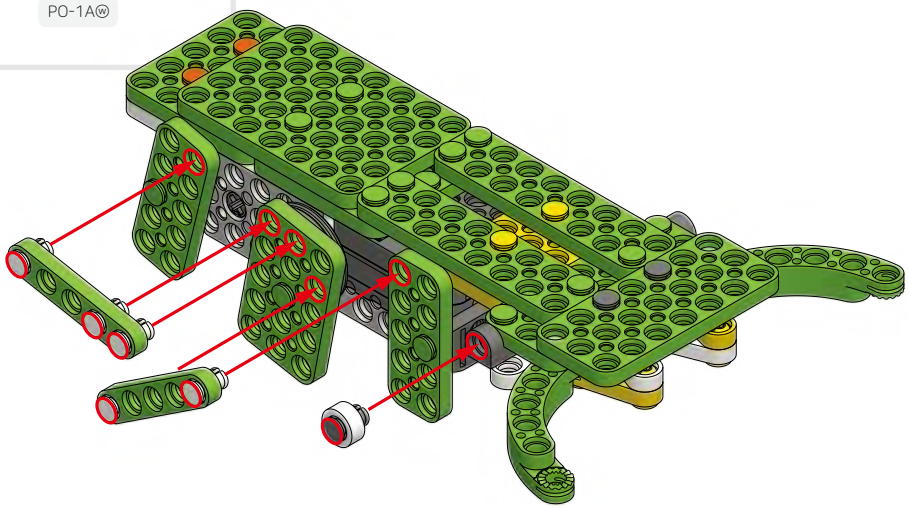
×1 PD-3b5ⓖ

×1 Horn-5X

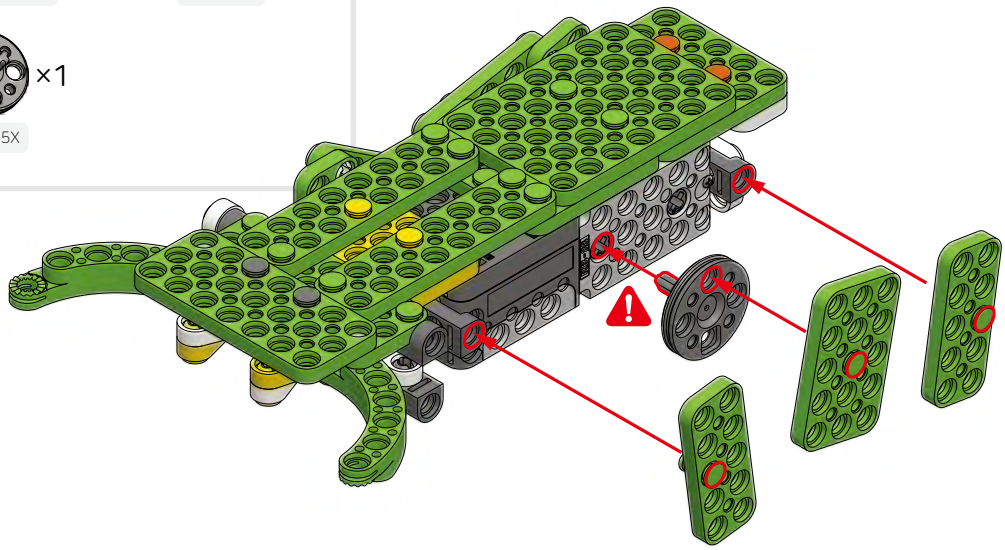


9





10



My Own Robot

Personalize your stag beetle robot by changing its appearance and antlers.

11

×6 Rivetⓦ

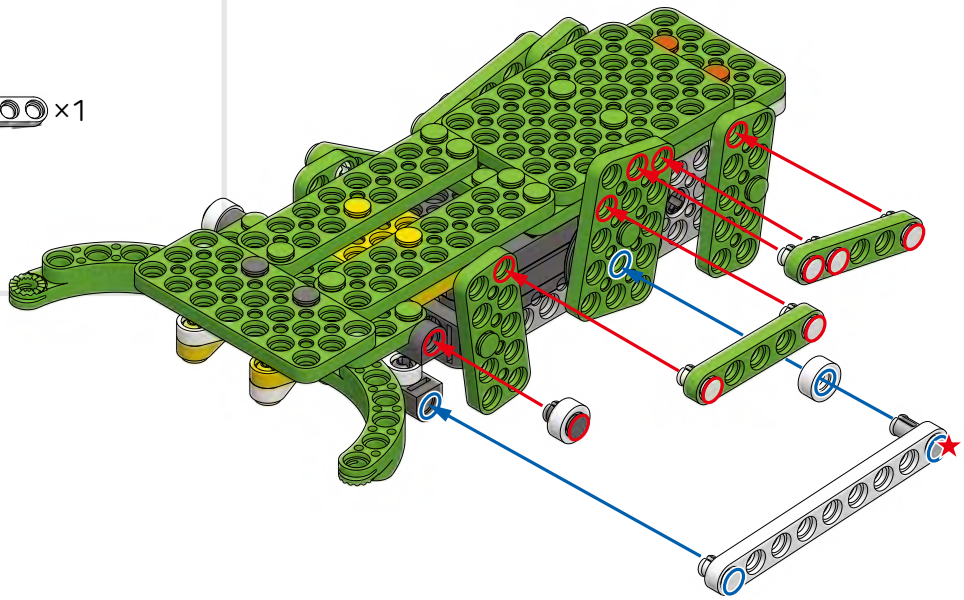
×1 Rivetⓚ

×1 Rivetⓖⓡ ★

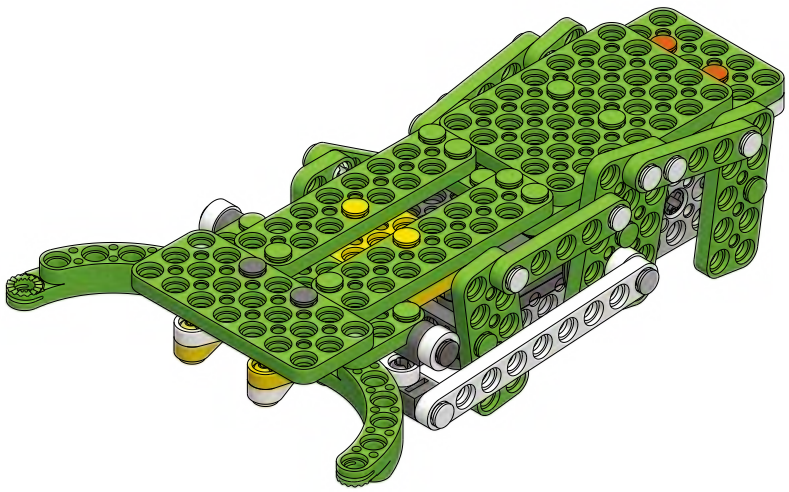
×2 Pl-1b5ⓖ

×1 Pl-1b9ⓦ

×2 PO-1Aⓦ



See Video



How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

Forward ×1

Backward ×2

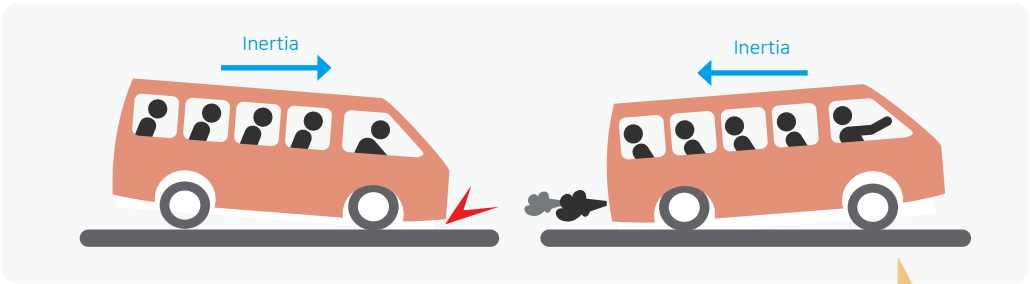
Detect Clap ×4

Remote Control ×5

11 What is inertia?

Let's learn about inertia and rotational inertia.

Inertia is the tendency of an object to remain unchanged, so an object in motion remains in motion and an object at rest remains at rest.



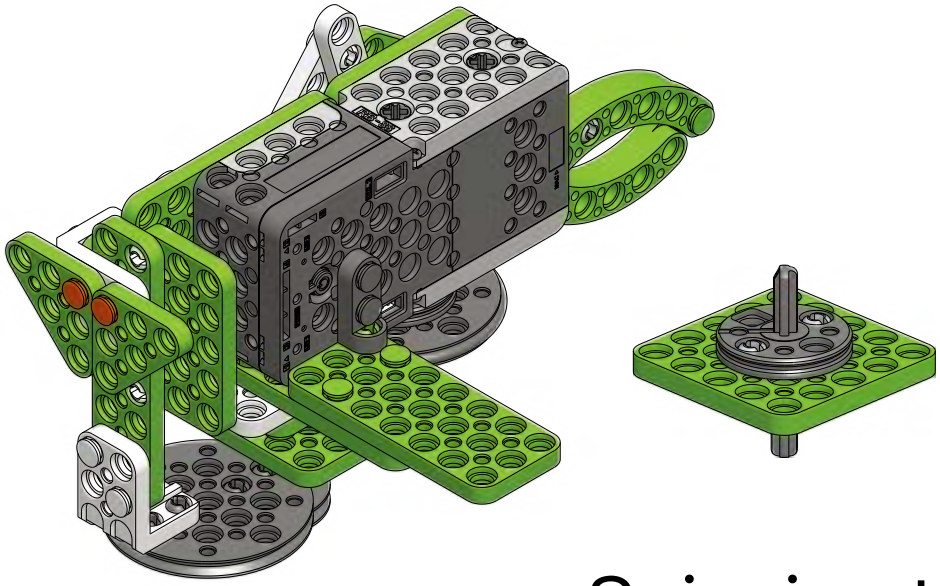
When a moving vehicle suddenly stops, your body will jerk forward. On the other hand, your body will jerk backward when the vehicle suddenly moves forward. This phenomenon is caused by inertia.

In the case of the spinning top, the spinning object has a tendency to continue spinning due to inertia.

Let's see how the spinning top robot works.

- Press the start button (1) 3 times to turn on the power.
- After pulling the handle all the way, insert the axis (4) of the top into the hole (3).
- Release the lever (2) and the top (5) will start spinning.
- Hold the robot with the top's bottom axis facing the floor and pull the lever (2) once again, and the top will fall to the floor and spin.

Create an exclusive arena for the spinning top and have a spin top contest.



Spinning top


×11
Rivet ⓦ


×2
Rivet ⓞ


×1
Rivet ⓨ


×1
Rivet ⓑ


×16
Rivet ⓖ

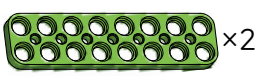

×9
Rivet ⓚ


×8
Rivet ⓖr ★


×1
Pl-1b5ⓦ


×1
Pl-1b9ⓦ

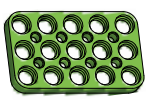

×1
PD-2b5ⓖ

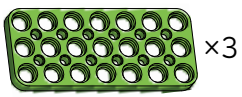

×2
PD-2b8ⓖ

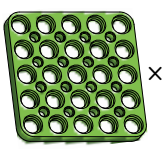

×2
PA-3b3ⓖ

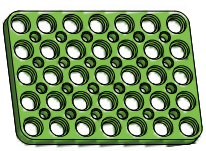

×1
PD-3b3ⓦ


×2
PD-3b3ⓖ

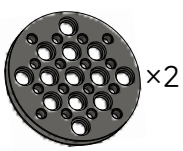

×1
PD-3b5ⓖ


×3
PD-3b7ⓖ


×2
PD-5b5ⓖ


×1
PD-5b7ⓖ

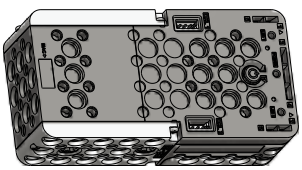
×1
RB-27


×2
PO-5b5ⓚ

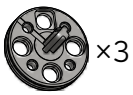

×1
TR-62

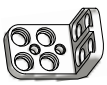

×2
PARC-5b5ⓖ


×1
PJ-1b2Sⓨ


×1
RB-88


×1
PO-3b3ⓚ


×3
Horn-5X


×2
PL-2b2ⓦ


×2
PL-1b2ⓚ


×3
PO-1Aⓦ

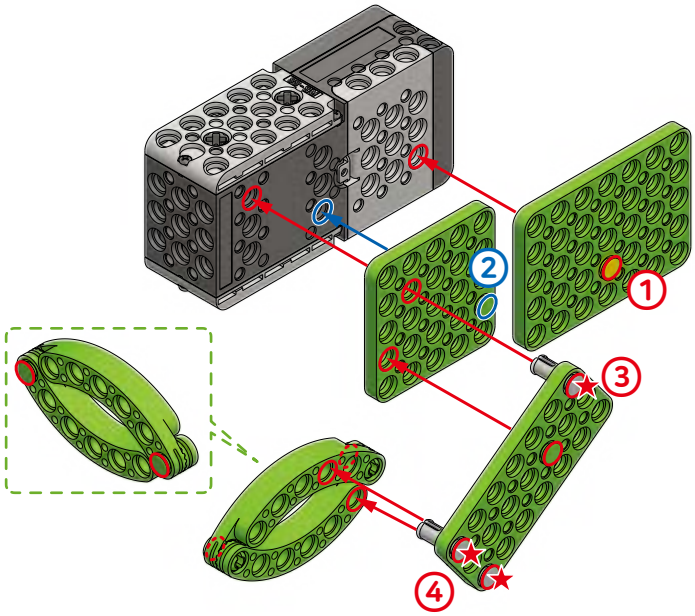
1

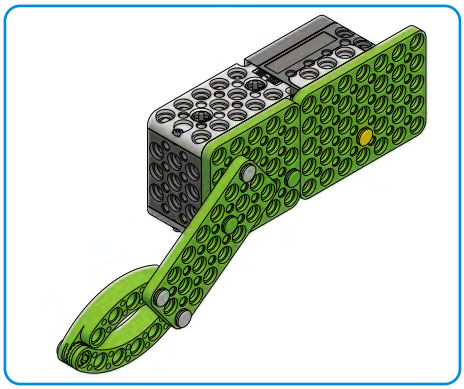
×1 Rivetⓨ ×4 Rivetⓖ ×3 Rivetⓖⓡ ★

×1 PD-3b7ⓖ ×1 PD-5b5ⓖ

×1 PD-5b7ⓖ ×2 PARC-5b5ⓖ

×1 RB-88





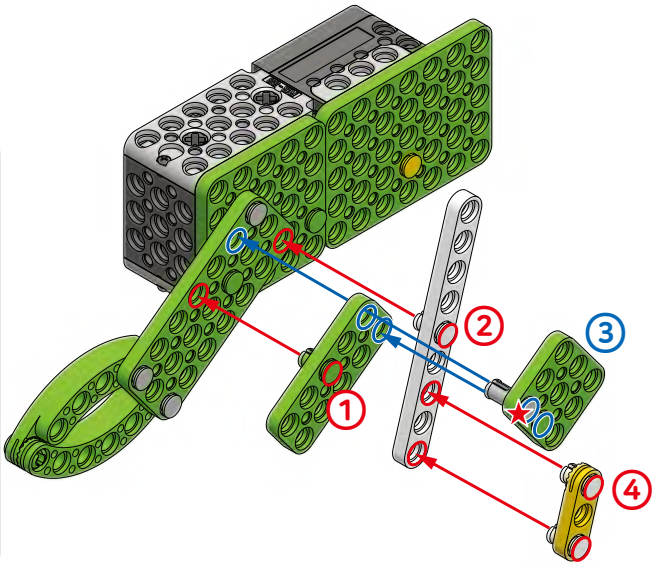
2

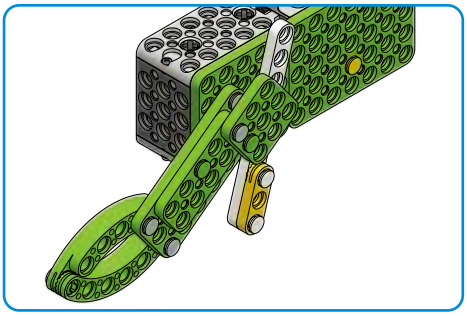
×3 Rivetⓦ ×2 Rivetⓖ ×1 Rivetⓖⓡ ★

×1 Pl-1b9ⓦ

×1 PD-2b5ⓖ ×1 PD-3b3ⓖ

×1 PJ-1b2Sⓨ





3

×1 Rivetⓦ

×1 Rivetⓑ

×2 Rivetⓖ

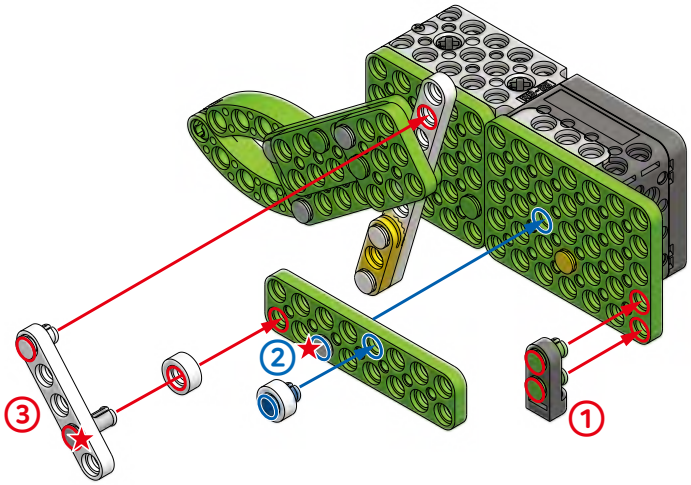
×2 Rivetⓖr ★

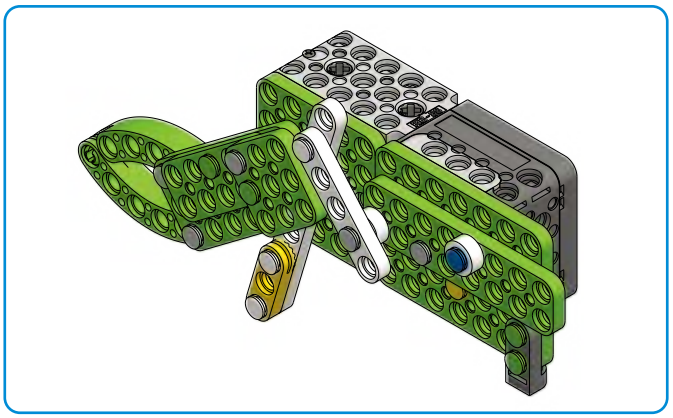
×1 Pl-1b5ⓦ

×1 PD-2b8ⓖ

×1 PL-1b2ⓚ

×2 PO-1Aⓦ





4

×4 Rivetⓦ

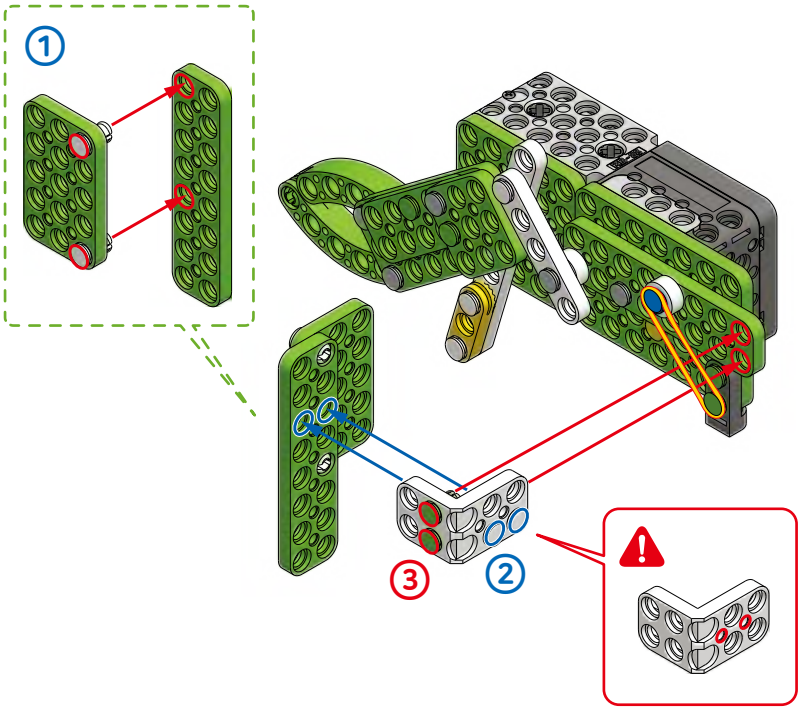
×2 Rivetⓖ

×1 PD-2b8ⓖ

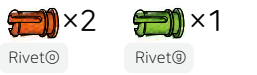
×1 PD-3b5ⓖ

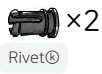
×1 PL-2b2ⓦ

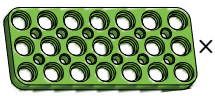
×1 RB-27

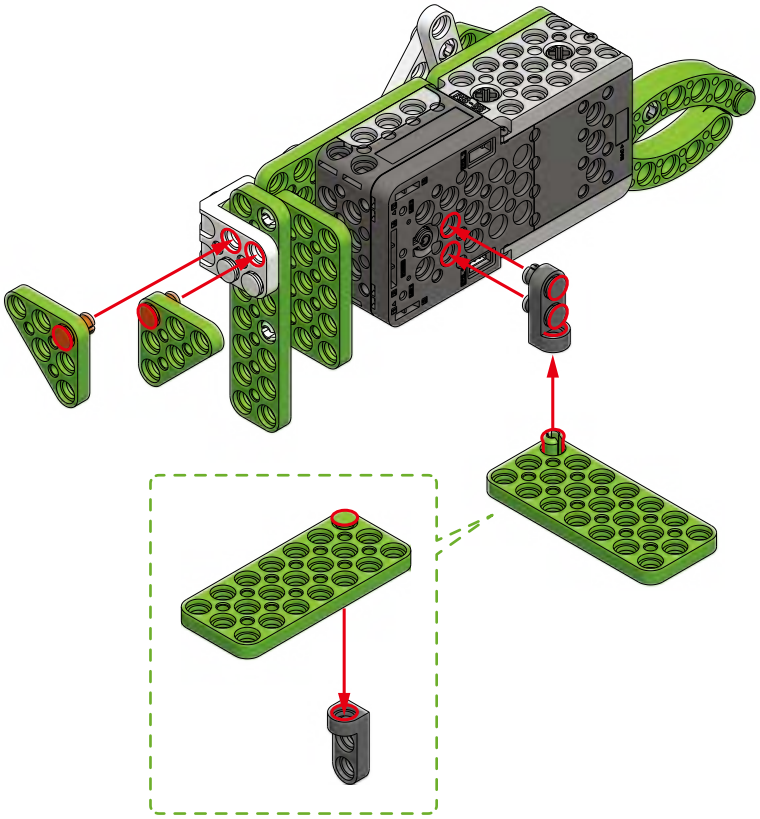


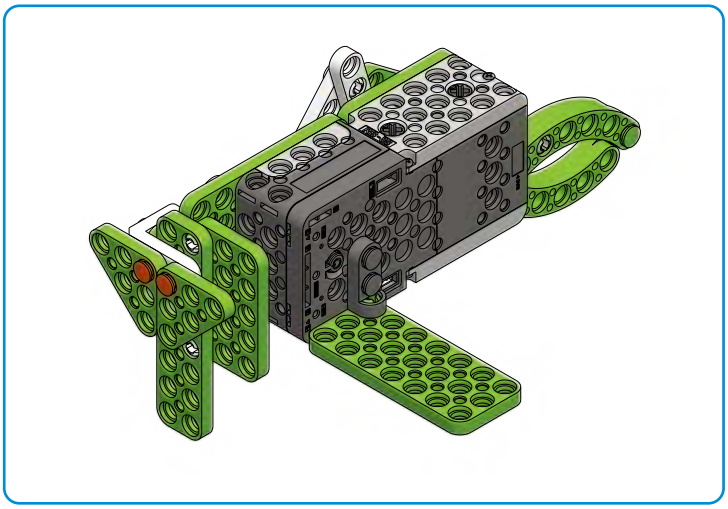
5











6

×1 Rivetⓦ

×5 Rivetⓖ

×2 Rivetⓚ

×1 PD-3b3ⓦ

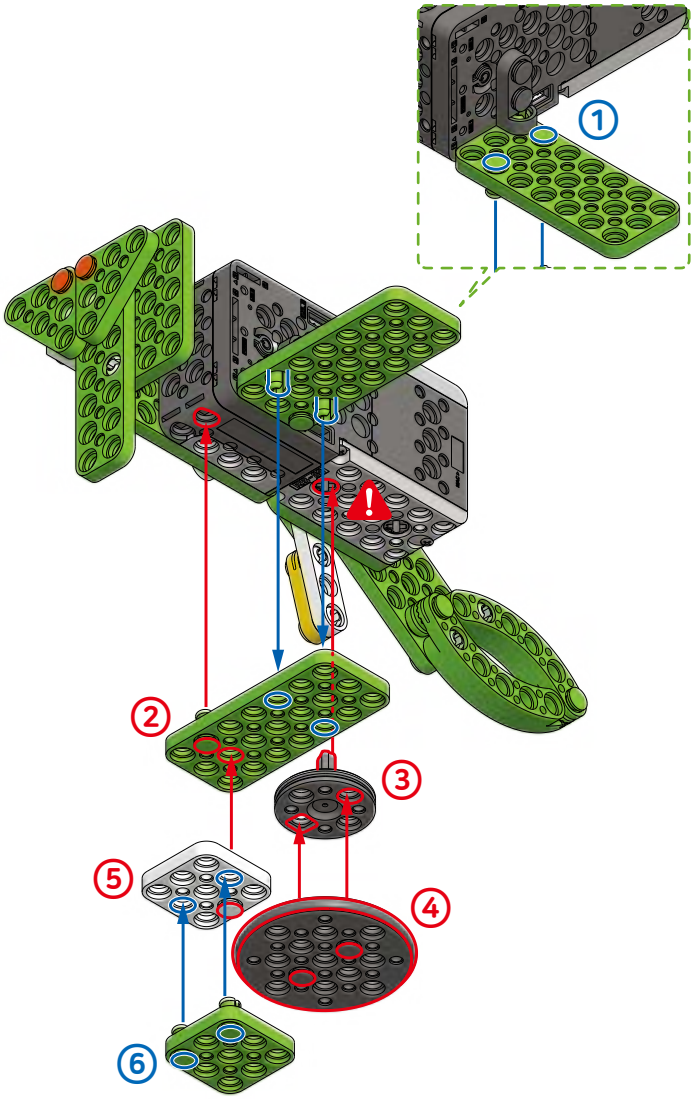
×1 PD-3b3ⓖ

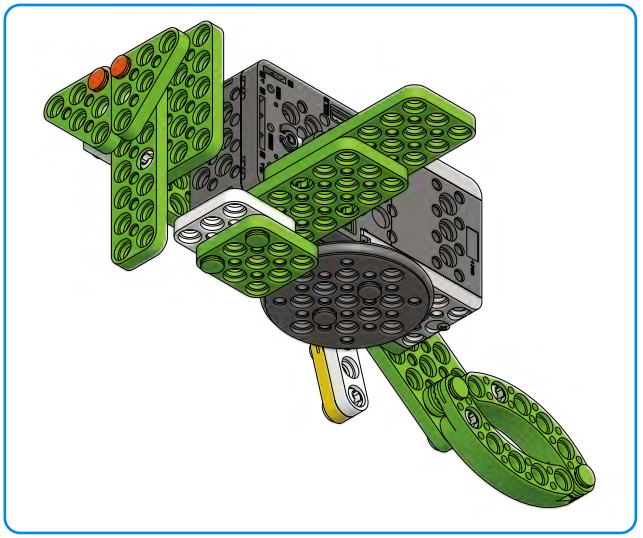
×1 PD-3b7ⓖ

×1 PO-5b5ⓚ

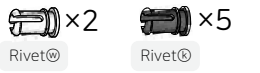
×1 TR-62

×1 Horn-5X





7

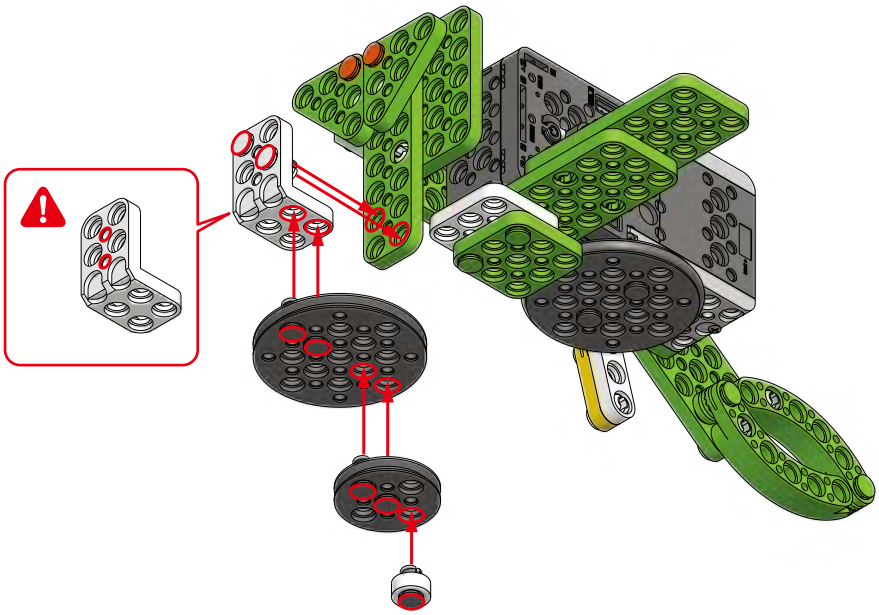


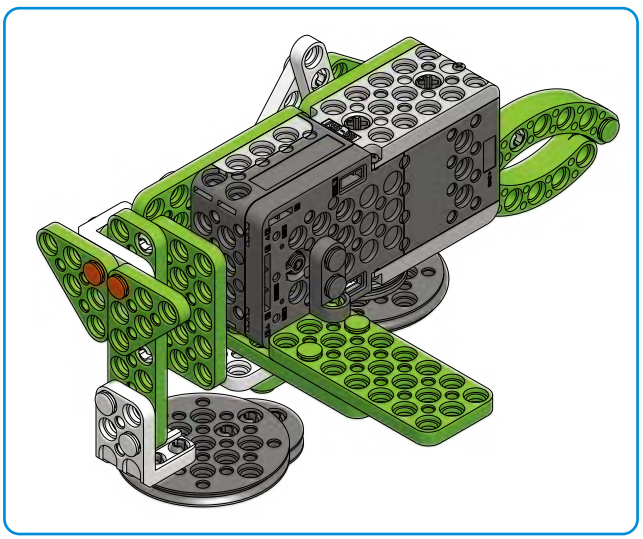
Rivetⓦ Rivetⓚ

PO-3b3ⓚ

PO-5b5ⓚ

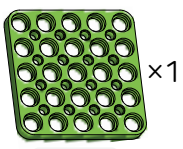
PO-1Aⓦ PL-2b2ⓦ



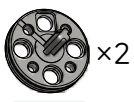


8

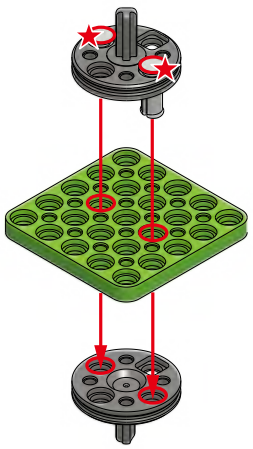
Rivetⓖⓡ ★

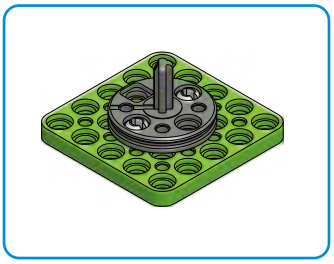


PD-5b5ⓖ



Horn-5X

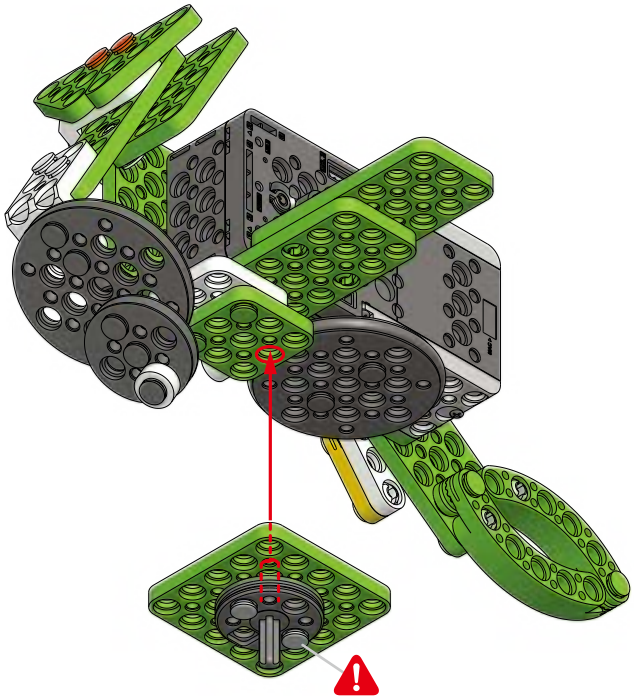




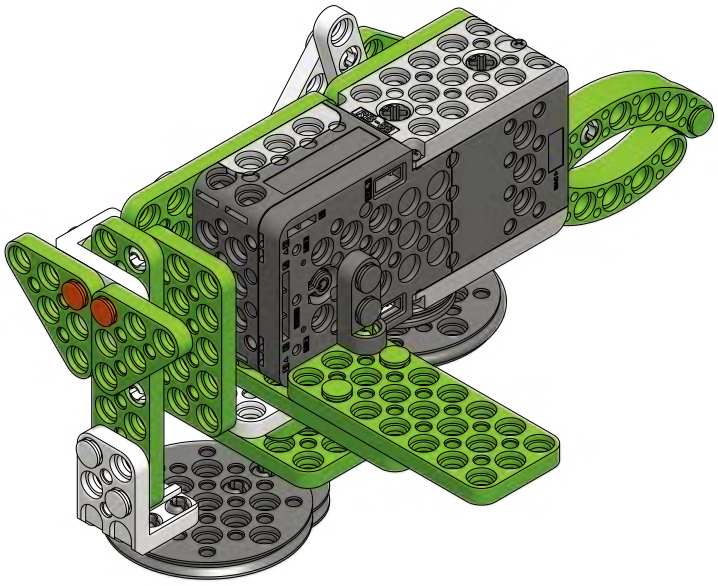
My Own Robot

Customize your spinning top using the remaining parts.

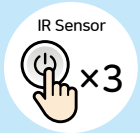
9



See Video



How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.



12 Let's make a cool dinosaur robot!

Let's talk about dinosaurs.

A long time ago, giant dinosaurs roamed the Earth. What types of dinosaurs lived during that era, and why can't we see them anymore?

Let's take a look at the different types of dinosaurs below and talk about some of their distinctive features.

Tyrannosaurus

Brachiosaurus

Triceratops

Let's draw dinosaurs and create a dinosaur art museum.

Draw the dinosaur you want to assemble and write down its features.

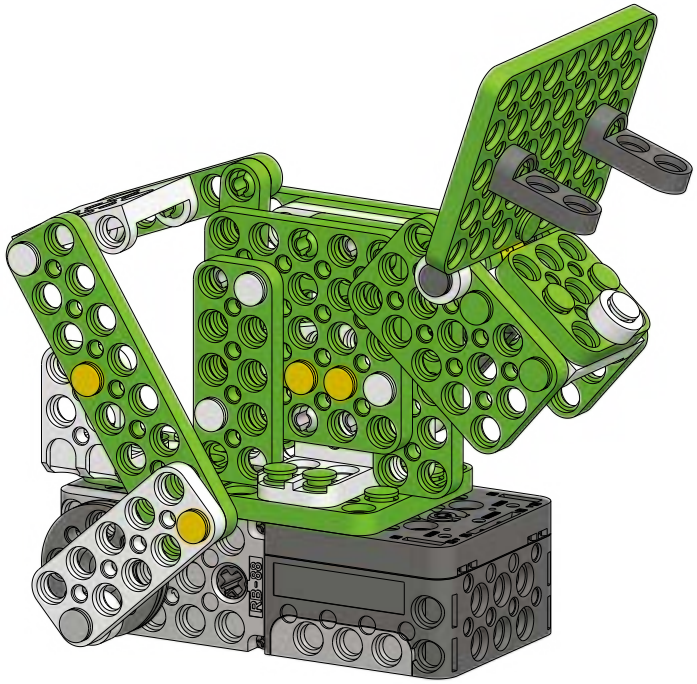
Dinosaur I will make today has

1.

2.

3.

Finish drawing and coloring your dinosaur and display your drawing in the dinosaur art museum. Then, assemble the Triceratops by following the assembly guide.



Triceratops


×13
Rivet ⓦ


×3
Rivet ⓚ


×24
Rivet ⓖ


×5
Rivet ⓨ

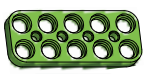

×7
Rivet ⓖr ★


×2
Pl-1b5ⓦ


×4
Pl-1b5ⓖ

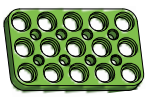

×1
Pl-1b7ⓦ

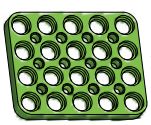

×2
PD-2b5ⓦ

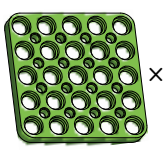

×4
PD-2b5ⓖ

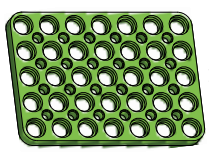

×1
PD-2b8ⓖ


×2
PD-3b3ⓖ


×2
PD-3b5ⓖ

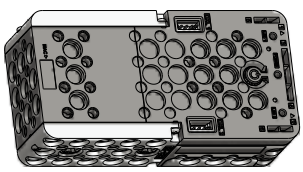

×1
PD-4b5ⓖ


×2
PD-5b5ⓖ

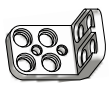

×1
PD-5b7ⓖ


×2
PJ-1b2Rⓨ


×3
PL-1b2ⓚ


×1
RB-88


×1
Horn-5X


×2
PL-2b2ⓦ


×2
PU-5ⓦ


×5
PO-1Aⓦ

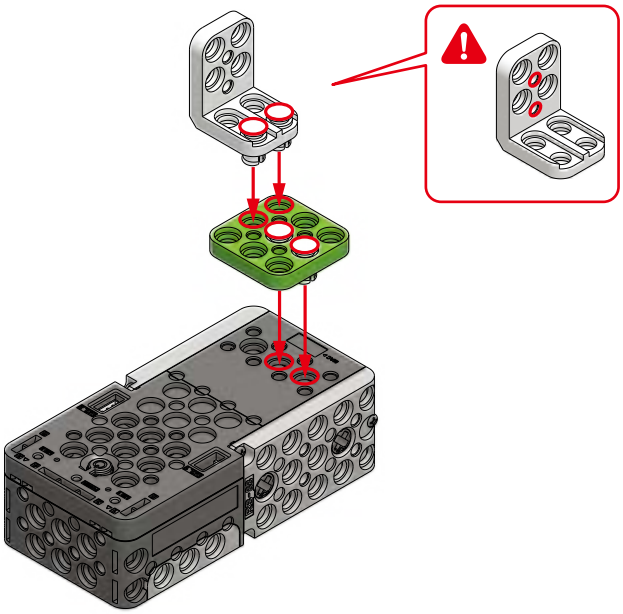
1

×4
Rivet ⓦ

×1
PD-3b3 ⓖ

×1
PL-2b2 ⓦ

×1
RB-88



2

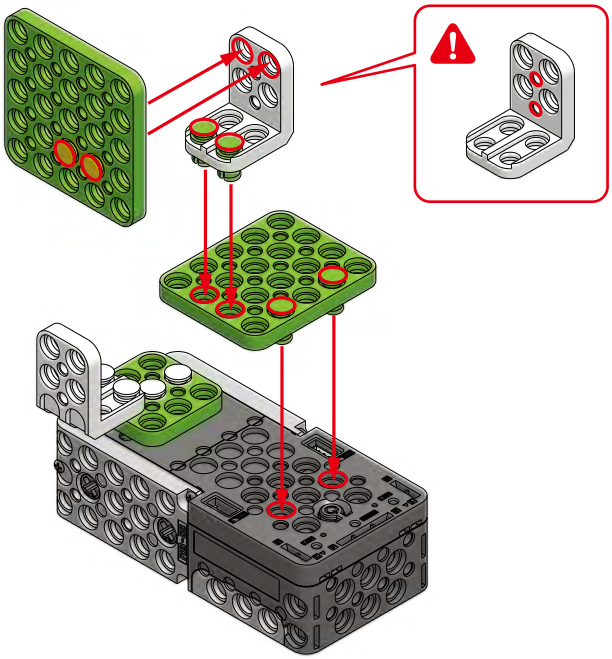
×4
Rivet ⓖ

×2
Rivet ⓨ

×1
PD-4b5 ⓖ

×1
PD-5b5 ⓖ

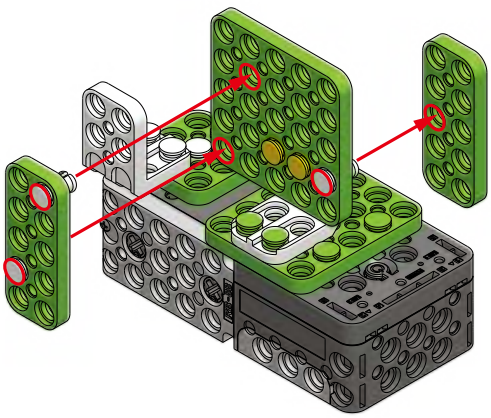
×1
PL-2b2 ⓦ



3

×3
Rivet ⓦ

×2
PD-2b5 ⓖ

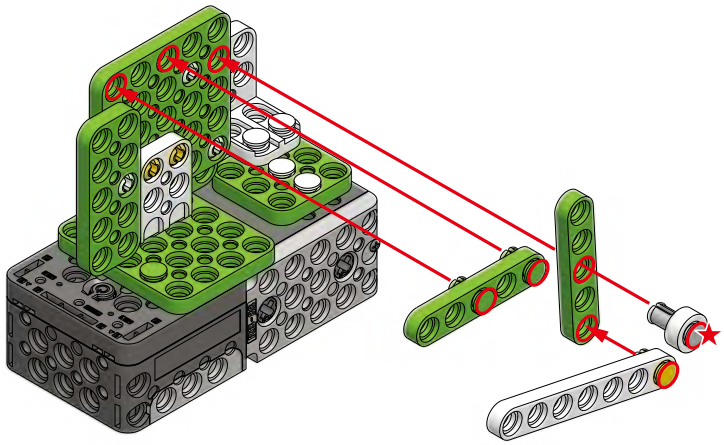


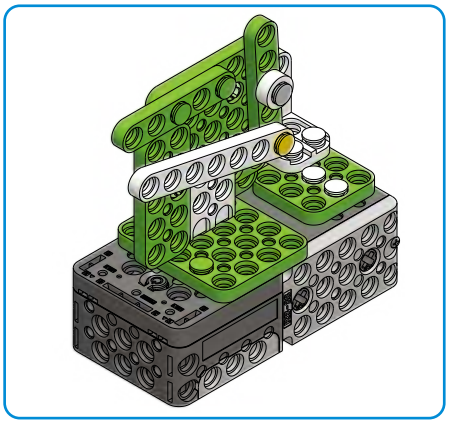
4

×1 Rivetⓨ ×2 Rivetⓖ ×1 Rivetⓖr ★

×2 Pl-1b5ⓖ

×1 Pl-1b7ⓦ ×1 PO-1Aⓦ





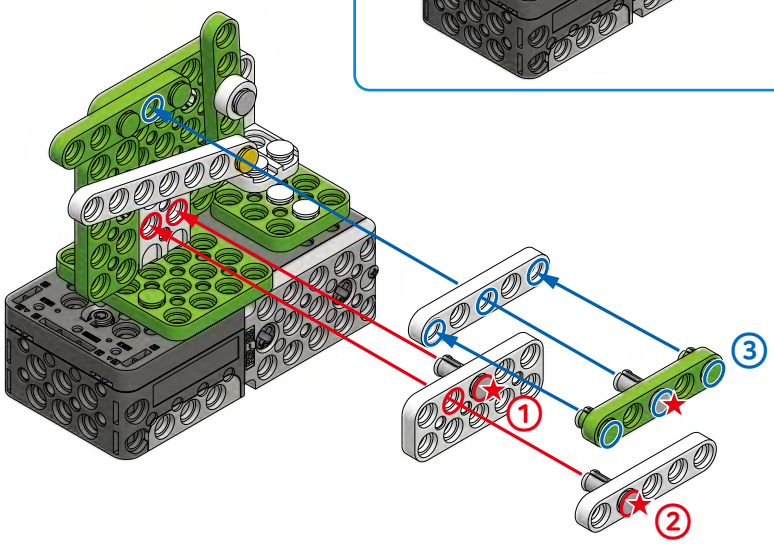
5

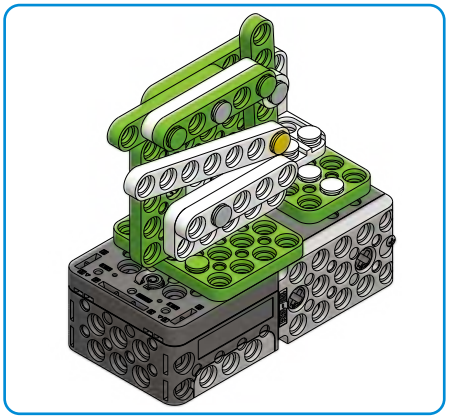
×2 Rivetⓖ ×3 Rivetⓖr ★

×1 Pl-1b5ⓖ

×2 Pl-1b5ⓦ

×1 PD-2b5ⓦ





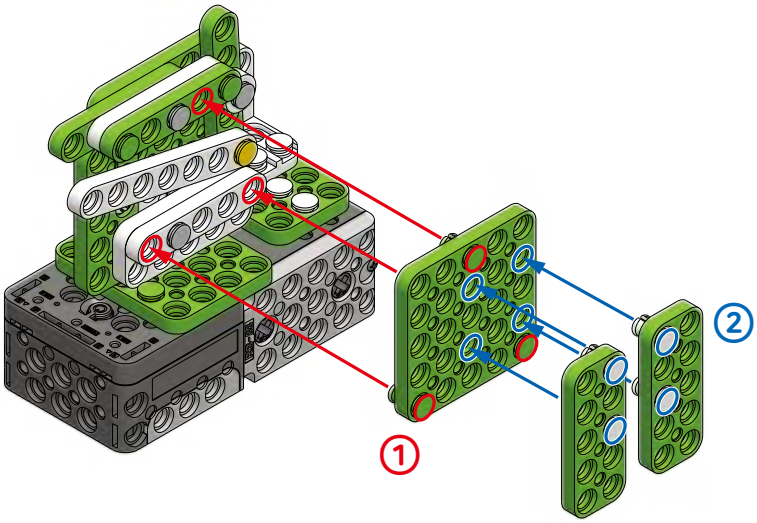
6

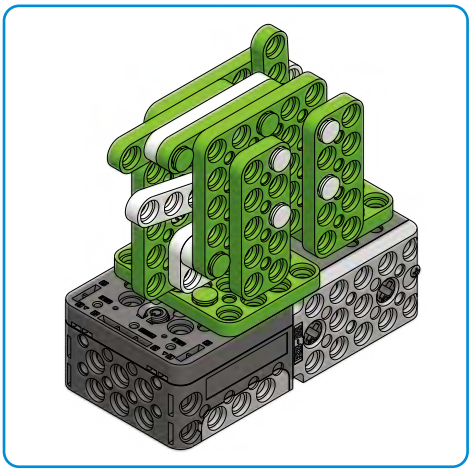
×4 Rivetⓦ

×3 Rivetⓖ

×2 PD-2b5ⓖ

×1 PD-5b5ⓖ





7

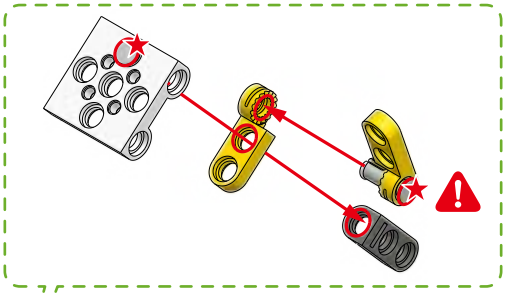
×1 Rivetⓚ

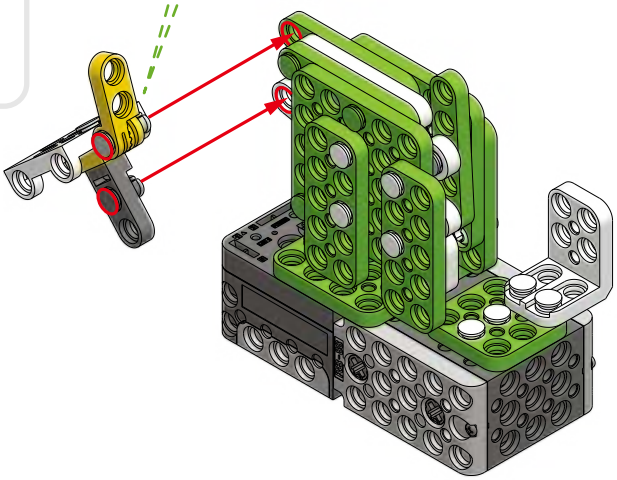
×2 Rivetⓖⓡ ★

×1 PU-5ⓦ

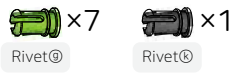
×1 PL-1b2ⓚ

×2 PJ-1b2Rⓨ



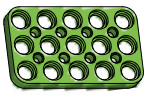


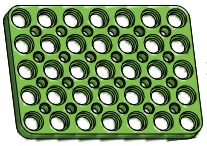
8


×7
Rivet⓰

×1
Rivet⓴

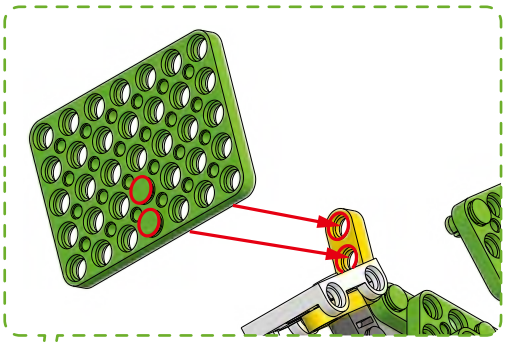

×1
Pl-1b5⓰

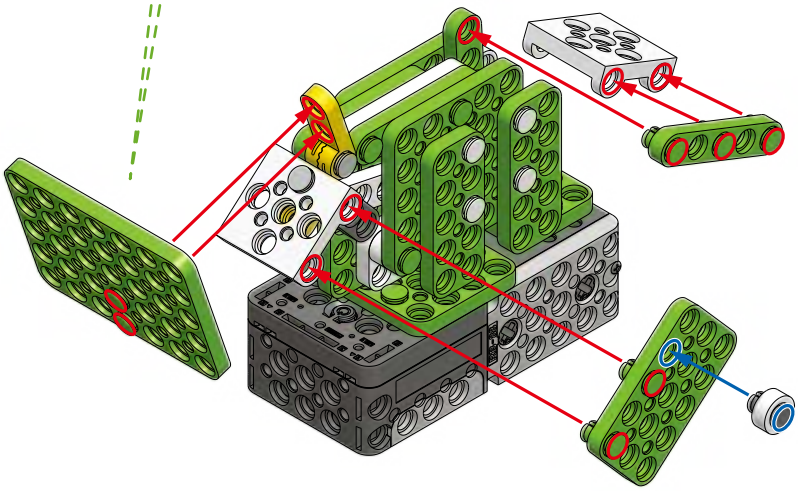

×1
PD-3b5⓰

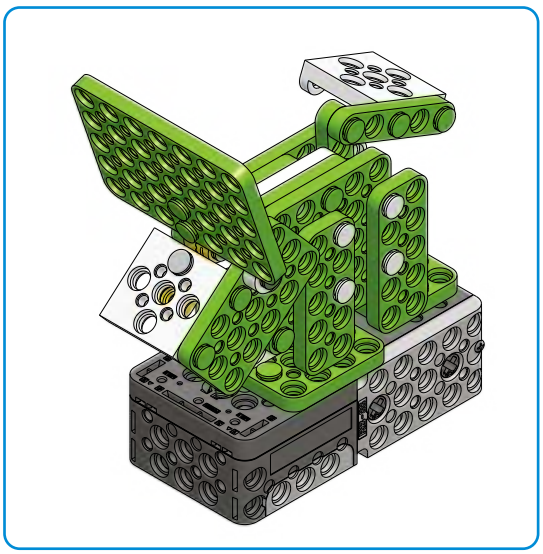

×1
PD-5b7⓰


×1
PU-5ⓦ


×1
PO-1Aⓦ





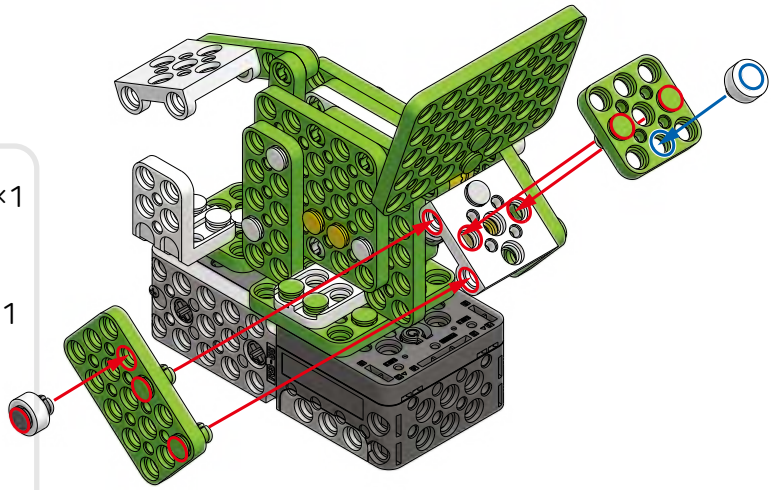


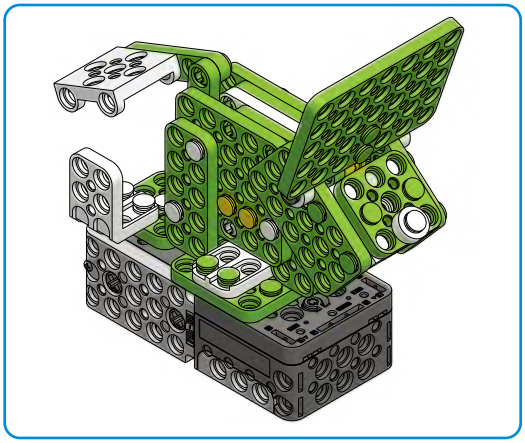
9

×1 Rivetⓦ ×4 Rivetⓖ ×1 Rivetⓚ

×1 PD-3b3ⓖ ×1 PD-3b5ⓖ

×2 PO-1Aⓦ



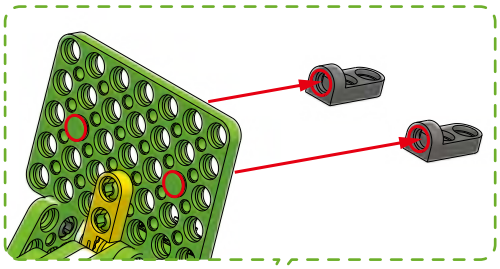


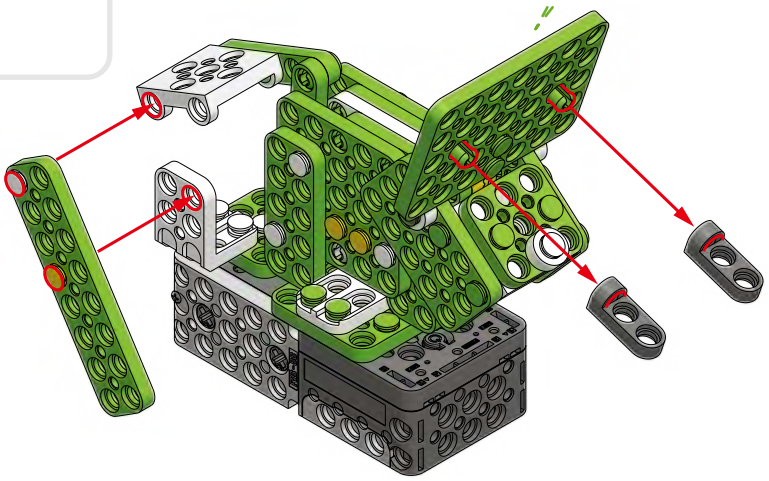
10

×1 Rivetⓦ ×1 Rivetⓥ ×2 Rivetⓖ

×1 PD-2b8ⓖ

×2 PL-1b2ⓚ





My Own Robot

Customize your dinosaur robot using the remaining parts.

11

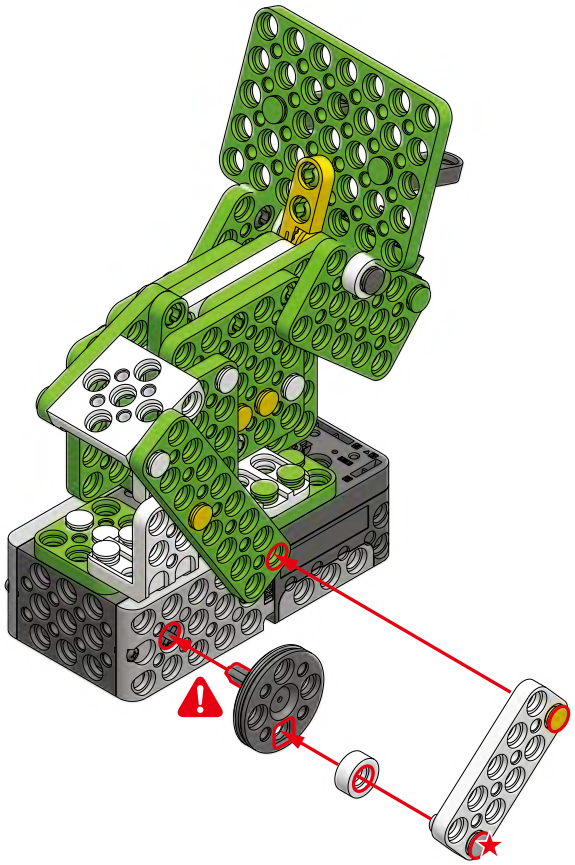
×1 Rivet(y)

×1 Rivet(gr) ★

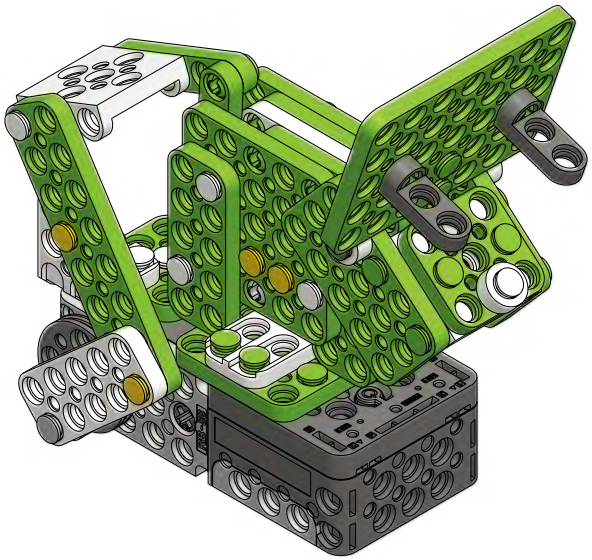
×1 PD-2b5(w)

×1 Horn-5X

×1 PO-1A(w)



See Video



How to run the [OLLO Spark_For All Examples] program after downloading it onto the robot.

Forward ×2

Backward ×1

Remote Control ×5

Robot Facts

The word robot was introduced to the public by the Czech writer Karel Capek in his play R.U.R. (Rossum's Universal Robots), performed in 1921. The word itself is derived from the Czech word robota, which means “forced labor” or “servitude.” In this play, robot is used to describe the humanlike machine that lacks emotions and works on behalf of humans.

Isaac Asimov, the renowned science fiction writer, introduced the "Three Laws of Robotics" in his 1950 novel, "I, Robot." These laws continue to serve as essential guidelines for humans in the development of robots.

First Law: A robot may not injure a human being or, through inaction, allow a human being to come to harm.
Second Law: A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.
Third Law: A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

(1) Who was the first person to use the word “robot” in his play R.U.R (Rossum's Universal Robots), which was performed in 1921?

① Isaac Asimov ② Karel Capek
③ Tezuka Osamu ④ AlphaGo

(2) The word “robot” originates from an old Church Slavonic word “robota.” Choose the correct meaning of the word “robota.”

① iron ② labor ③ artificial intelligence ④ motor

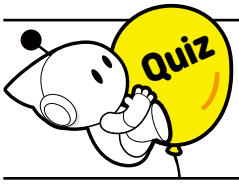
(3) Who first presented the Three Laws of Robotics in his novel “I, Robot,” published in 1950?

① AlphaGo ② Karel Capek ③ Isaac Asimov ④ Tezuka Osamu

(4) According to the three laws of robotics, which of the following behaviors is not appropriate for a robot?

① Getting hit by a ball to protect human beings.
② Being attacked by humans, but not fighting back.
③ Ignoring the commands of humans because AI robots are smart.
④ Seeking shelter to escape the rain during a downpour.

Answers : (1)② (2)② (3)③ (4)③



OLLO Spark Quiz

(1) Choose the incorrect statement about the OLLO Spark controller (RB-88).

① Uses either one 1.5V battery or three 1.2V rechargeable batteries.
② After pressing the start button to turn on the power, you can run the program.
③ There are 4 motor shafts for operating the robot.
④ Infrared sensors are not used.

(2) Choose the correct statement about precautions that should be taken when using robots with batteries.

① Batteries must be short-circuited to increase the power of the motor.
② It is okay to charge non-rechargeable batteries and use them.
③ Never use old and new batteries together.
④ Batteries exposed to water will not create any harm or problems.

(3) Choose the incorrect statement about R+Block.

① R+Block is a easy-to-use block-coding program.
② R+Block can be used in the STEAMCUP app.
③ R+Block includes various AI features such as audio and video.
④ R+Block cannot be used on smartphones.

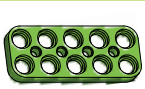
(4) Choose the incorrect statement about elasticity.

① Elasticity is the ability of an object to return to its original shape after being subjected to a force.
② All objects never return to their original shape once their shape is changed.
③ Rubber bands, spring, and trampolines are some examples of elastic objects.
④ A bow is an example of an object that uses elasticity and is able to shoot an arrow using elasticity.

(5) Choose the incorrect statement about STEAM education.

① The A in STEAM stands for Age.
② The S in STEAM stands for Science.
③ The E in STEAM stands for Engineering.
④ The M in STEAM stands for Mathematics.

(6) Which of the following options has a name that correctly matches its image?

① Rivet 

② Plate 

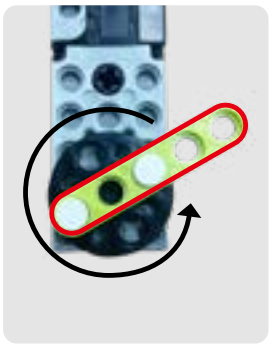
③ Rivet Tool 

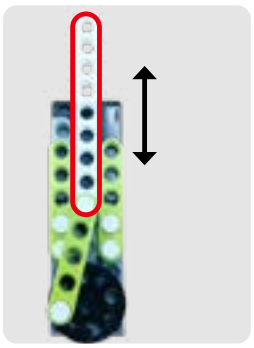
④ Cross-shaped Horn 

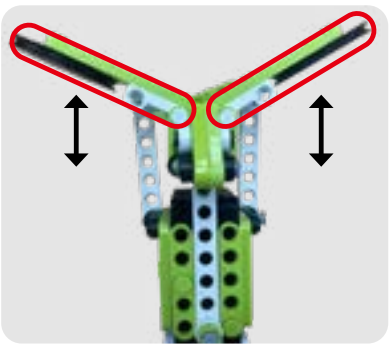
(7) Choose the incorrect statement about the RB-88 controller's power button.

① Press the power button to turn on the power.
② When the [OLLO Spark_For All Examples] is saved, the robot's motion varies according to the number of times the start button is pressed.
③ When the controller is turned on, pressing the power button once will turn off the controller.
④ The location of the start button can be known only after disassembling the controller.

(8) Choose the image with the part marked in red that does not reciprocate.

① 

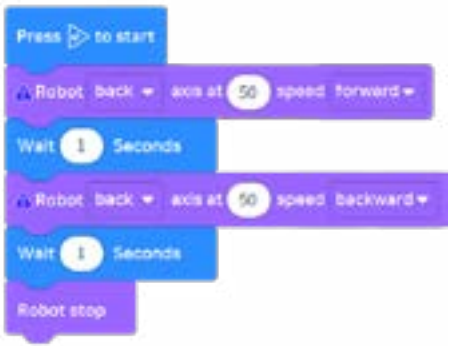
② 

③ 

(9) Choose the incorrect statement about angles.

① The angle between a horizontal and a vertical straight line is called a right angle.
② The measurement of a right angle is 60 degrees.
③ The measurement of an obtuse angle is greater than 90 degrees, and an angle with 135 degrees is an obtuse angle.
④ The location of the start button can be known only after disassembling the controller.

(10) Choose the correct statement about the R+Block code shown below for controlling the Bull Robot.



① When the code is executed, the robot moves forward for 1 second and stops.
② When the code is executed, the robot repeatedly moves forward and backward.
③ The rotation speed of the motor is set to 80.
④ When the code is executed, the robot stops after moving forward for 1 second and moving backward for 1 second.

Answers : (1)④ (2)③ (3)④ (4)② (5)① (6)④ (7)④ (8)① (9)② (10)④

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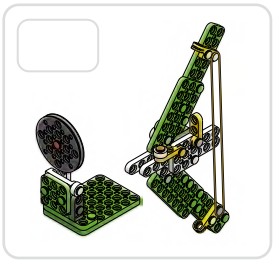
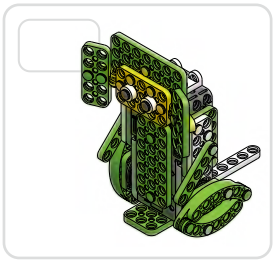
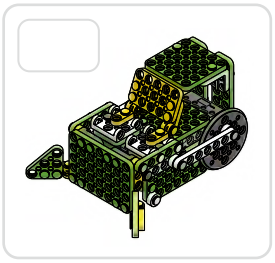
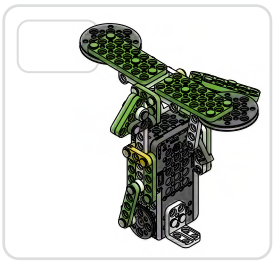
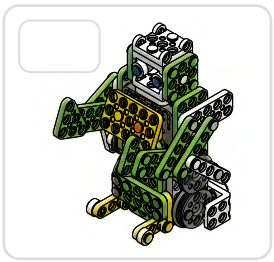
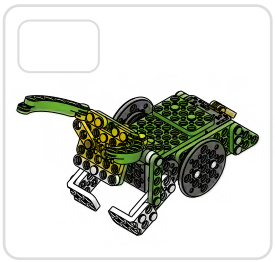
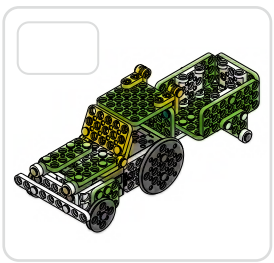
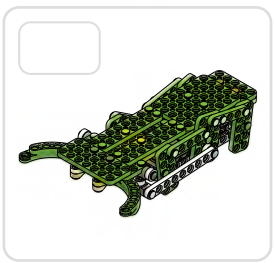
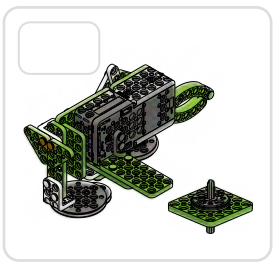
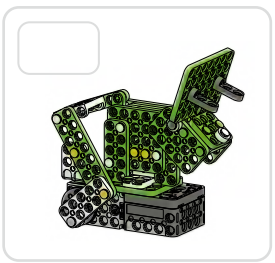
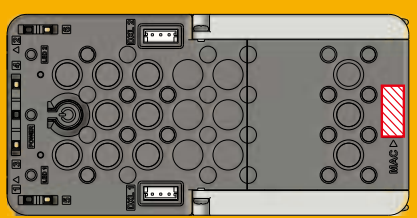
OLLO Spark

Check after assembling the robot





Name