



my robot time

MRT3 Series

- MRT3 curriculum is developing for helping students(age 6 - 13+), through robotics, learn essential STEM (science, technology, engineering, and math) concepts.
- Step by step and systematic building instructions for MRT3 educational robot kits.

**Beginner
Level**

**Foundation
Level**

**Intermediate
Level**

**Advanced
Level**

MRT3-2. Beginner Level

CONTENTS



<i>Part List</i>	4
<i>How to use the main board?</i>	6
<i>How to use the Remote Controller?</i>	8
<i>What are we going to learn?</i>	9
○ STEM 1. The muscle of Robot—Motor	11
○ Robot Making1--Mini Tank	12
○ STEM 2. What's IR Sensor(Inferared Sensor)	18
○ Robot Making2--Duckling	19
○ STEM 3. Learn the principle of Light	26
○ STEM 4. The Shaft wheel and Steer wheel	27
○ Robot Making3--Power Spin	28
○ STEM 5. Making My Own Power Spin	34
○ STEM 6. The eyes of Robot—IR Sensor1	35



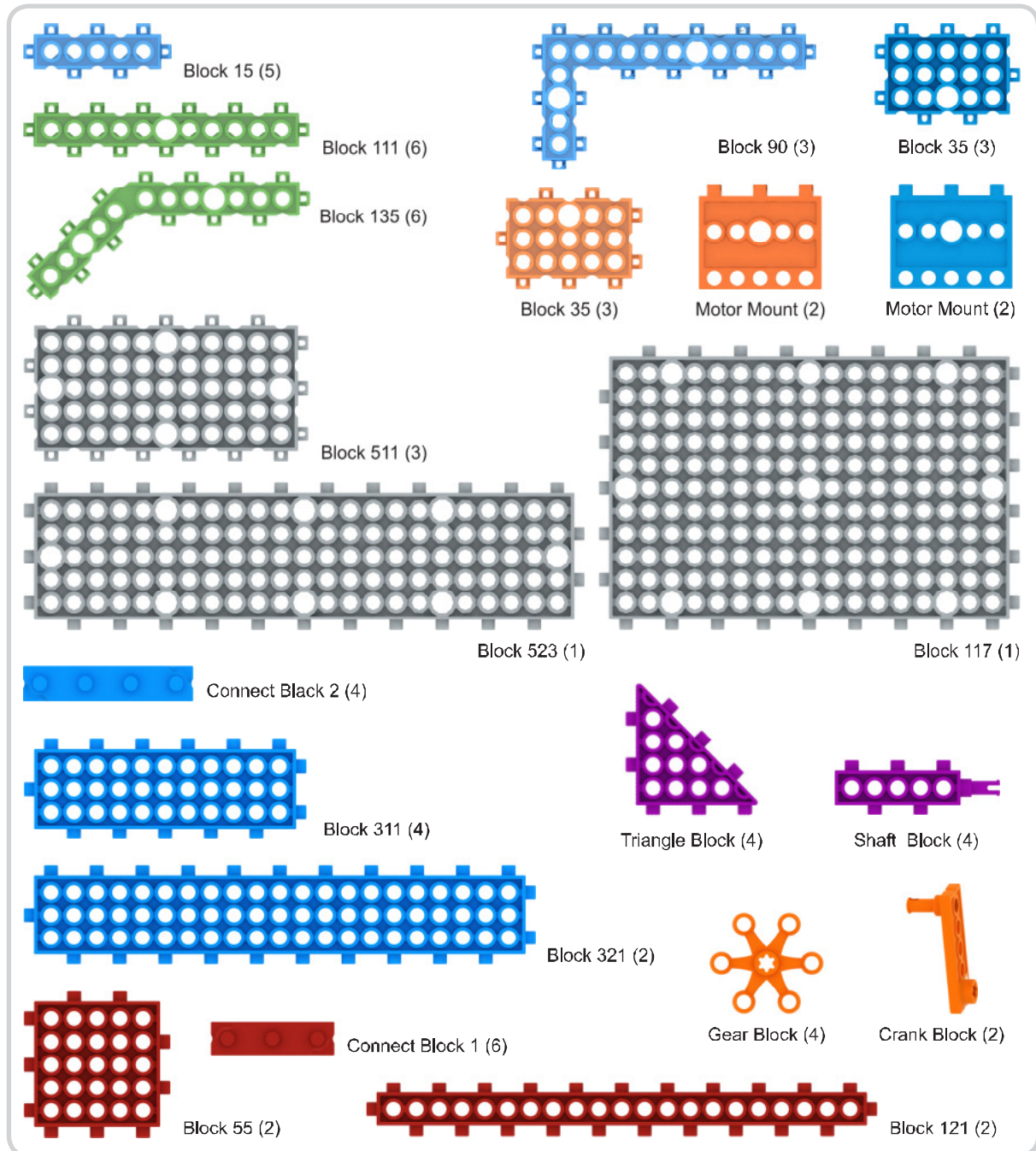
○ Robot Making4--Sumo—Bot	36
○ Robot Making5--Skier Man	47
○ STEM 7. The eyes of Robot—IR Sensor2	56
○ STEM 8. what is avoider?	58
○ Robot Making6--Huna—E	60
○ STEM 9. The Avoider that can avoid objects	67
○ STEM 10. I like black line—Linetracer	68
○ Robot Making7--Line Tracer Train	69
○ STEM 11. Learn the Position of Sensor	80
○ STEM 12. The energy from movement—Kinetic energy	81
○ Robot Making8--Target Shooting Game With Gun	82
○ STEM 13. The transformation of energy—Roller Coaster	93
○ Robot Making9--Car and Car key	94
○ STEM 14. Energy can change back and forth	105



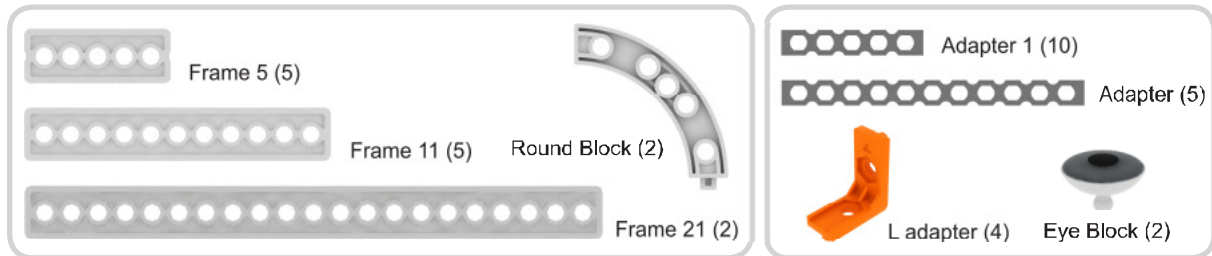
Part list

Block

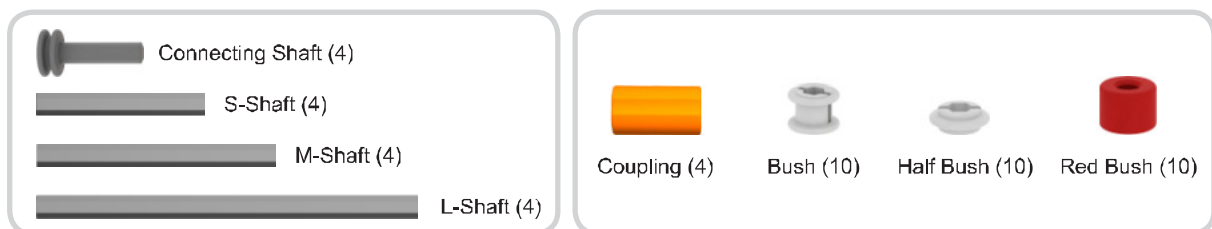
※ The form and color of some parts may be different when compared to actual parts due to continues improvement of production quality.



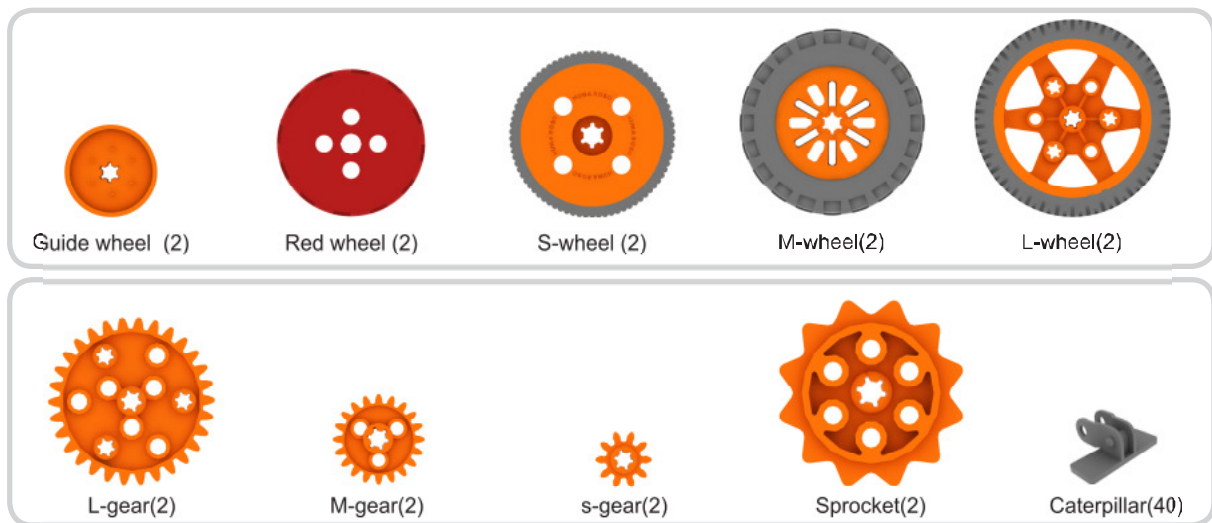
Frame / Adapter



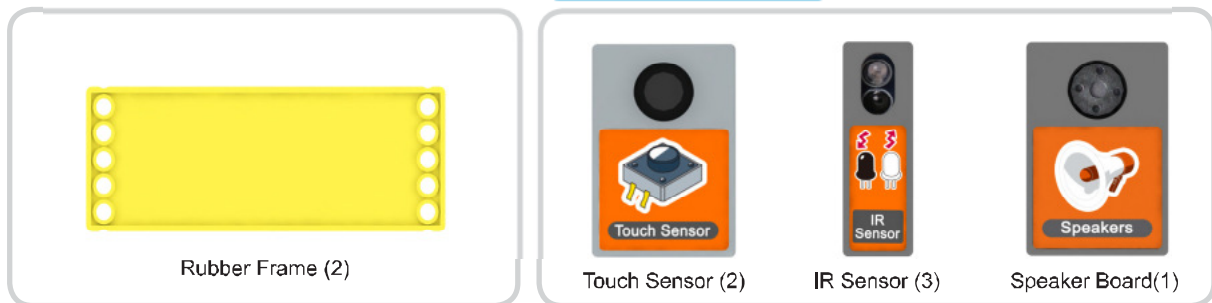
Shaft / Bush



Gear / Wheel



Electronic Parts

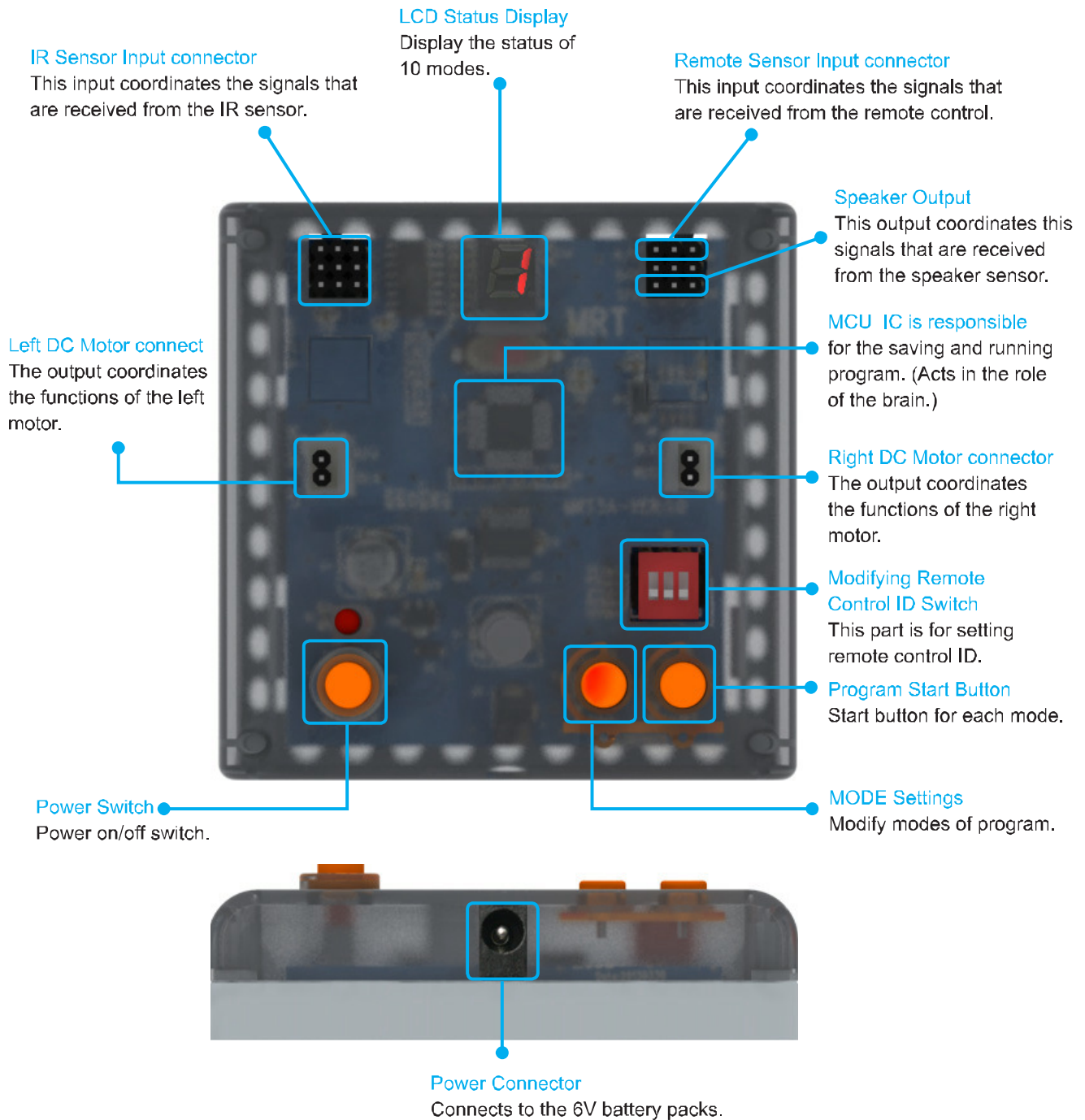




Technology

How to use the electronic parts?

Mainboard assembly/Function of each feature



Mode Setting

1. Press mode button and the LCD will be changed as below. Please select your favorite function.
2. After selecting your favorite mode, press start button and the robot will move.

MODE 1



Free Move

MODE 2



Remote control control

MODE 3



Line Tracer

MODE 4



Avoider

MODE 5



Stalker

MODE 6



Drop Checker

MODE 7



Touch

MODE 8



Remote Control + IR

MODE 9



Remote Control + Touch

MODE 0



Remote Control(R)

IR Sensor



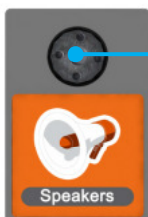
"Send" light

An infrared signal is sent to the object.
If there is a reflection, the information is sent to the 'receive' light part.

"Receive" light

This receives the signal from the above part and converts that signal into the input signal.

Speaker Sensor



This sensor receives the Sound from MB and sent out.

Touch Sensor

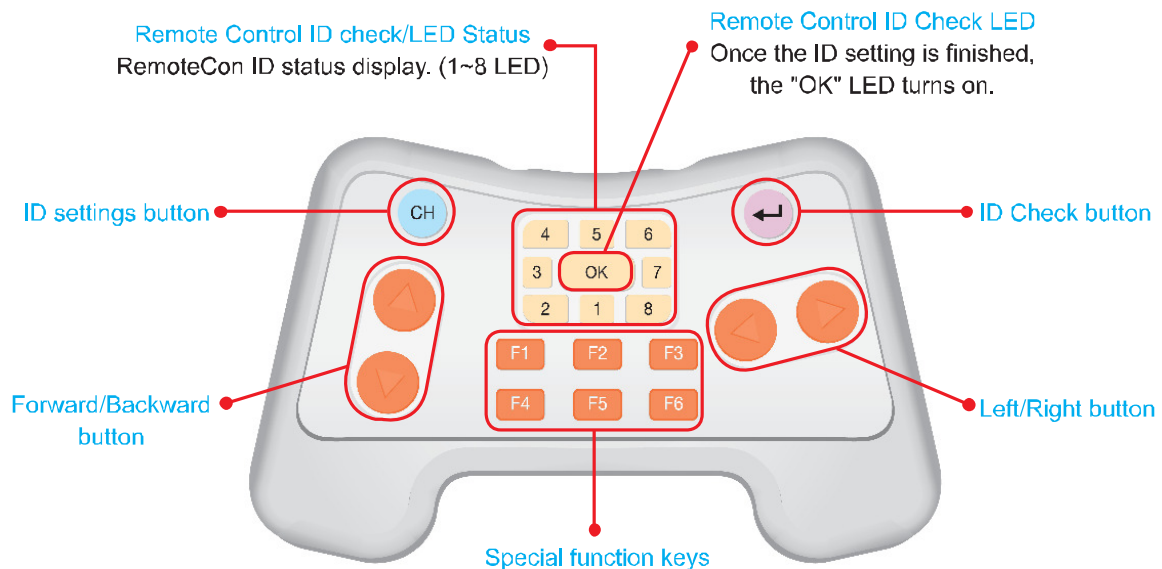


set the output signal as ON/OFF function.



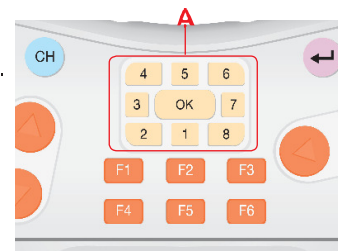
How to use the remote control?

Remote Control configuration



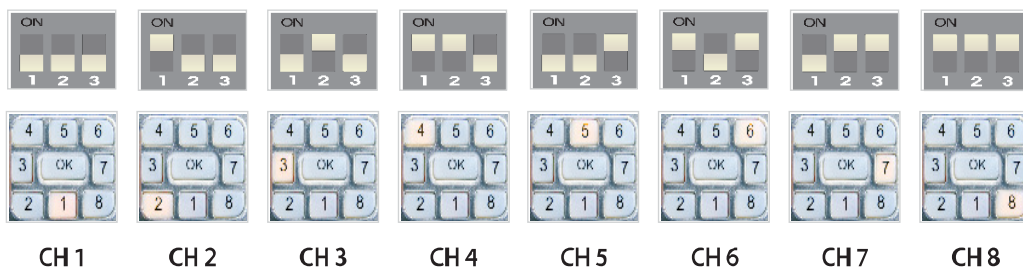
Setting remote control ID

- ① Turn on the robot.
 - ② Select # 2 mode of robot.
 - ③ Press **CH** button while holding **↵** button. The **A** panel ID LED turns on and shows you what mode you chose.
 - ④ Press **CH** button while holding **↵** button and choose your ID. (Number 1~8)
 - ⑤ After selecting ID, if you release **↵** Button and press **CH** button, ID will be selected.
 - ⑥ The LED on the mainboard will blink 3 times and it will turn off automatically.
That means the ID Selection is finished.
 - ⑦ If you press **↵** button, you can see your selected ID.
- ※ If there is a problem, repeat steps 1-7 carefully.



How to set up communication ID

- ※ The maximum number of channels can be set as shown below without interference.
Use the picture to assign the channels to the communication ID.





What robots are we going to assemble?



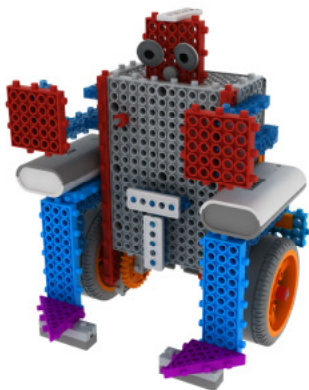
1. Mini Tank



2. Duckling



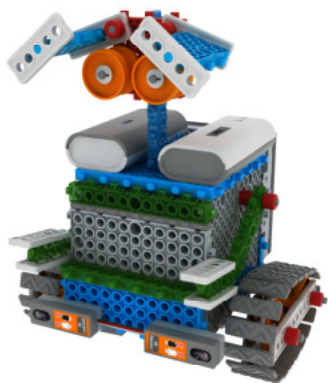
3. Power Spin



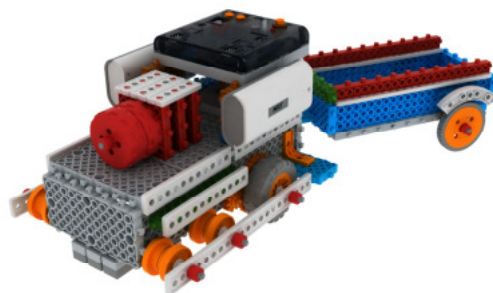
4. Sumo-Bot



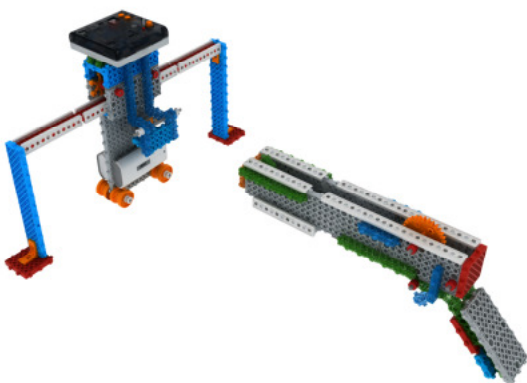
5. Skier Man



6. Huna-E



7. Line Tracer Train



8. Target shooting game with gun



9. Car and car key



Technology

STEM 1. The muscle of Robot-Motor

Who will win?

1

Wait! My robot is not working! Help me, Huna..

2

I think your robot has a broken motor.

What's a motor?

3

A motor is a machine that converts other forms of energy into mechanical energy and so It is important part.

4

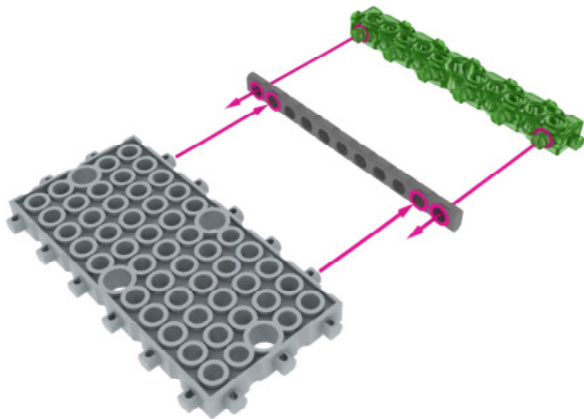
Ah! The motor is the muscle of the robot!



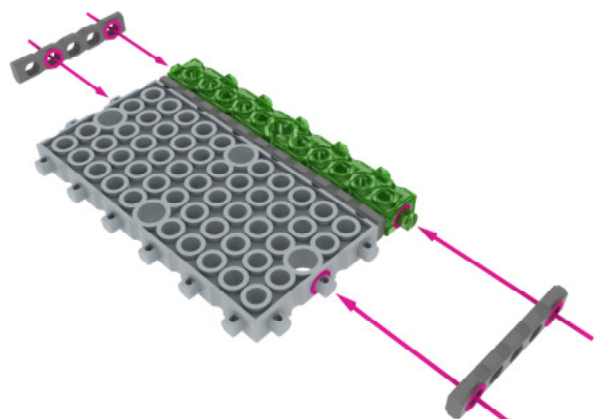
**Robot Making1-Mini Tank
(with sound)**



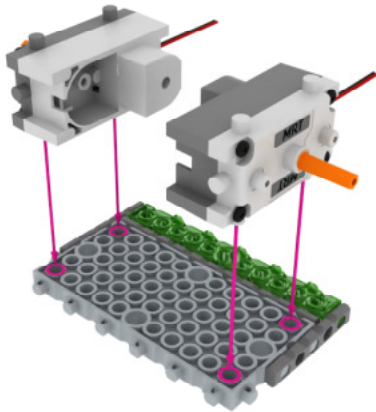
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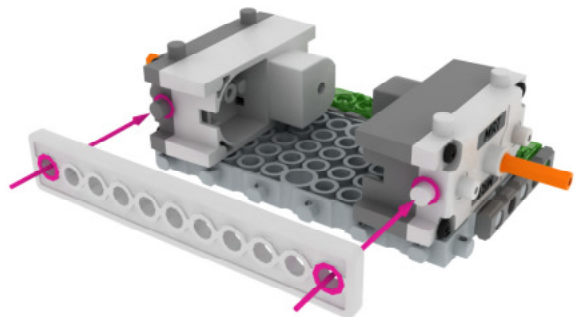
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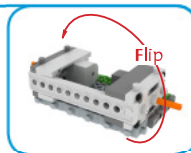
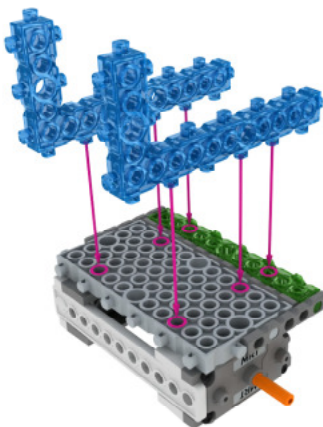
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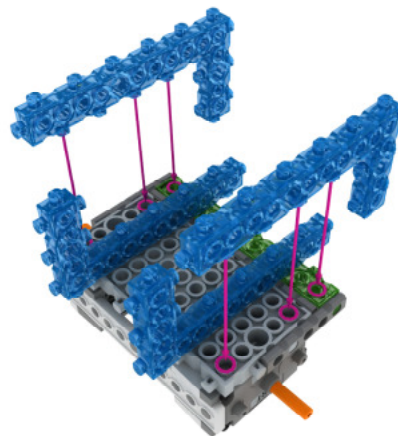
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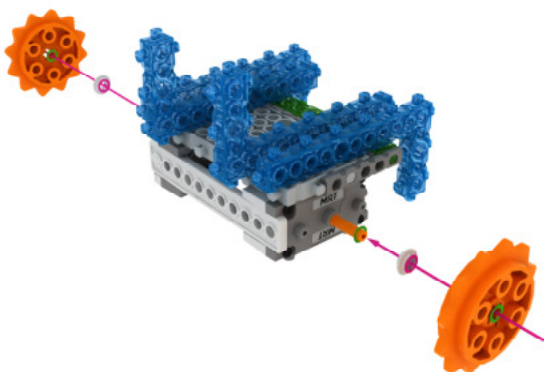
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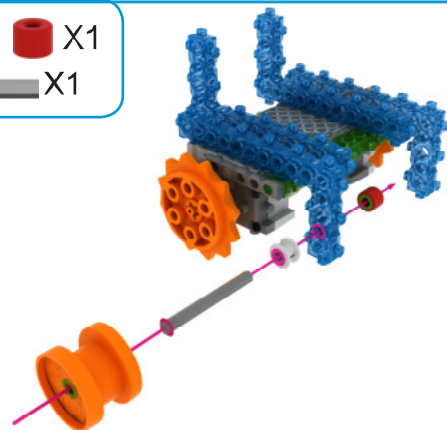
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X2

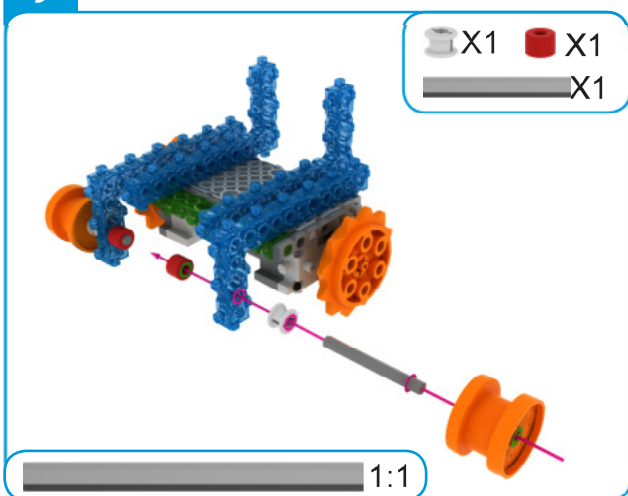
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X1 X1 X1

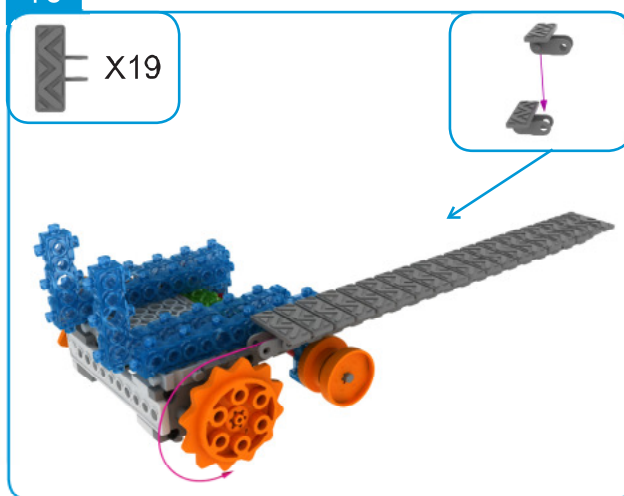


1:1

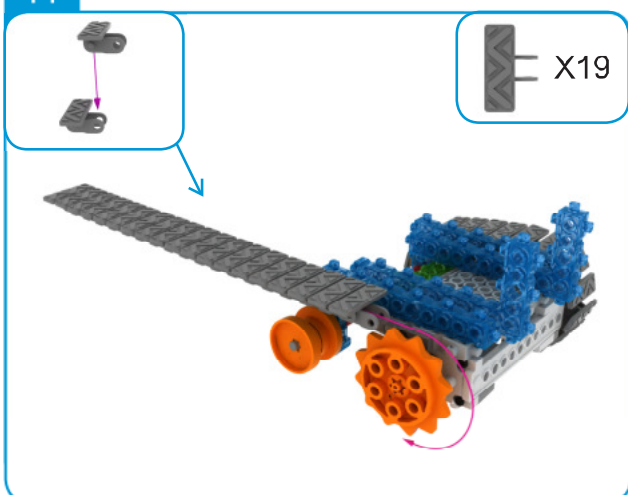
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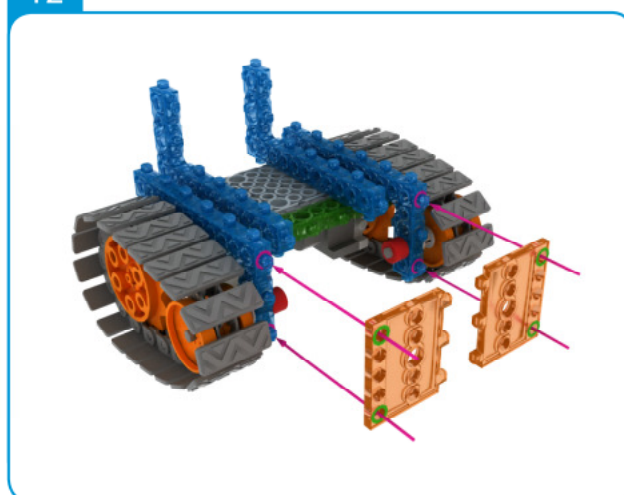
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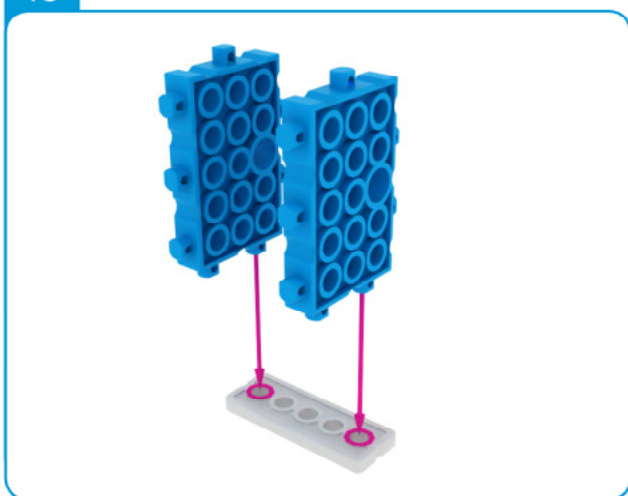
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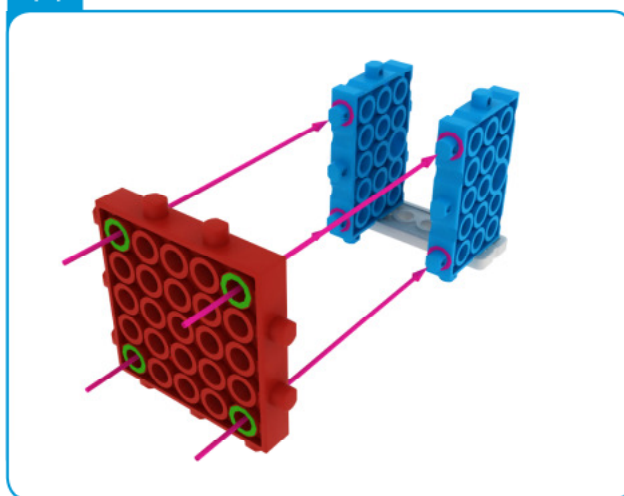
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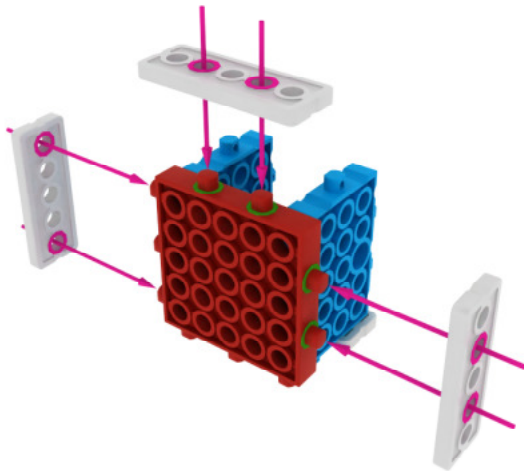
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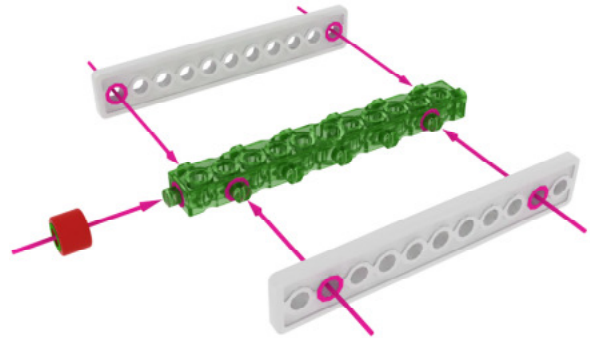
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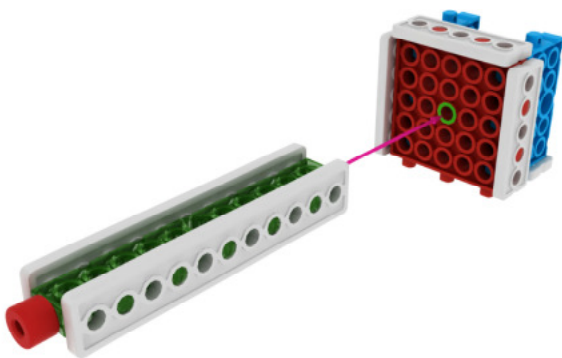
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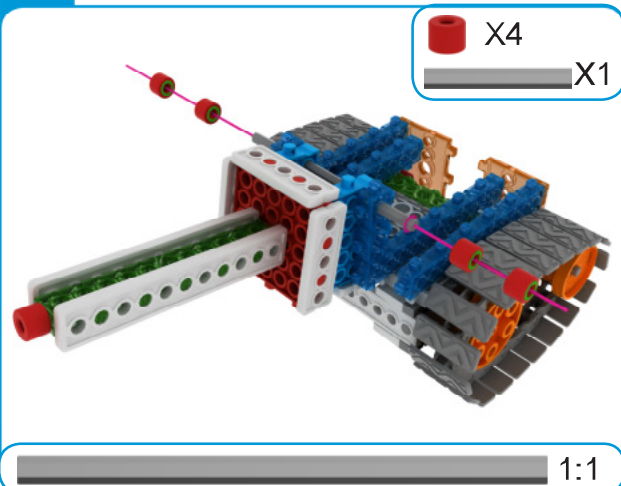
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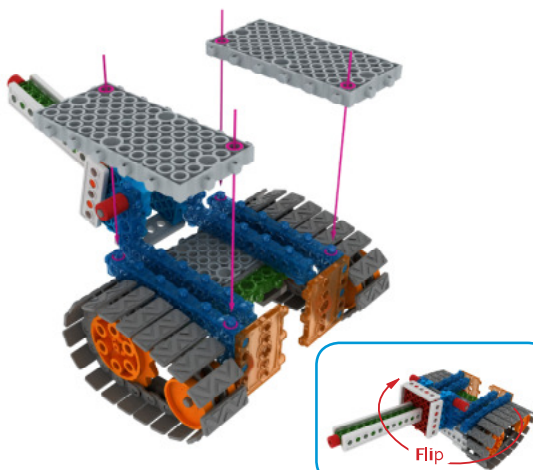
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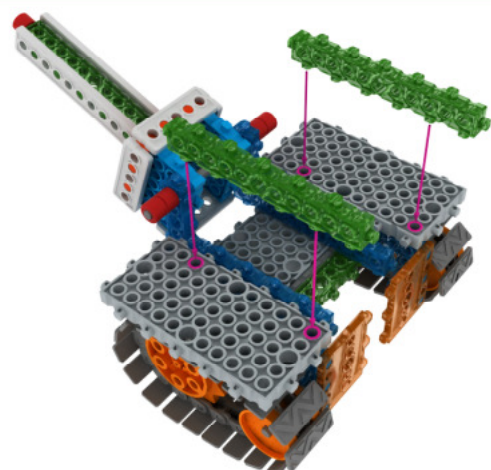
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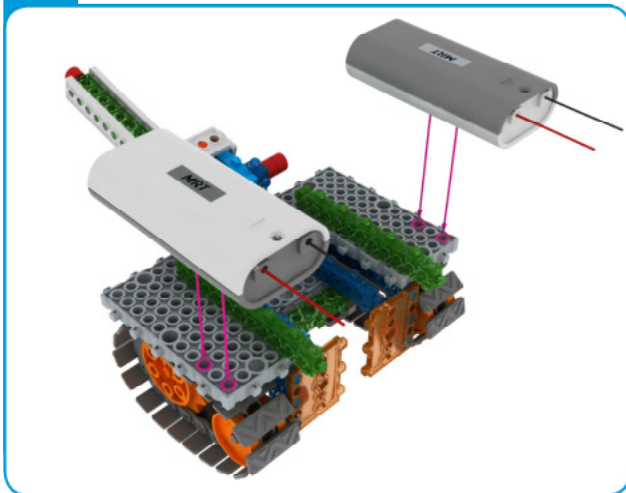
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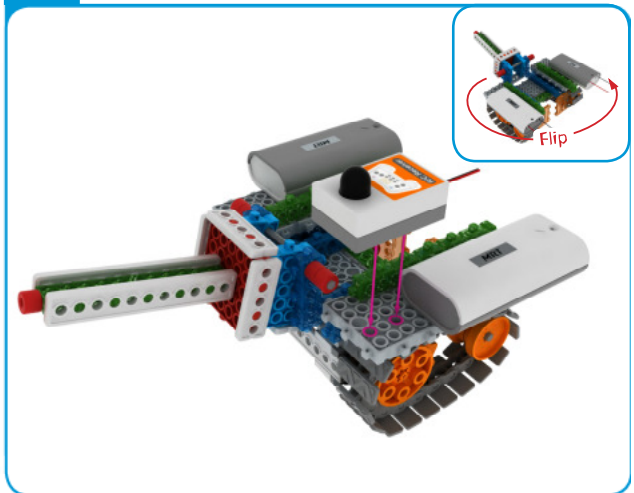
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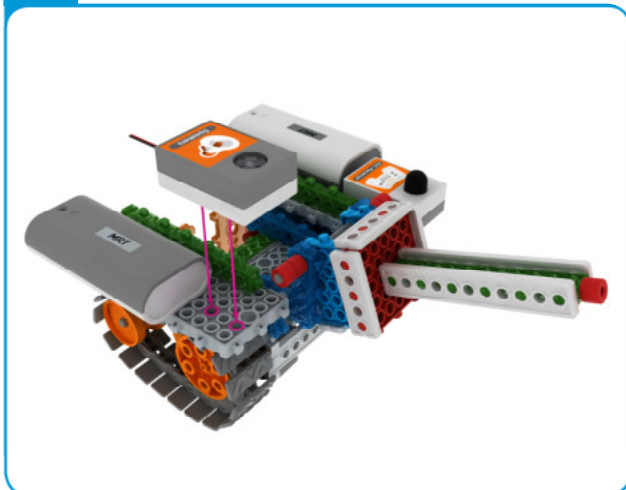
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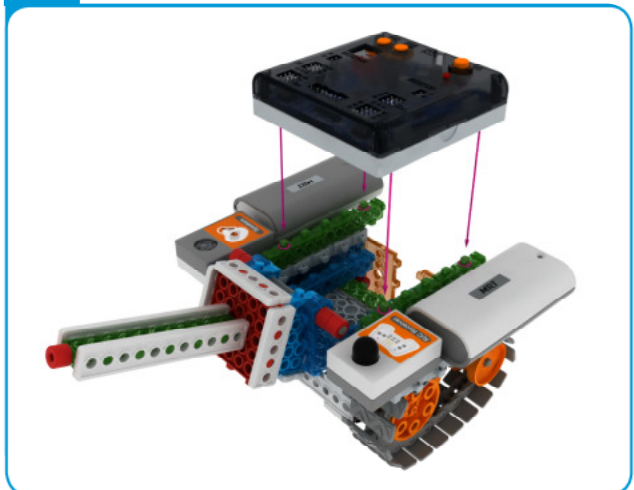
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23



24



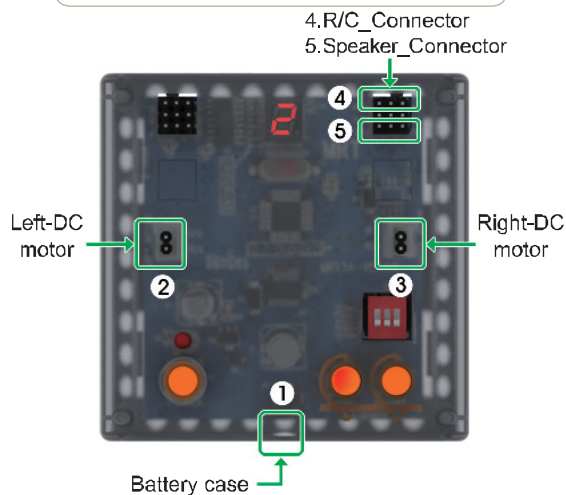
End





How to operate Tank?

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect R/C receiver board to R/C connector.
5. Connect Speaker Sensor to IN2 connector.

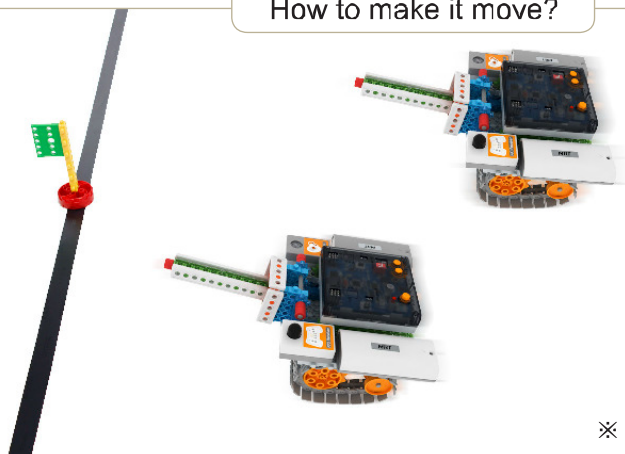
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

MODE # 2		Remote control Mode
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4. Select Remote ID.
5. Press the START button.

How to make it move?



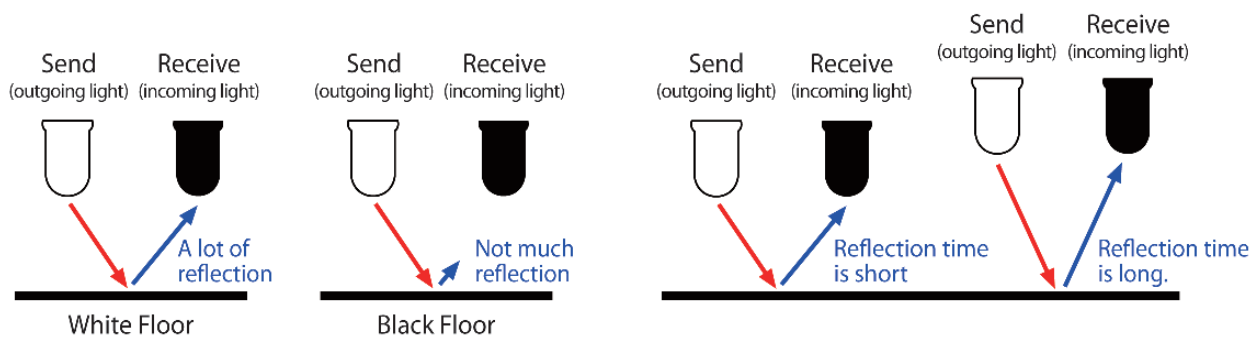
※ Play funny game with your friends



STEM 2. What's IR Sensor (INFRARED SENSOR)

IR sensor?

- An IR sensor has a send and receive part. The time taken to receive the signal can be converted into a distance for the robot to measure. An IR Sensor can also detect between light and dark surfaces.



Recognize light and shade

Measure distance



Make a pet robot that will follow you everytime.

A large, light blue, spiral-bound notebook page with horizontal lines for writing.

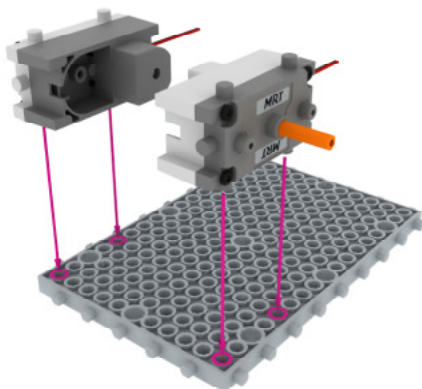


Engineering
Art

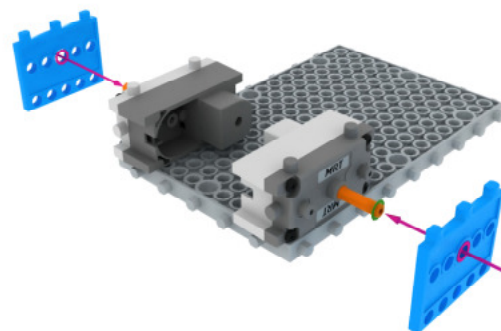
Robot Making2-Duckling (with sound)



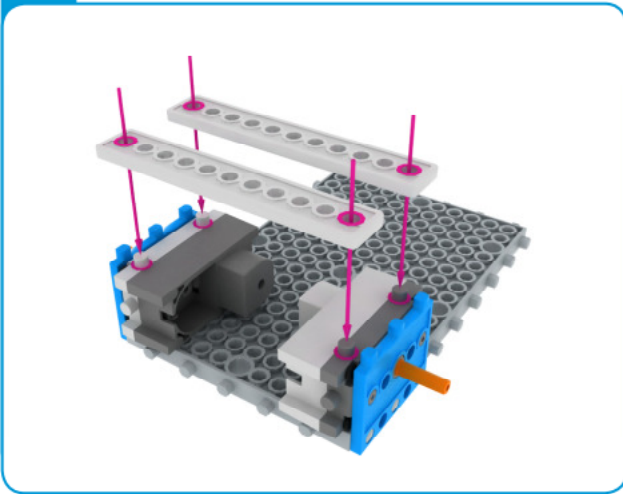
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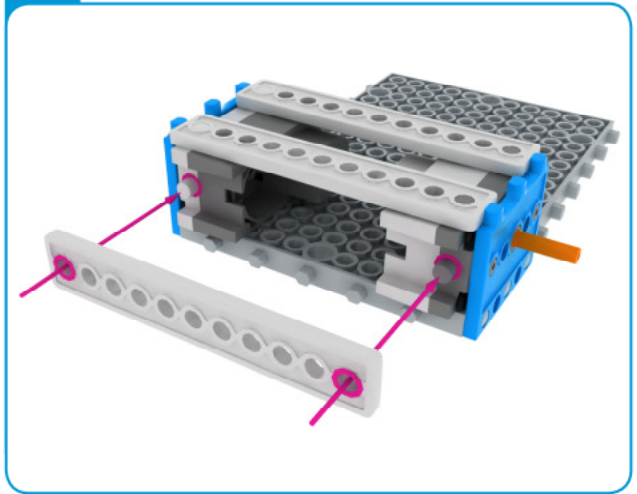
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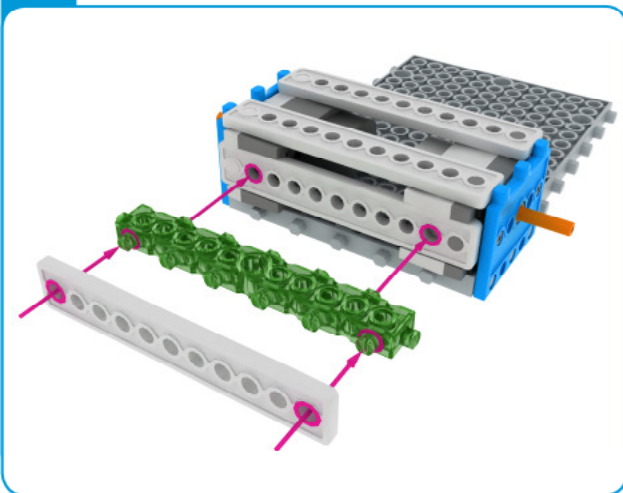
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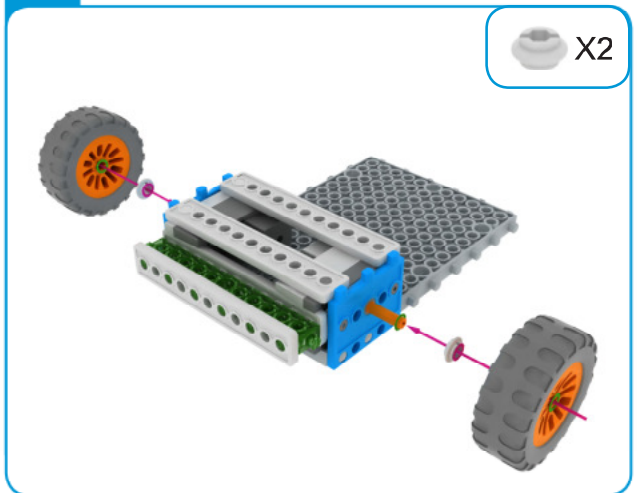
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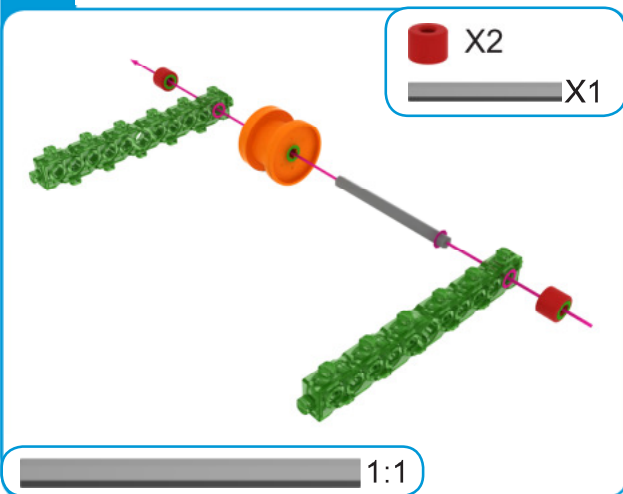
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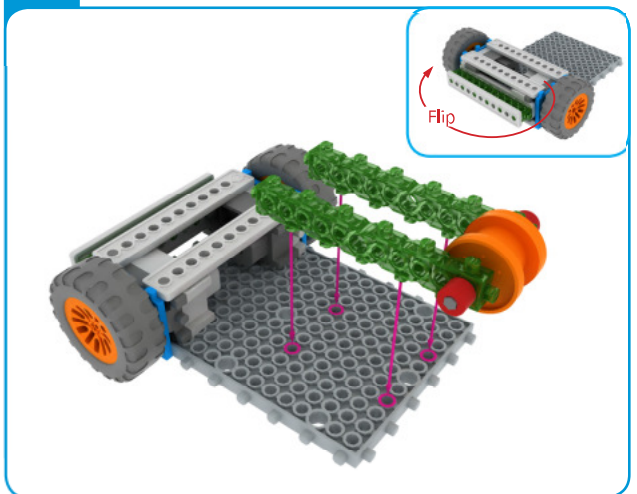
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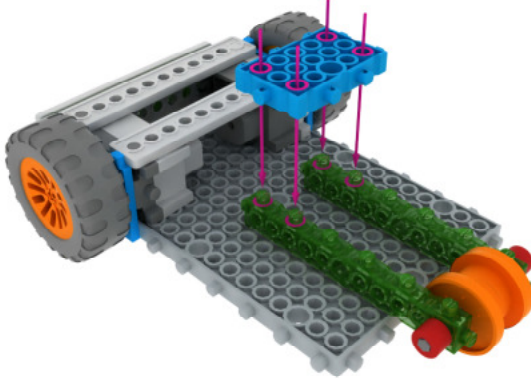
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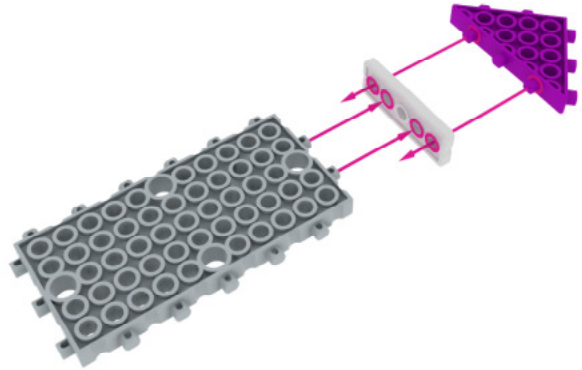
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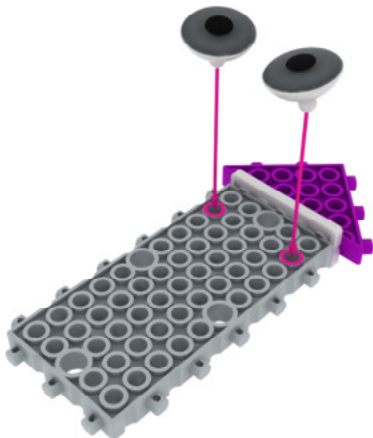
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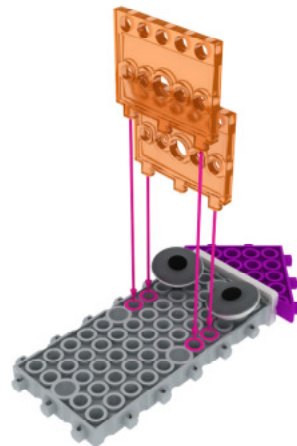
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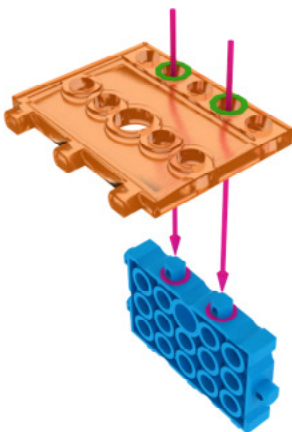
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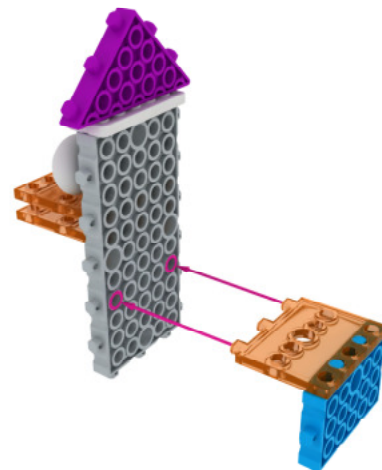
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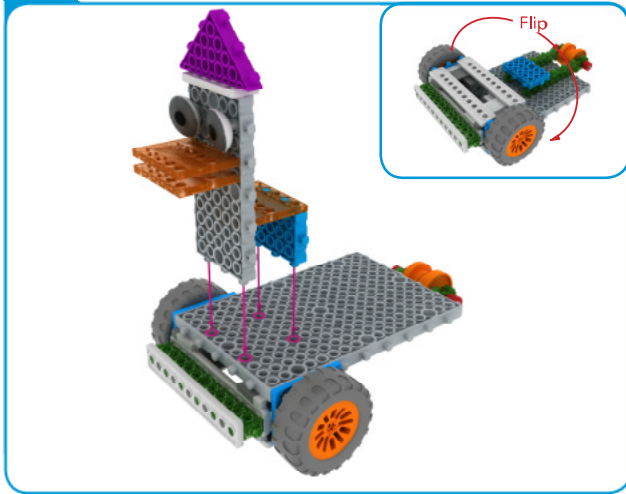
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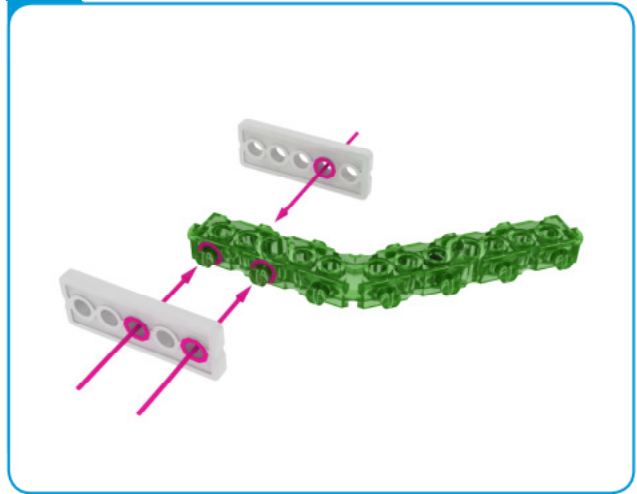
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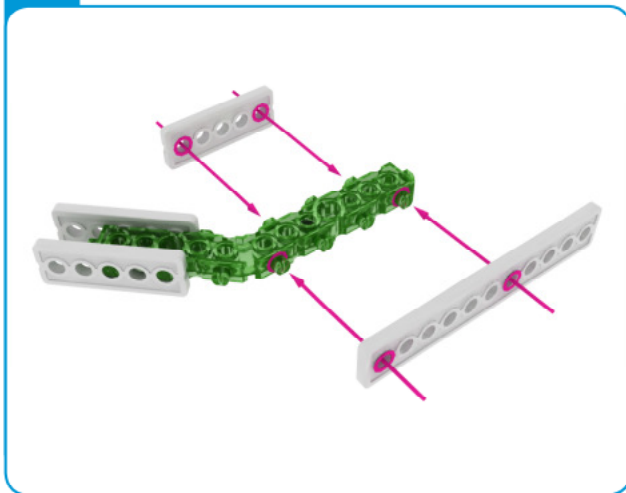
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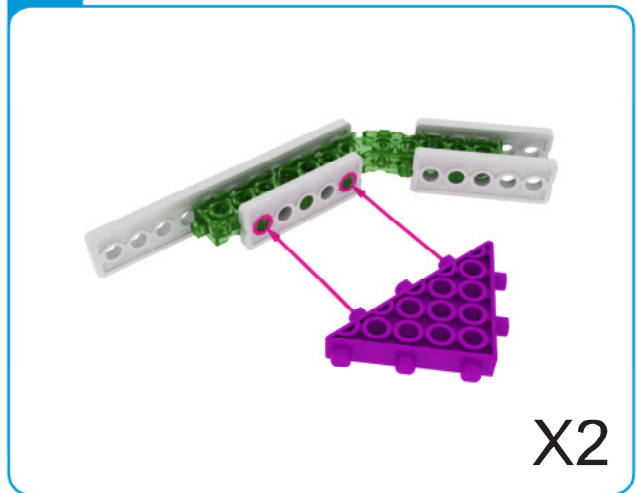
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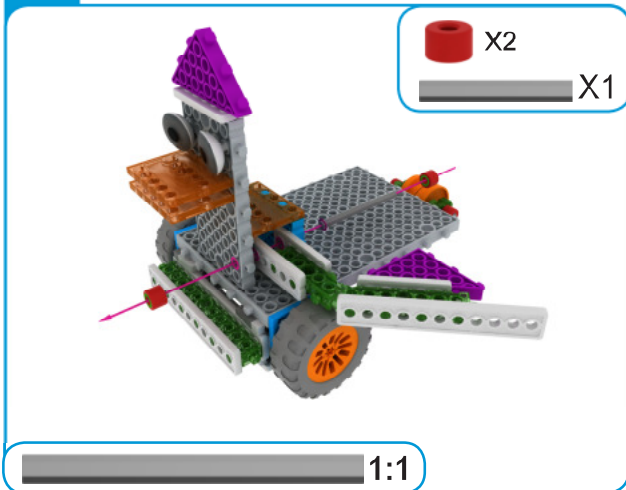
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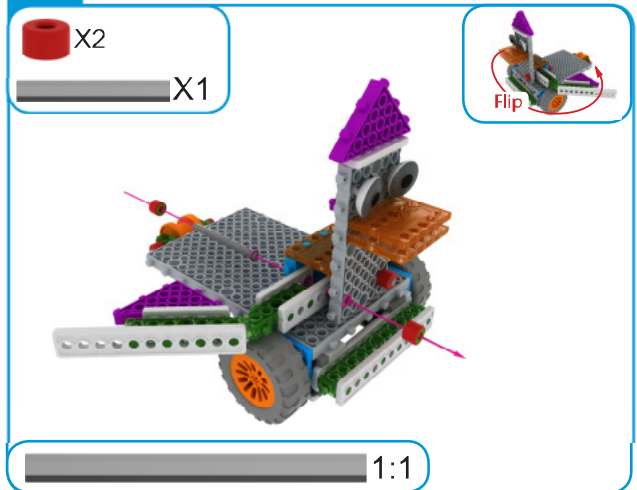
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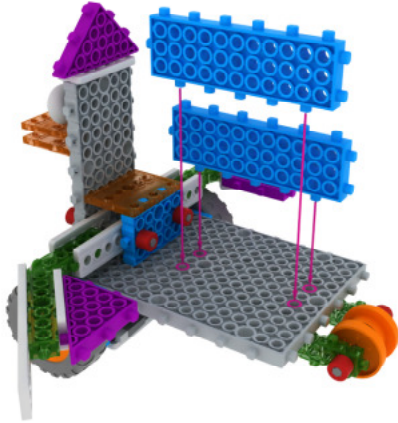
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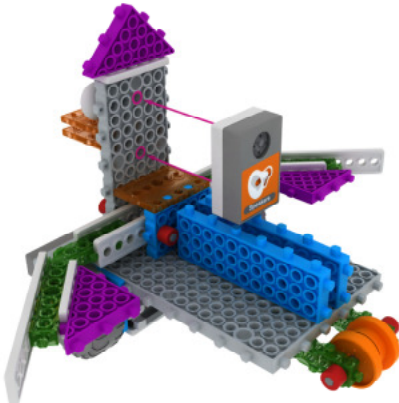
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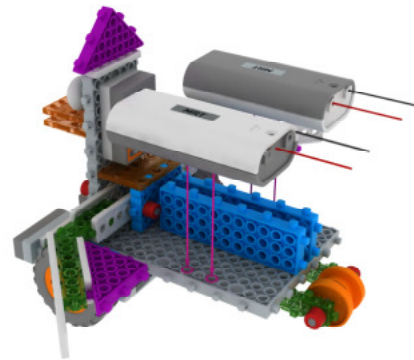
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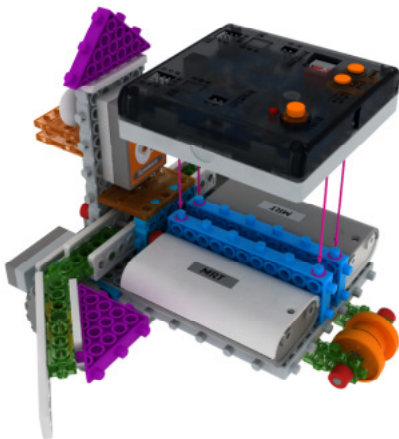
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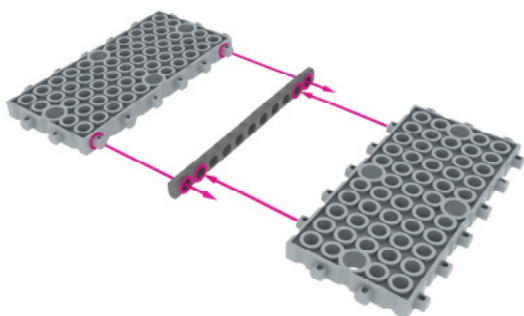
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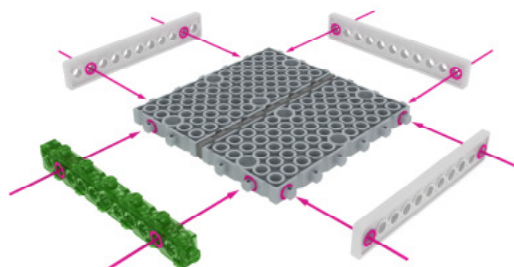
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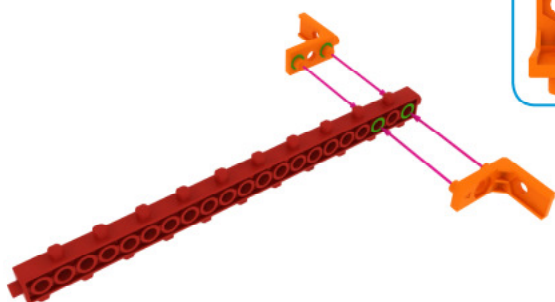
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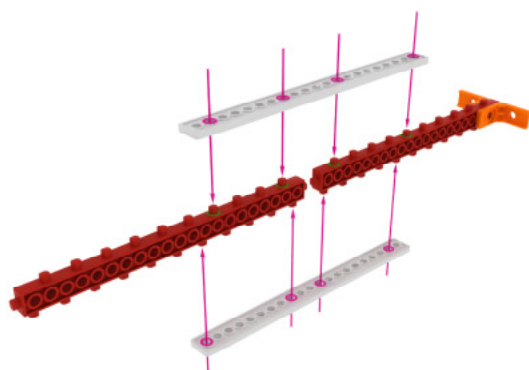
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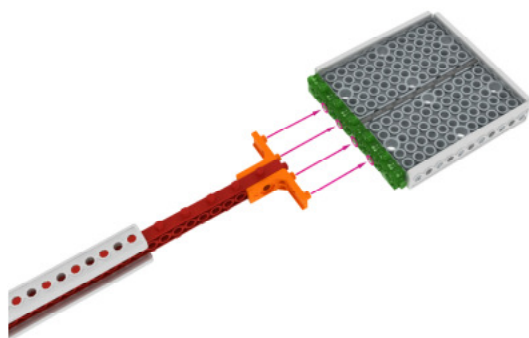
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31



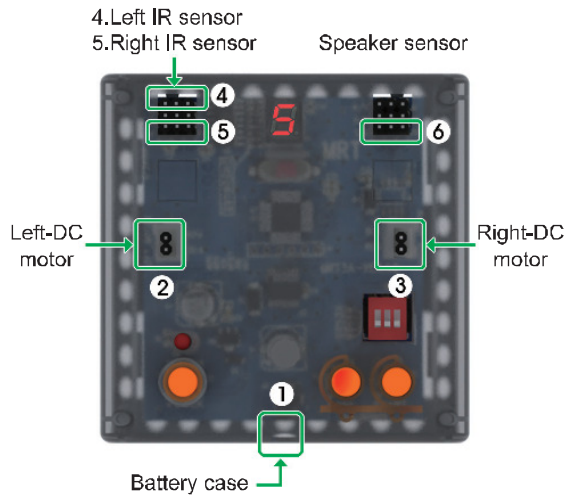
End





How to operate the Duck

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect R/C receiver board to R/C connector.
5. Connect Right IR sensor to R connector.
6. Connect speaker sensor to INZ connector.

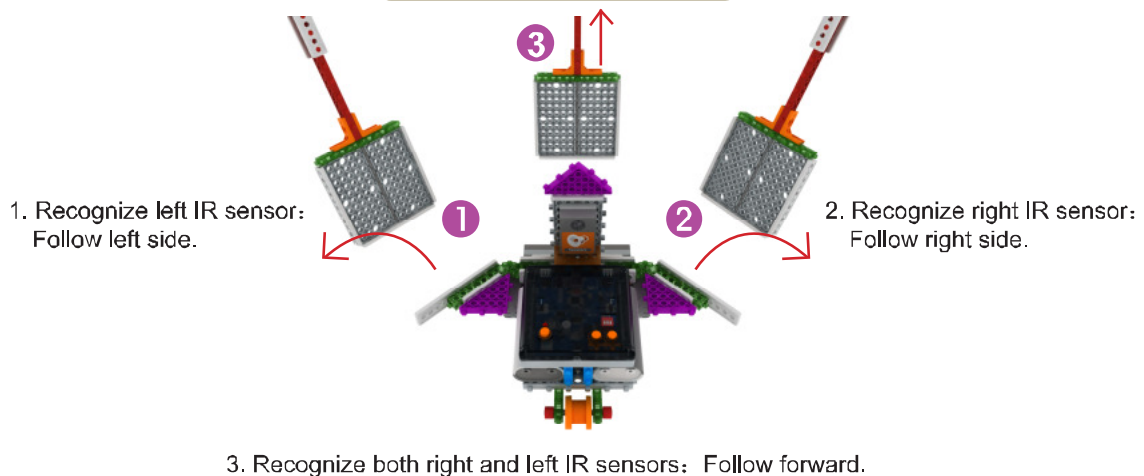
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.



4. Select Remote ID.
5. Press the START button.

How to make it move?



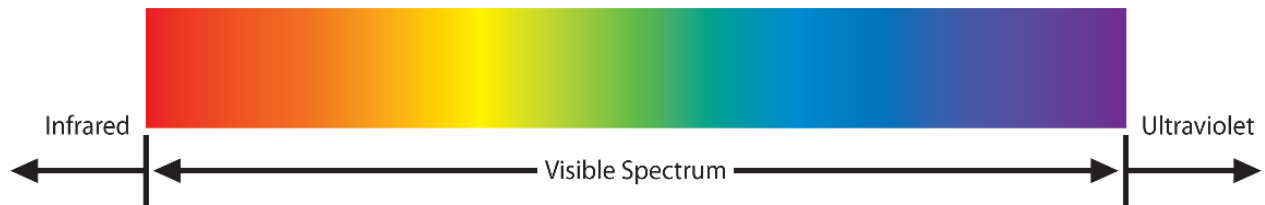


Science

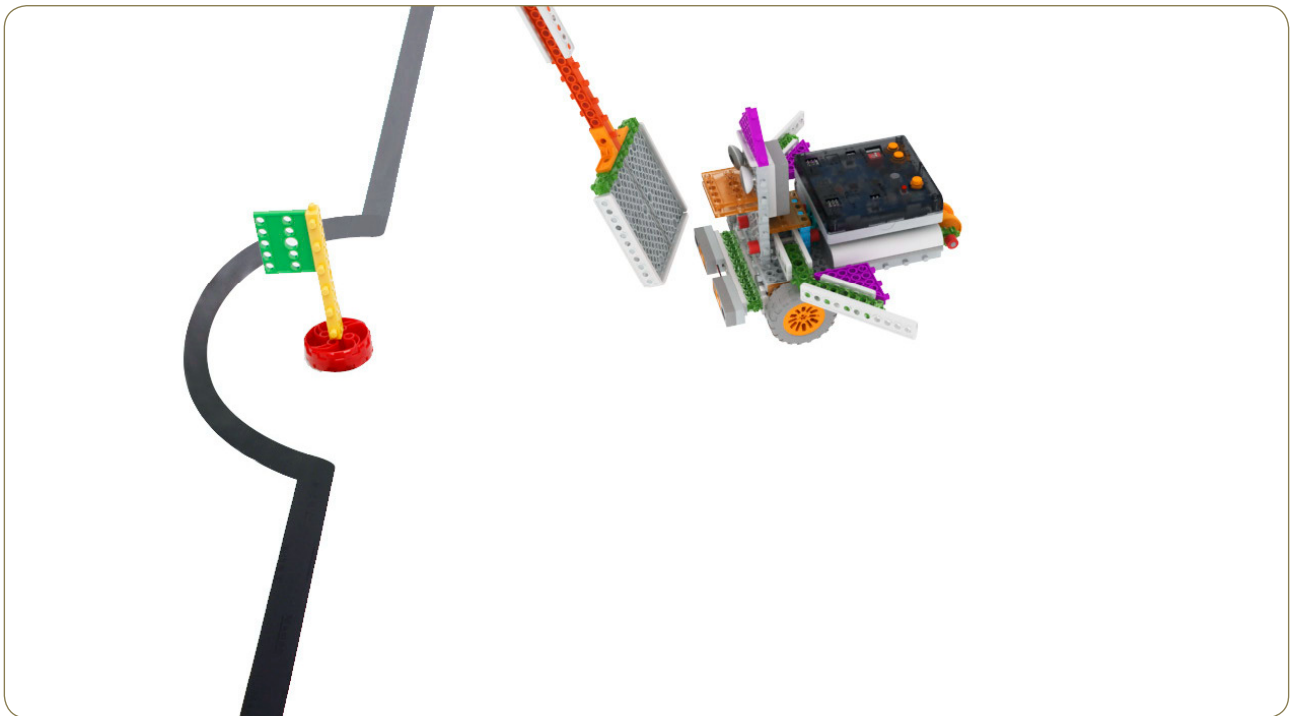
STEM 3. Learn the principle of Light

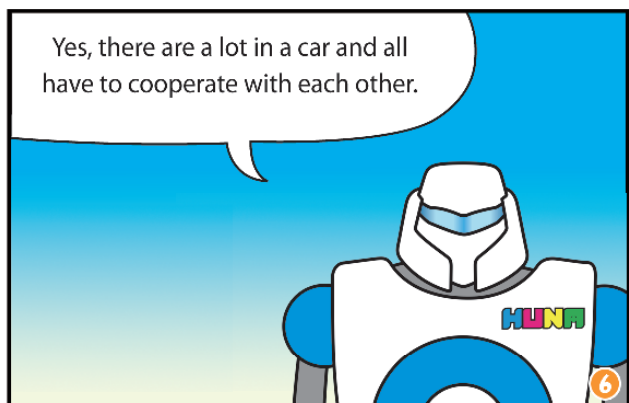
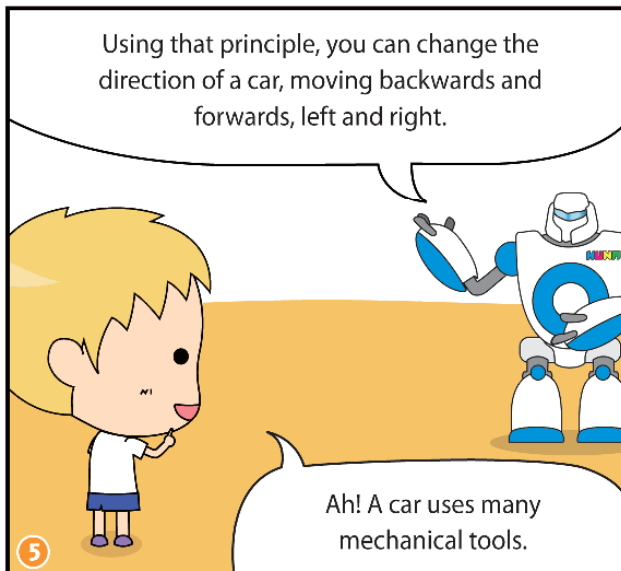
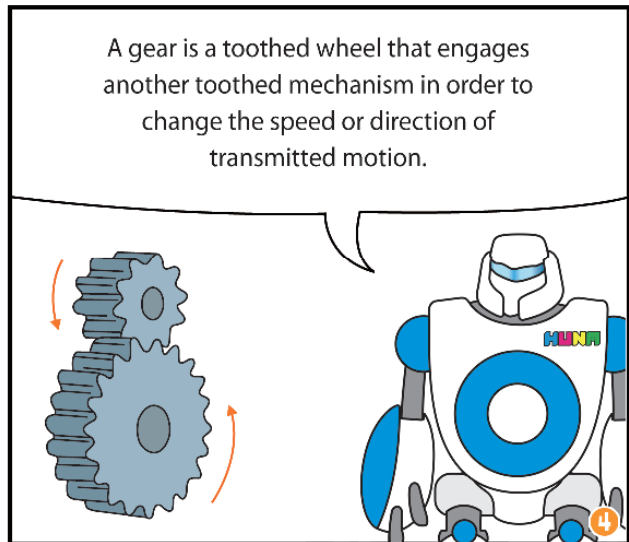
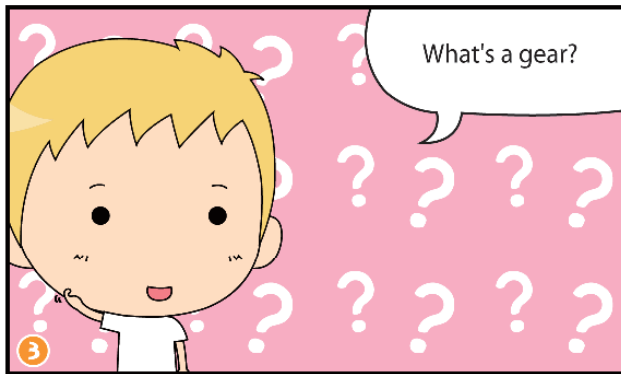
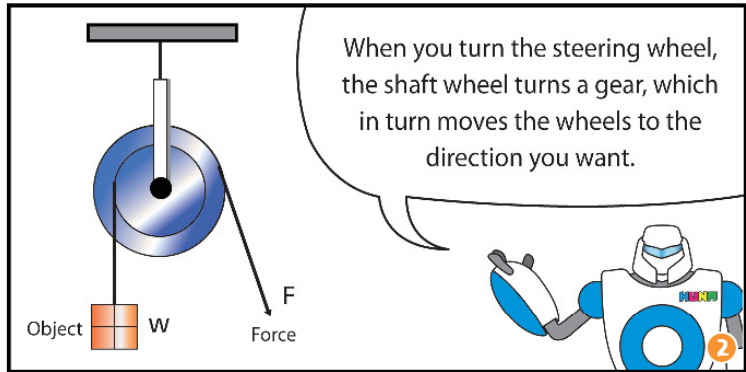
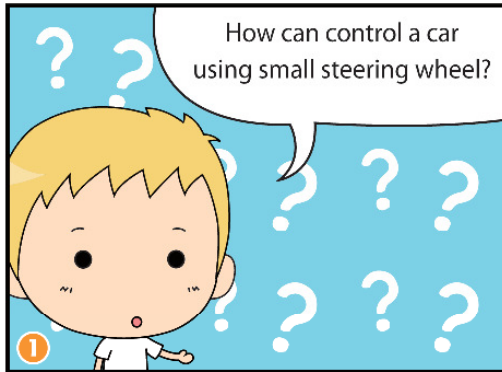
Kind of light

- **Infrared light** : Infrared radiation is popularly known as "heat" or sometimes "heat radiation", since many people attribute all radiant heating to infrared light and/or to all infrared radiation to being a result of heating.
- **Visible light** : Humans can see the this kind of light. More specifically, you see the light that is not absorbed by objects.
- **Ultraviolet light** : It is believed to induce the production of Vitamin D and can also be used for sterilization and pasteurization. However, it is harmful to our eyes and skin if we are exposed to direct sunlight.



Let's make a pet robot that can follow you everywhere.

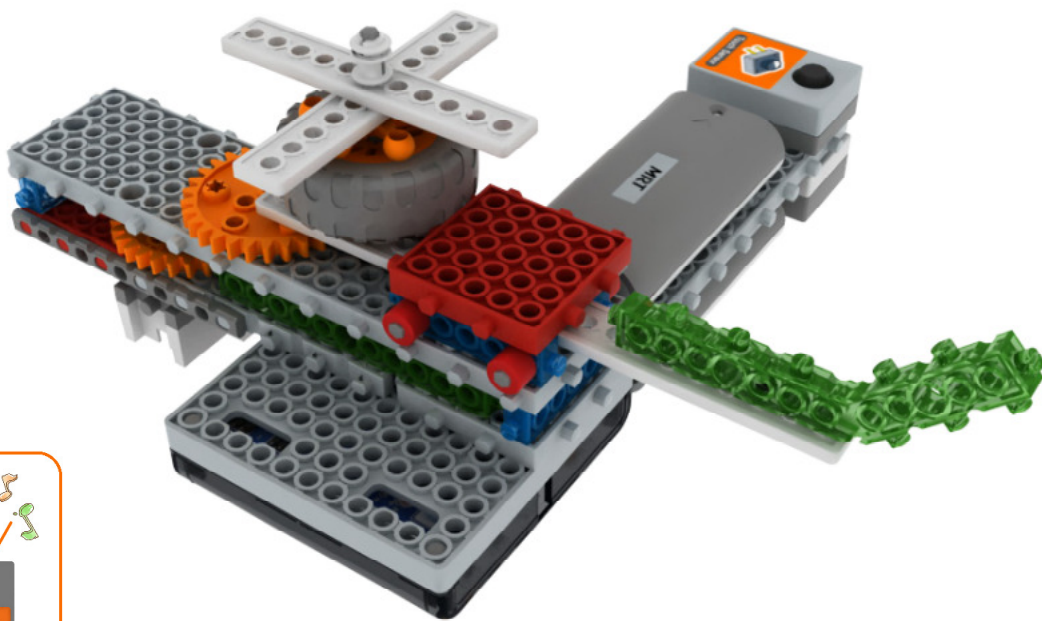




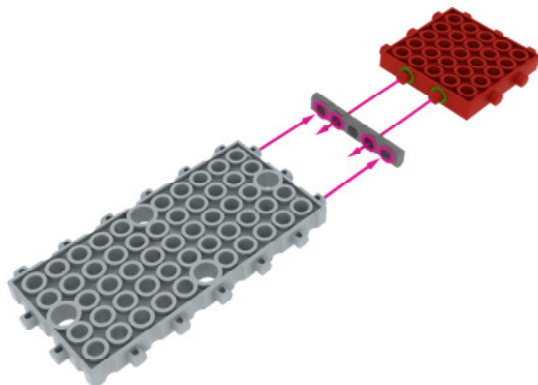


Technology
Engineering

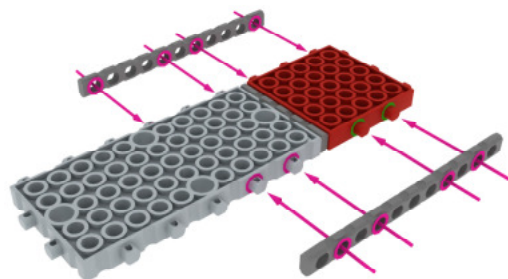
Robot Making3-Power Spin (with sound)



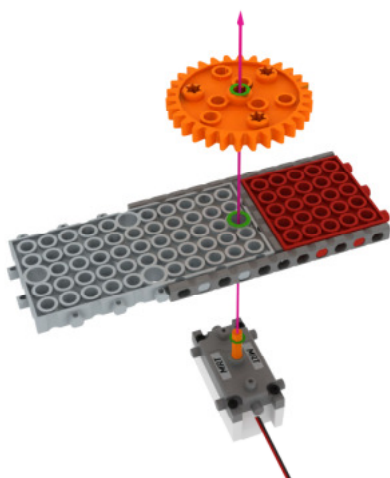
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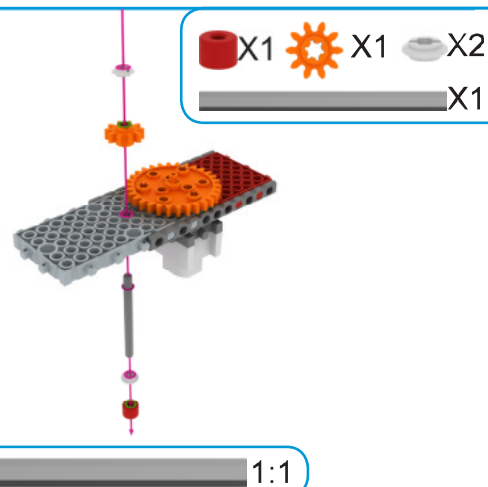
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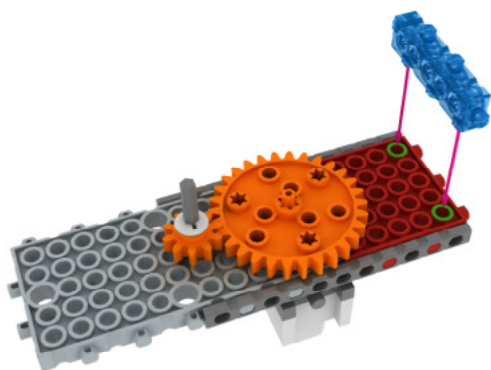
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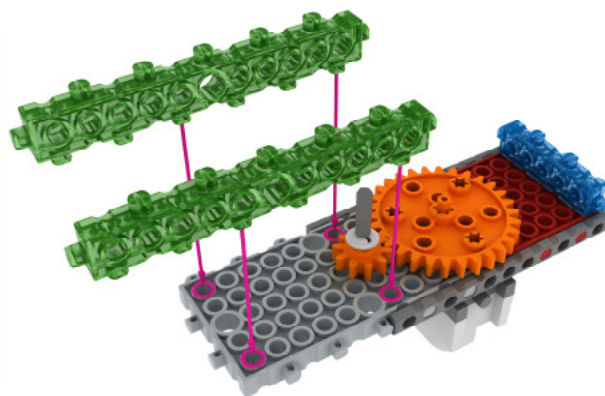
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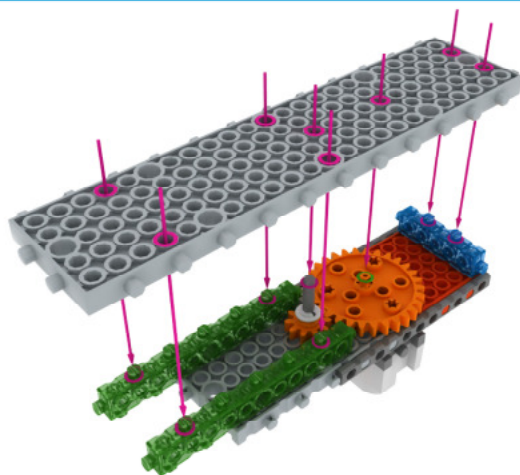
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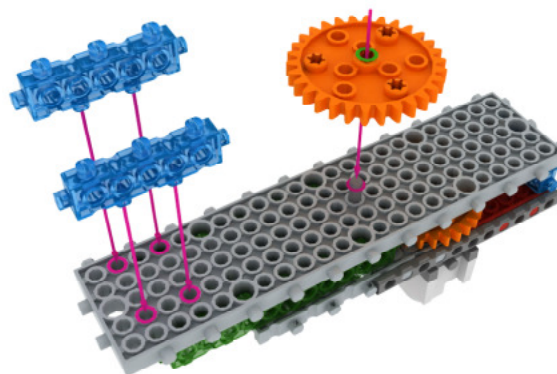
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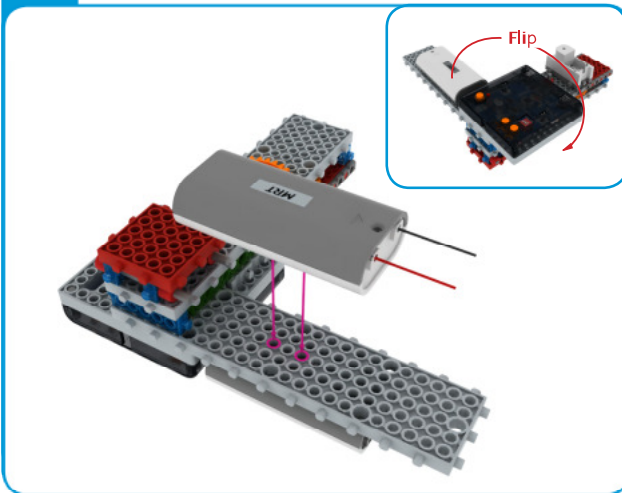


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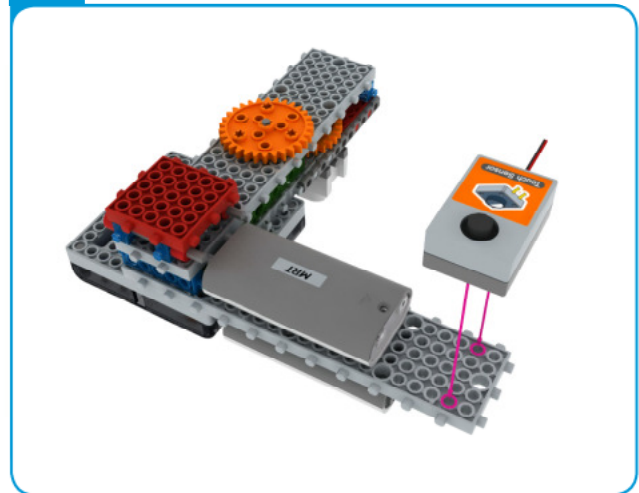




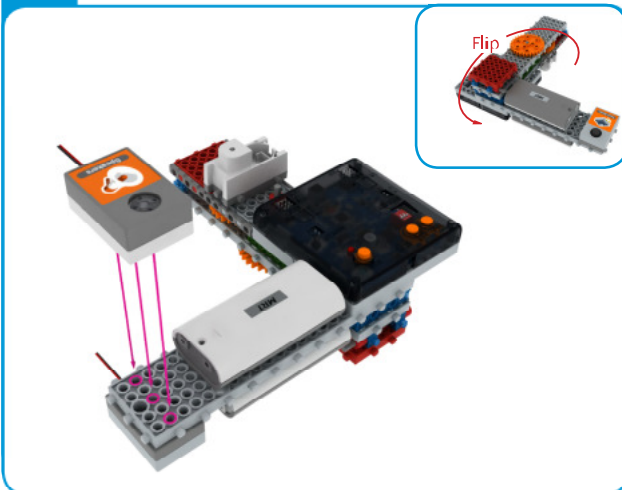
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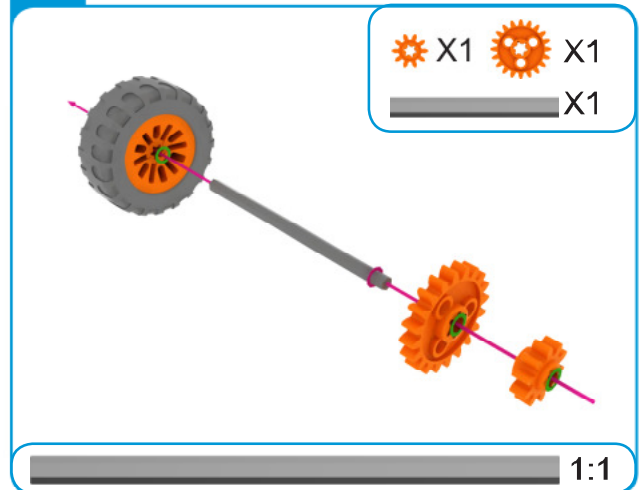
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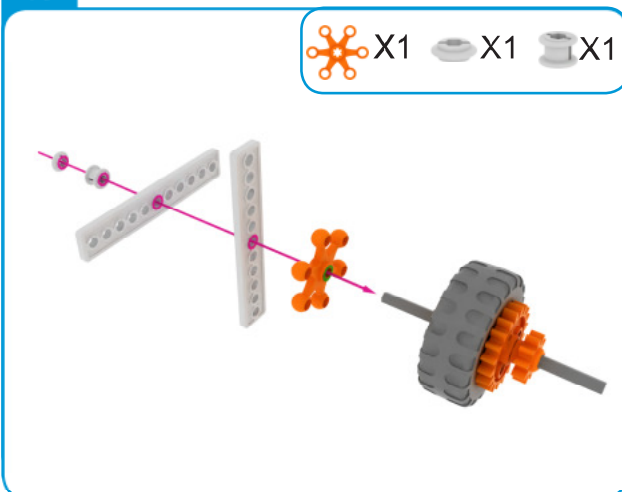
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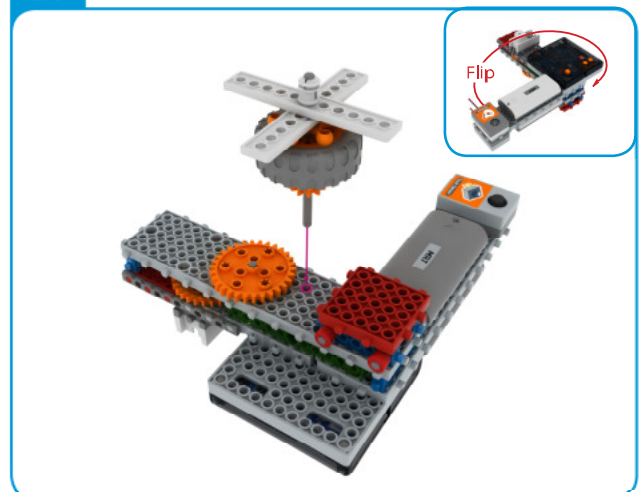
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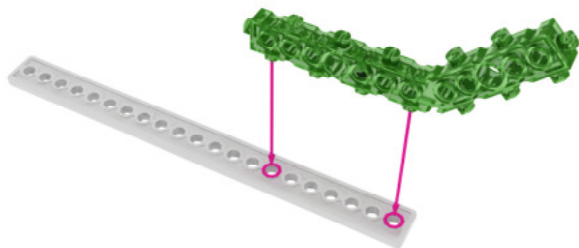
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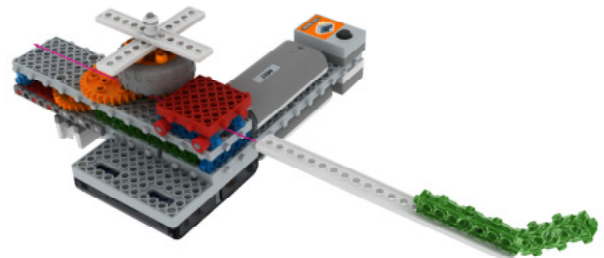
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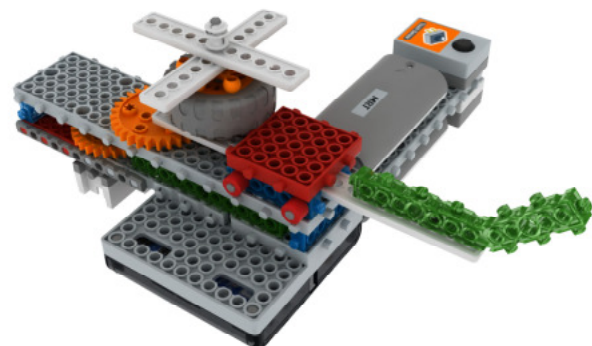
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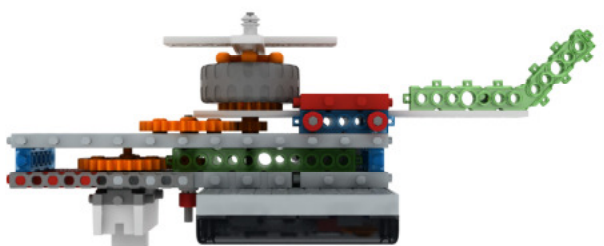
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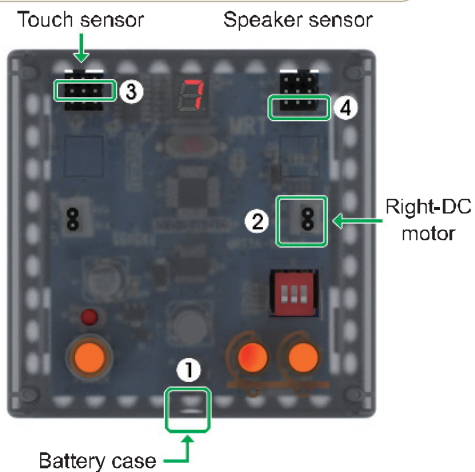
End





How to operate the Power Spin?

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Touch sensor to C connector.
4. Connect the Speaker Sensor to IN2 connector.

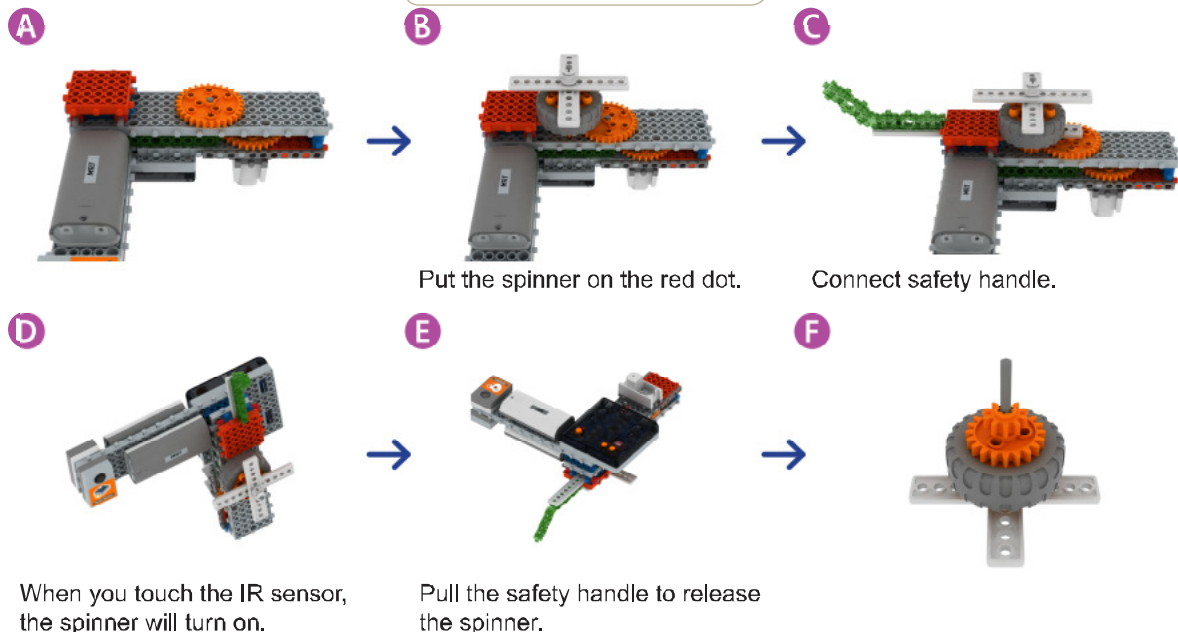
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

MODE # 7		Touch Mode
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4. Select Remote ID.
5. Press the START button.

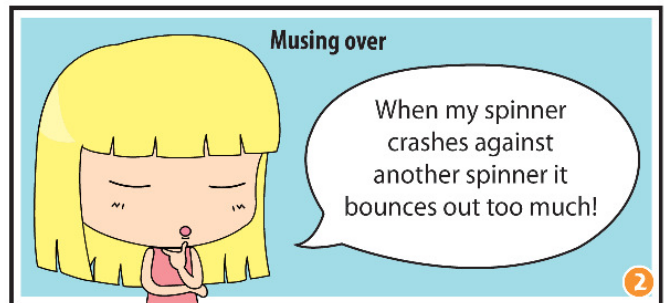
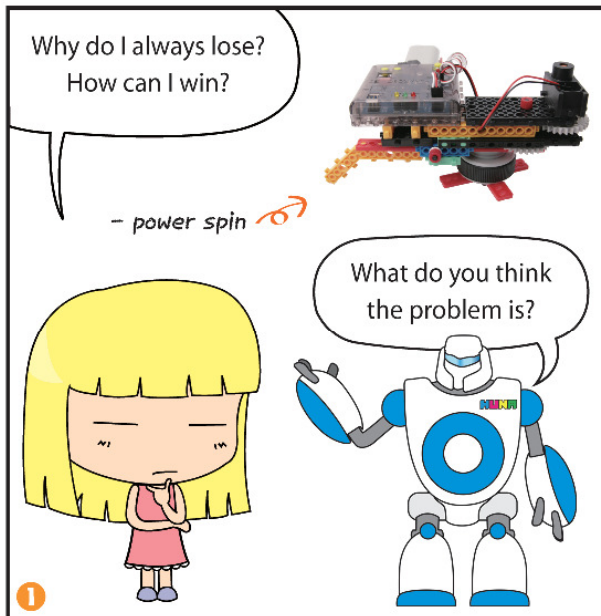
How to make it move?



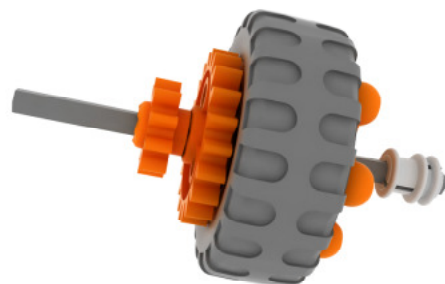


Engineering
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STEM 5. Making My Own Power Spin

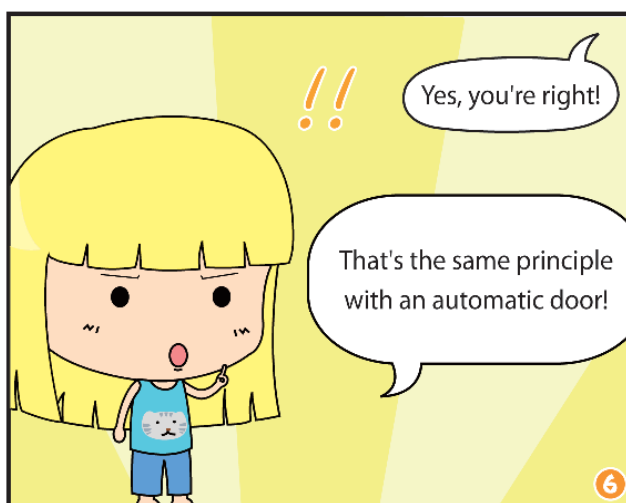
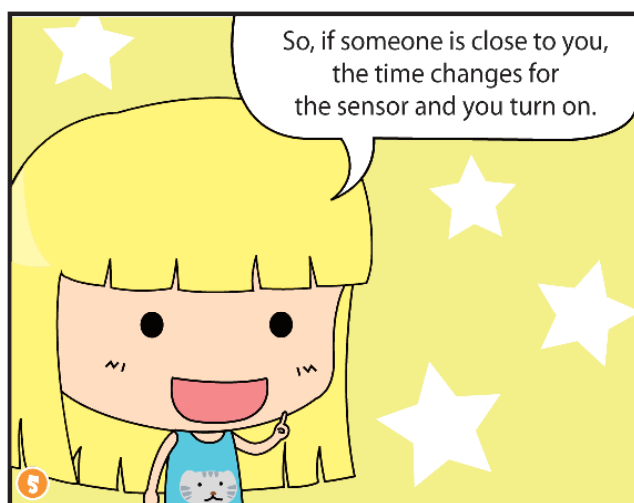
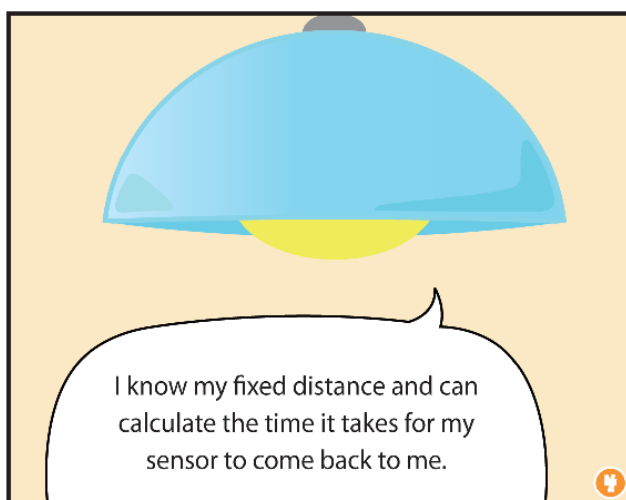
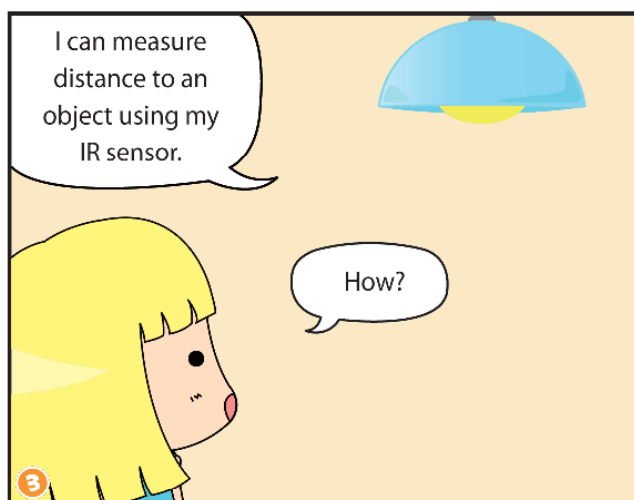
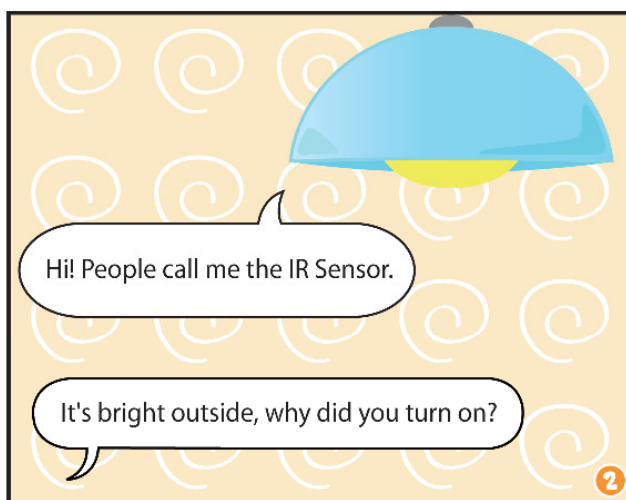
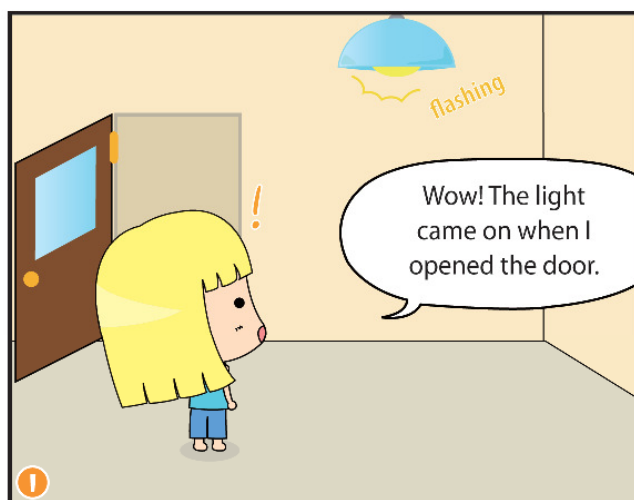


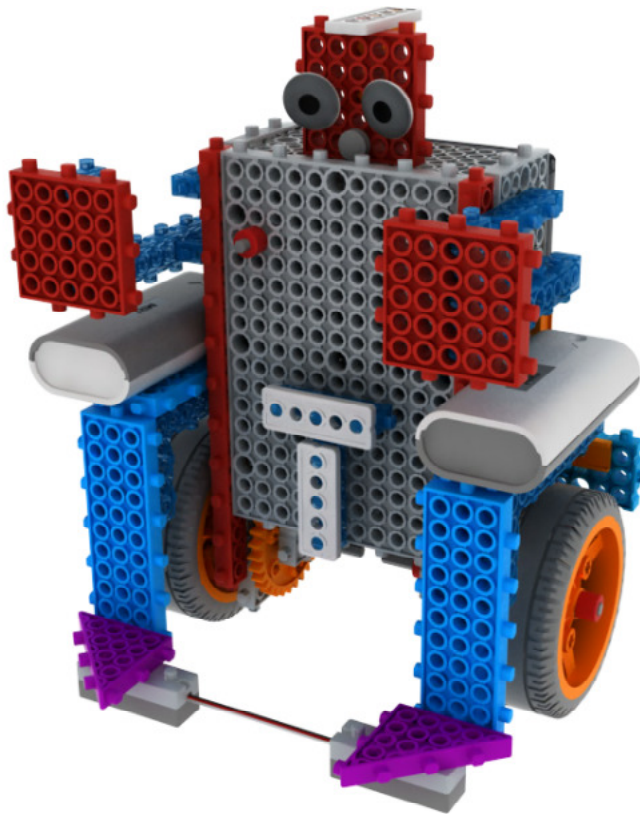
Make your own spinner for battle with your friends!





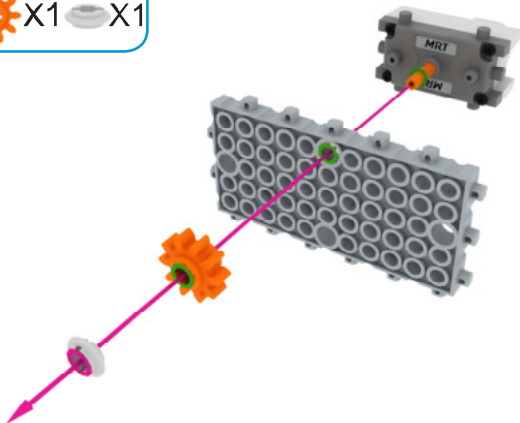
STEM 6. The eyes of Robot-IR Sensor1





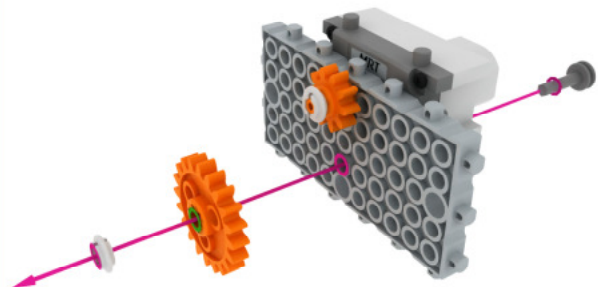
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 X1  X1

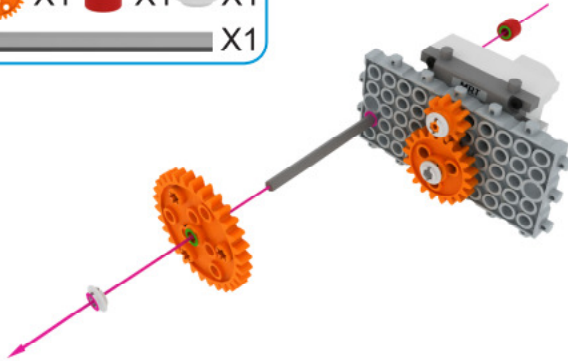
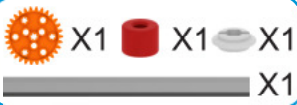


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 X1  X1  X1



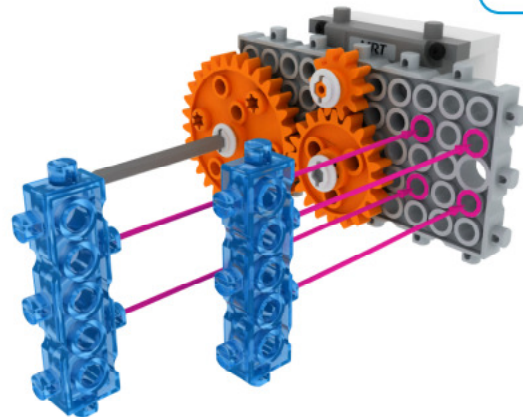
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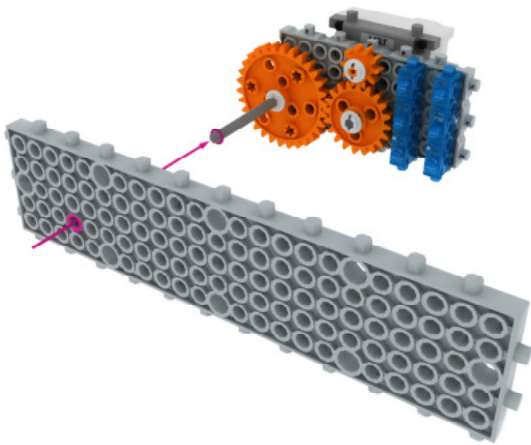
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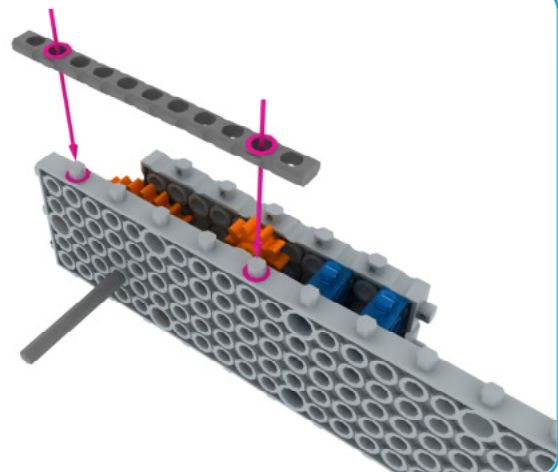
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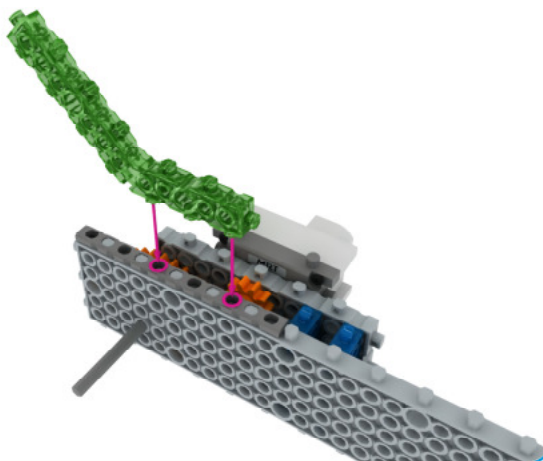
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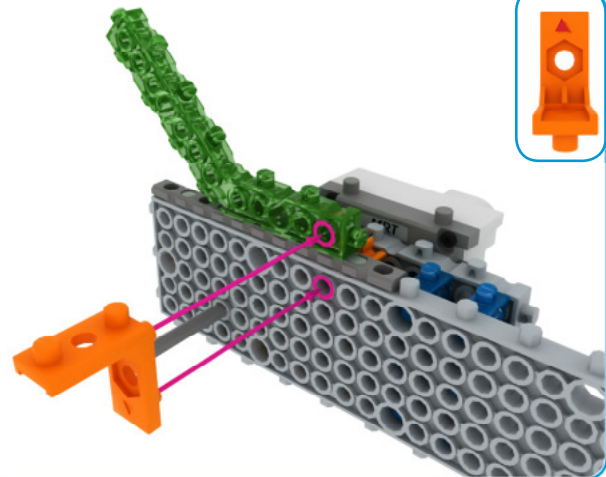
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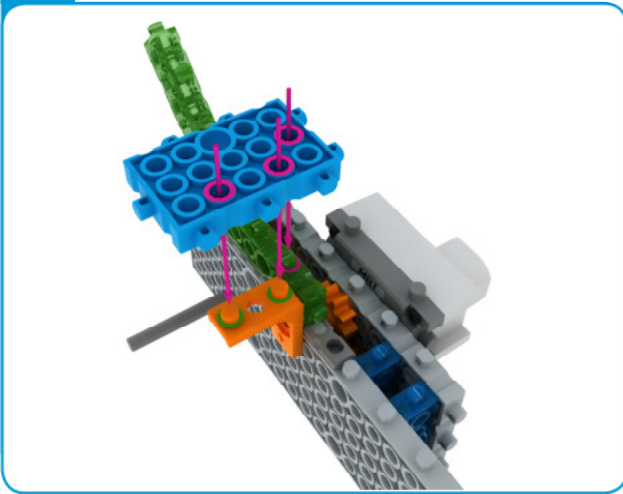
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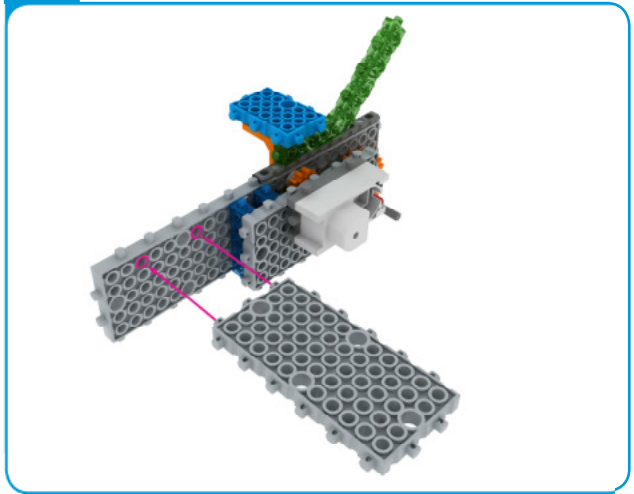
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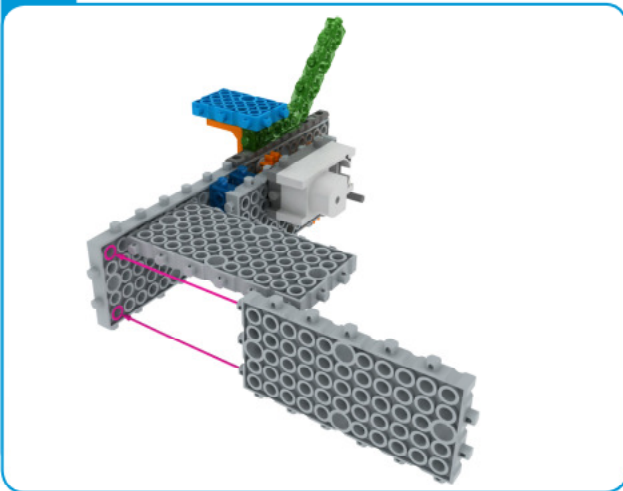
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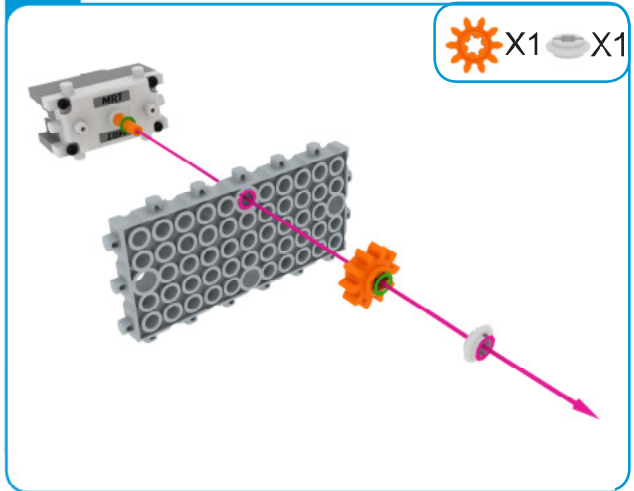
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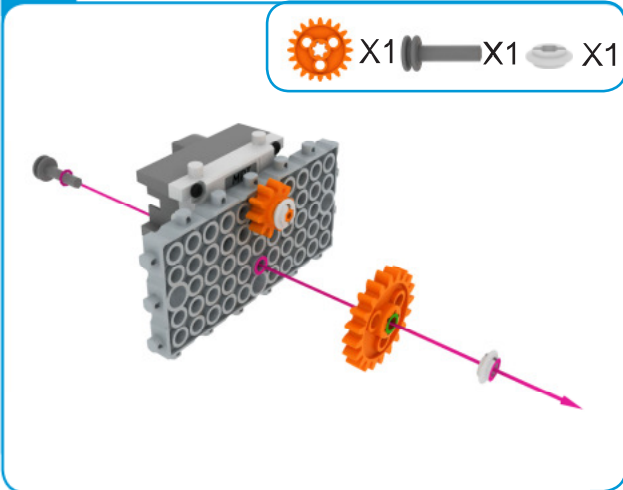
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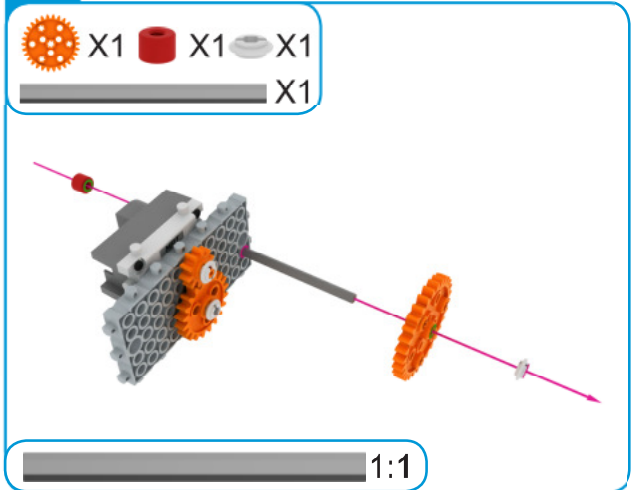
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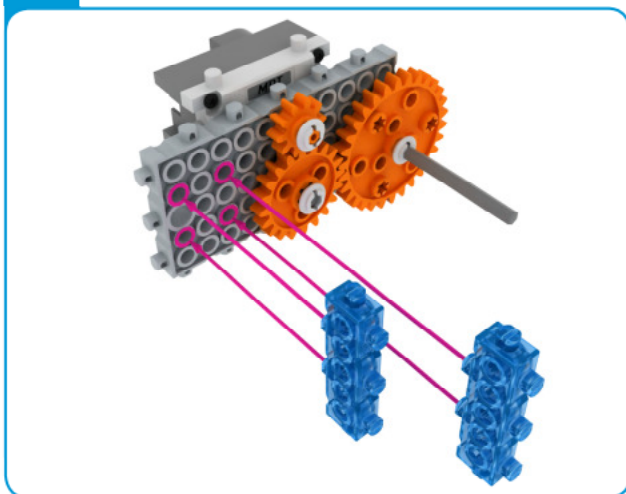
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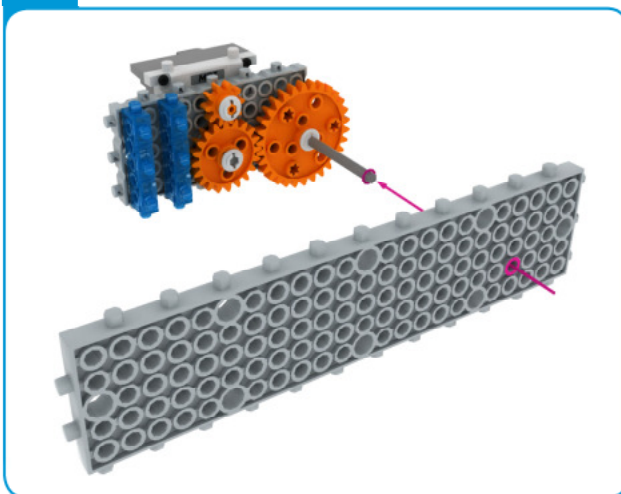
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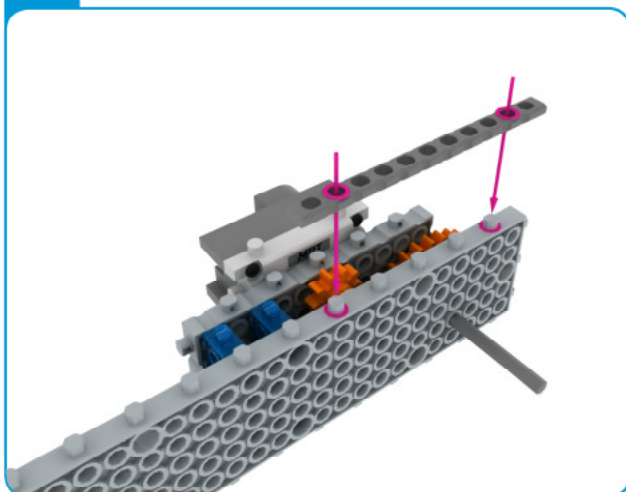
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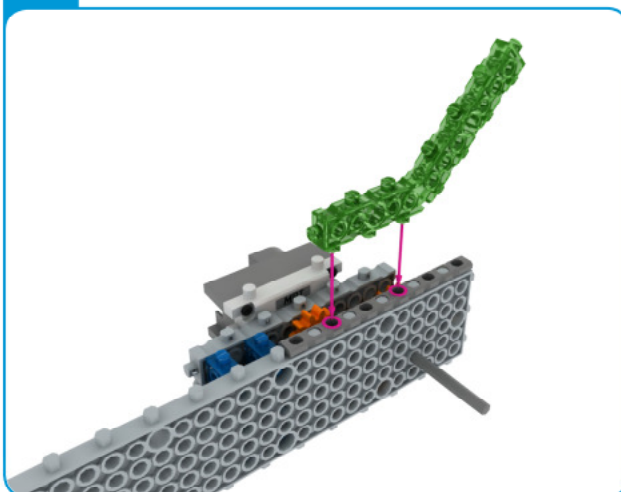
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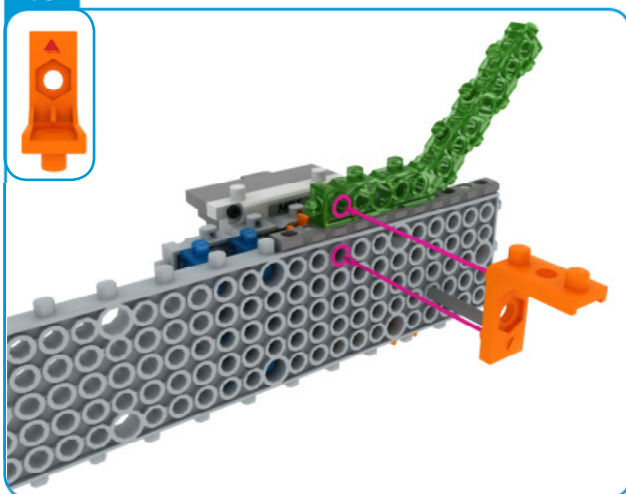
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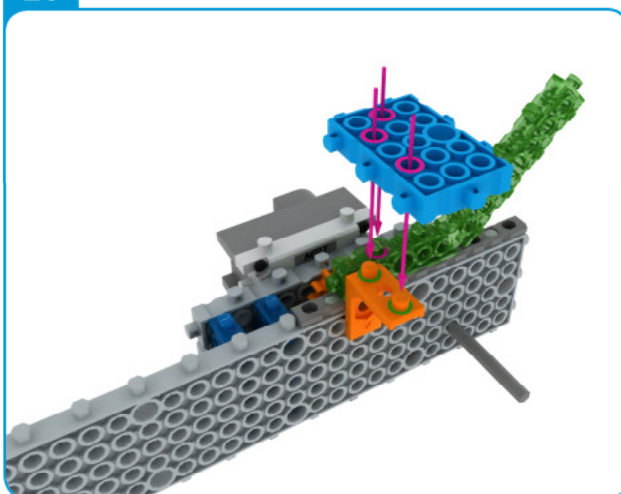
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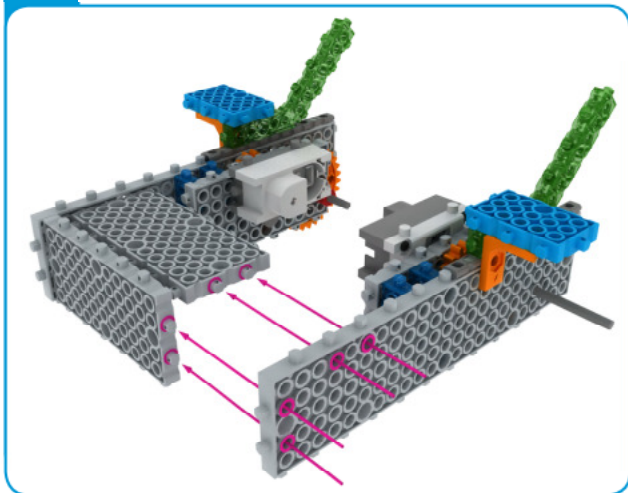
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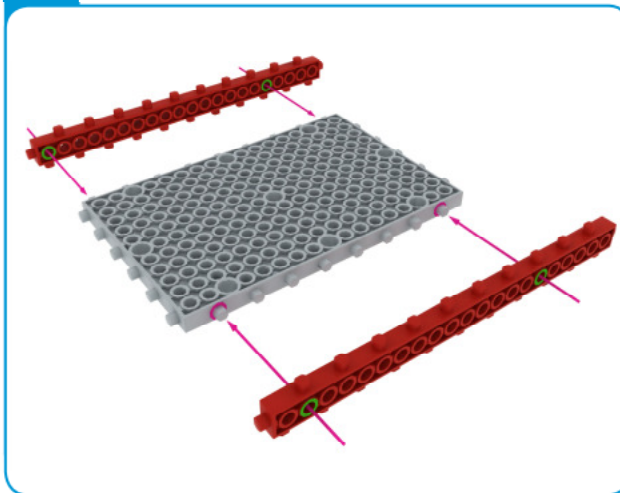
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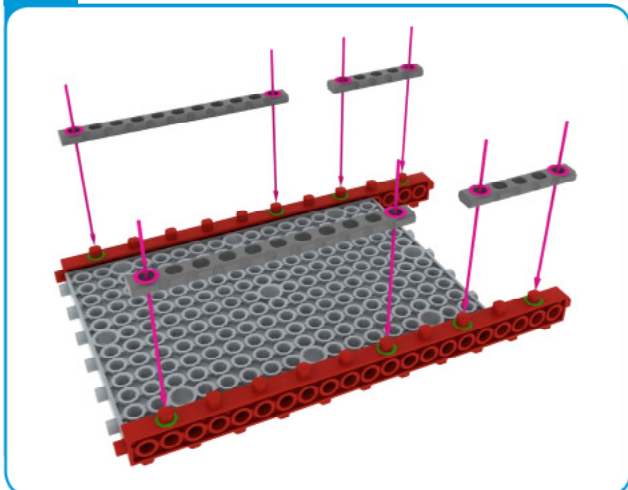
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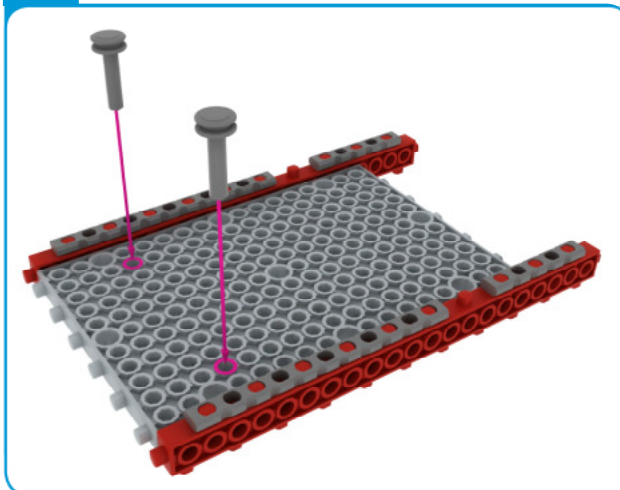
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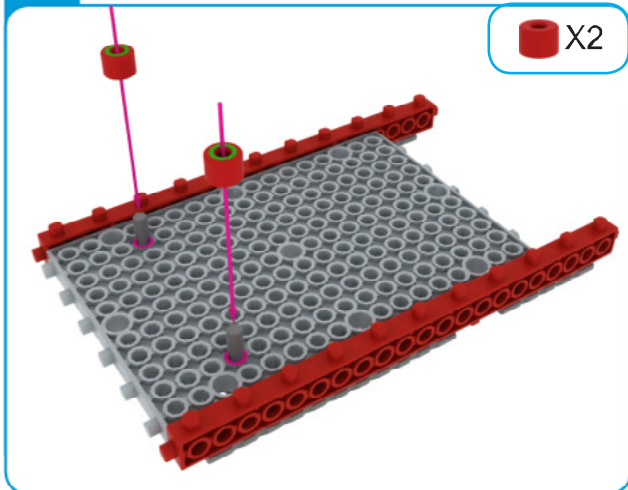
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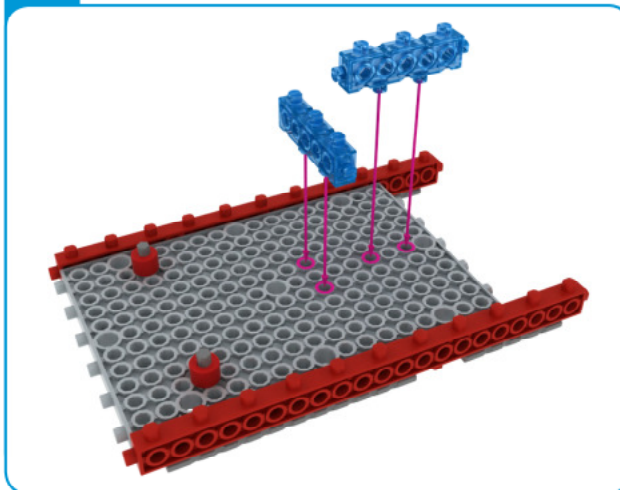
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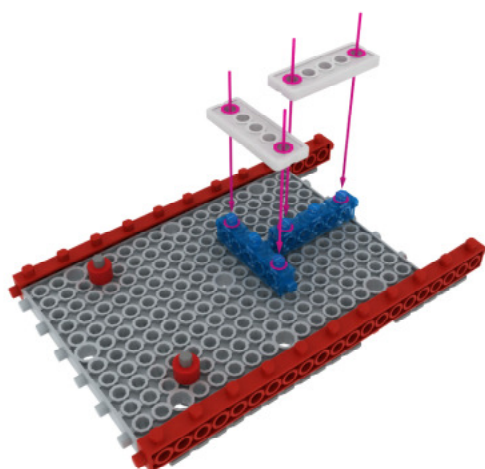
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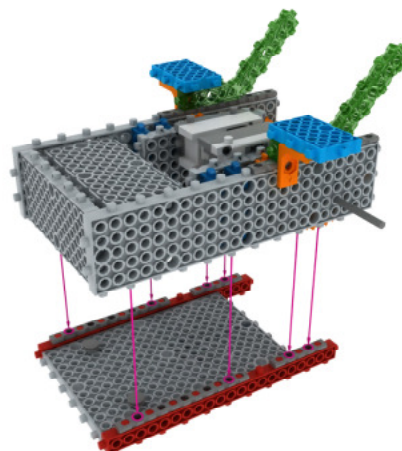
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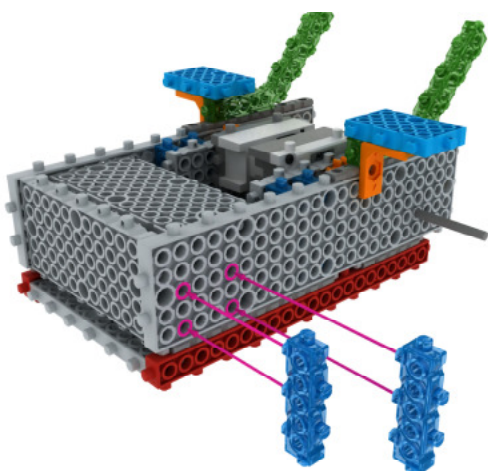
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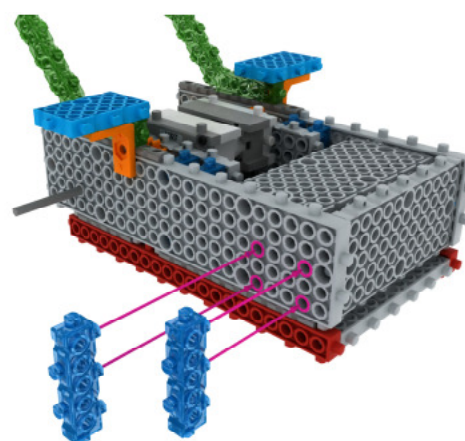
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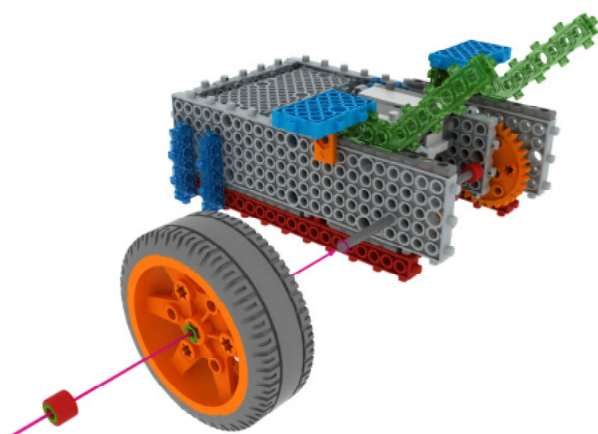
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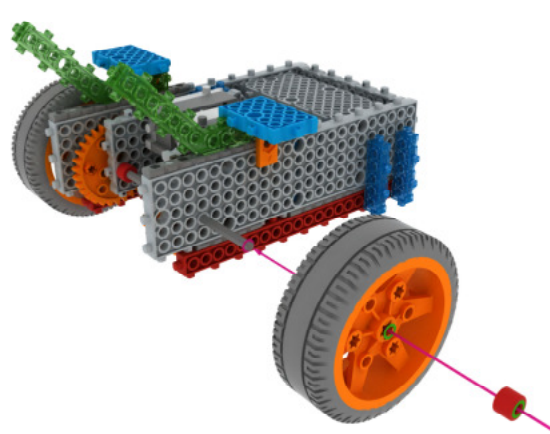
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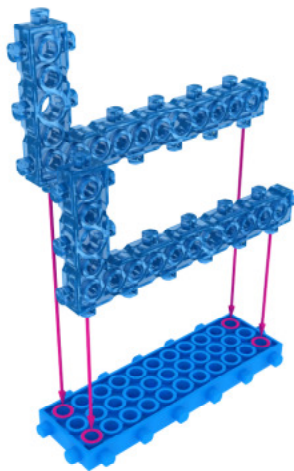
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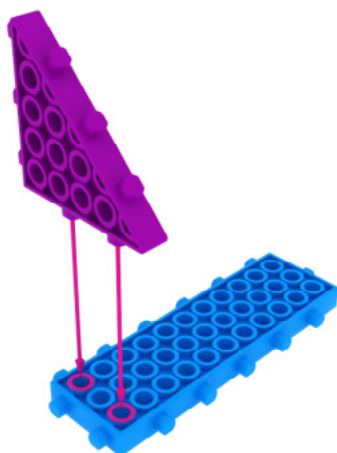
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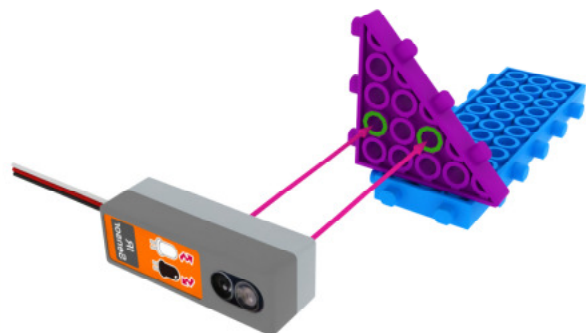
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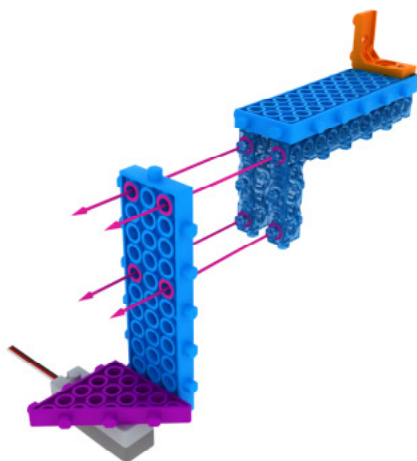
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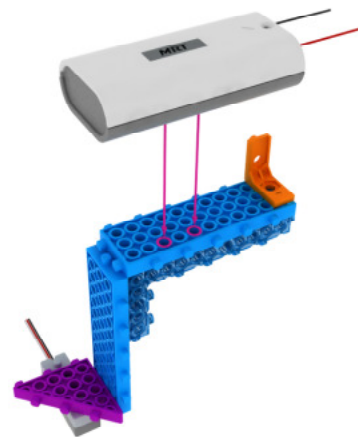
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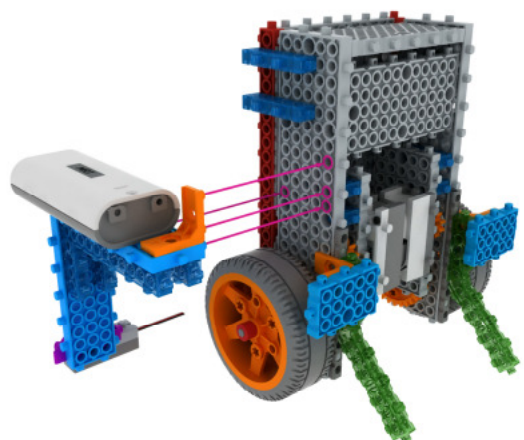
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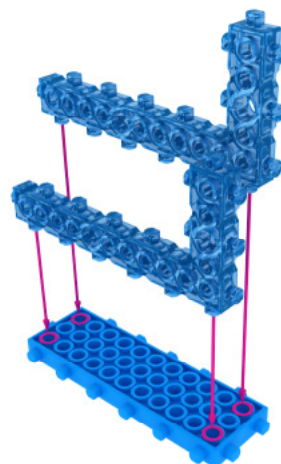
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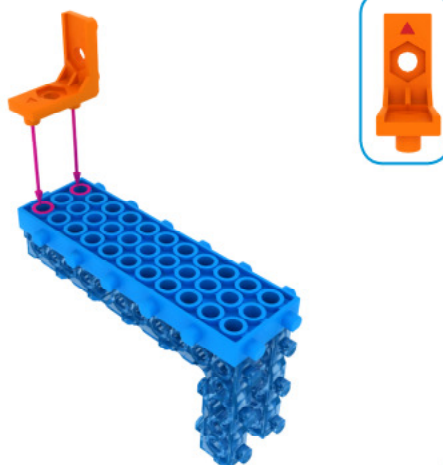
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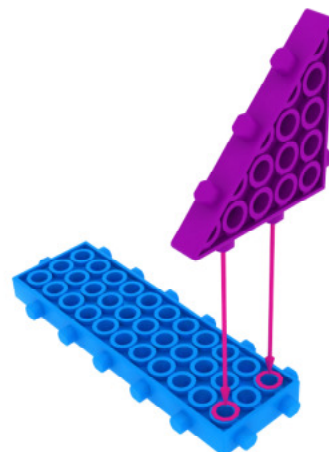
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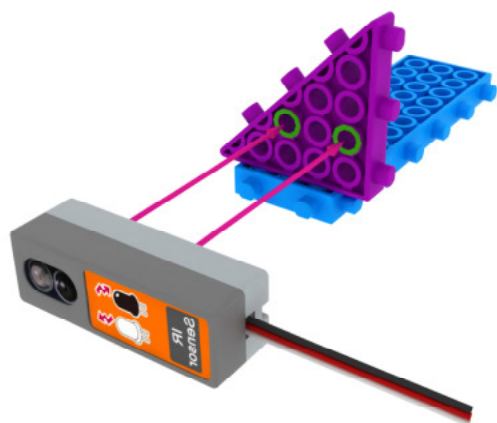
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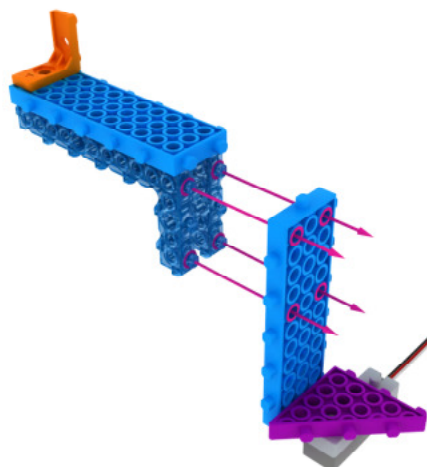
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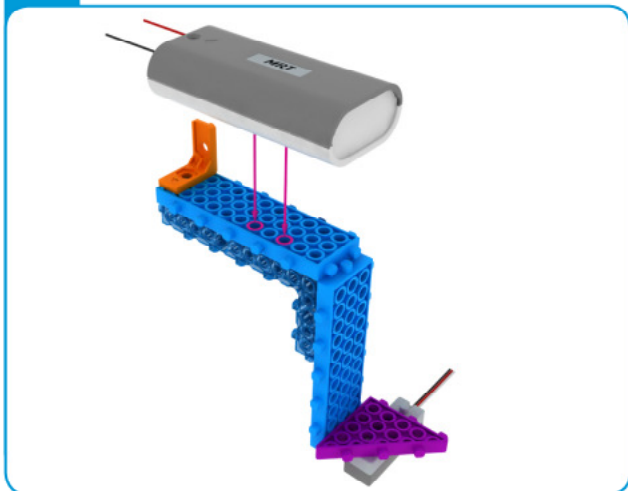
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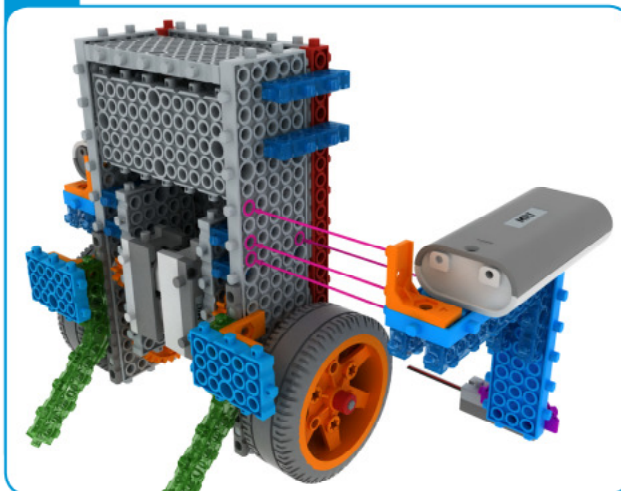
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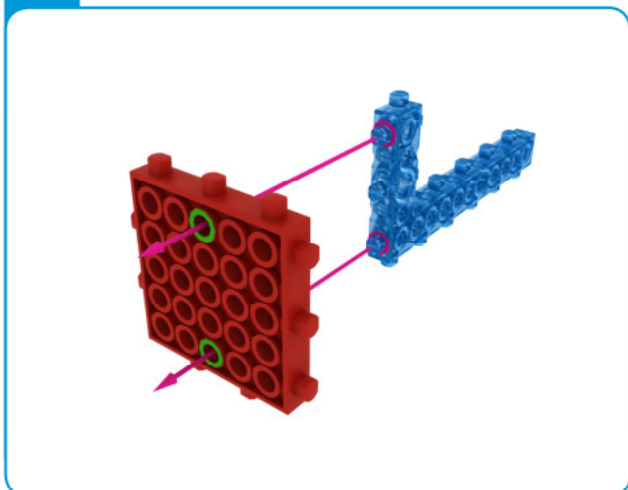
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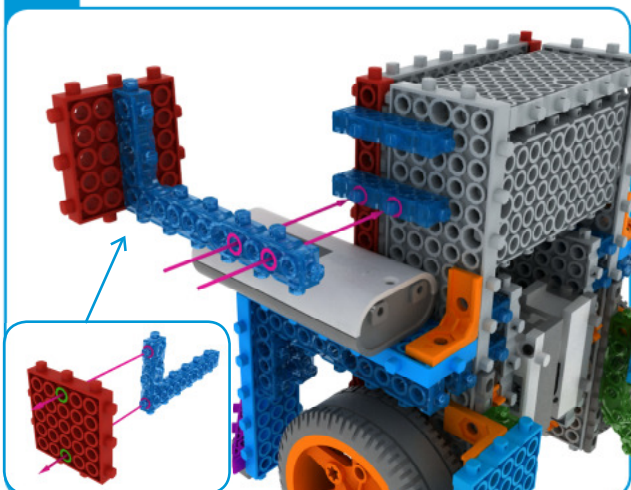
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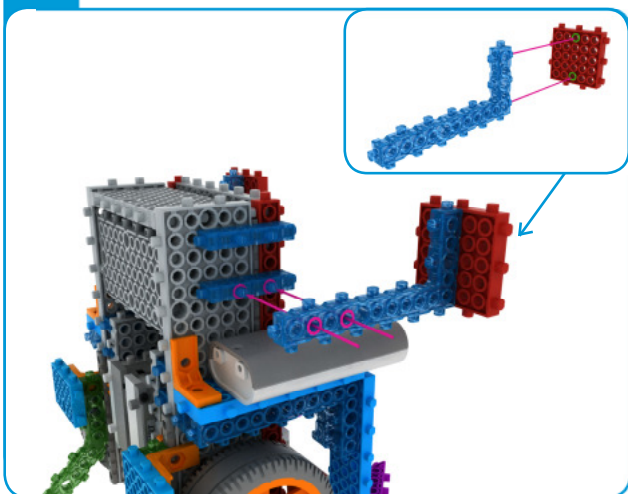
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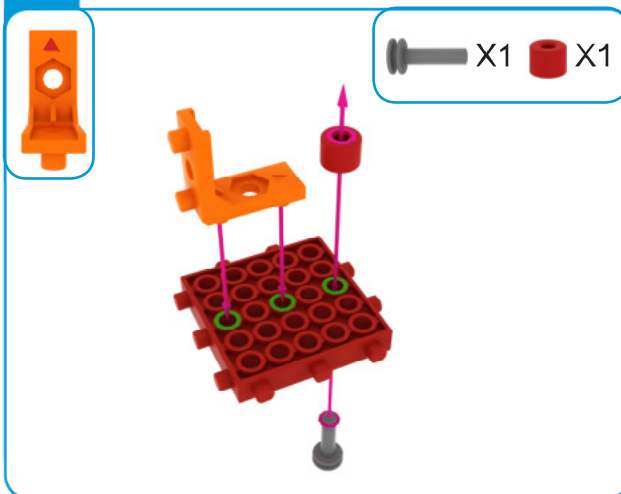
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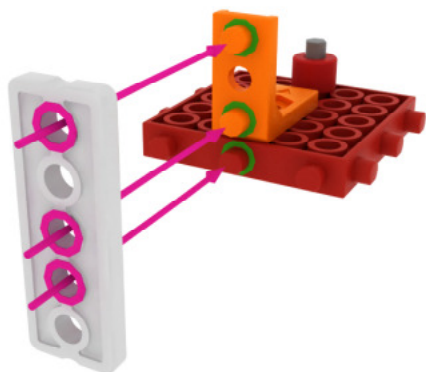
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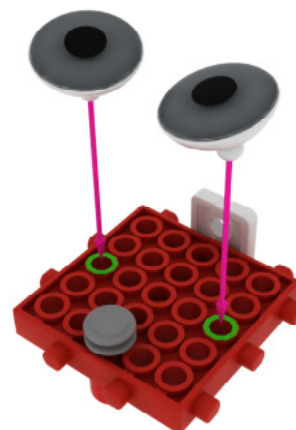
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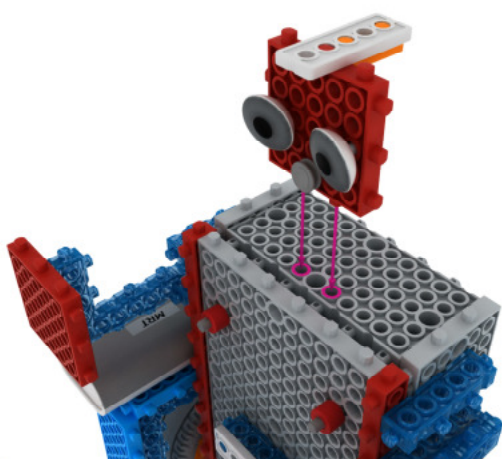
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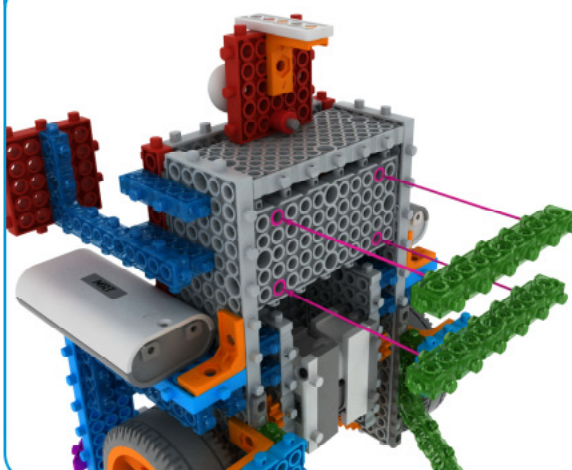
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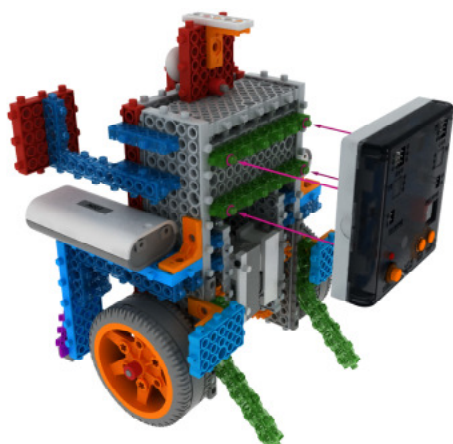
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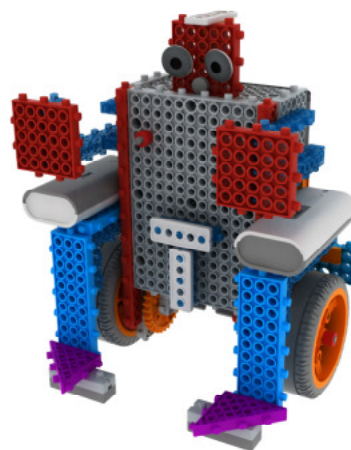
54



55



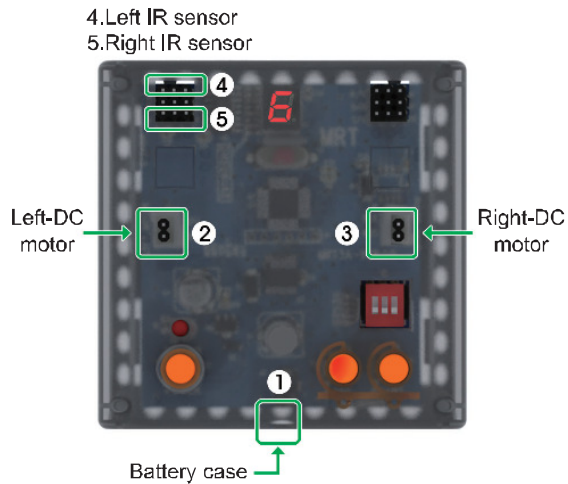
End





How to operate the Sumo-Bot

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect Left IR sensor to R connector.
5. Connect Right IR sensor to R connector.

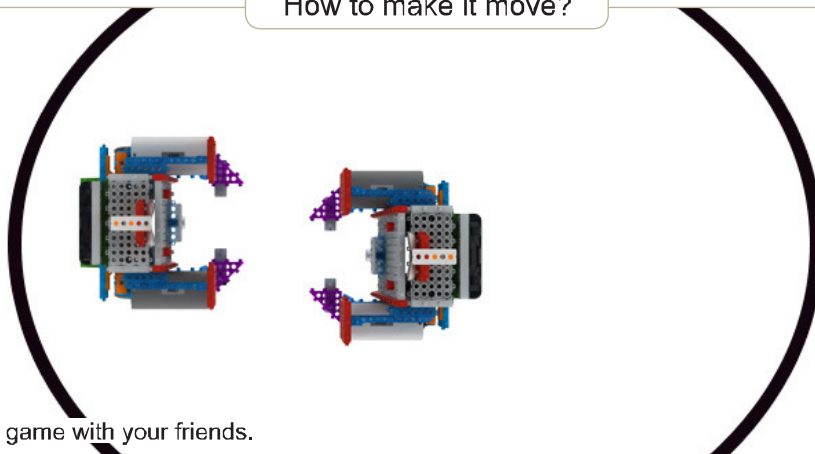
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.



4. Select Remote ID.
5. Press the START button.

How to make it move?

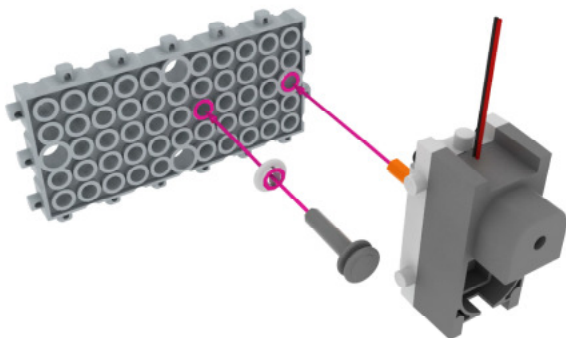


※ play funny game with your friends.

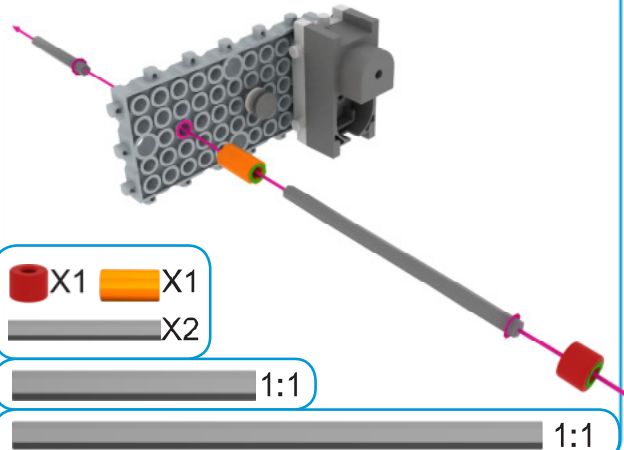
Engineering Art **Robot Making 5-Skier Man (with sound)**



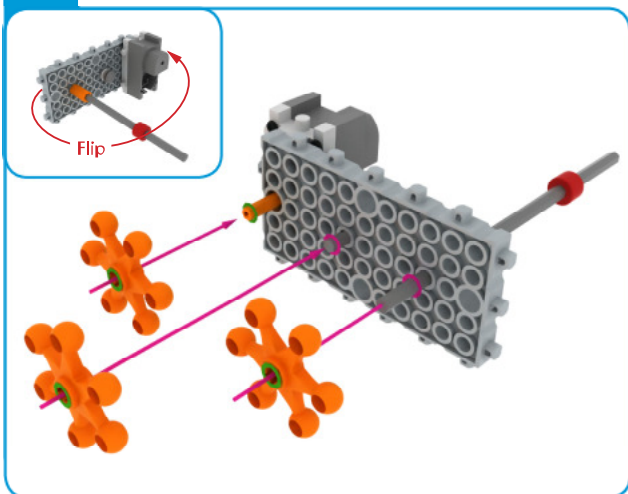
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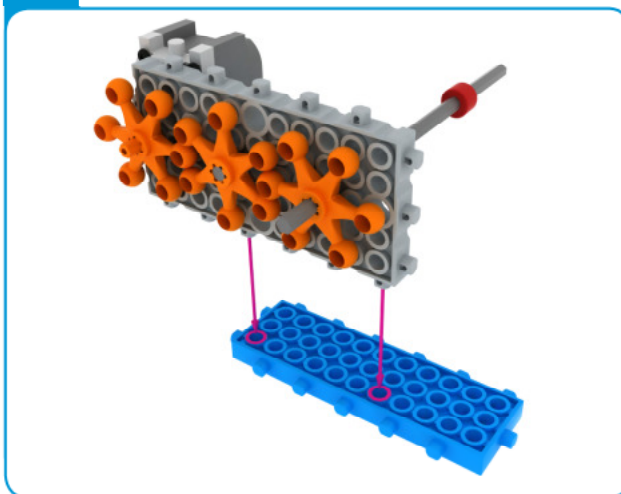
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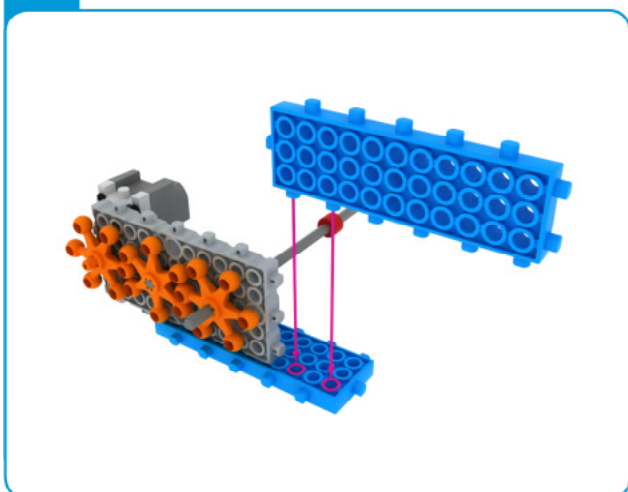
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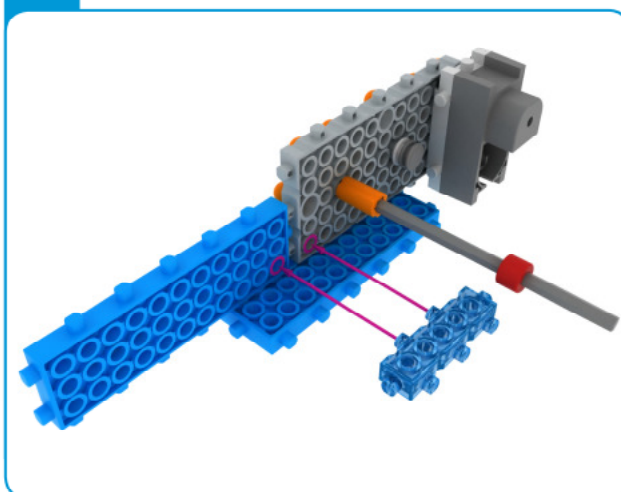
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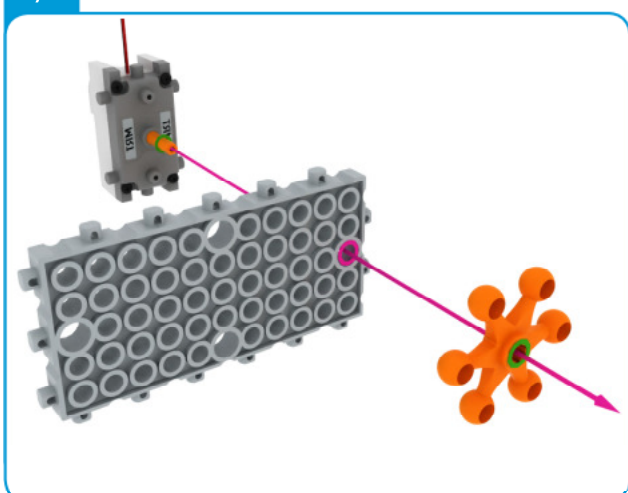
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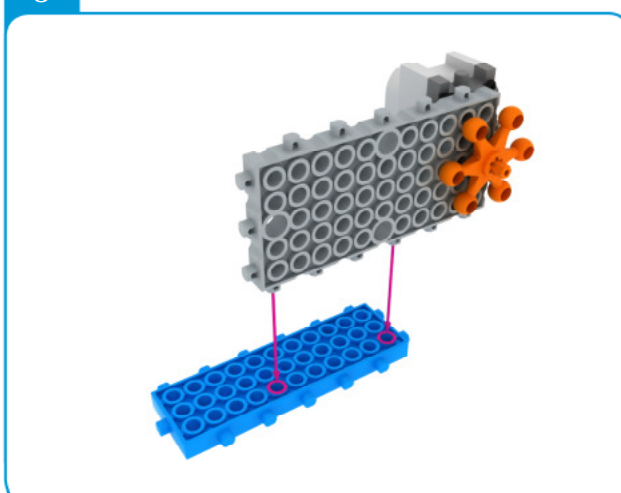
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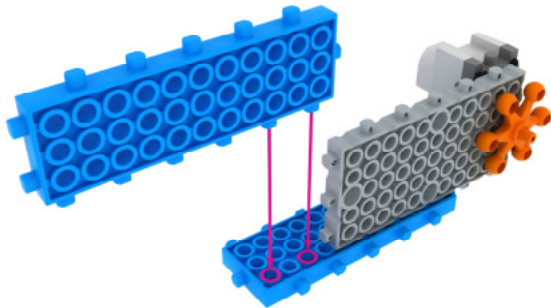
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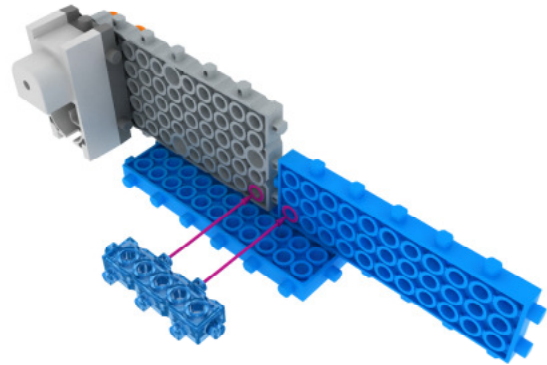
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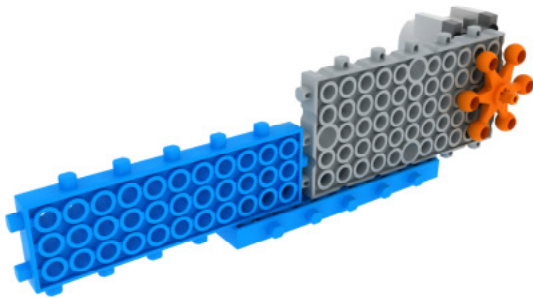
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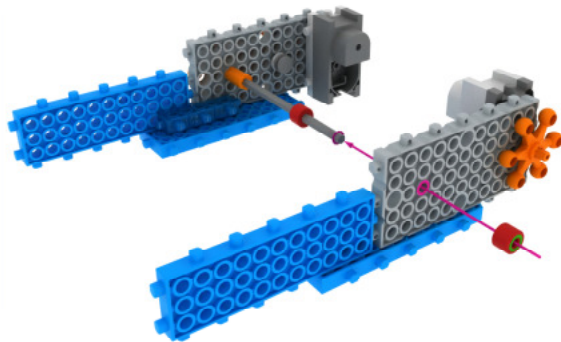
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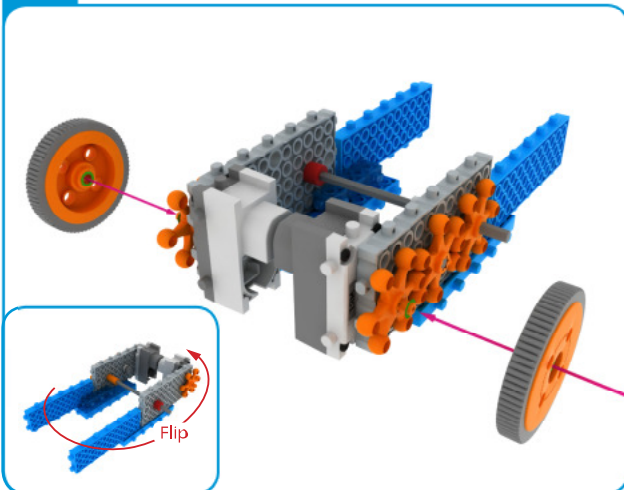
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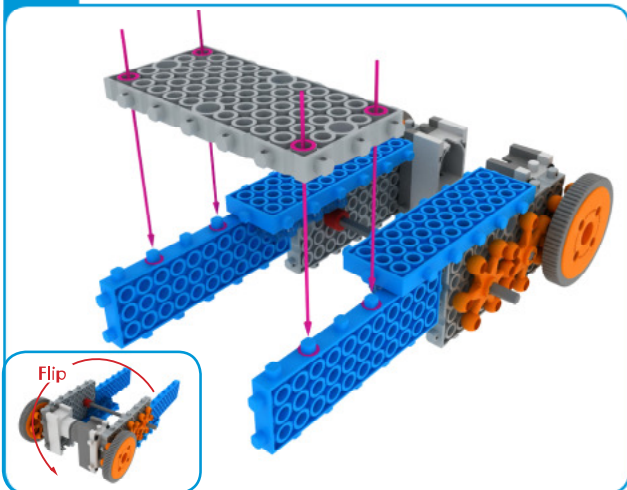
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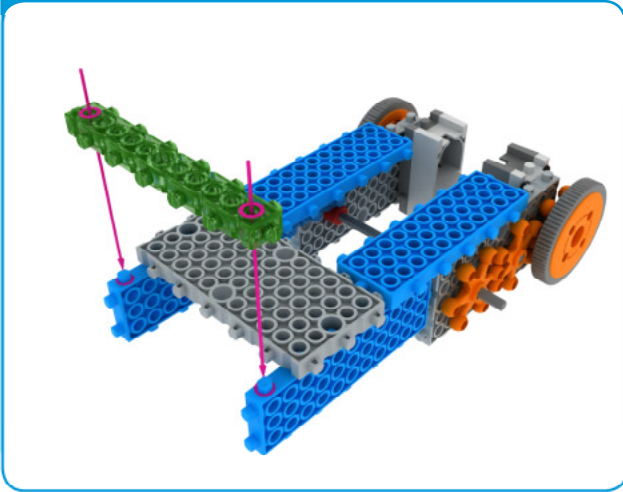
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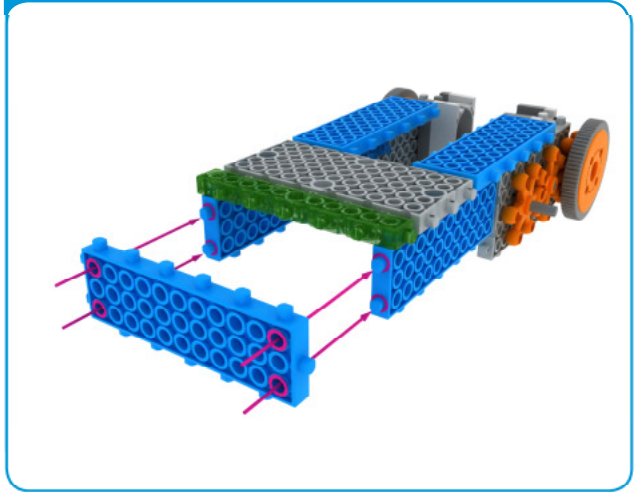
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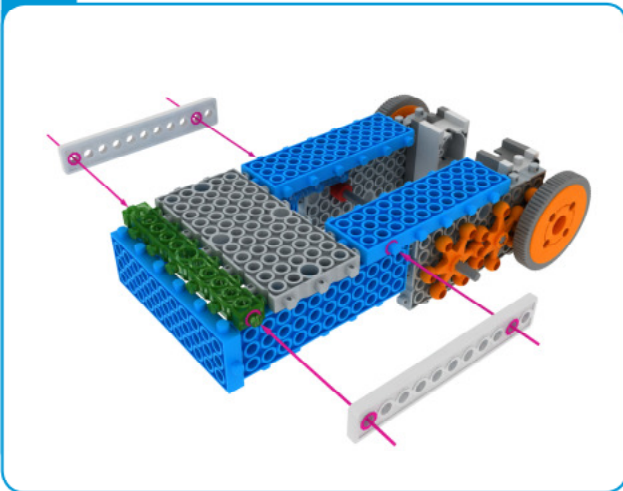
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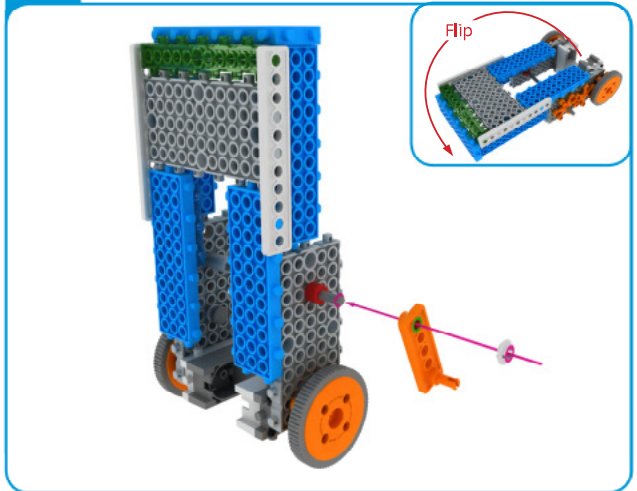
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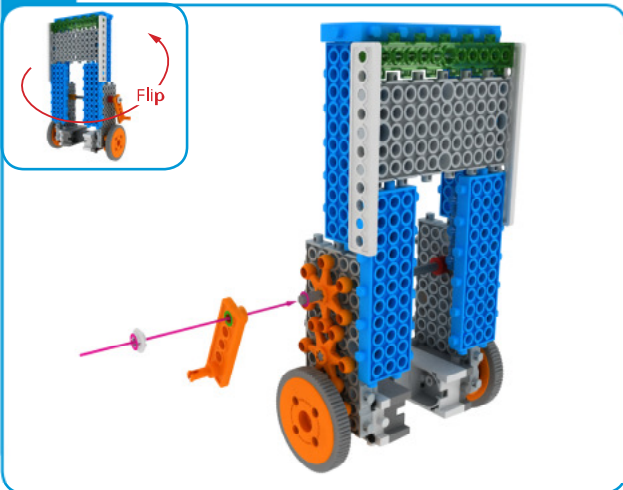
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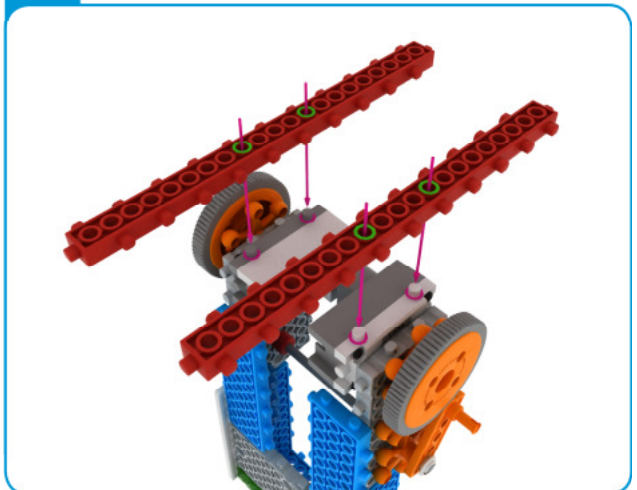
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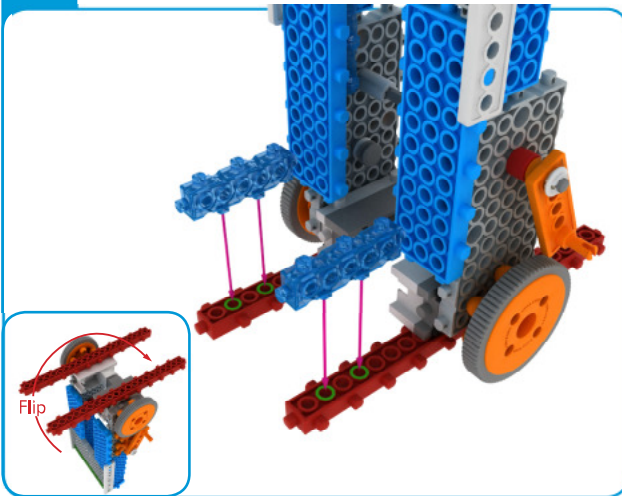
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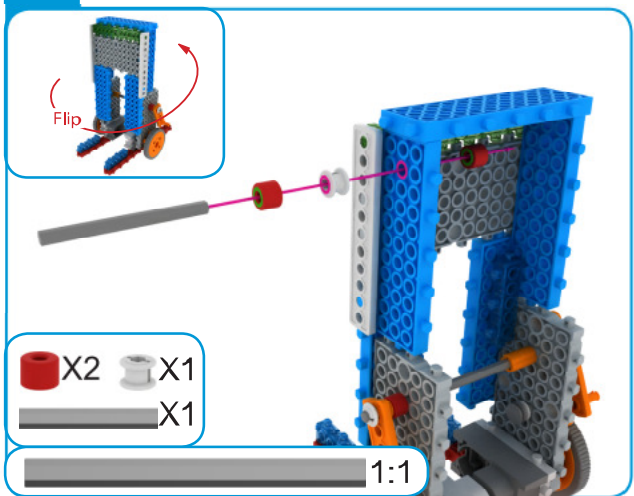
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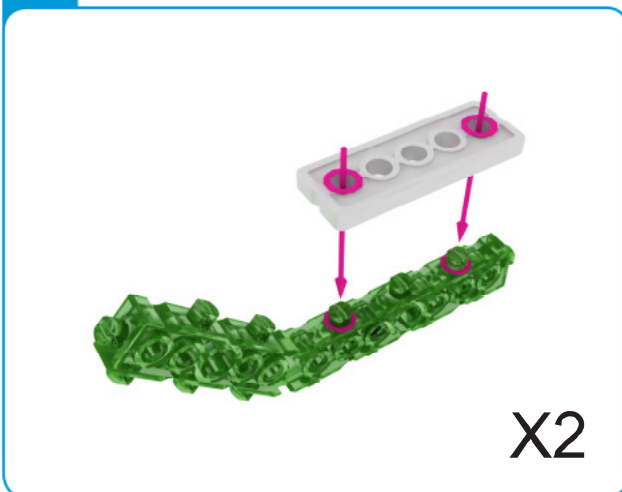
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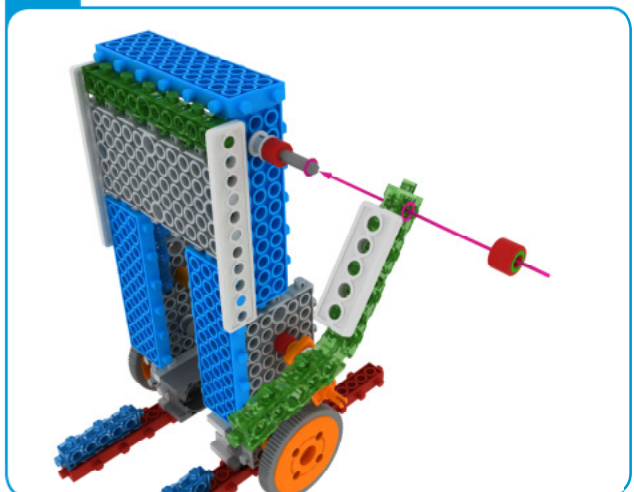
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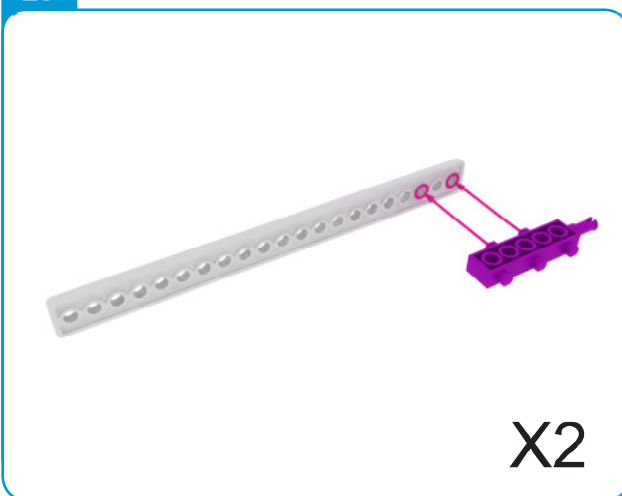
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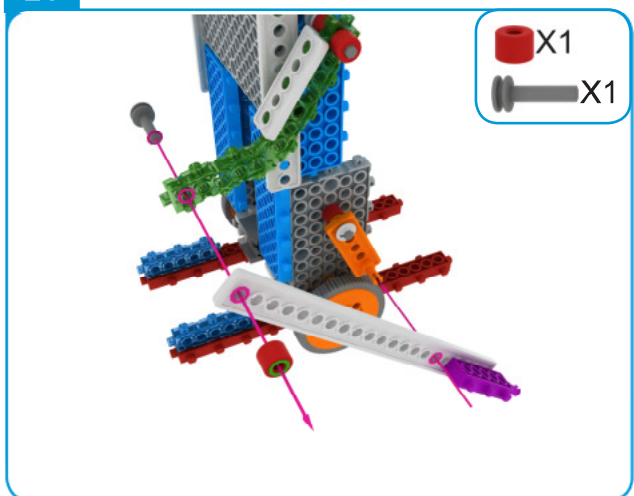
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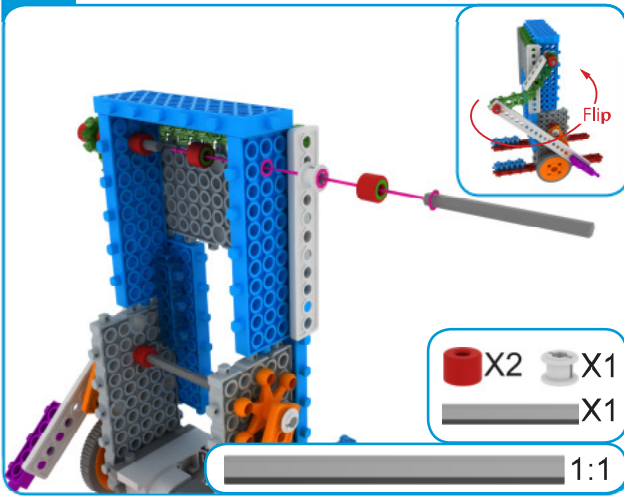
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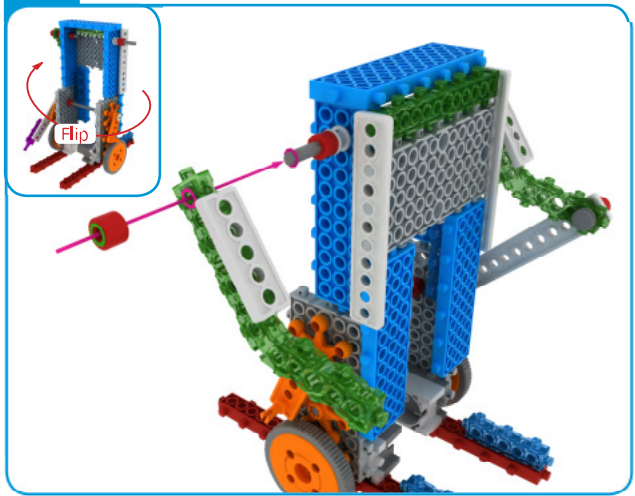
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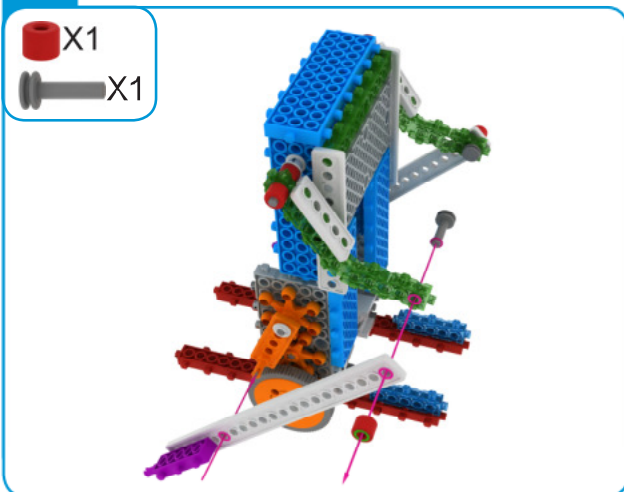
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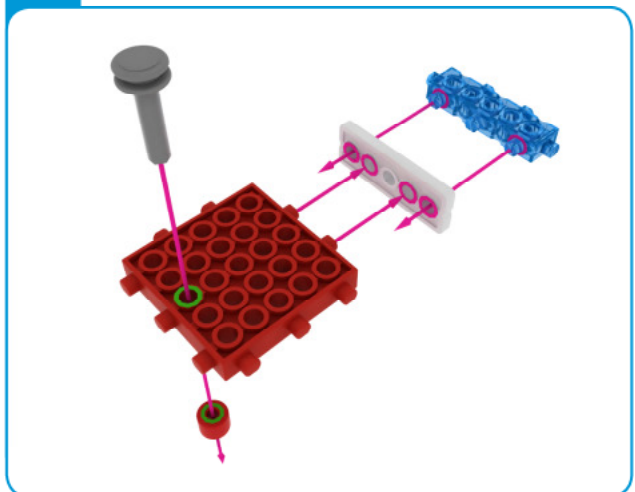
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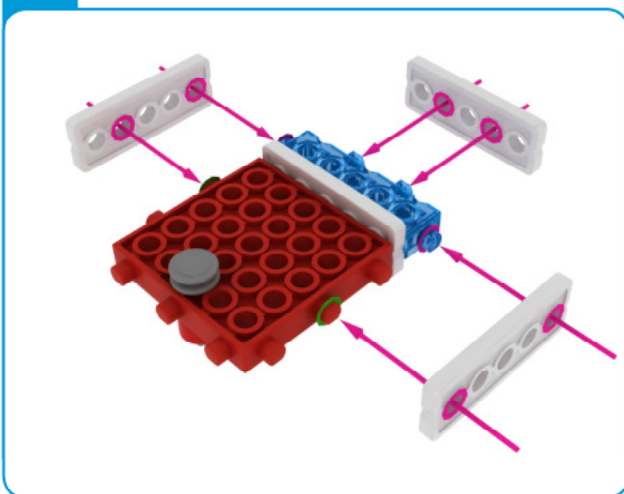
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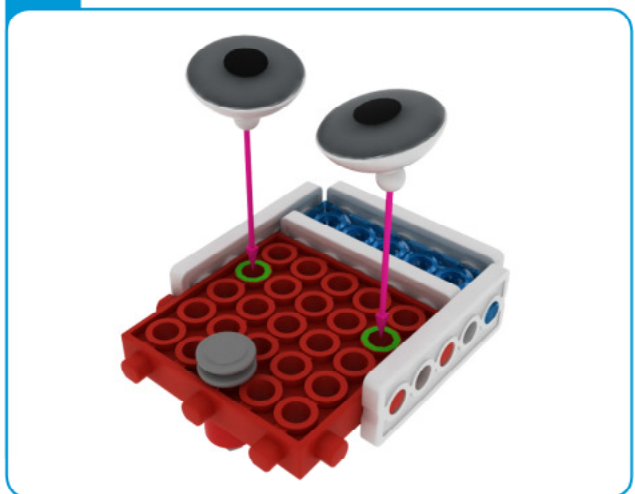
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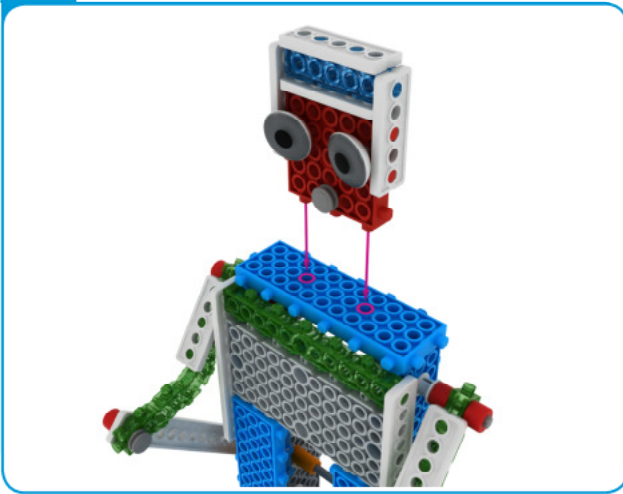
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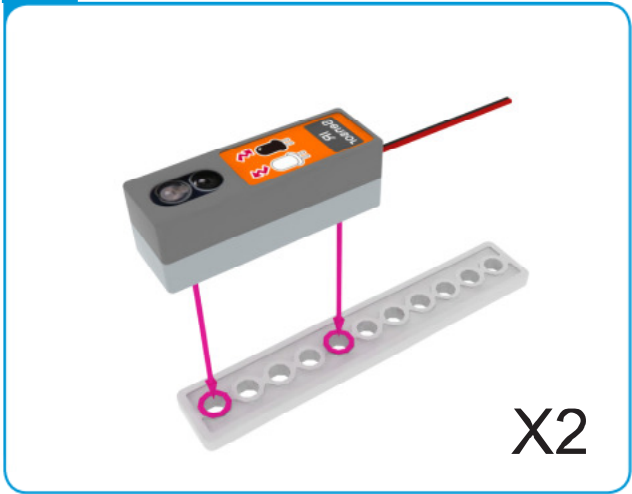
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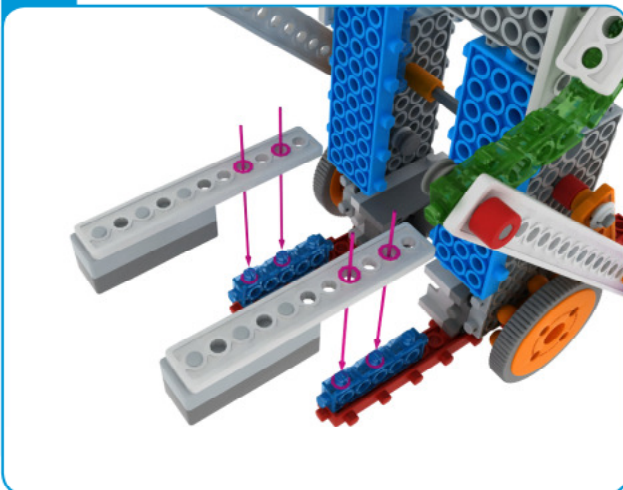
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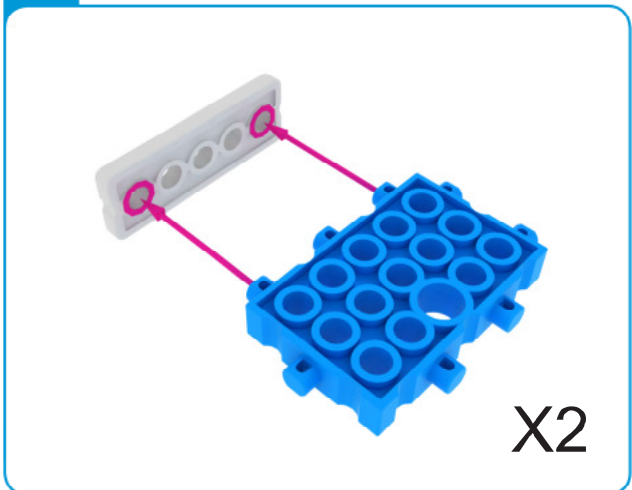
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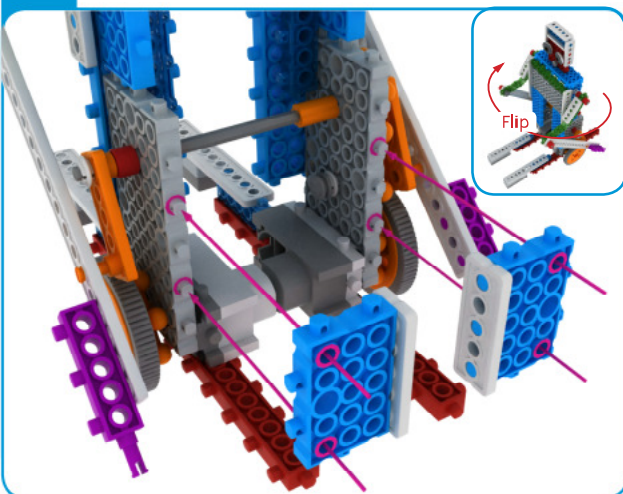
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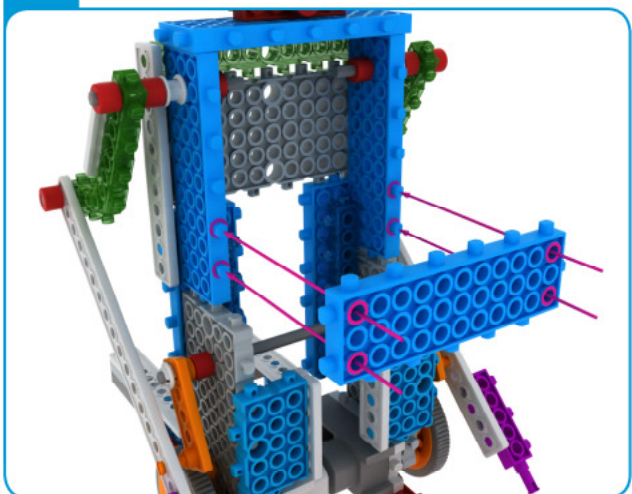
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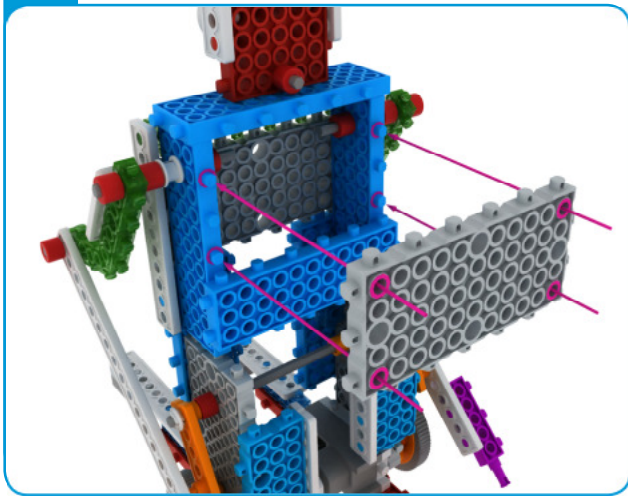
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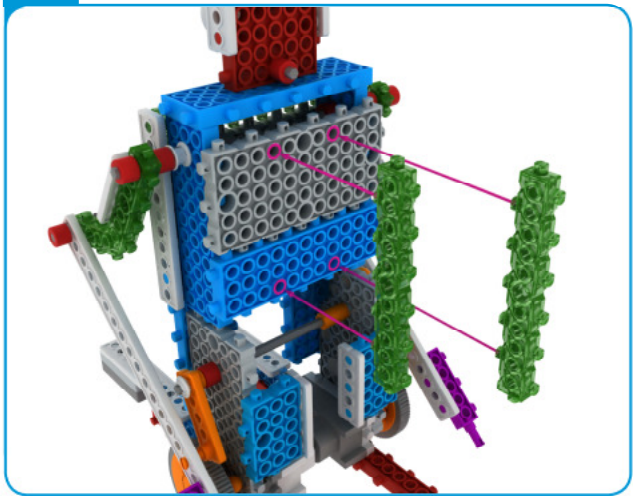
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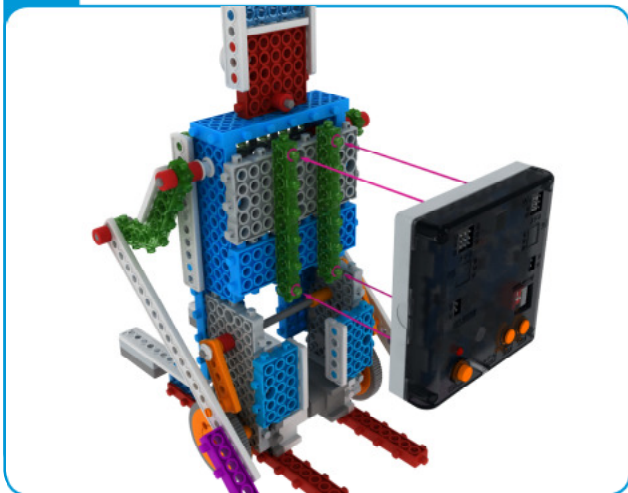
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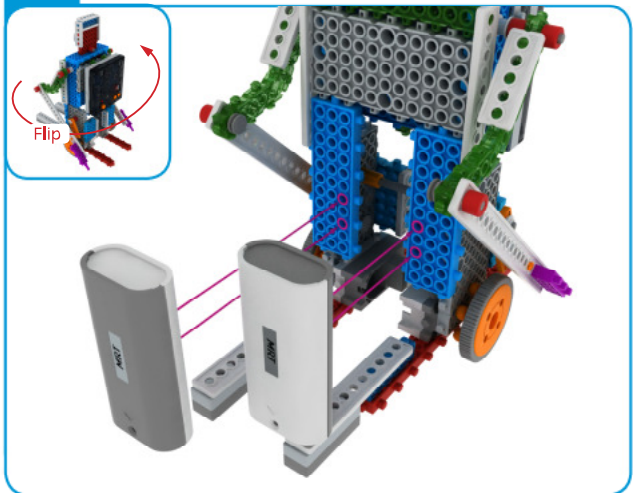
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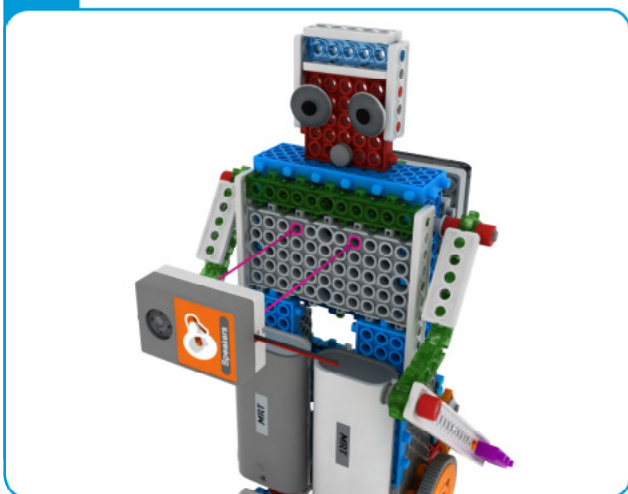
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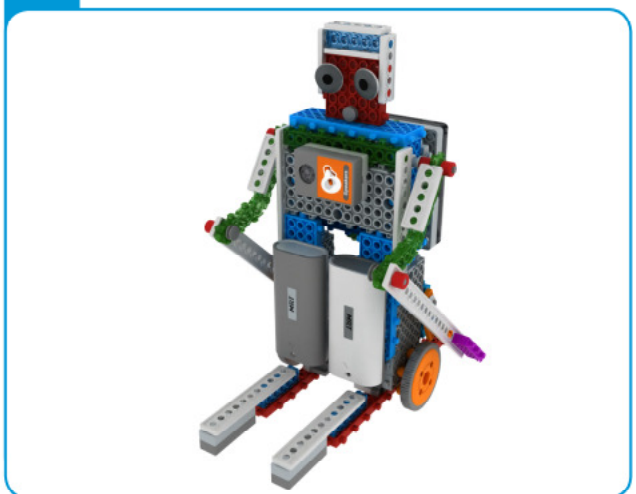
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43



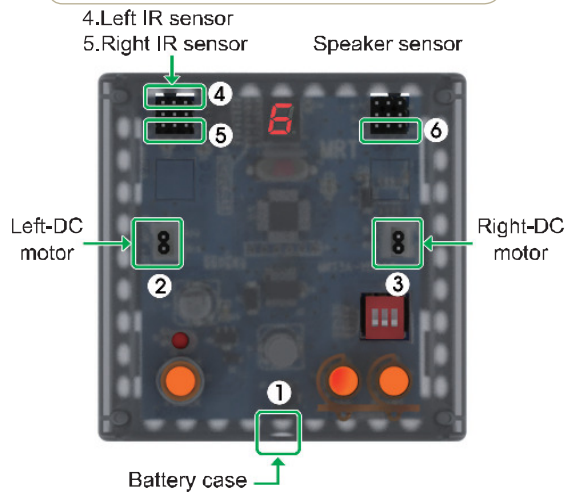
End





How to operate the Skier Man

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect Left IR sensor to R connector.
5. Connect Right IR sensor to R connector.
6. Connect speaker sensor to INZ connector.

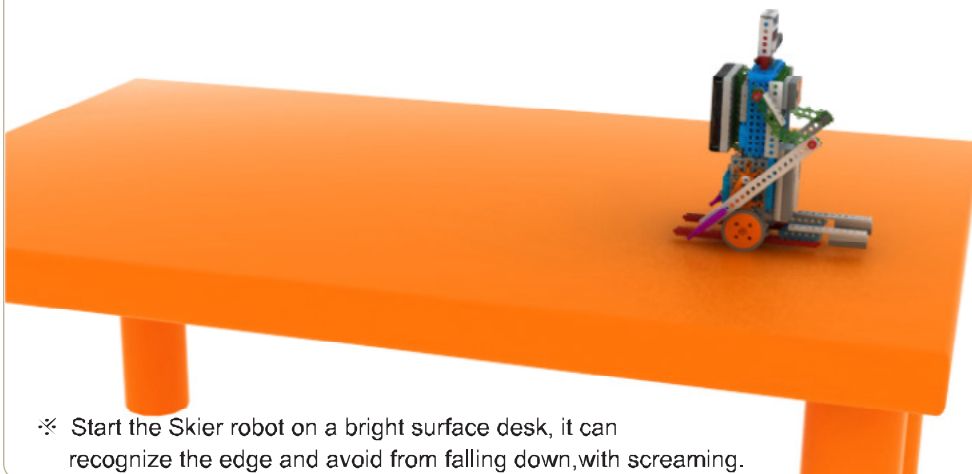
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

MODE # 6		Drop Checker Mode
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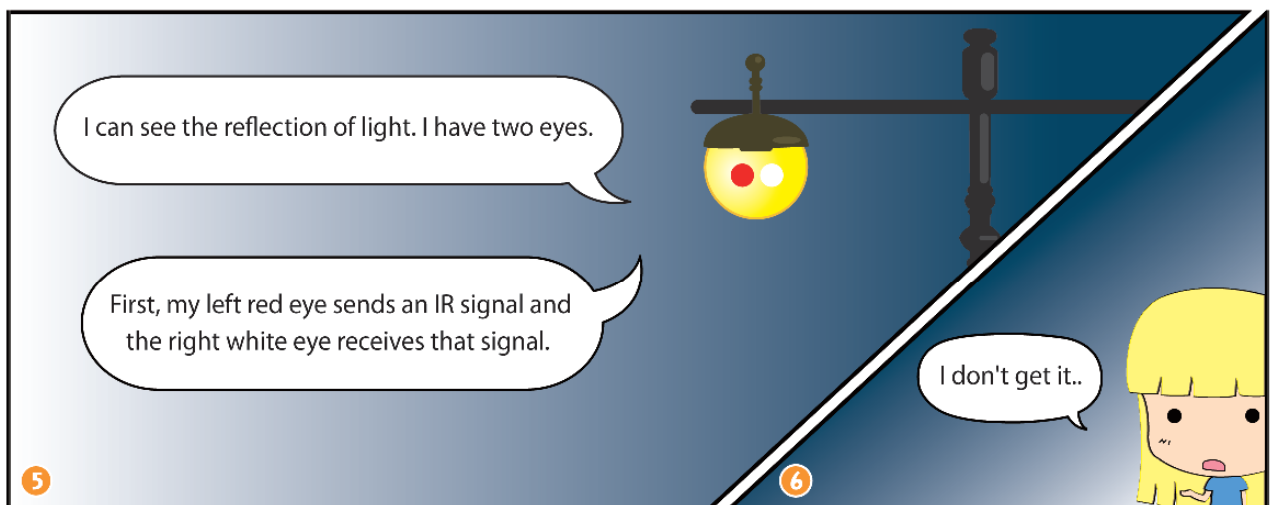
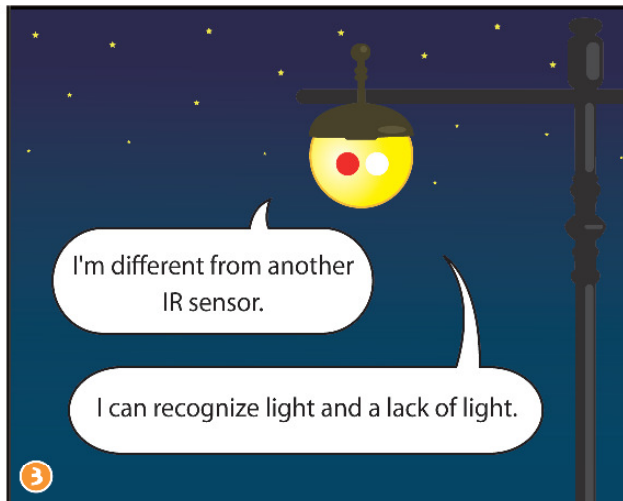
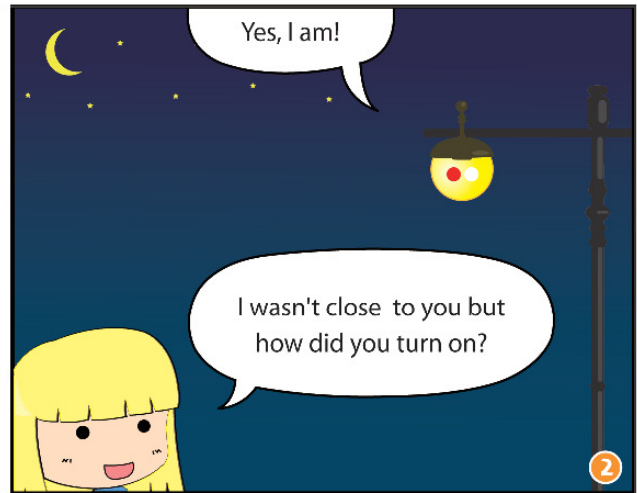
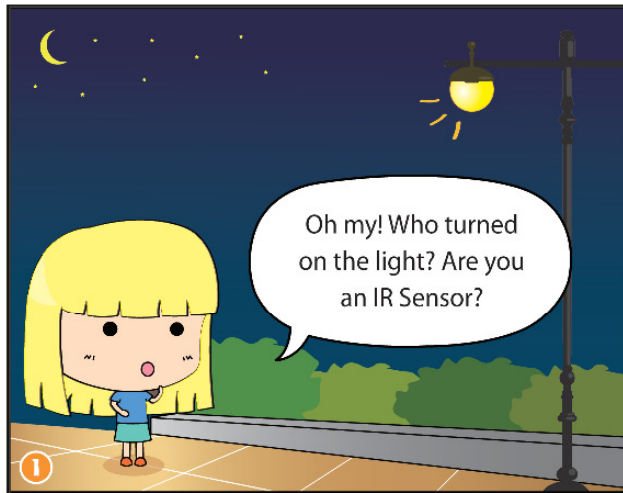
4. Select Remote ID.
5. Press the START button.

How to make it move?





STEM 7. The eyes of Robot-IR Sensor2



I can see the reflection of light. I have two eyes.

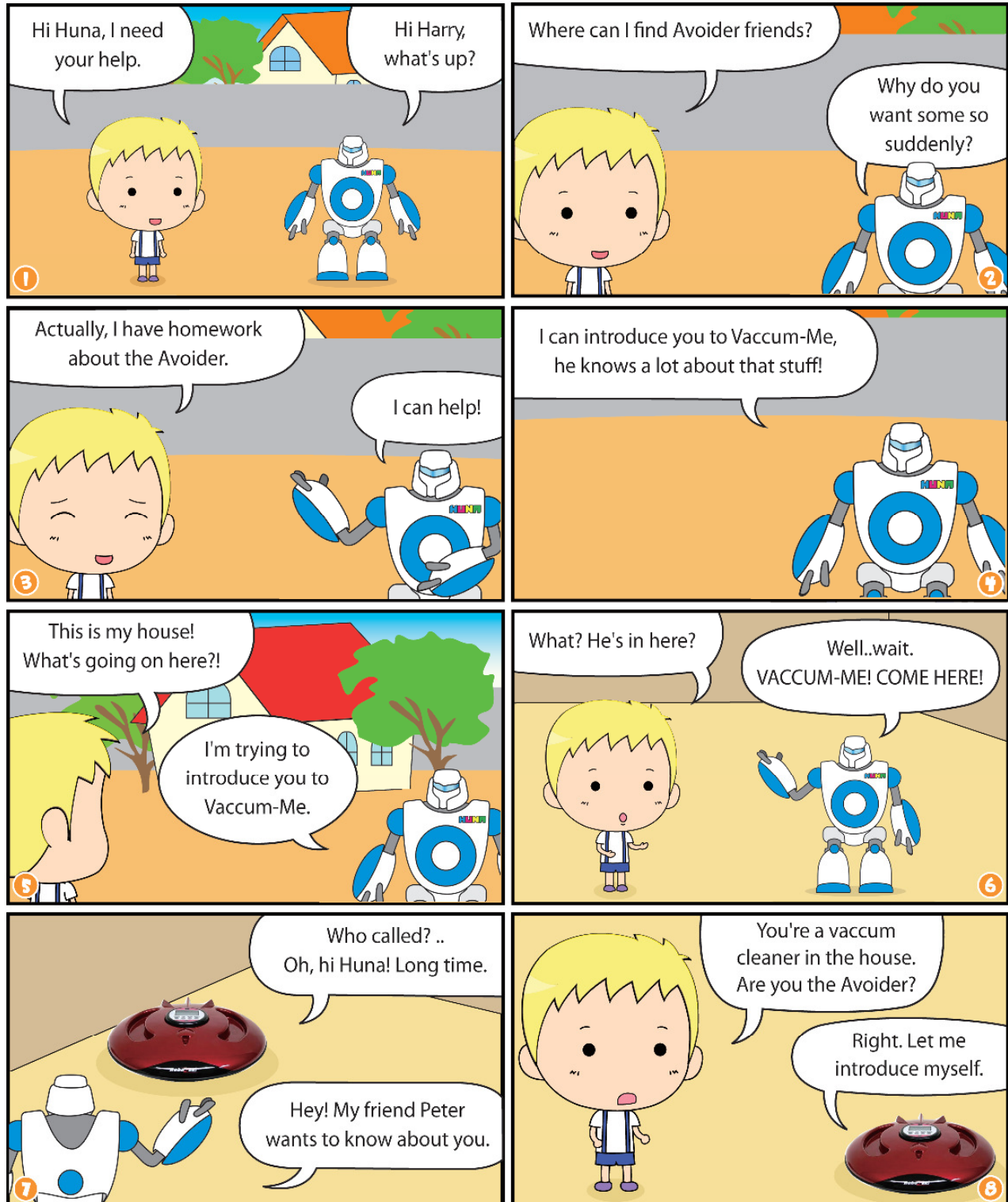
First, my left red eye sends an IR signal and the right white eye receives that signal.

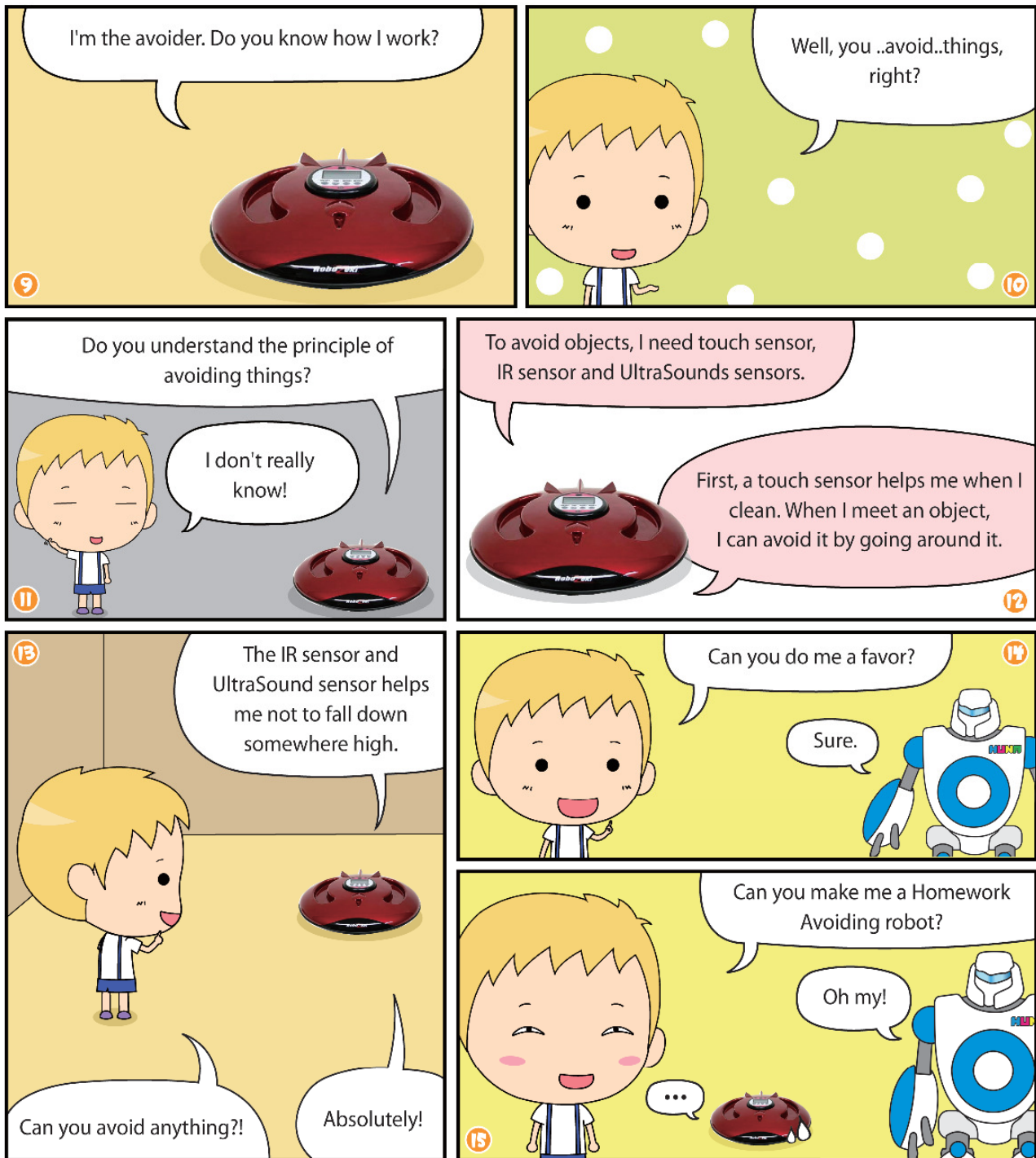
I don't get it..





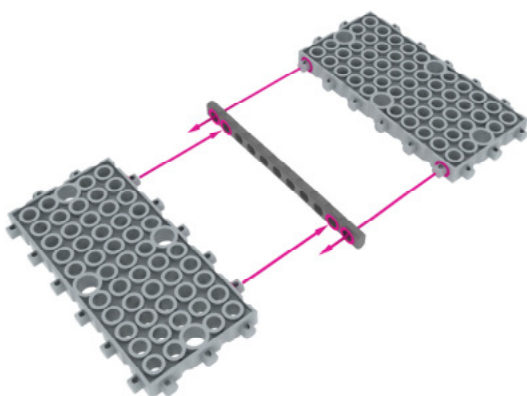
STEM 8. what is avoider?



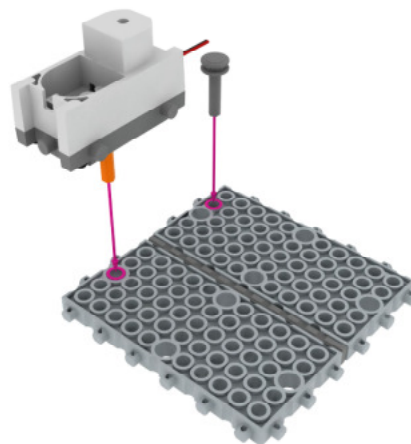




1

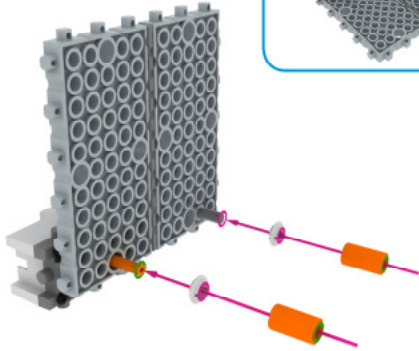
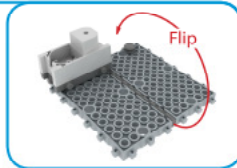


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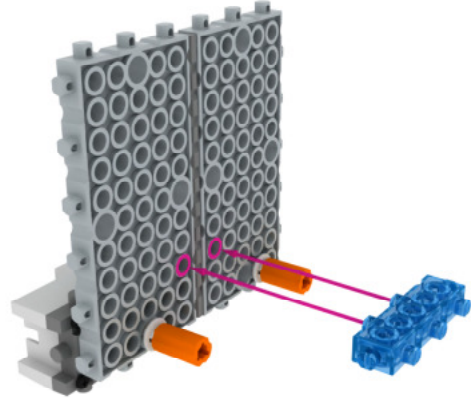


3

Orange X2  X2

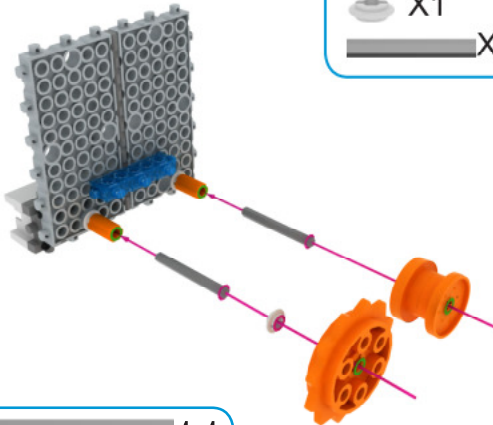


4



5

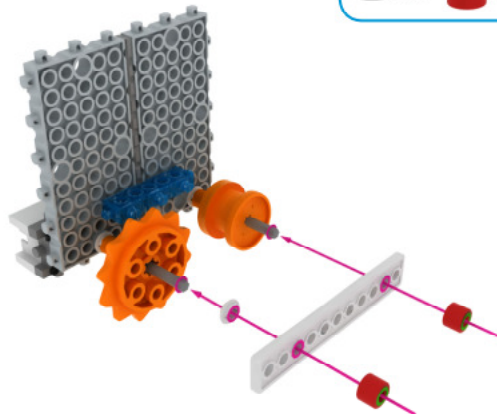
 X1
Grey 1x4 Beam X2



1:1

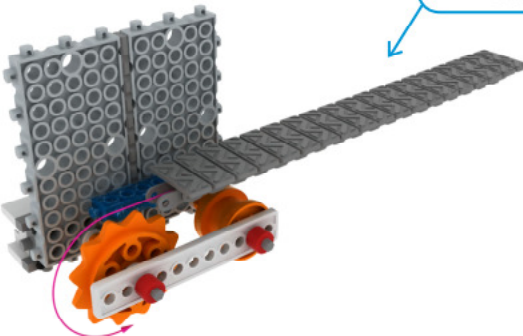
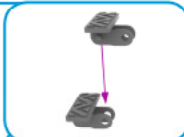
6

 X1  X2

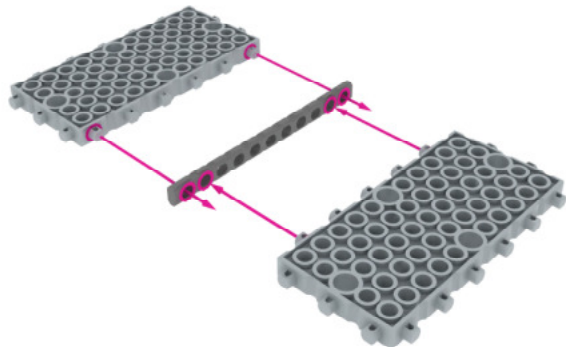


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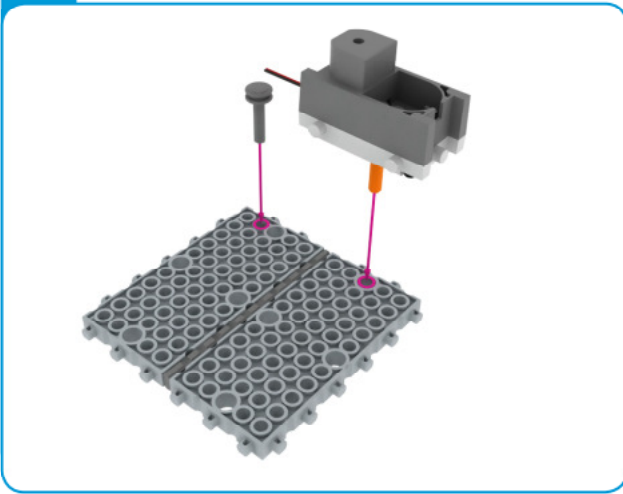
Grey 1x19 Beam X19



8

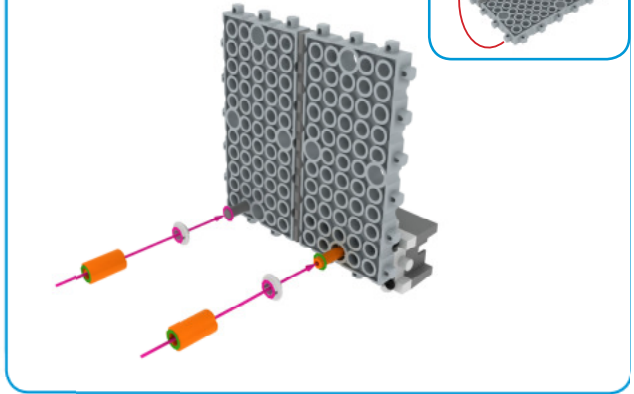
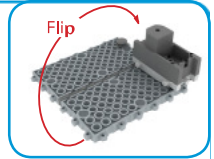


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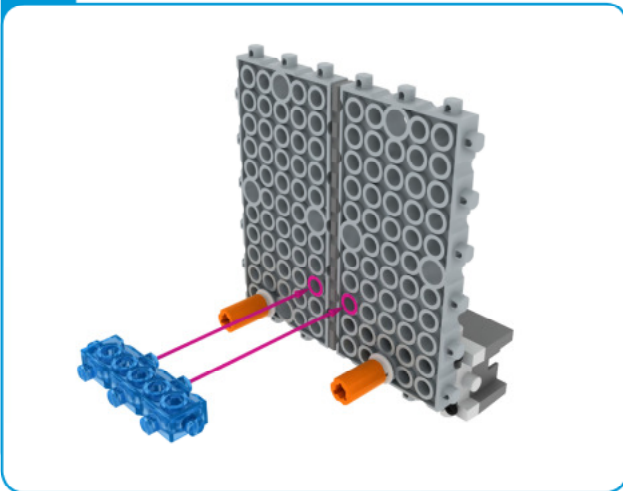


10



 X2  X2

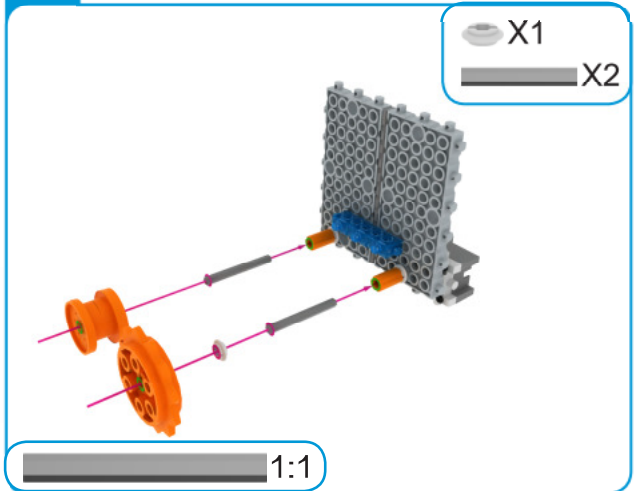


11



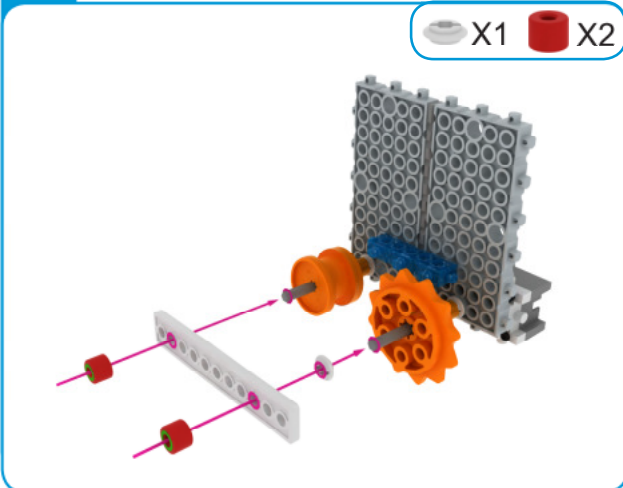
12

 X1
 X2



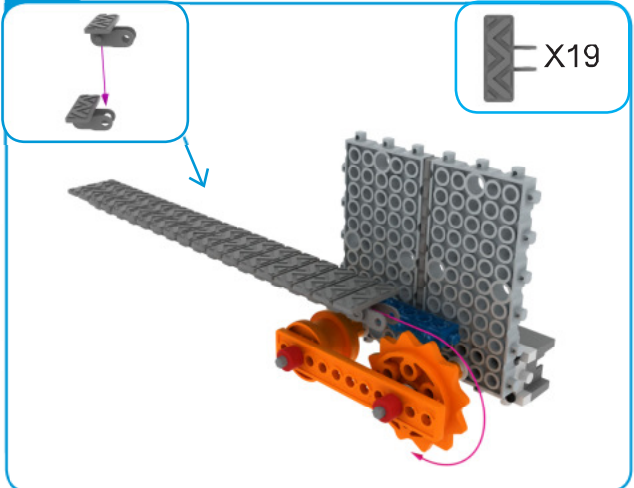
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 X1  X2

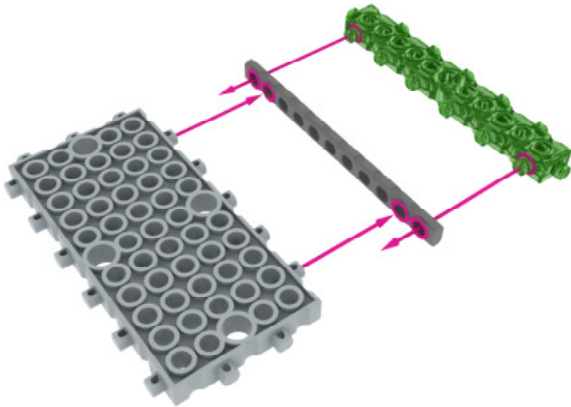


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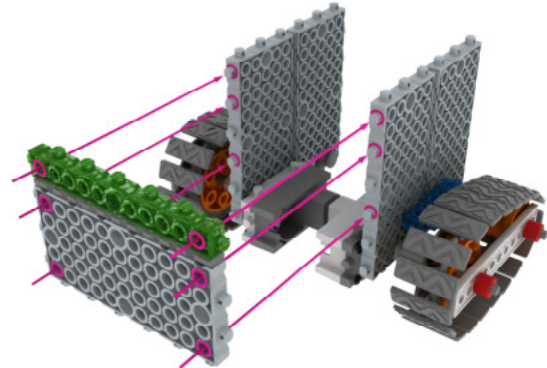
 X19



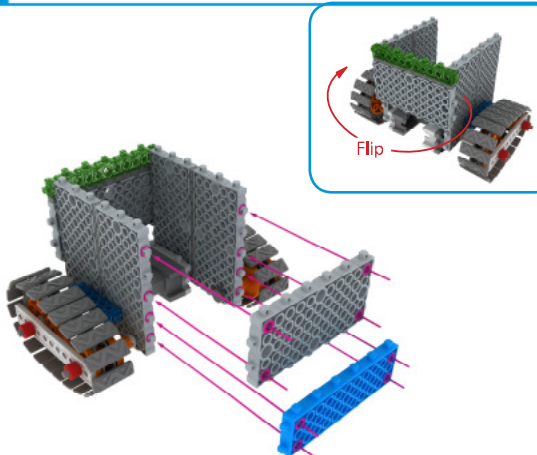
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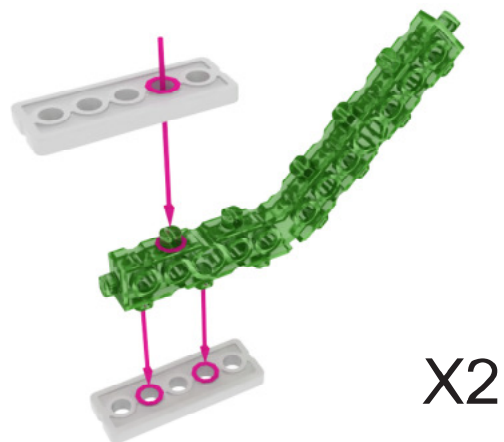
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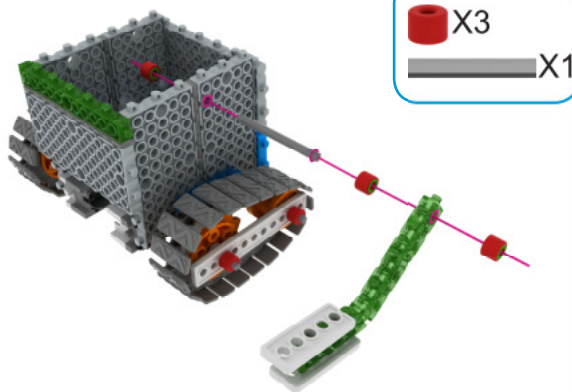
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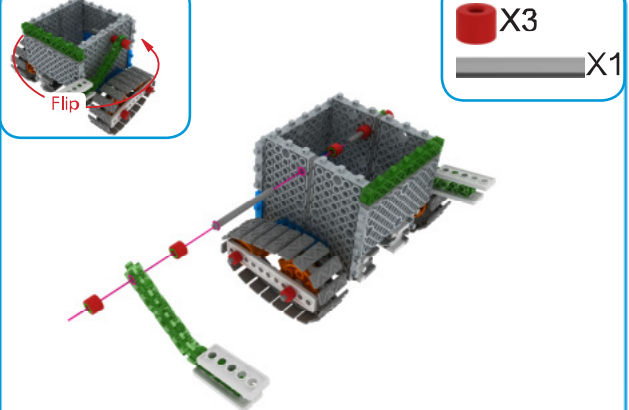
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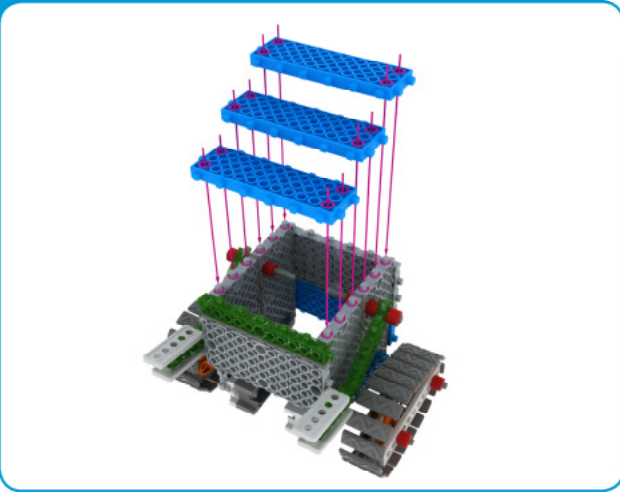
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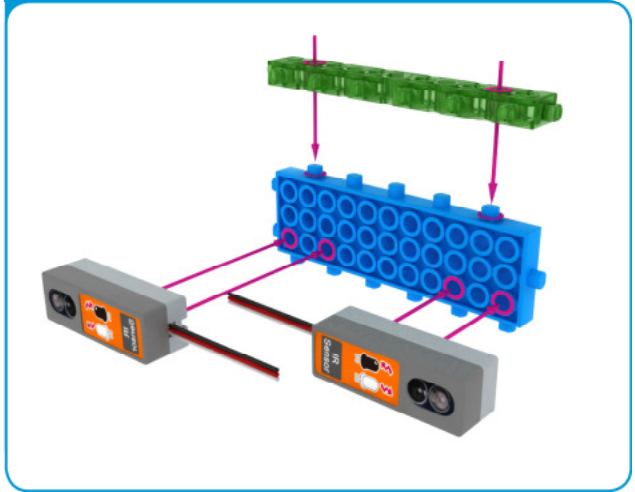
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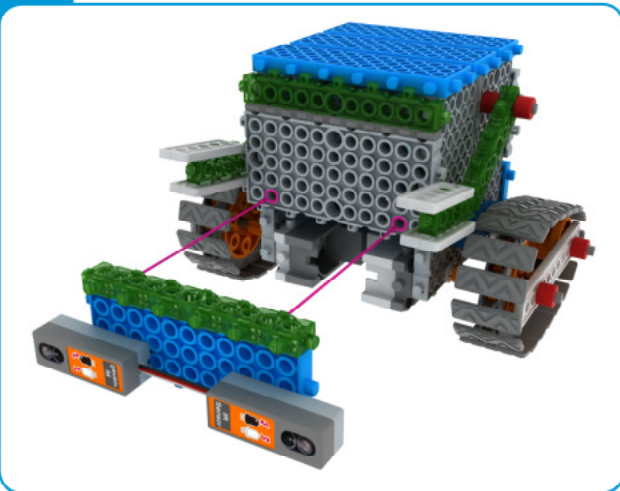
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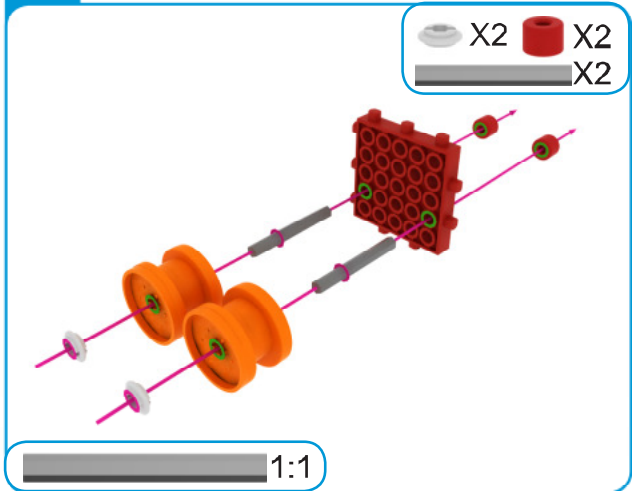
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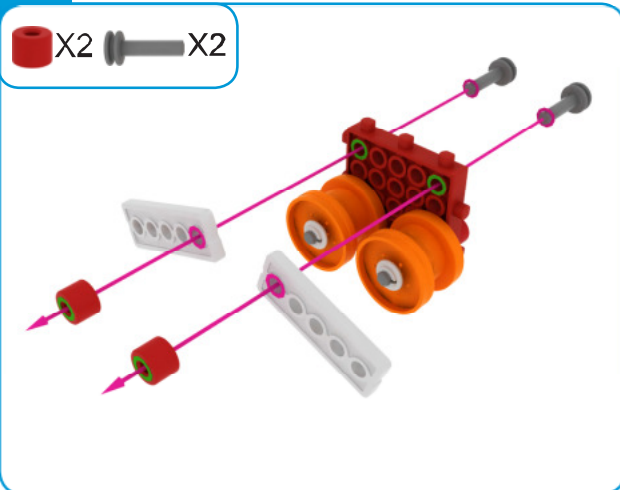
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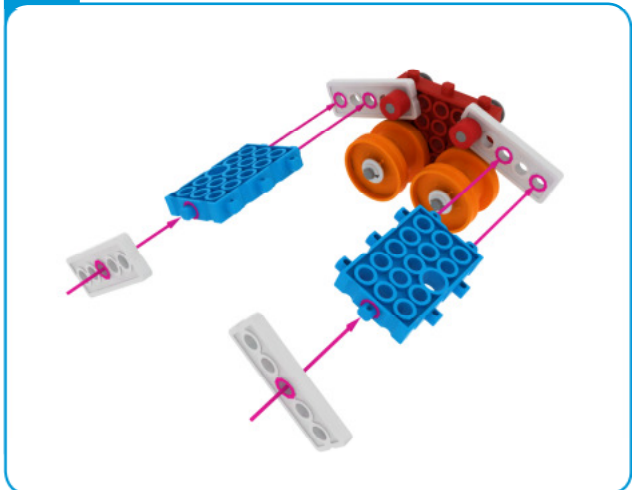
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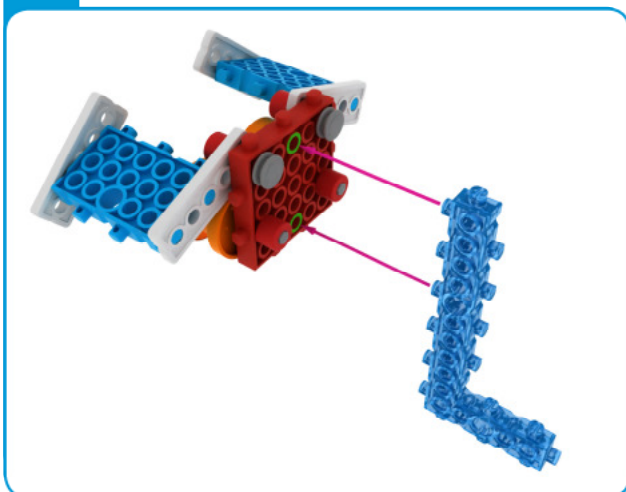
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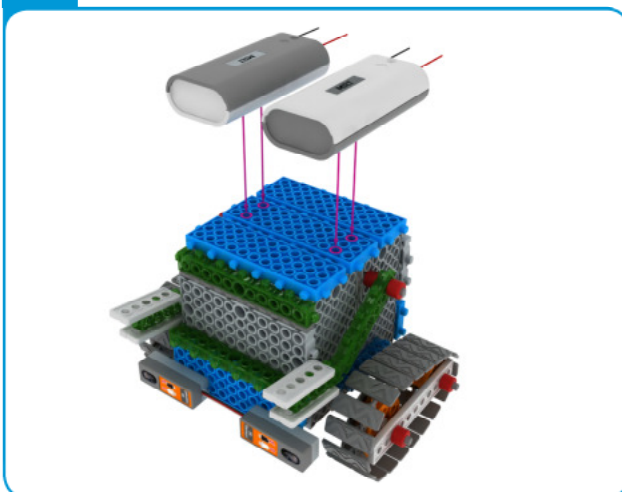
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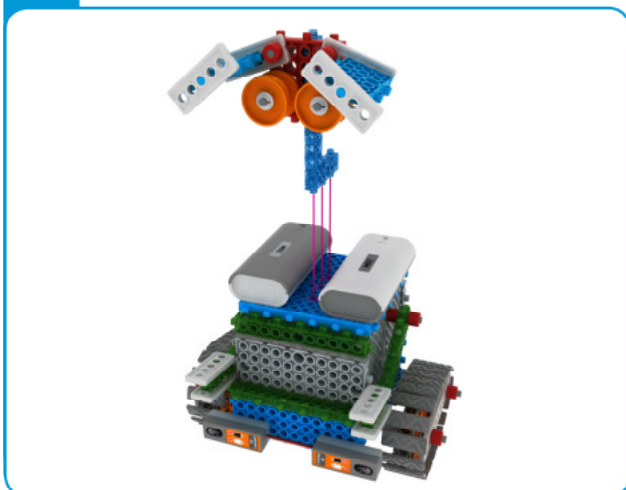
27



28



29



30



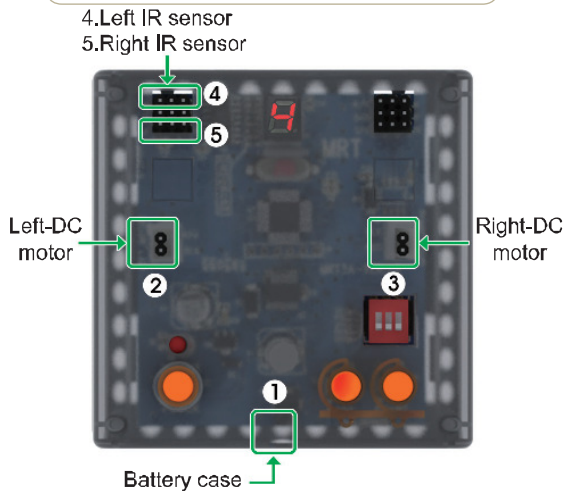
End





How to operate the Huna-E

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect Left IR sensor to R connector.
5. Connect Right IR sensor to R connector.

Setting mode

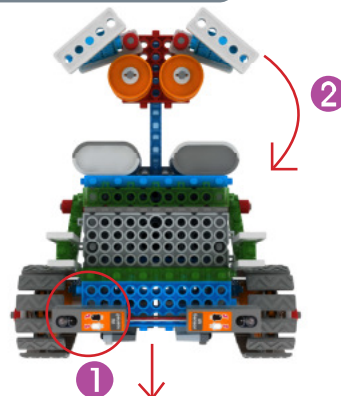
1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

MODE # 4		Avoider Mode
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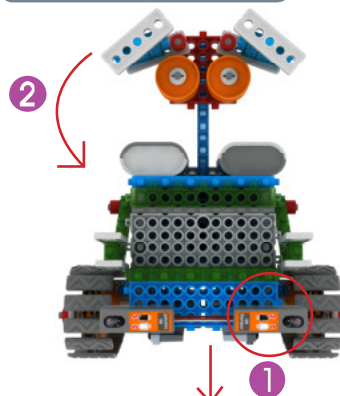
4. Select Remote ID.
5. Press the START button.

How to make it move?

A Right IR Sensor



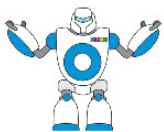
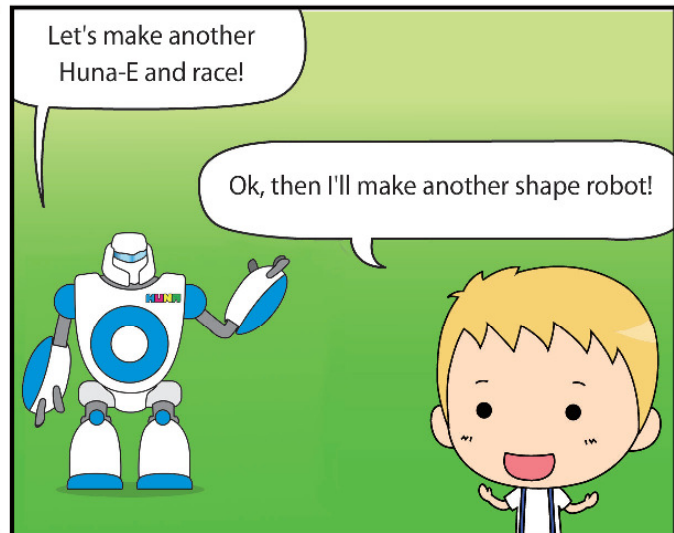
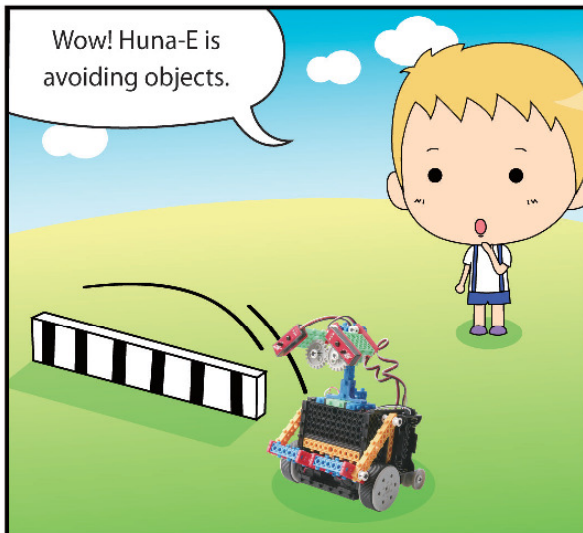
B Left IR Sensor



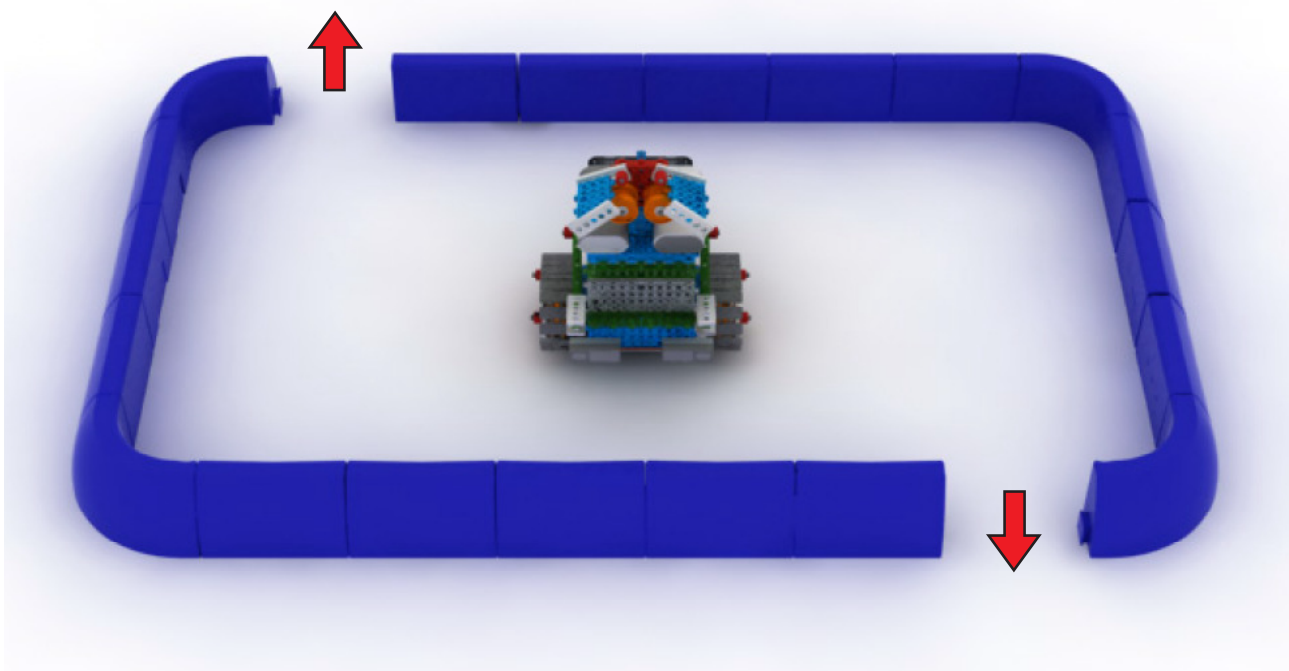
1. Recognize right IR sensor: Backward, then follow left side.
2. Recognize left IR sensor: Backward, then follow right side.

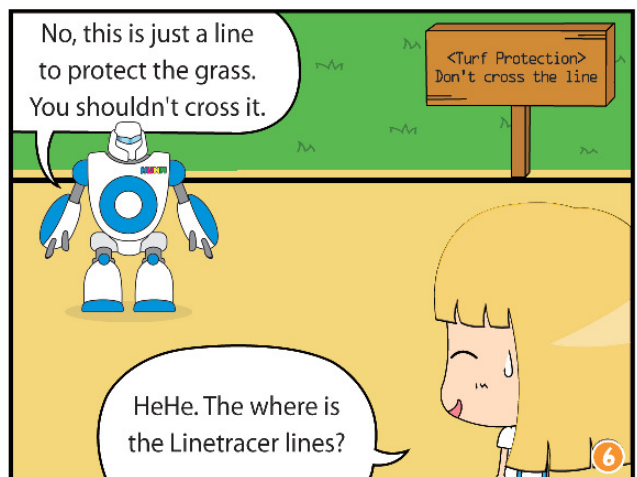
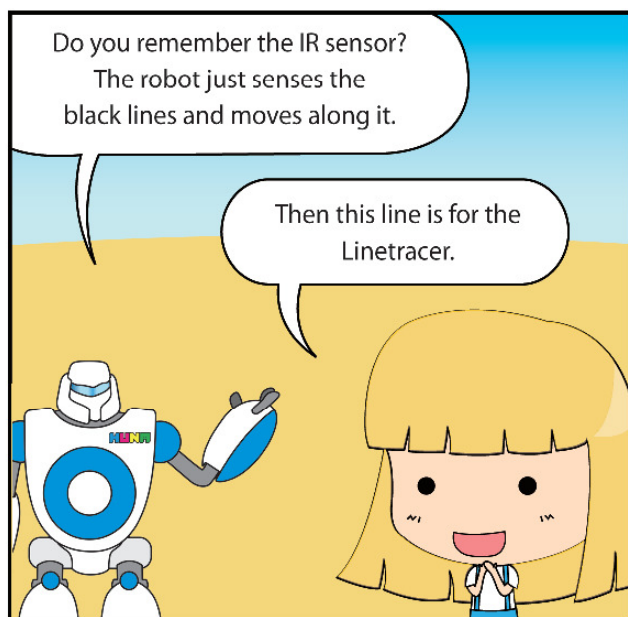
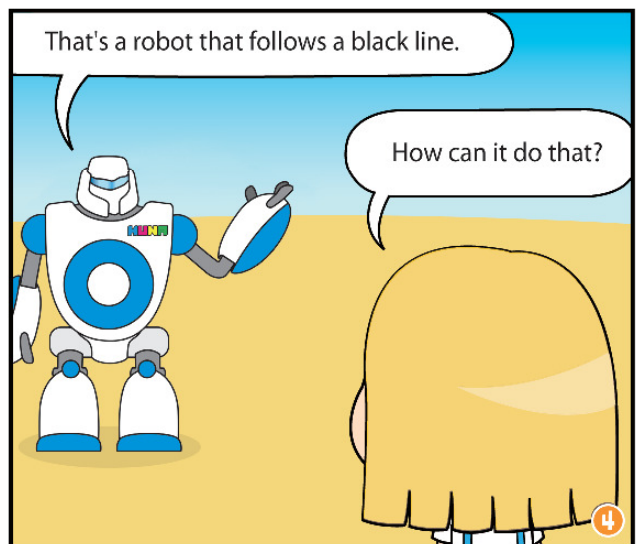
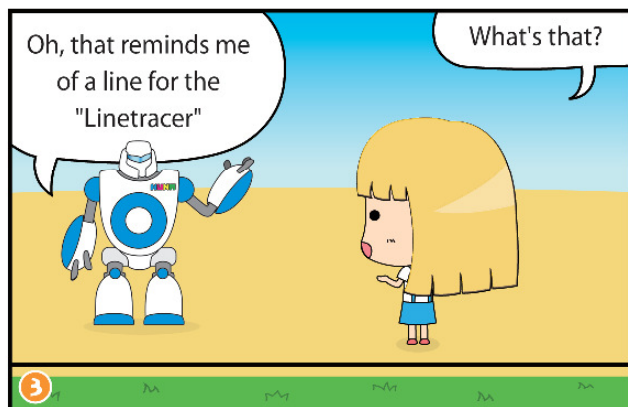
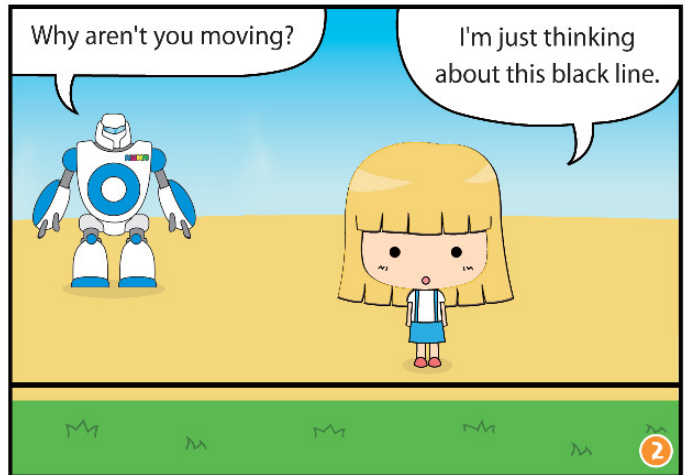
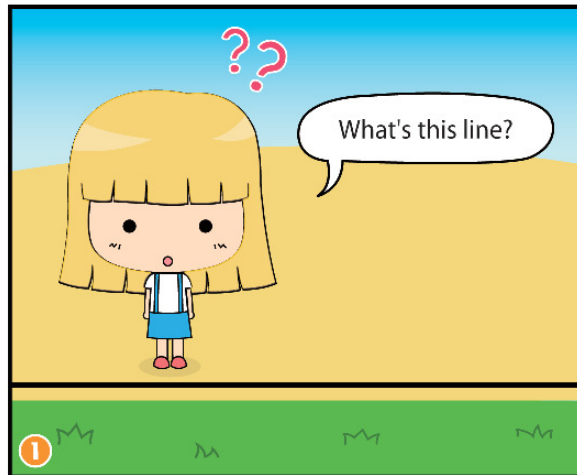


STEM 9. Avoider can avoid objects



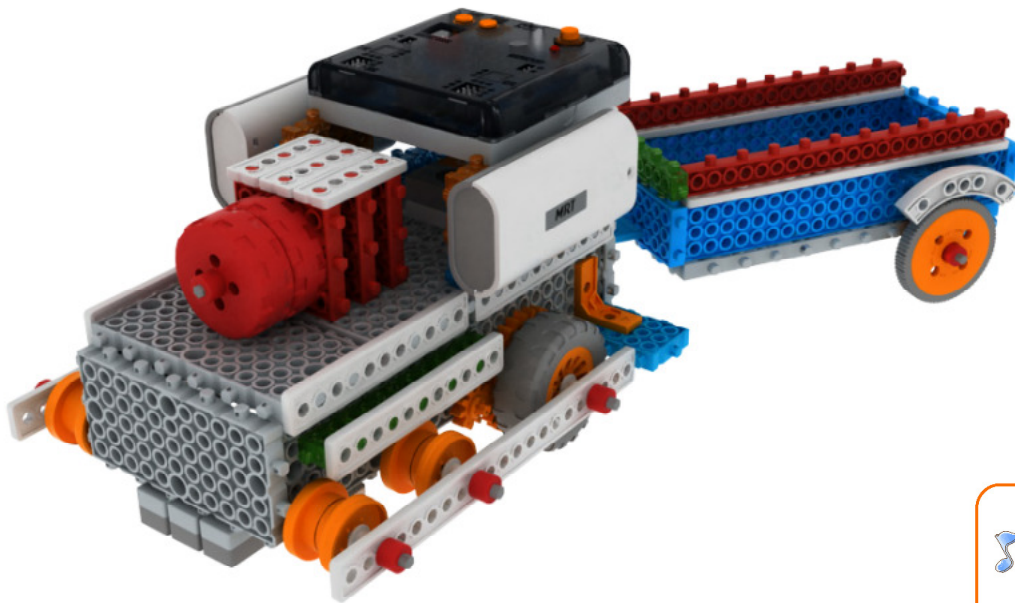
Let's make another shape of Huna-E robot avoid object.





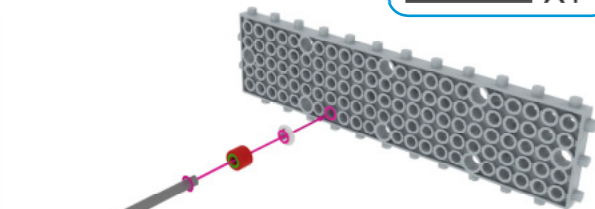


Engineering Art Robot Making 7-Line Trace Train (with sound)



1

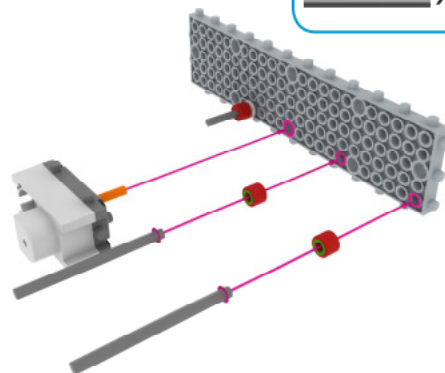
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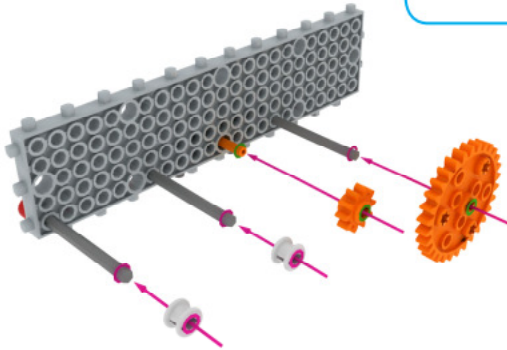
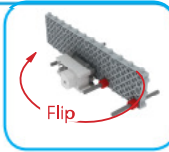
X2 X2



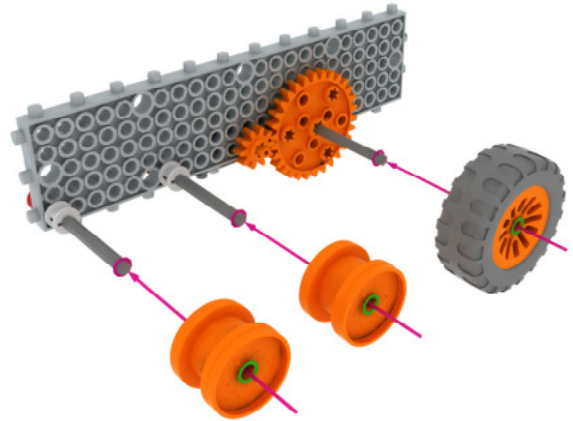
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X2 X1 X1

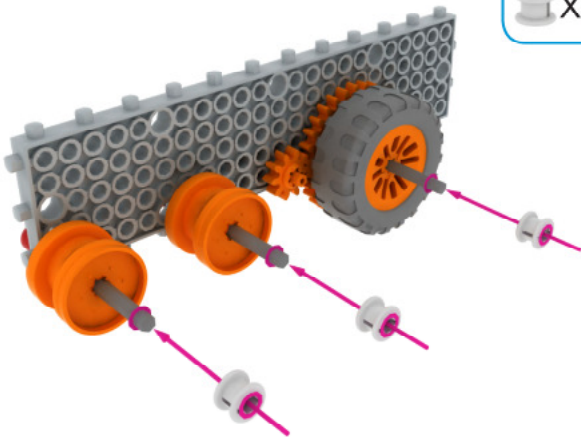


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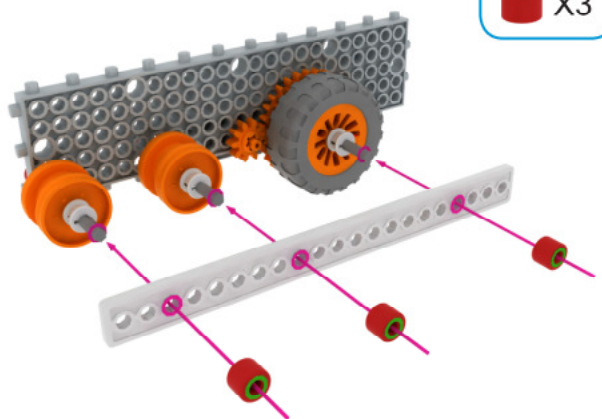
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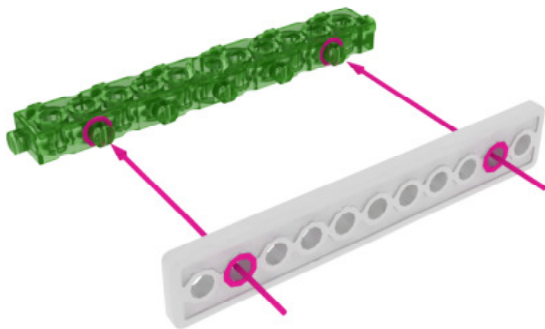


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X3



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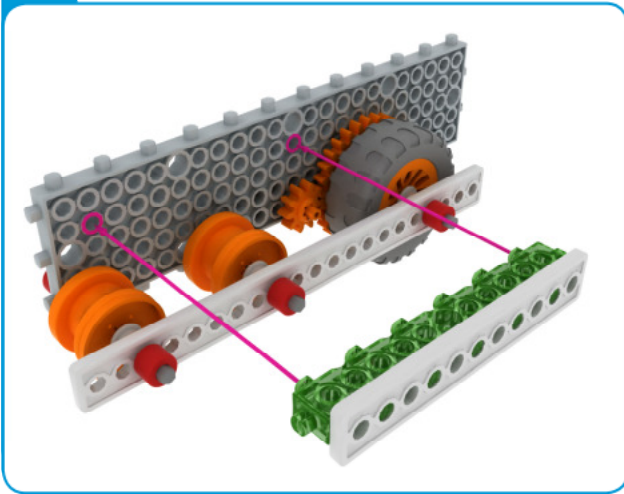


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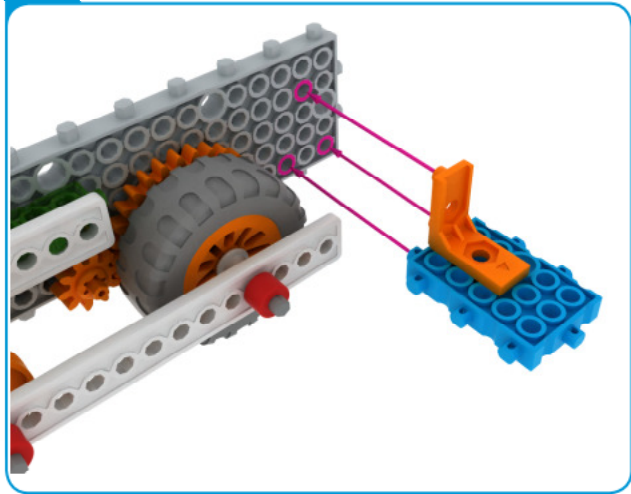
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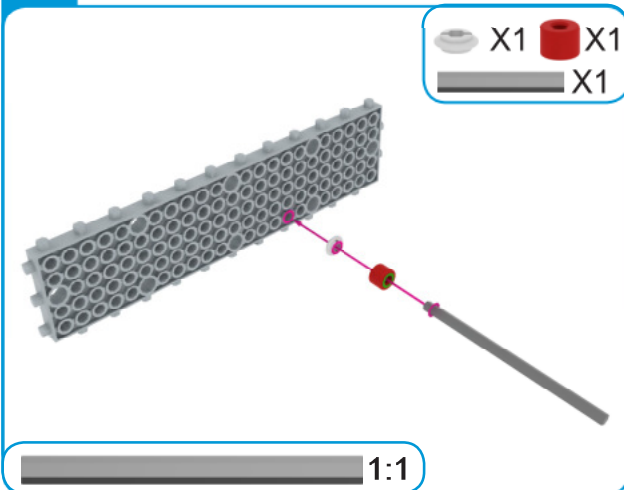
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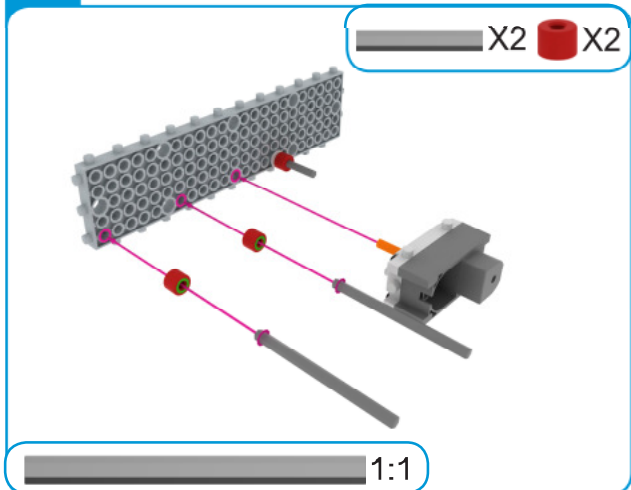
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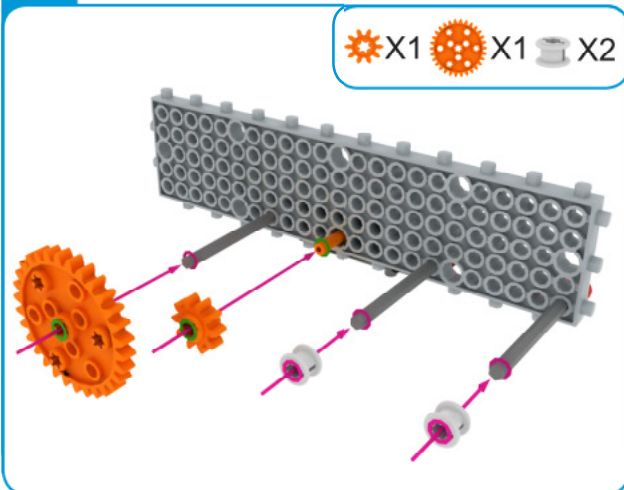
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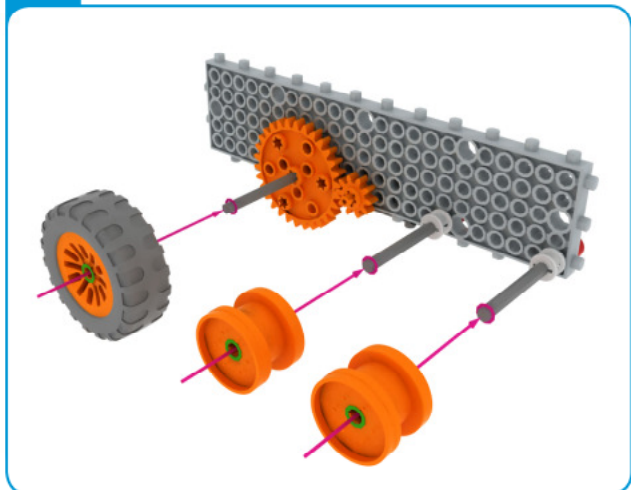
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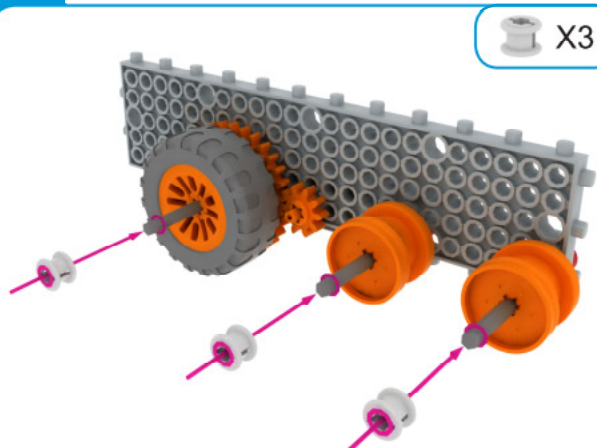
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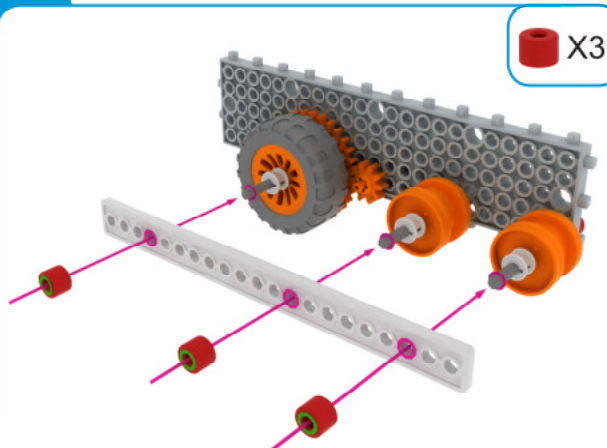
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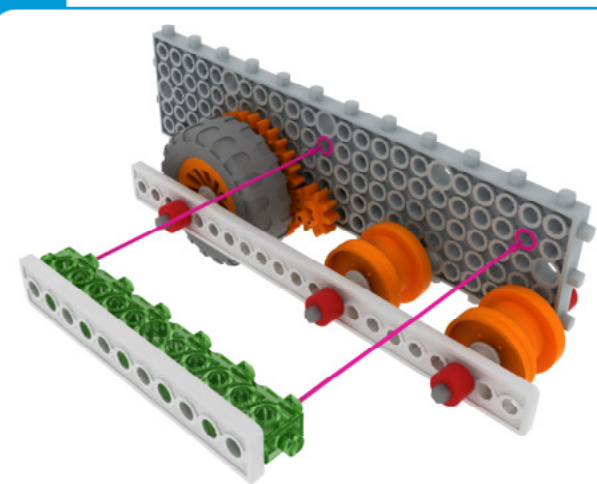
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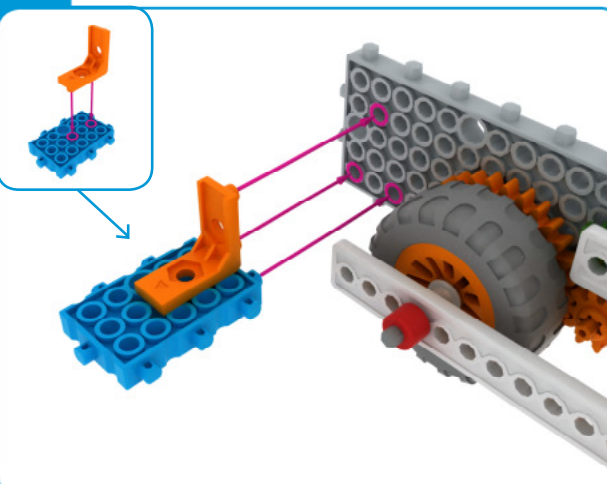
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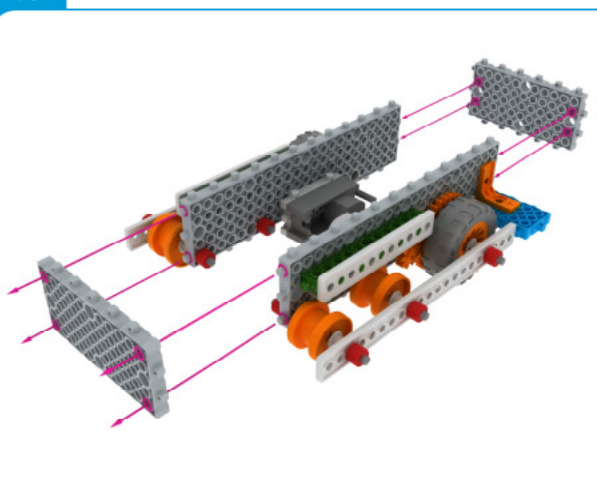
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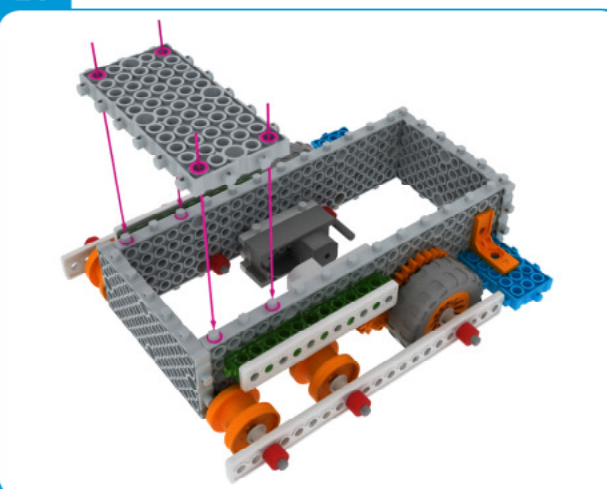
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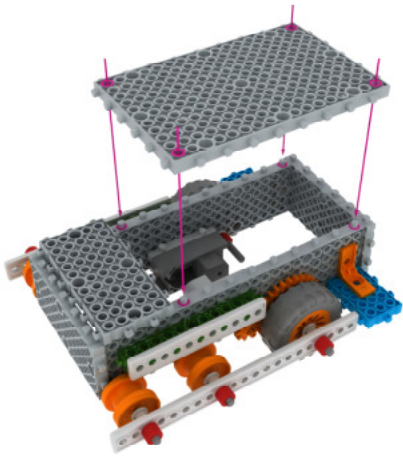
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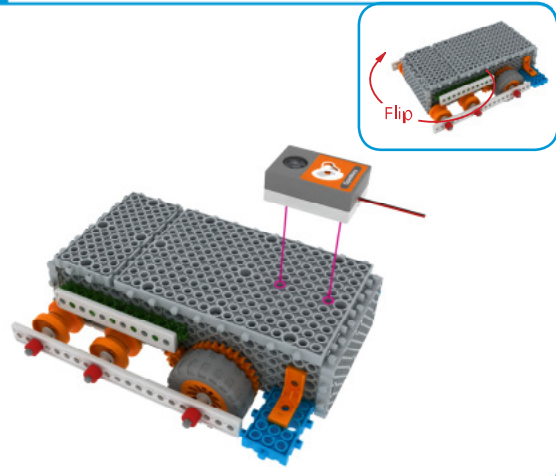
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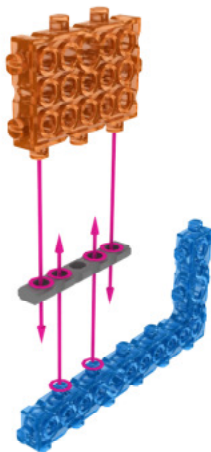
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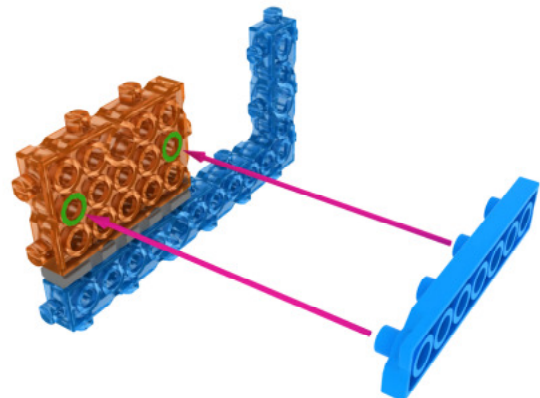


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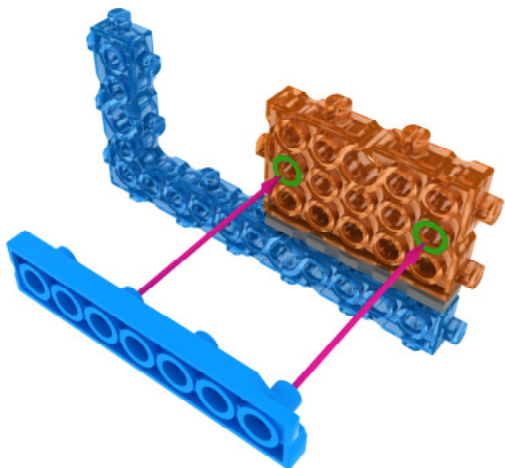


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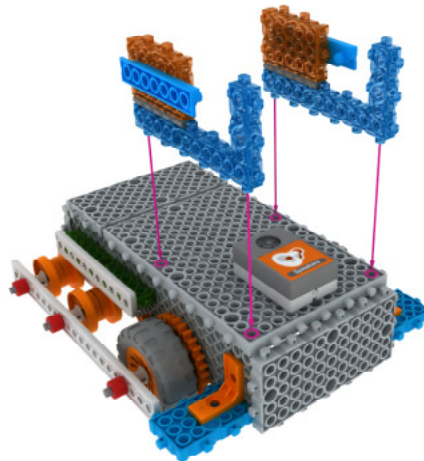
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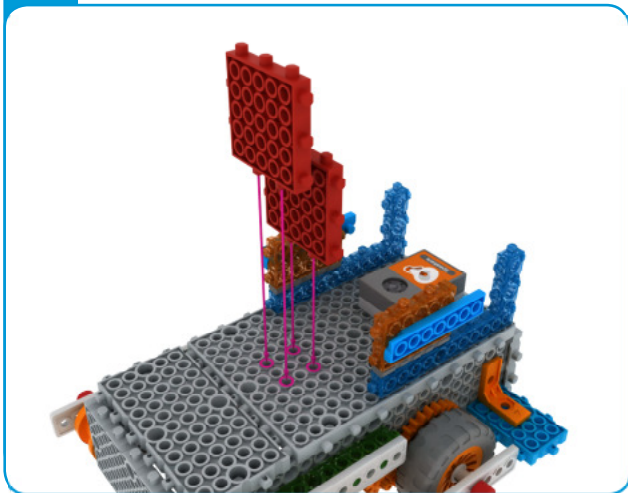
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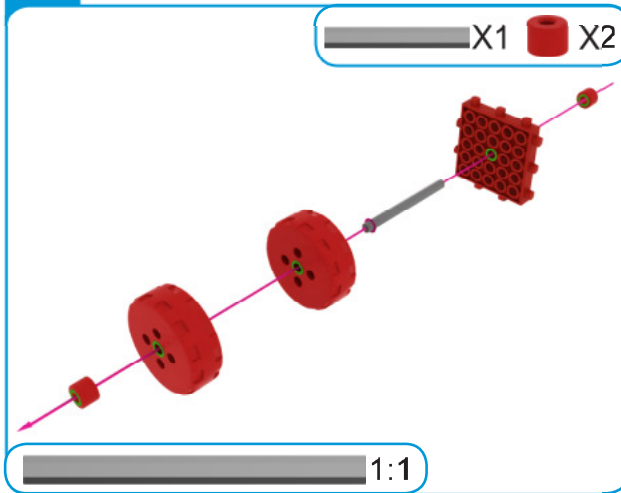
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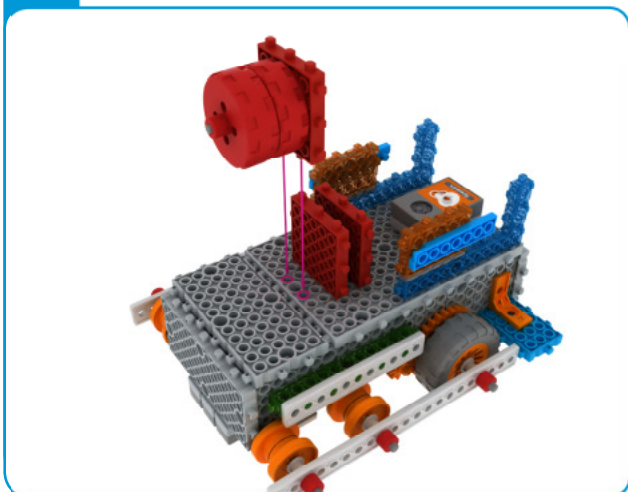
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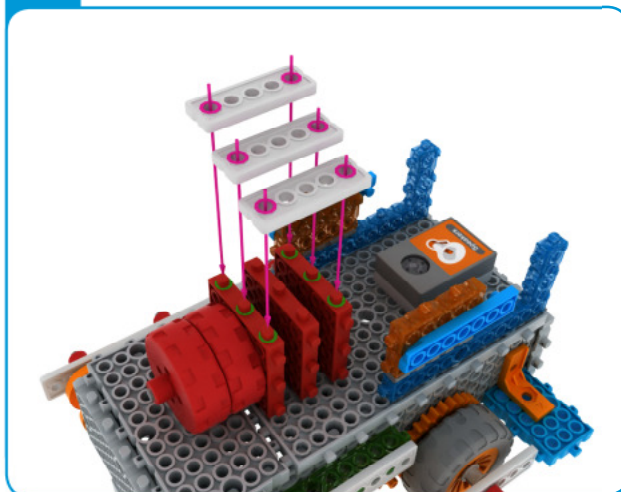
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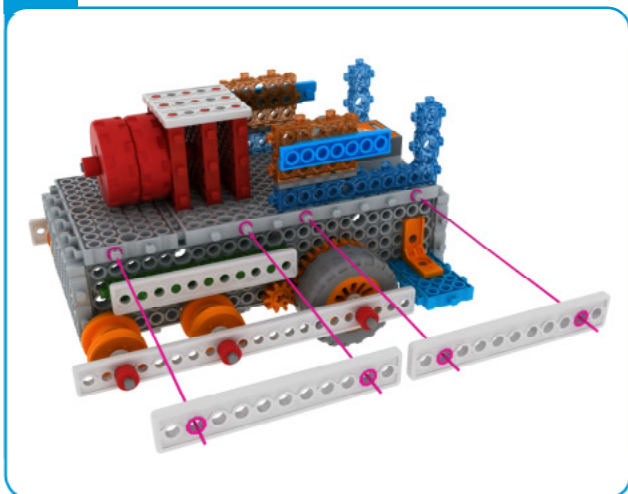
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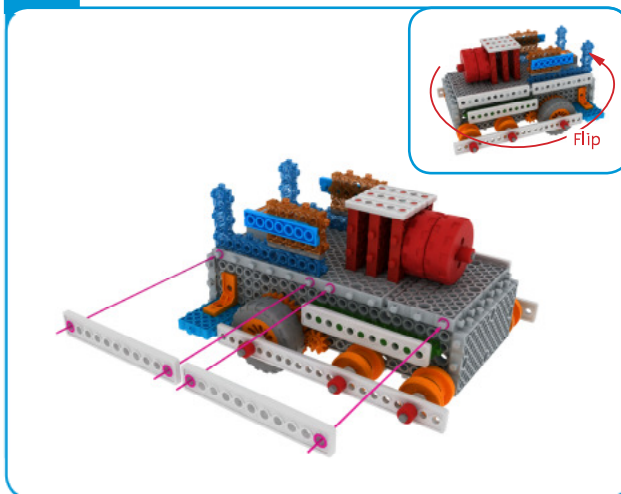
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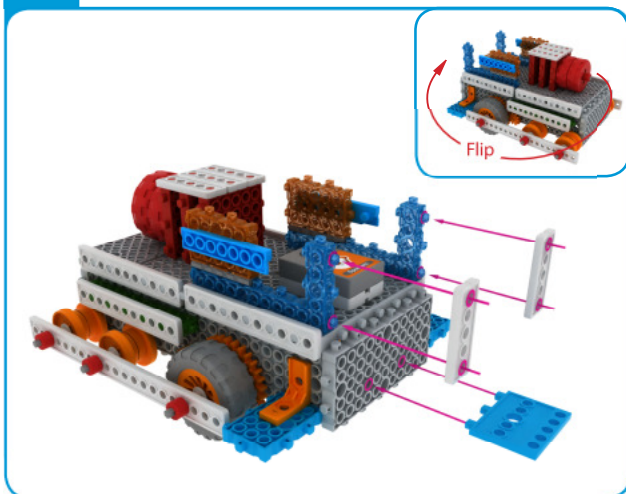
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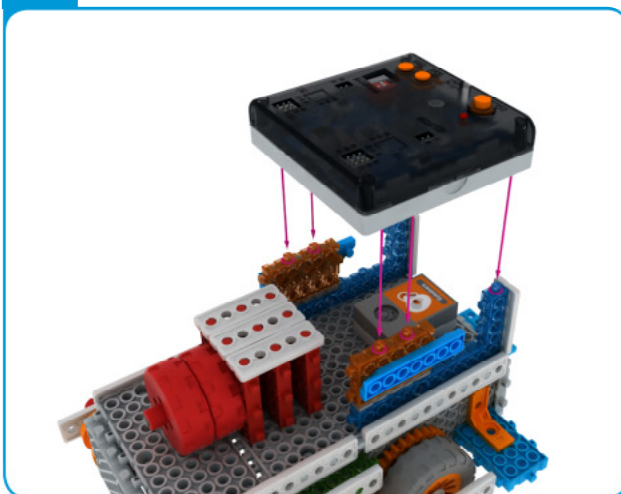
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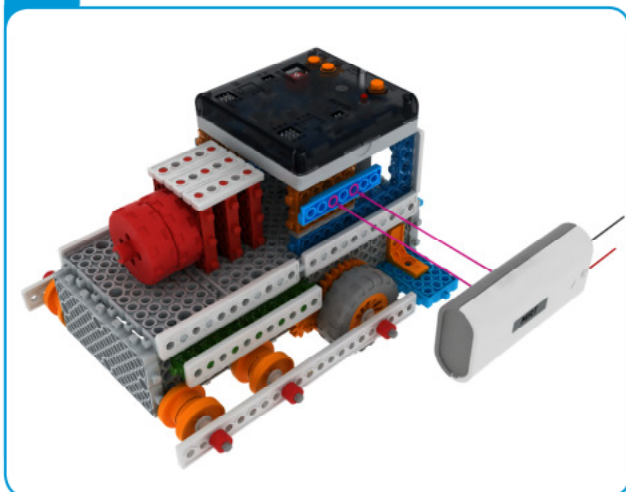
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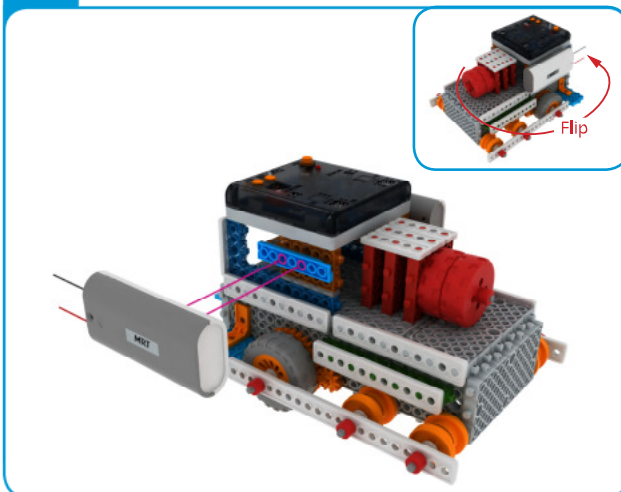
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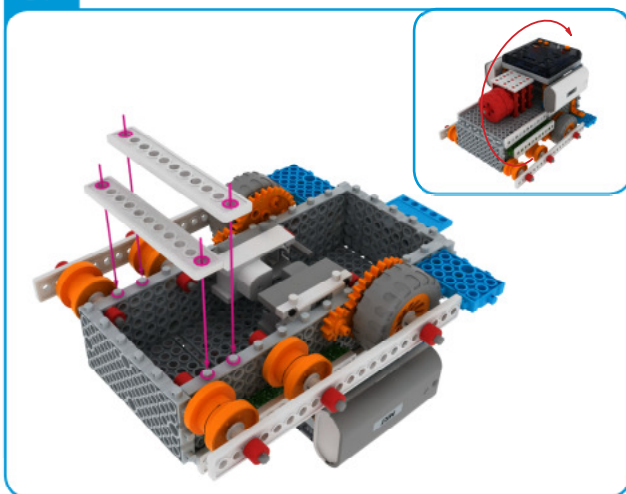
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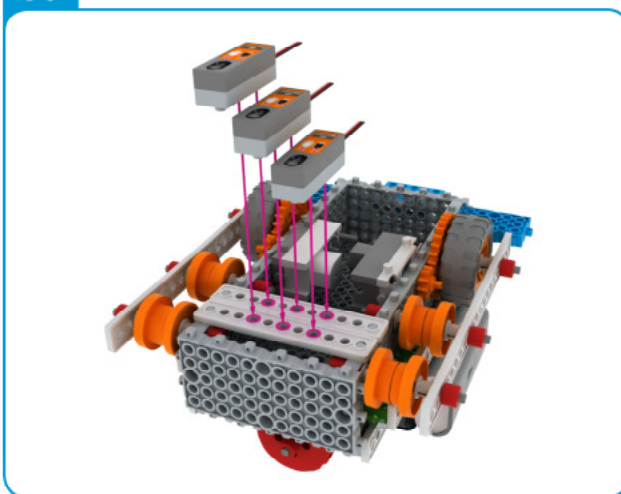
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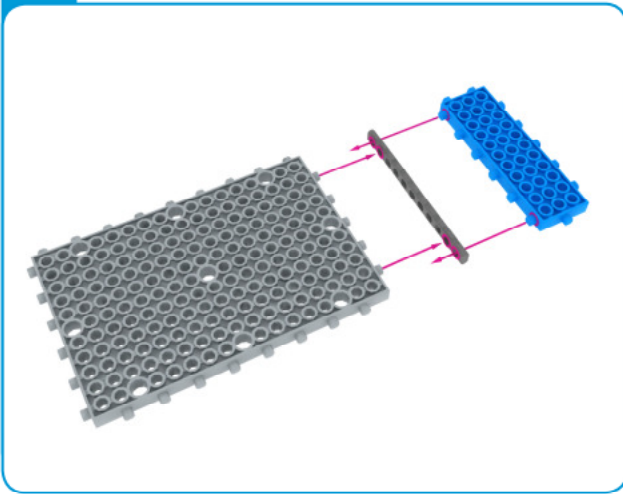
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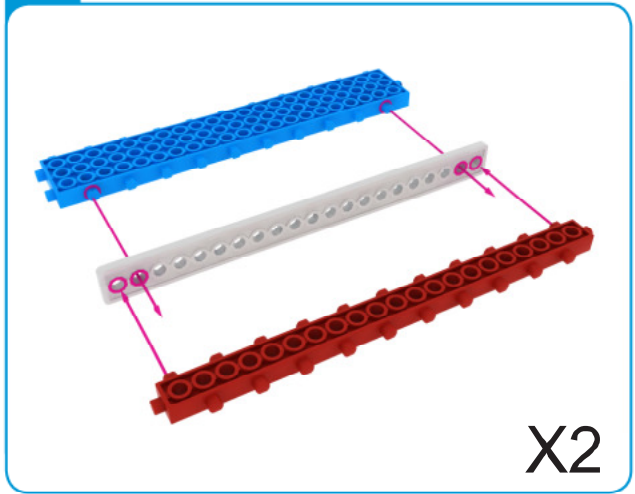
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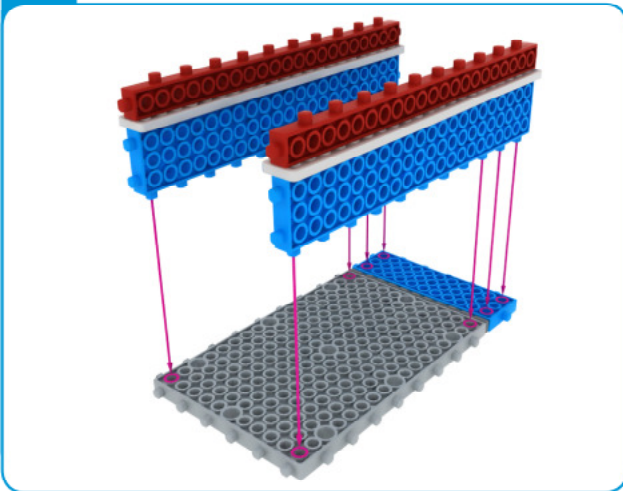
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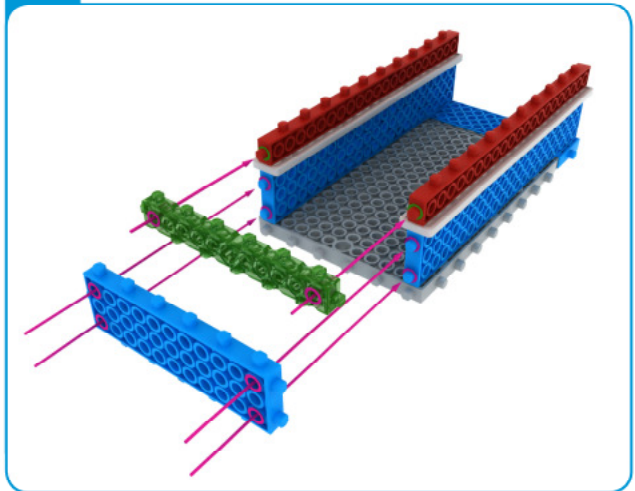
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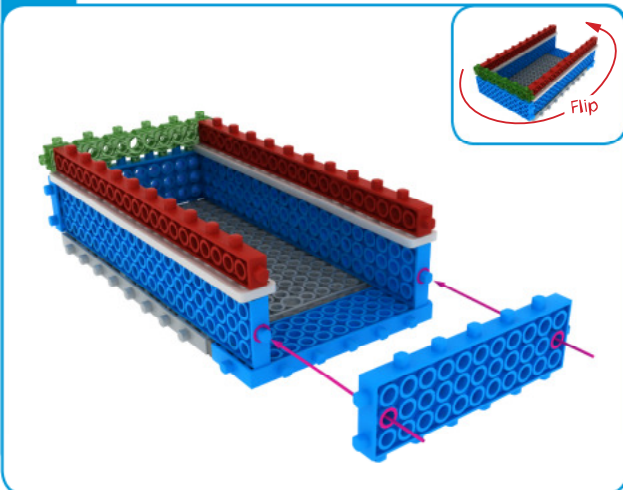
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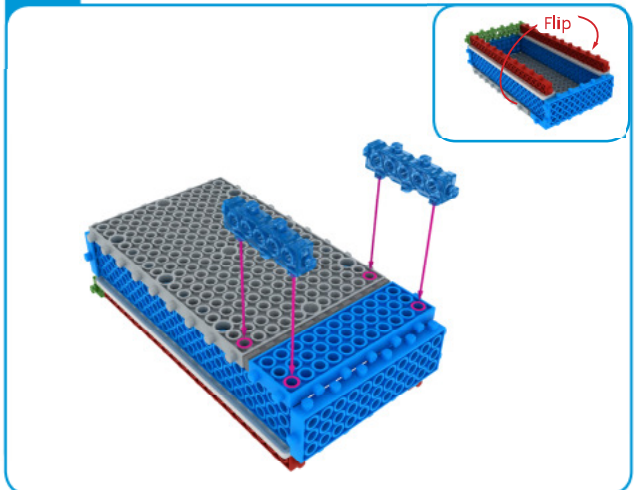
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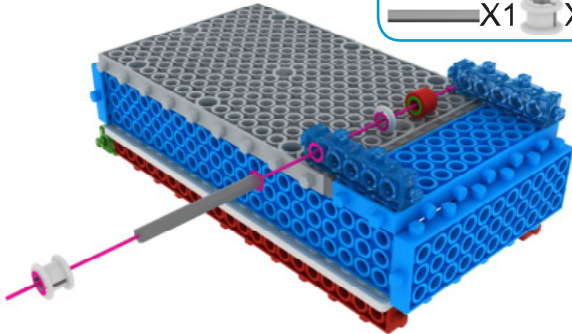


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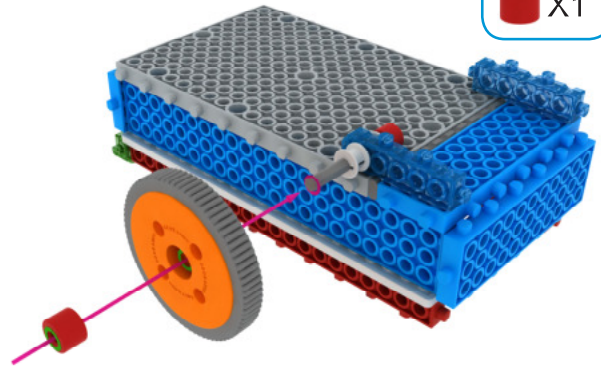
X1 X1
X1 X1



1:1

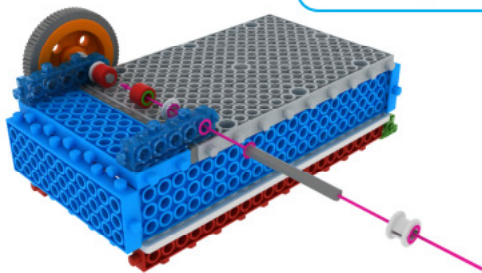
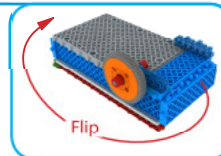
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X1



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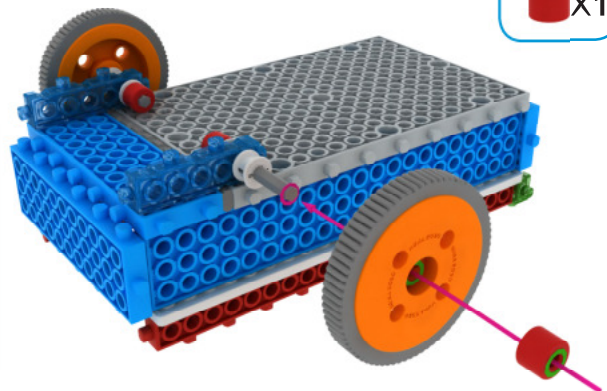
X1 X1 X1
X1



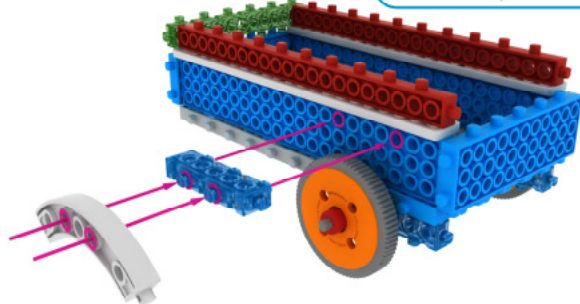
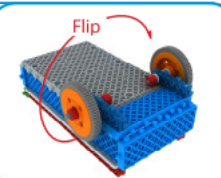
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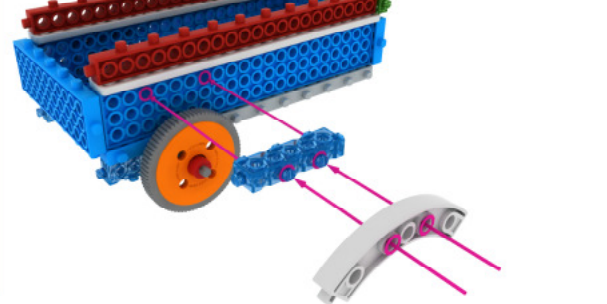
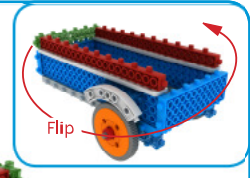
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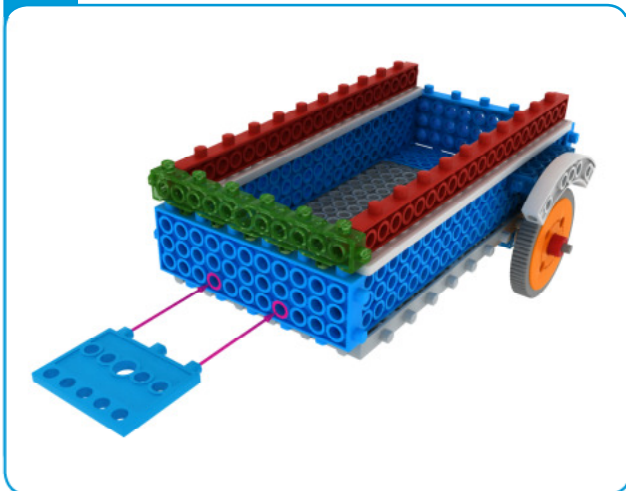
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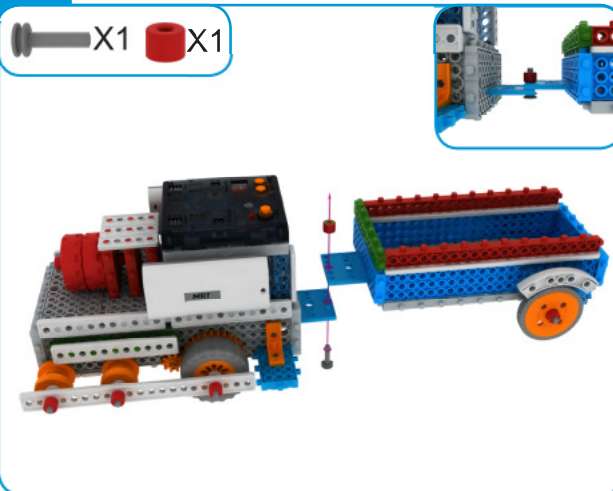
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51



52



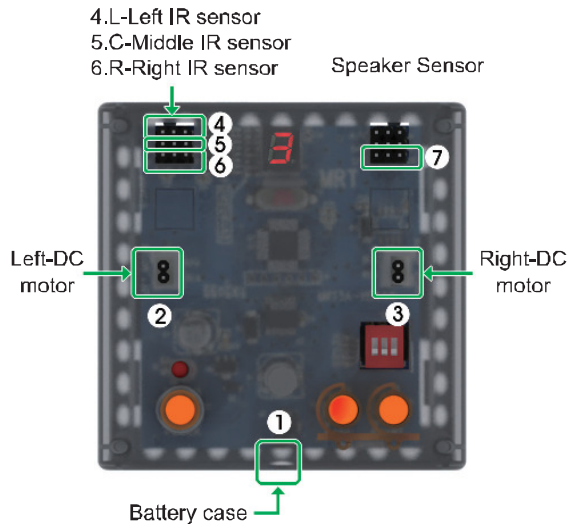
End





How to operate the Line Tracer Train

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect Left IR sensor to L connector.
5. Connect Middle IR sensor to C connector.
6. Connect Right IR sensor to R connector.
7. Connect the Speaker Sensor to IN2 connector.

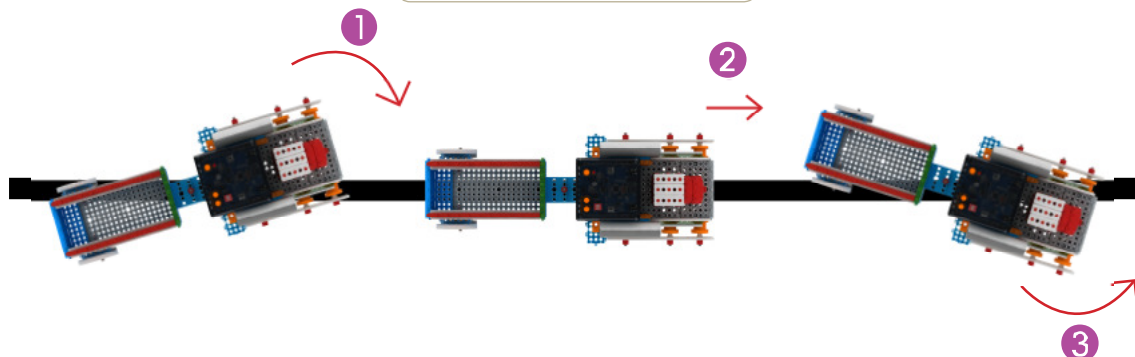
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

MODE # 3		Line tracer Mode
----------	--	------------------

4. Select Remote ID.
5. Press the START button.

How to make it move?

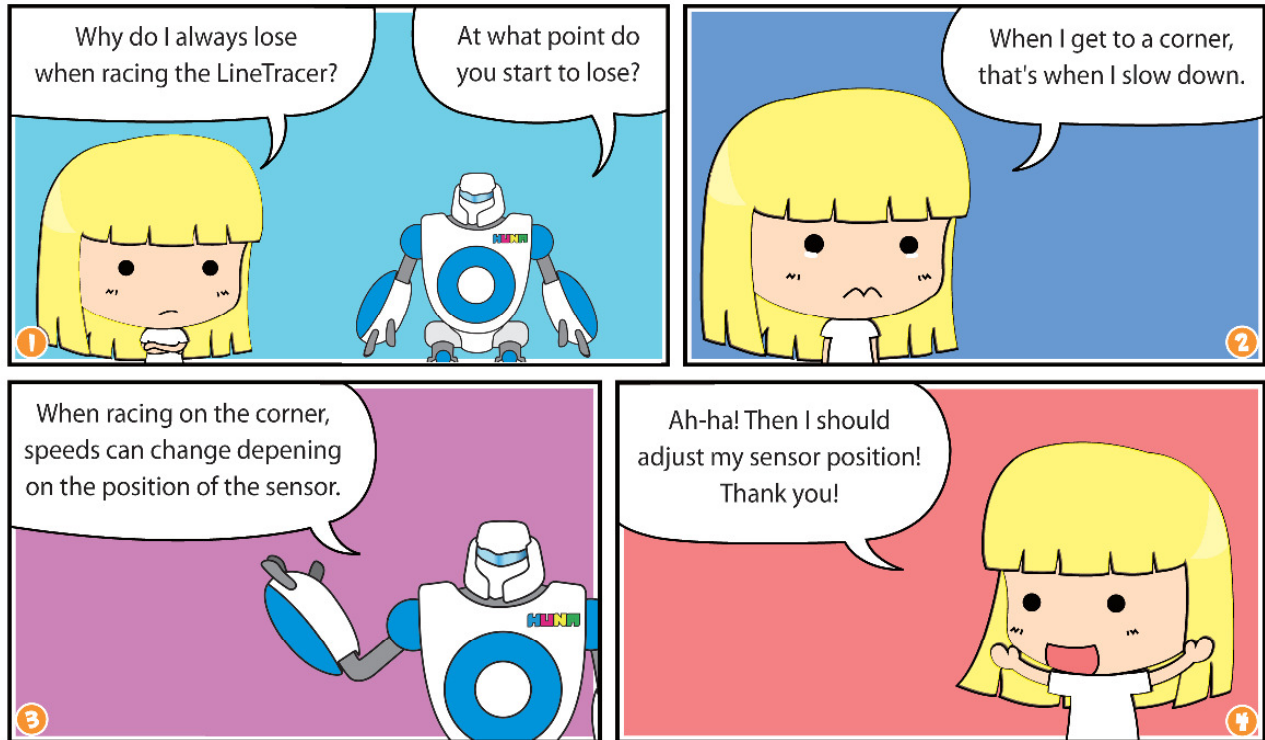


1. When the train separates from the line on the left, it automatically turns right.
2. Straight movement..
3. When the train separates from the line on the right, it automatically turns left.



Technology
Engineering

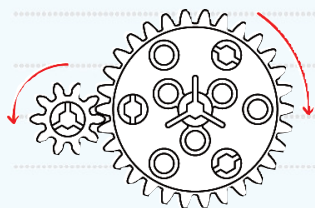
STEM 11. Learn about the position of sensor



Let's adjust the sensor position and find the best place for you to take those corners!



- ※ Let's change Line Tracer to Remote Control (Mode 2).
It might move the opposite Why?
- ※ Think about it, and make it better.



Hint1: Reduction gears.

- ※ If you find out the reason, please try to change to Mobe 0. and operate it.
What will happen?





Science

STEM 12. The energy from movement-Kinetic energy

1 Huna~, I accidentally got hurt when a child ran into me?

2 He was a little boy, so I thought I wouldn't get hurt. Ahh, it hurts so much..

3 Are you ok, Harry? Did you get a bandage?

4 Well, he had a lot of kinetic energy, so it probably made him stronger.

5 Kinetic energy? Is that the energy that moving objects possess?

6 Right~ It's the force that the moving objects have..

7 Wow, energy also occurs when we are moving! So that means there is more energy while we are running than when we are walking.

8 OK! The faster an object moves, the higher amount of power it creates. It's the same as potential energy, where the height of the object influences the amount of energy.

9 Aha~. So what thing has kinetic energy?

10 An electronic fan converts electronic energy into kinetic energy. This kinetic energy can be seen as the wings of the fan turns.

11 Look around you, there are many things that uses kinetic and potential energy.

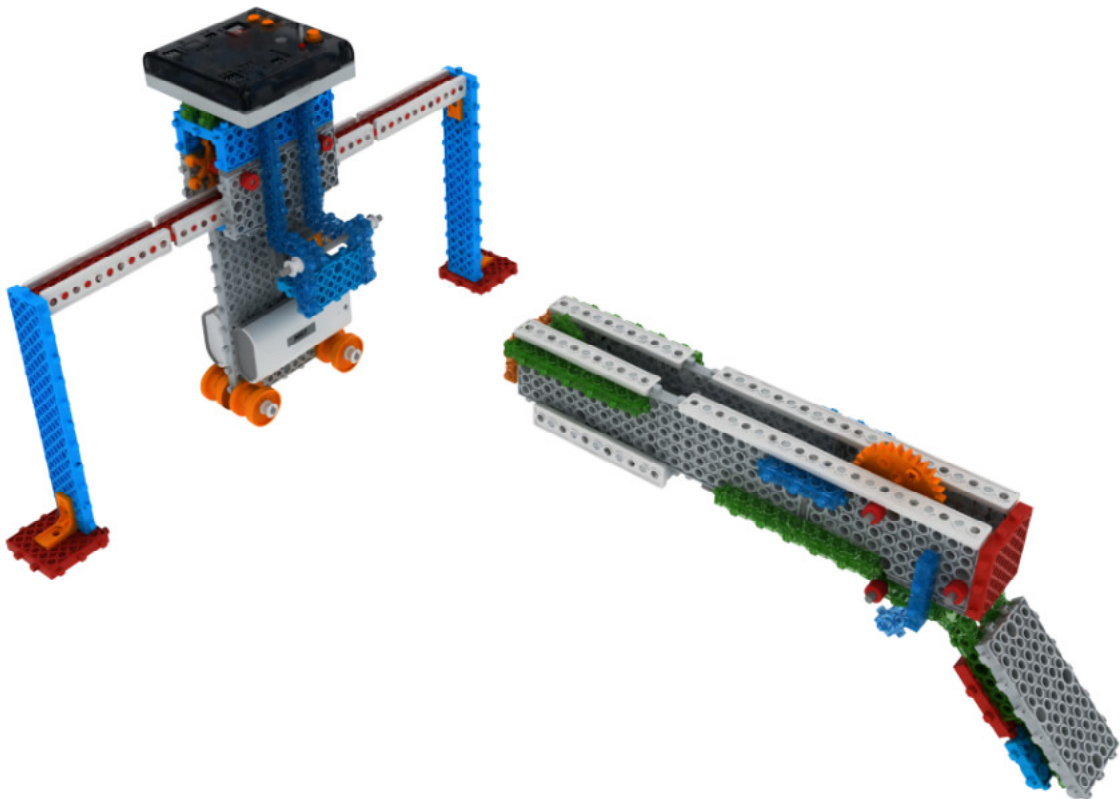
12 Wow, I am quite impressed with these little things that have so much energy. Because of this energy, the little boy got stronger.

13 Sure, so don't feel relaxed just because someone is small and weak. Be careful from now on!

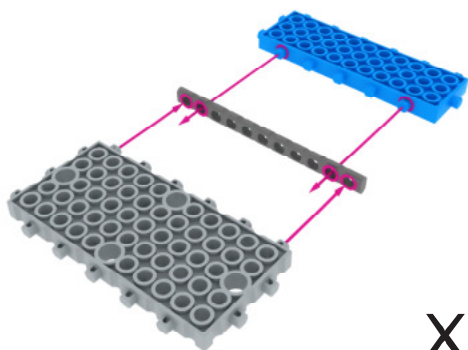


Engineering
Art

Robot Making8-Target Shooting Game

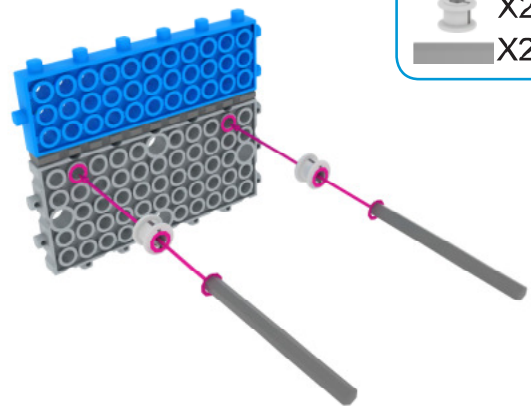


1 Making the target



X2

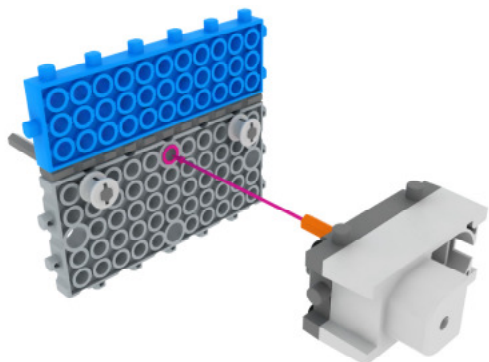
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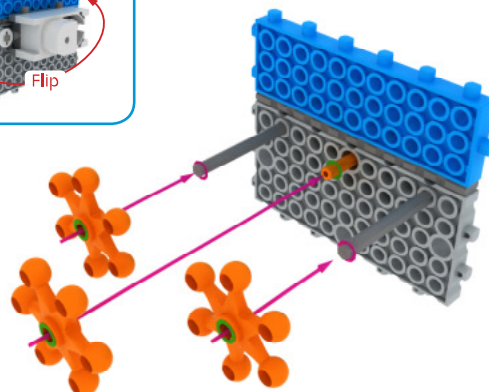
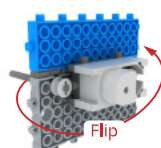
X2
X2

1:1

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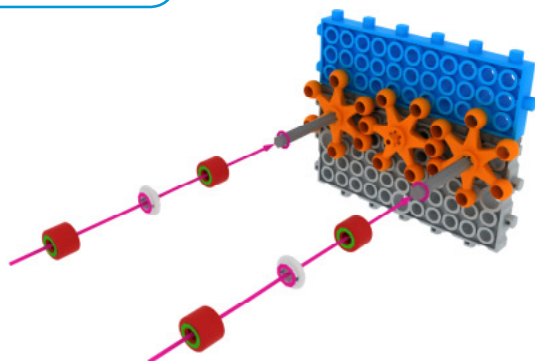


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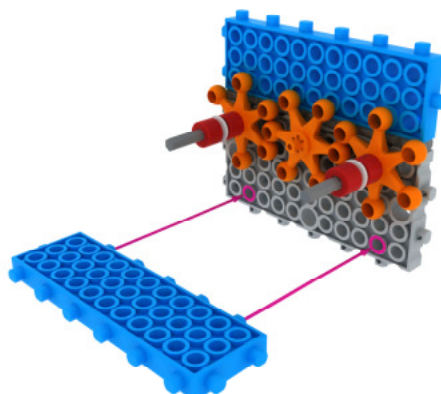


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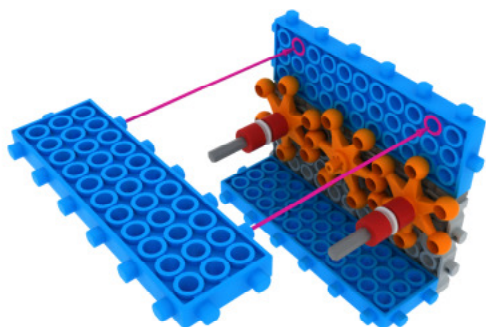
X4 X2



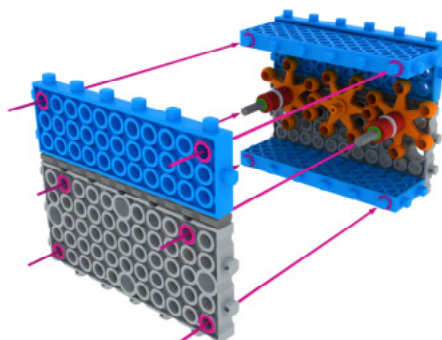
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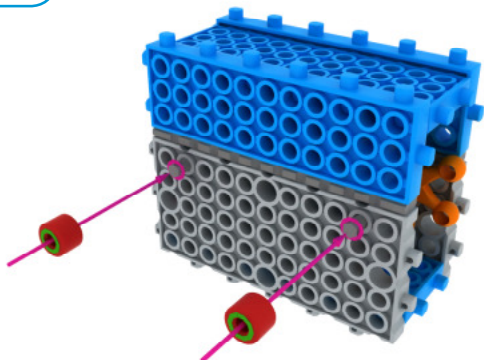


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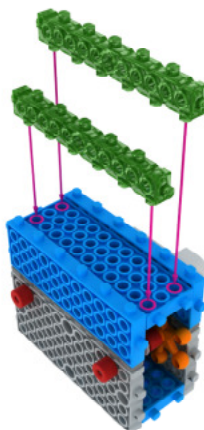


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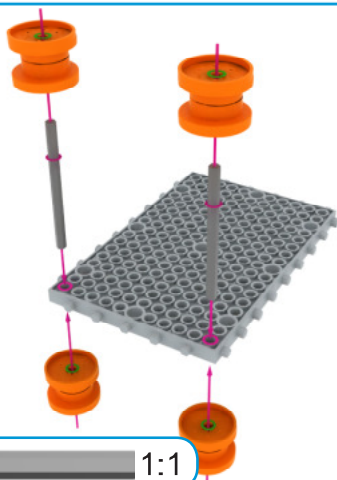
 X2



10



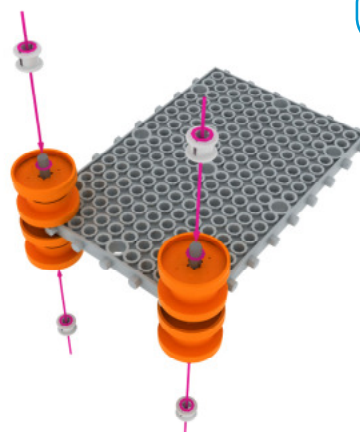
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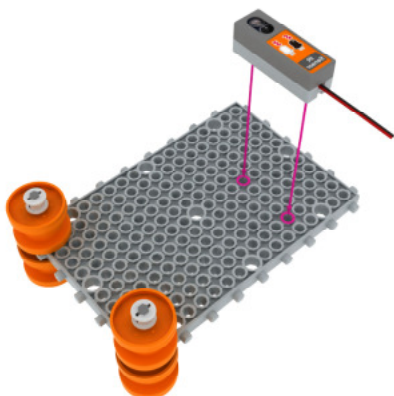
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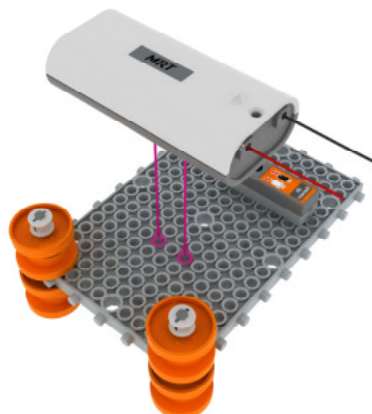
 X4



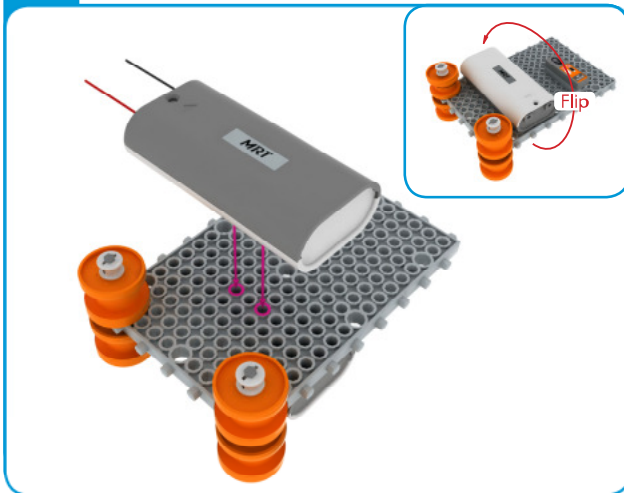
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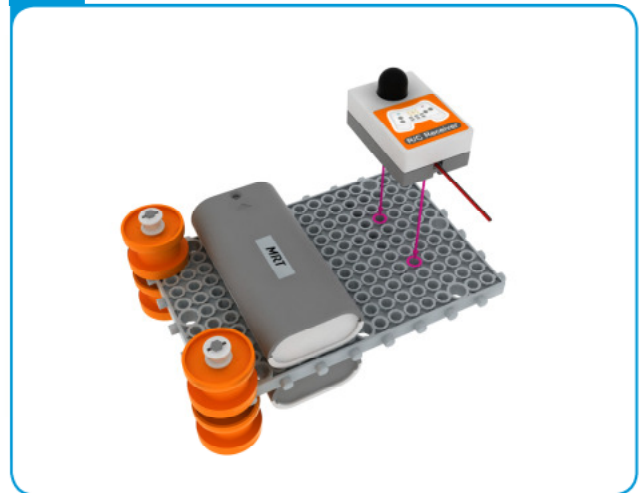
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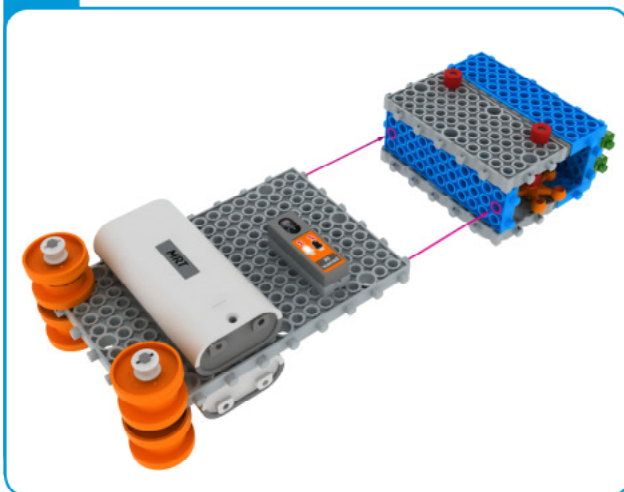
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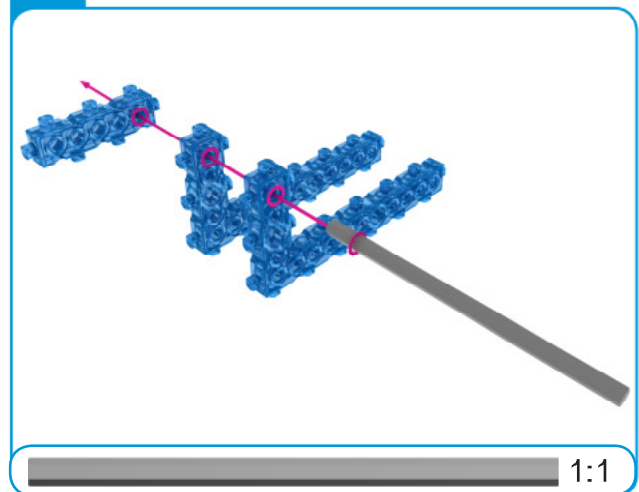
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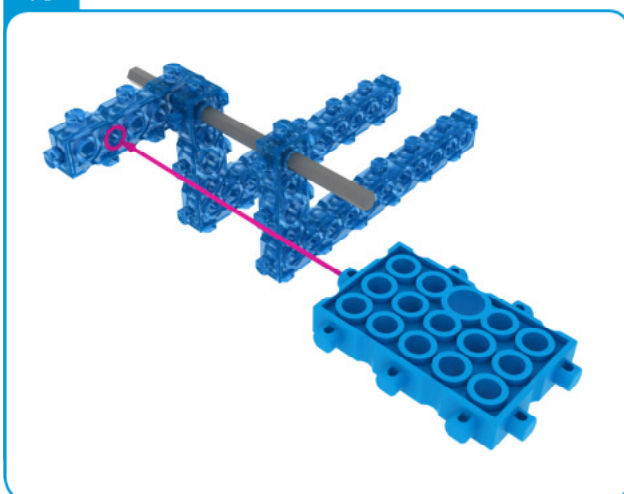
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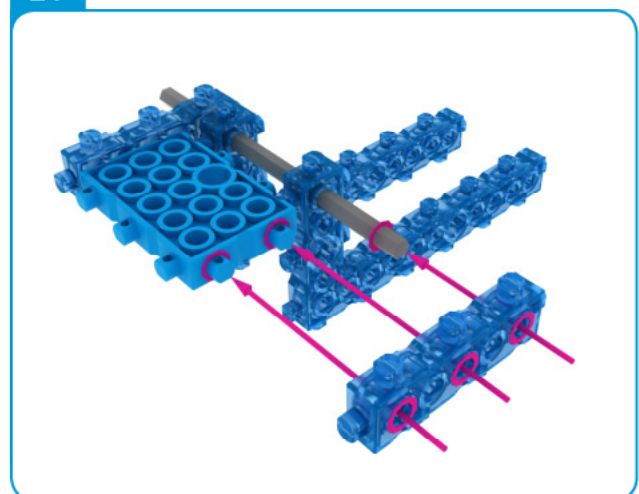
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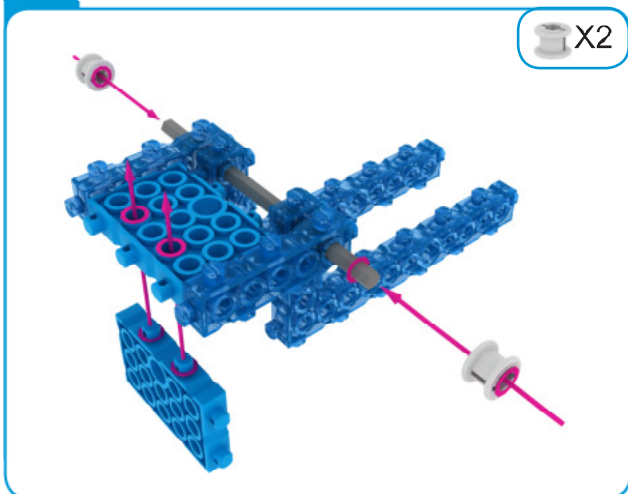
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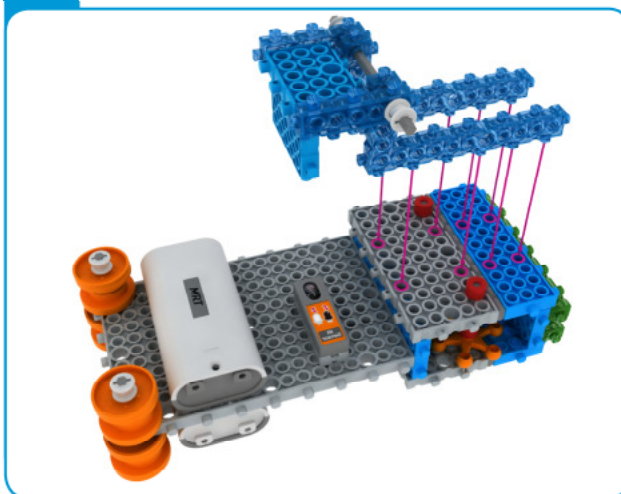
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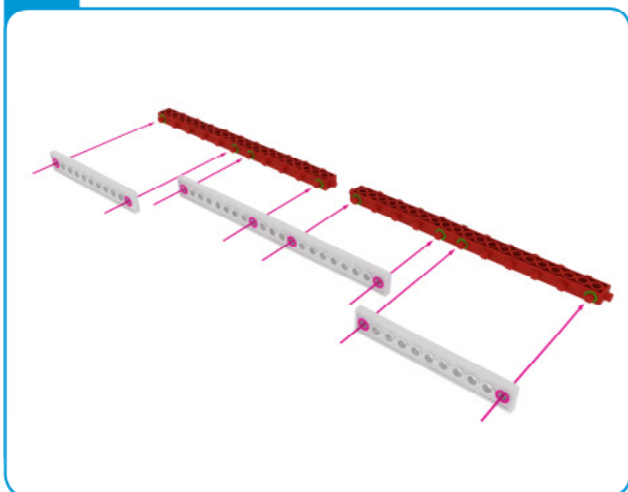
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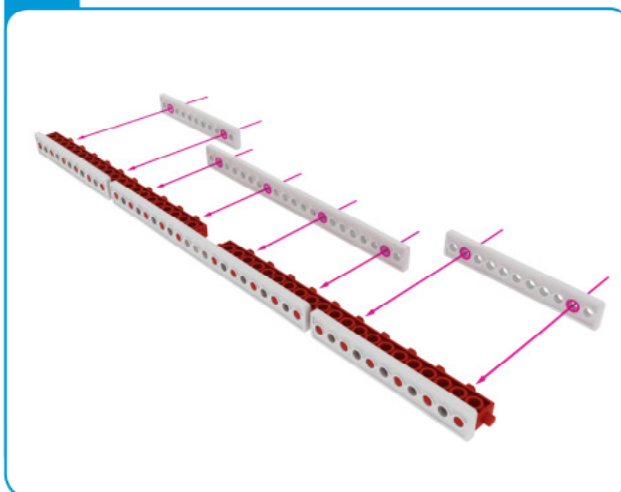
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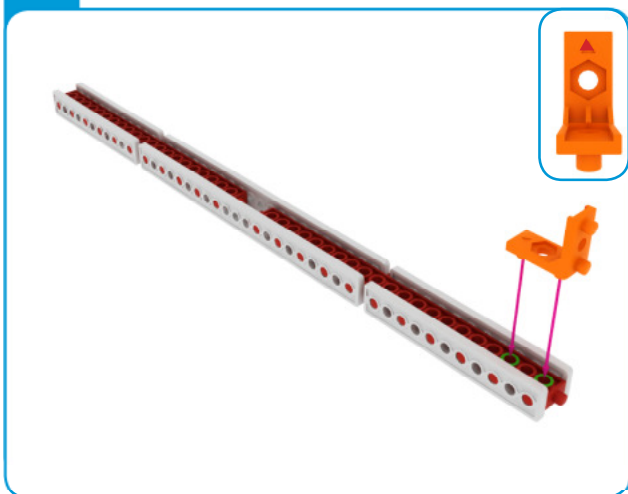
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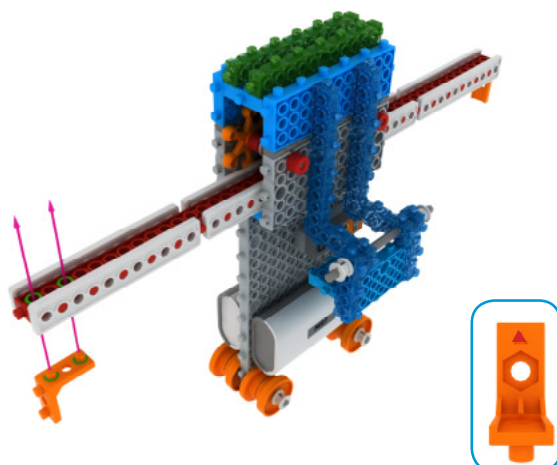
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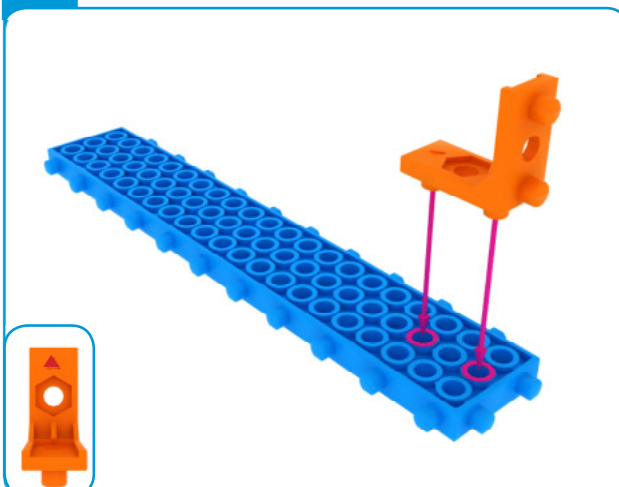
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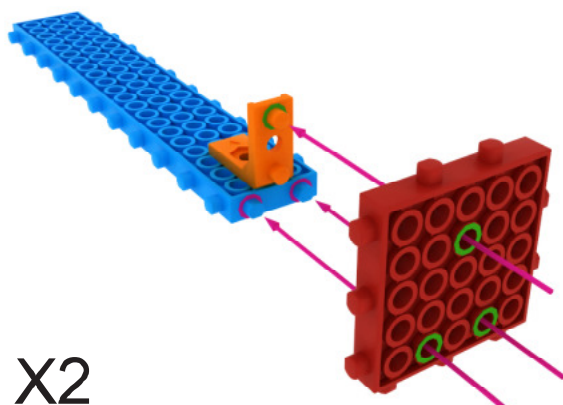
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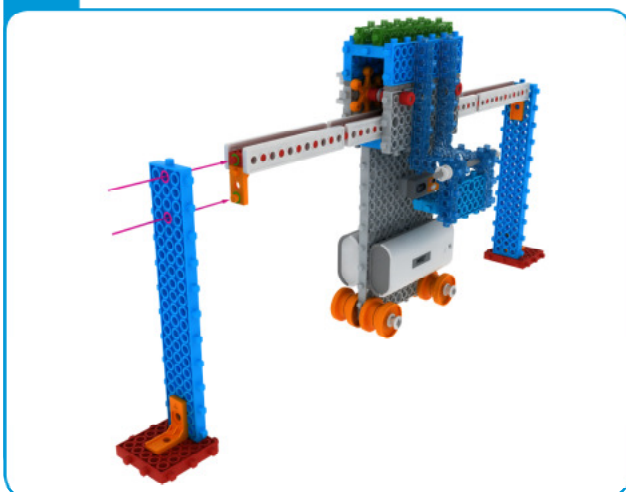
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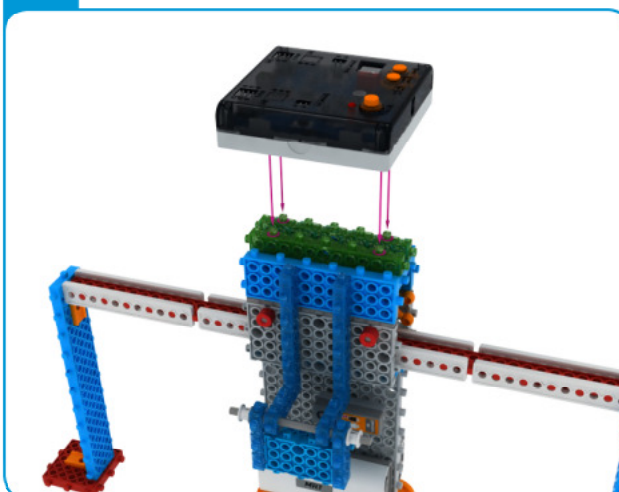
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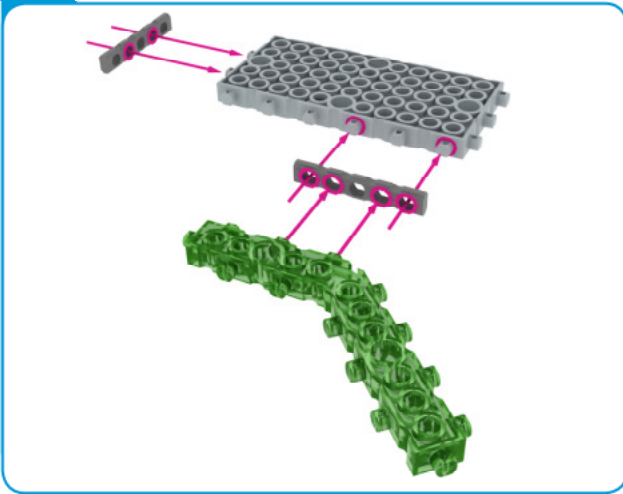
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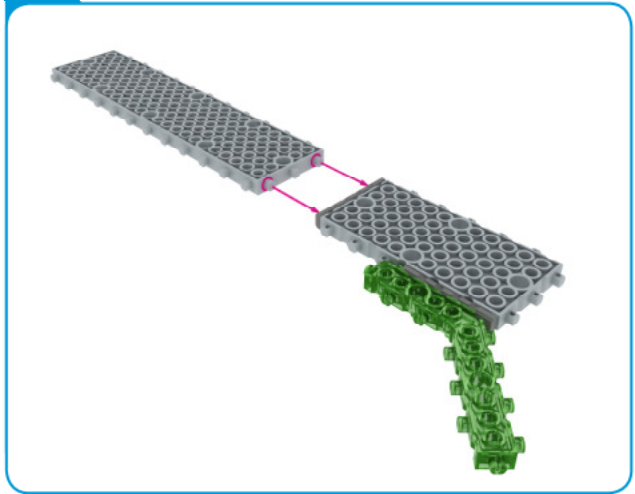
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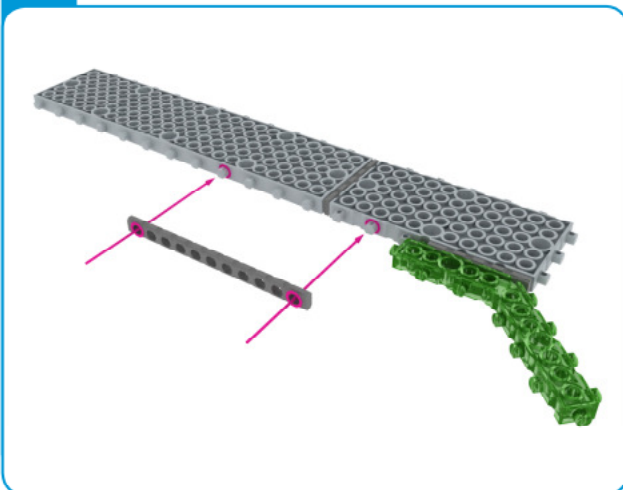
33 Making the gun



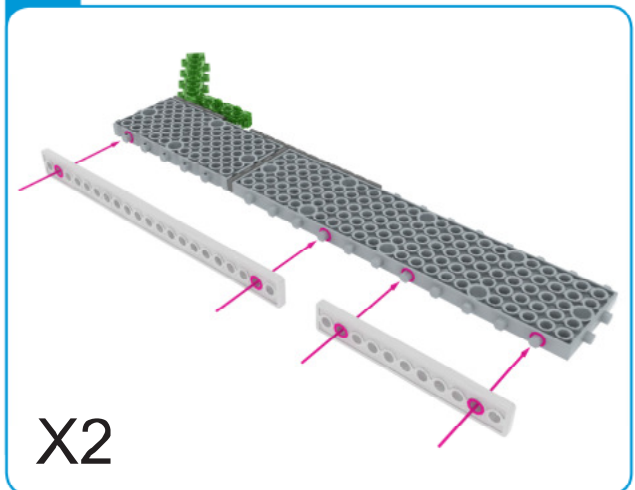
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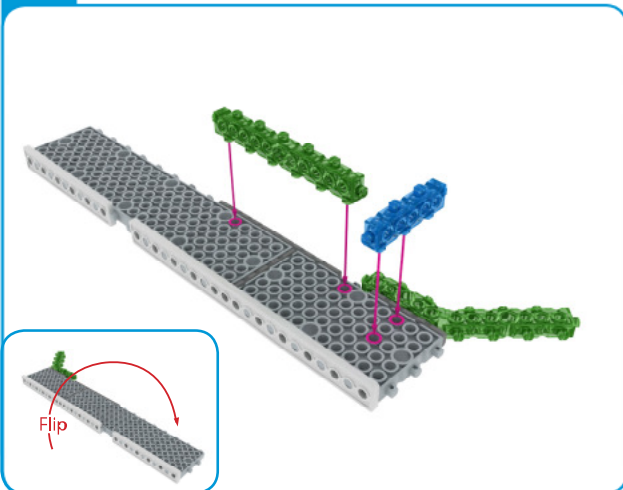
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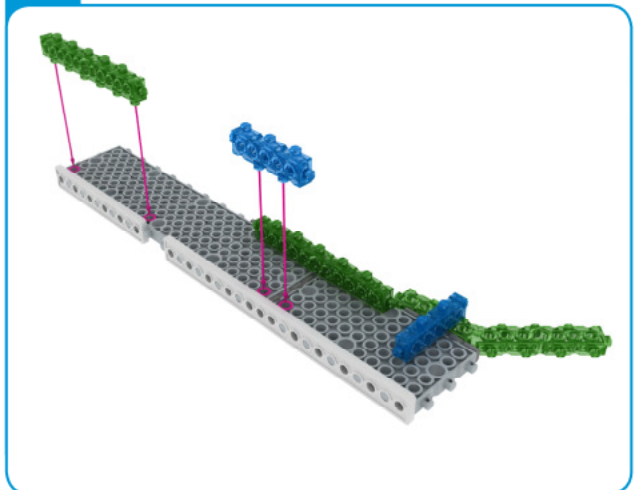
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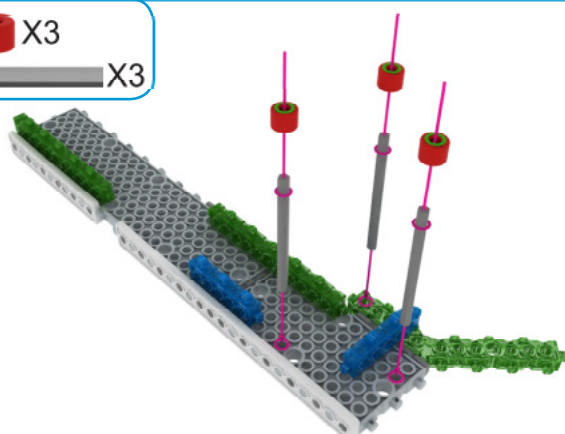


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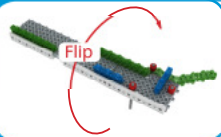
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Red Pin X3
Grey Pin X3

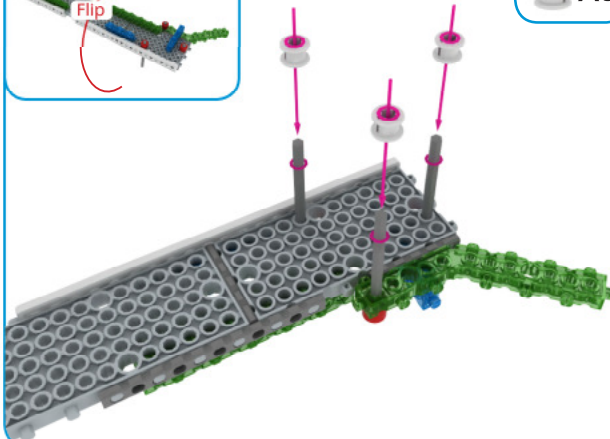


1:1

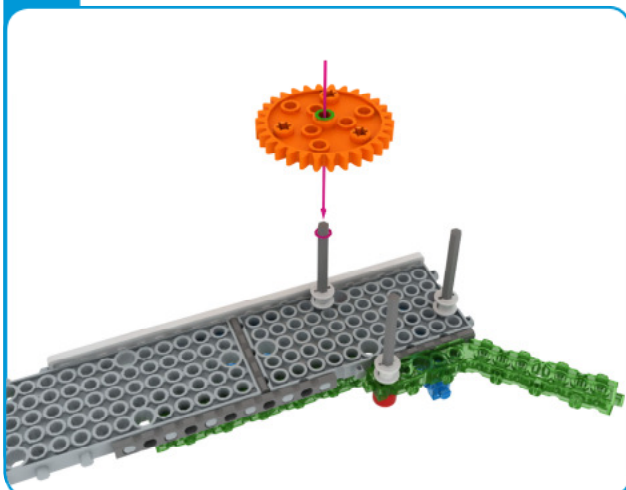
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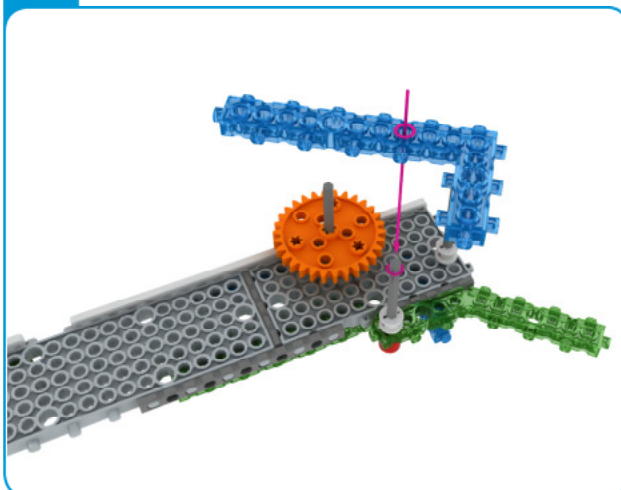
White Pin X3



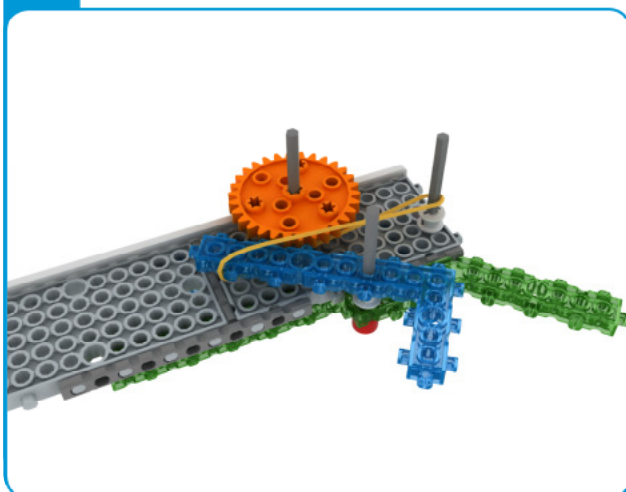
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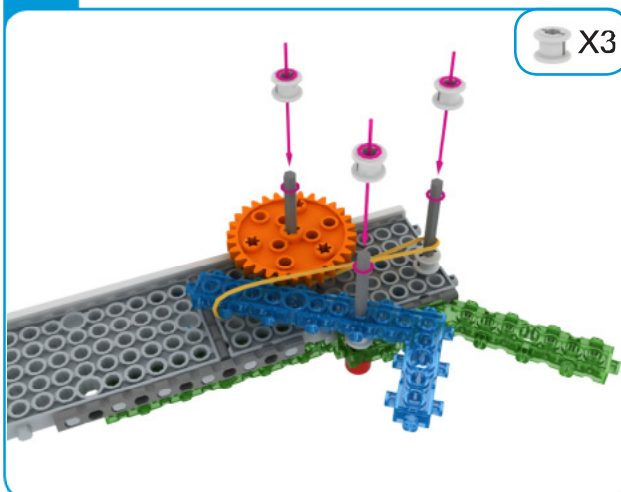


43 ※ 请提前做好橡皮筋 (圈两下)

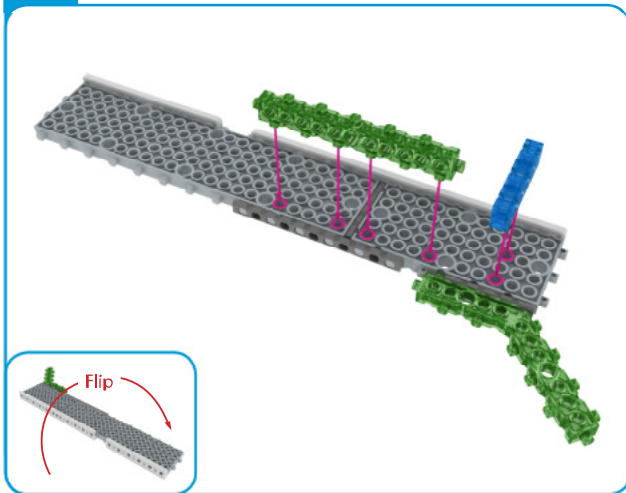


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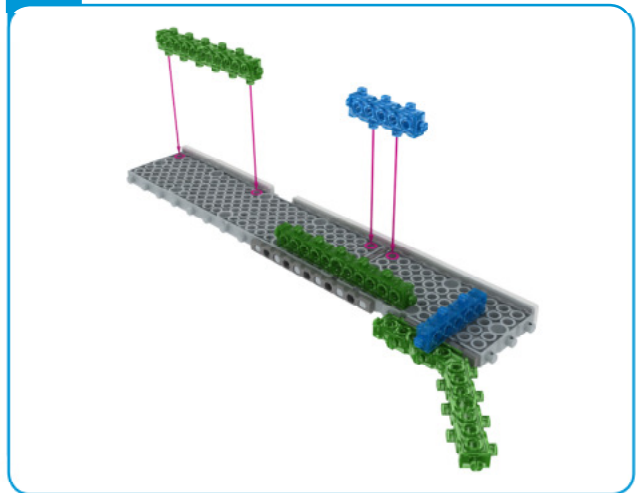
White Pin X3



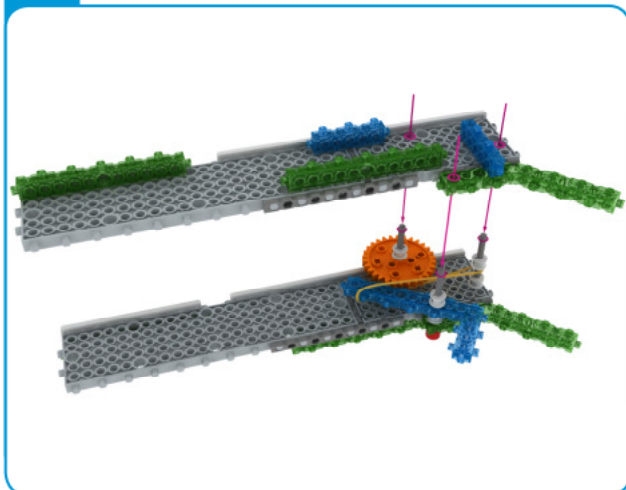
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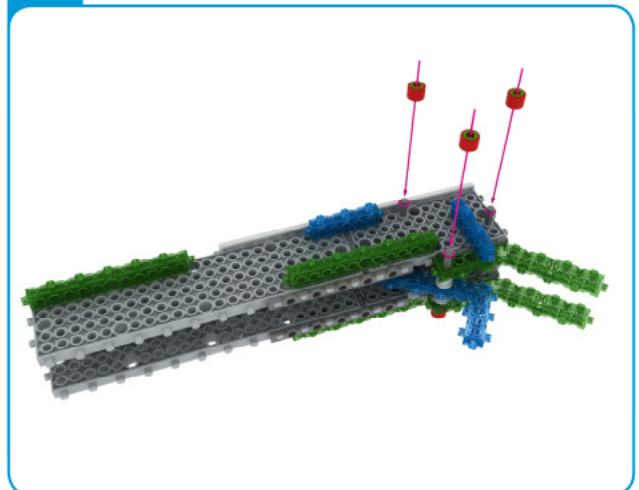
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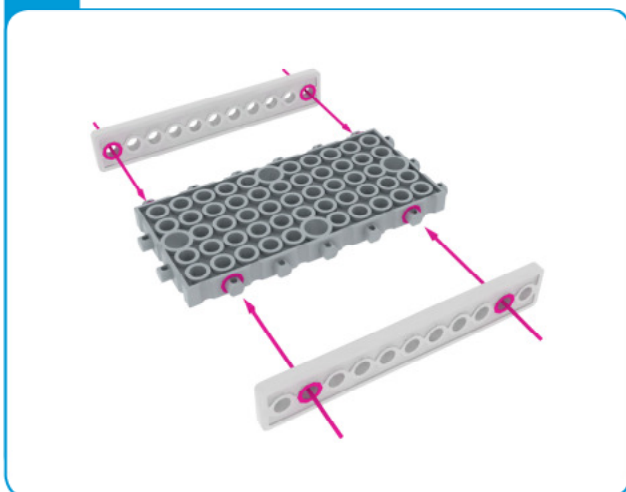
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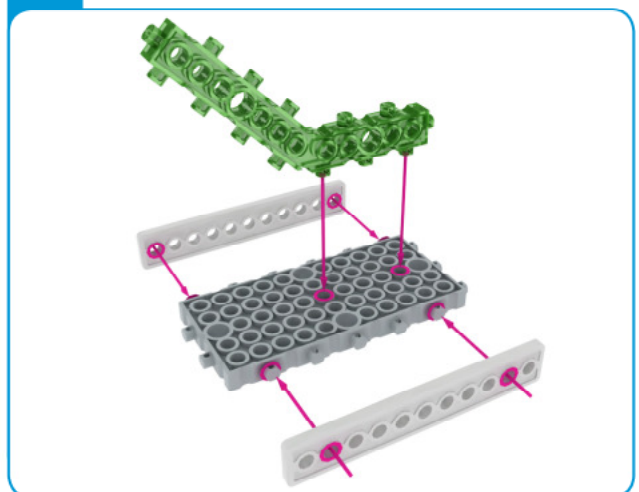
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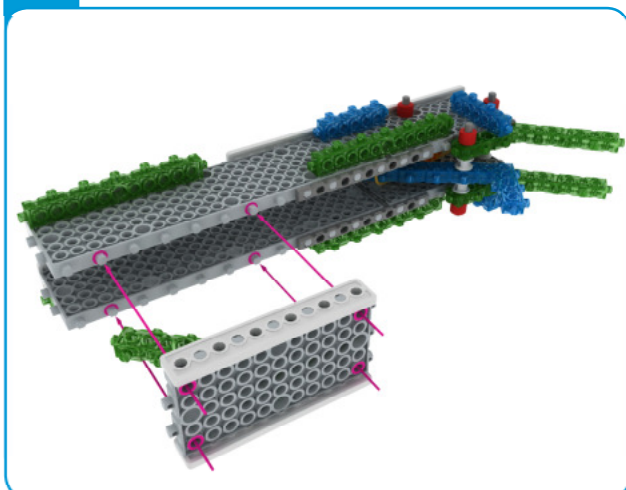
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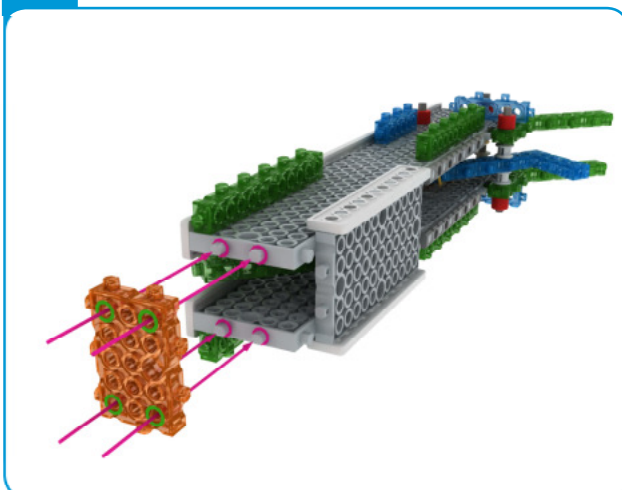
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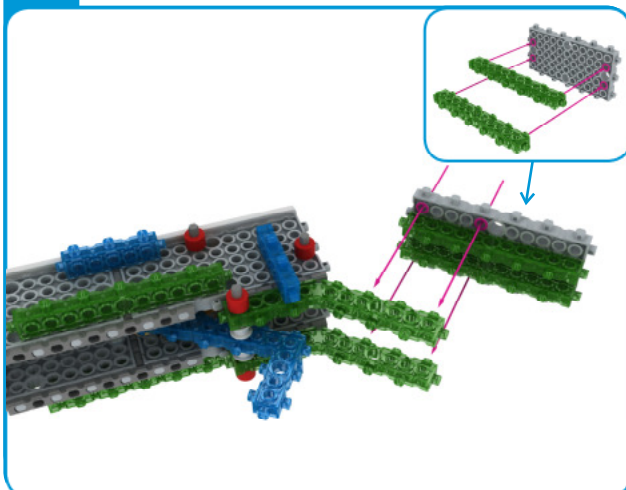
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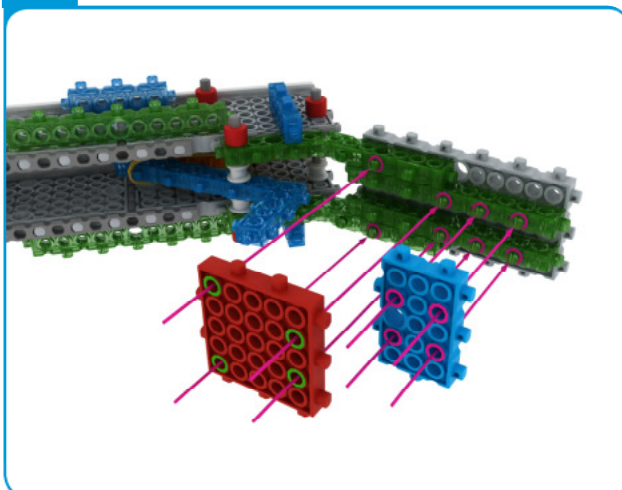
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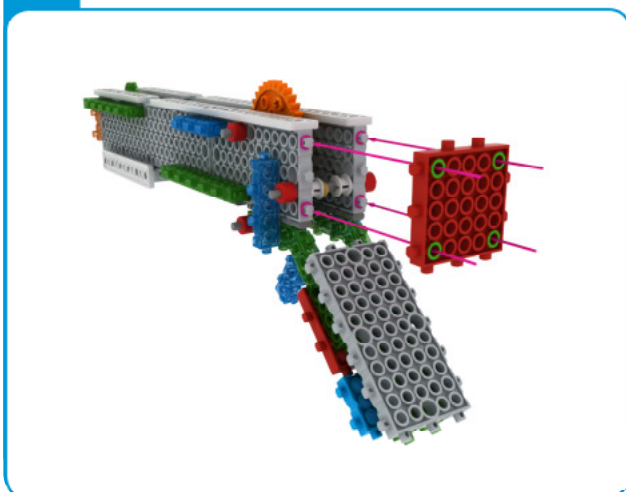
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54



55



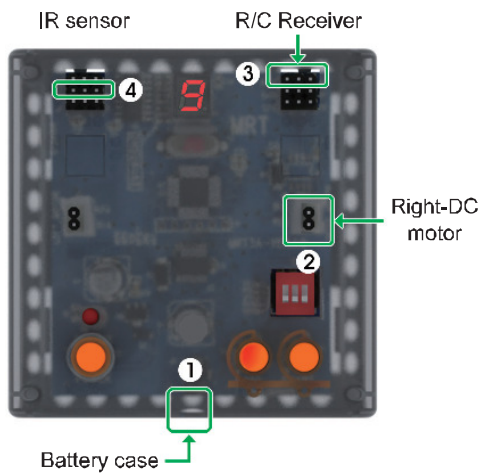
End





How to operate the Target Shooting Game

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect DC motor to Right-motor connector.
3. Connect Remote Control to R/C connector.
4. Connect IR Sensor to C connector.

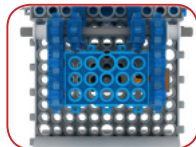
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

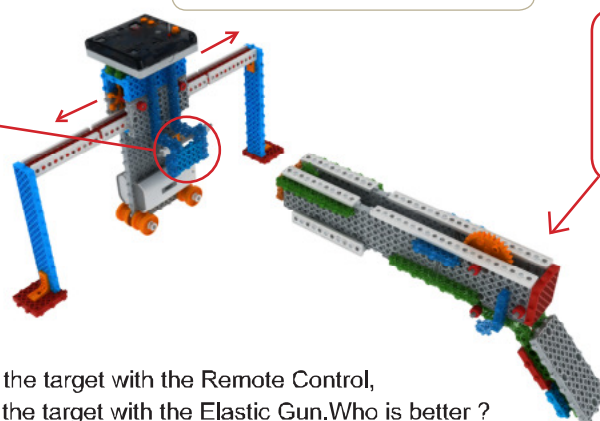
MODE # 9	9	Remote Control +Touch Mode
----------	---	-------------------------------

4. Select Remote ID.
5. Press the START button.

How to make it move?



※ Shoot to the center
if hit it, the target
will stop for a while.



※ one friend control the target with the Remote Control,
other friend shoot the target with the Elastic Gun. Who is better ?



Science STEM 13. The transformation of energy-Roller Coaster

Harry, look at this picture.

Wow! it's a roller coaster! That looks really exciting! Let's go to the amusement park!

No, let's go to the amusement park a little bit later~
Do you know why I showed you the picture of the roller coaster?

Do you want to ride the roller coaster?

I'll tell you about it later~
I showed you the picture of the roller coaster so that you can see a roller coaster uses both kinetic and potential energy.

That may be why a roller coaster is so strong~

Ha ha ha! But it can only produce one kind of energy at a time, because it changes one kind of energy to another kind of energy.

What? It is not strong?
How do roller coasters change energy?

When roller coaster is rising up, does it go up slowly?
Because it's speed decreases as it goes up the kinetic energy gradually changes into potential energy.

운동에너지-->위치에너지 위치에너지-->운동에너지

The opposite is also true when the roller coaster is coming down, it's speed increases, and it's height decreases. That is why potential energy changes into kinetic energy.

Wow, a lot of things happen in a roller coaster!

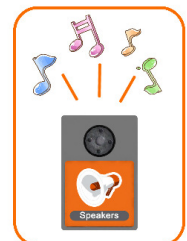
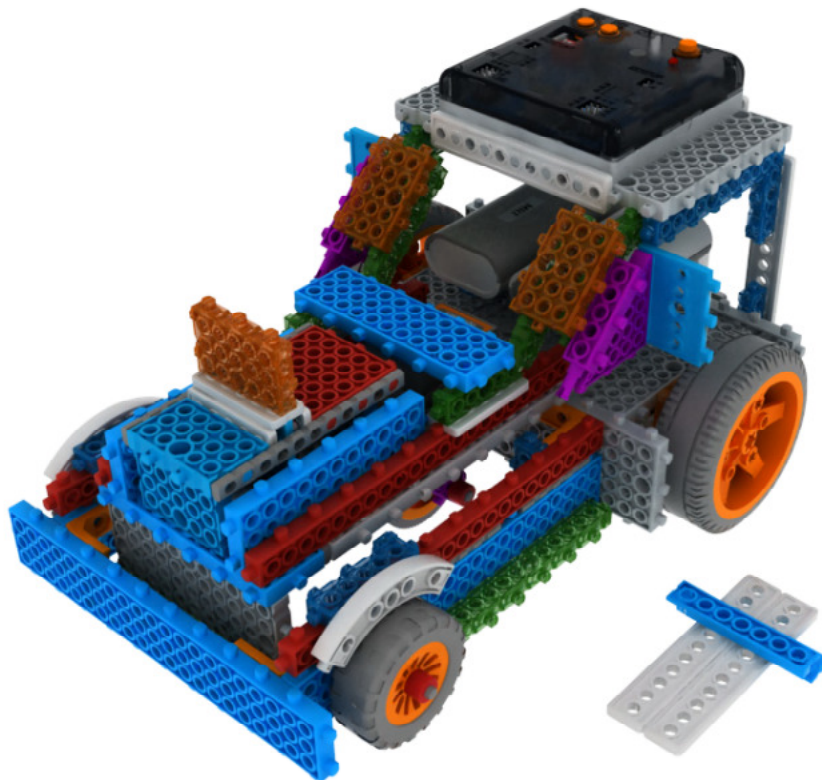
Now, let's go to the amusement park.

OK! Let's go ahead and feel how energy changes to other kinds of energy.

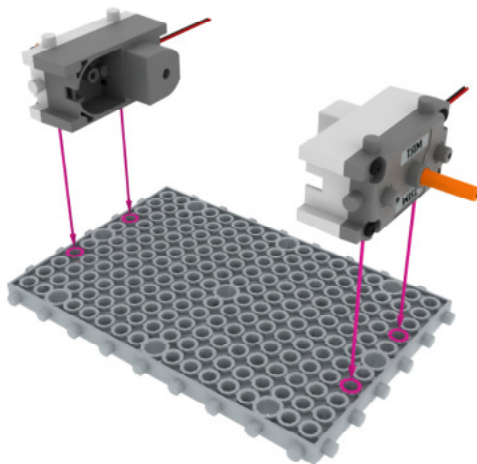


Engineering
Art

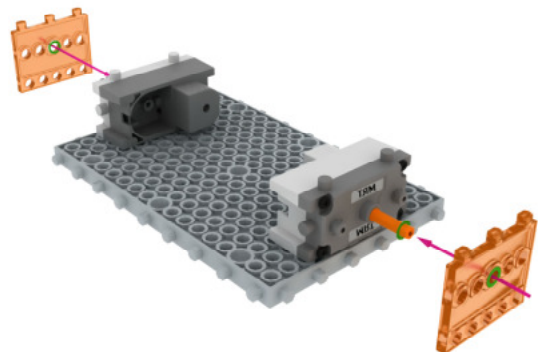
Robot Making9-Car and Car Key (with sound)



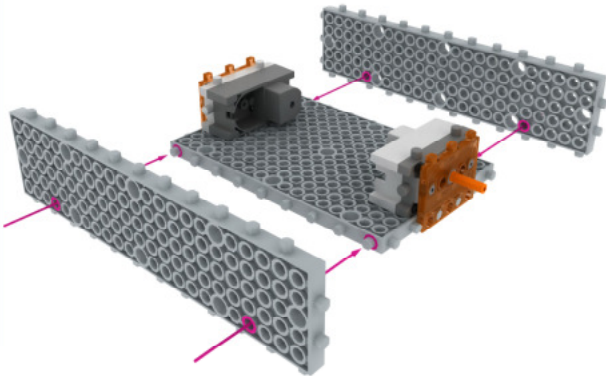
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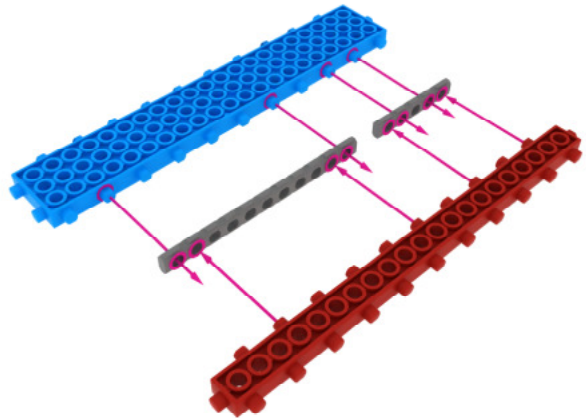
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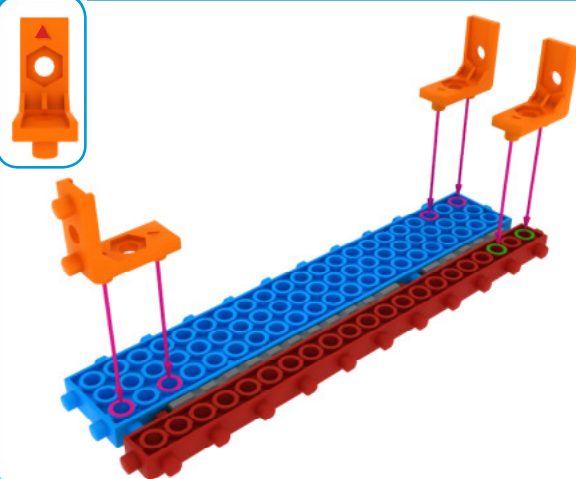
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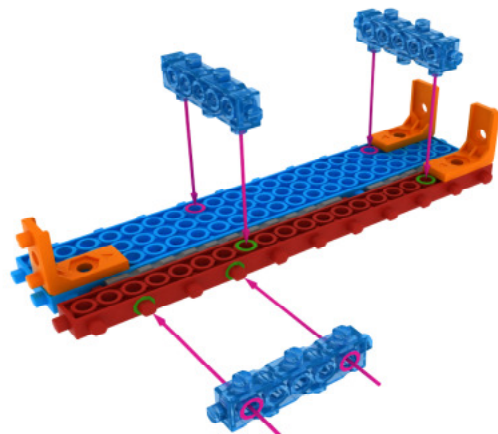
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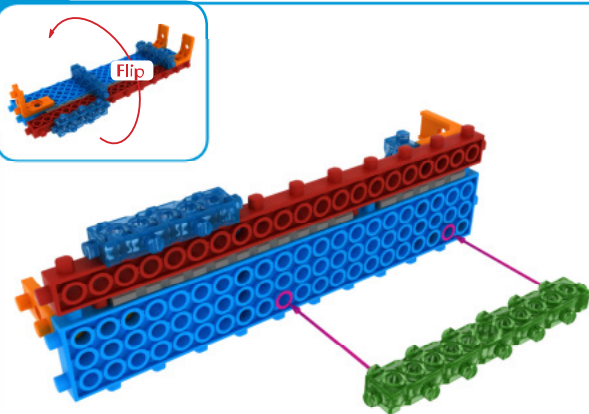
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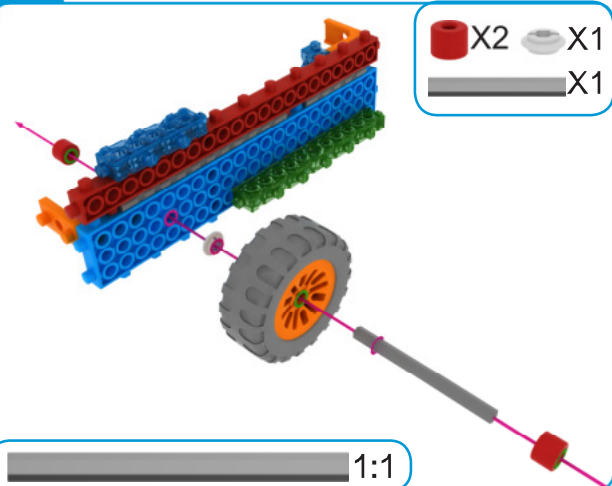
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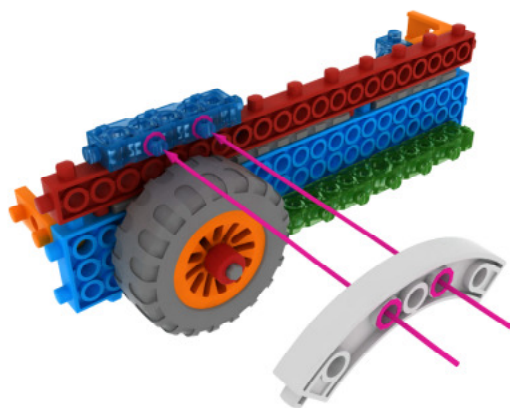
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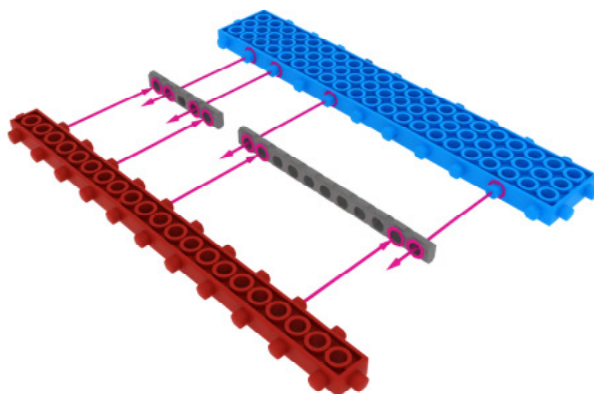
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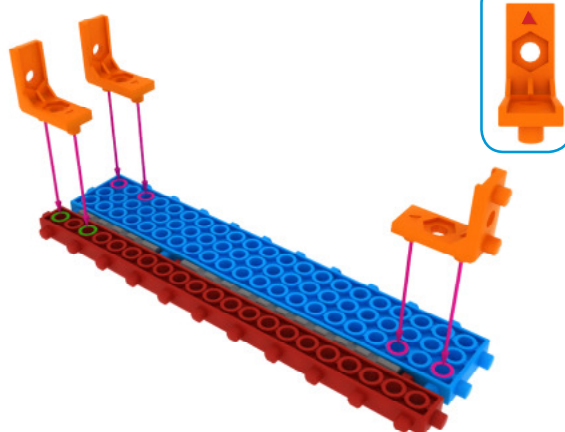
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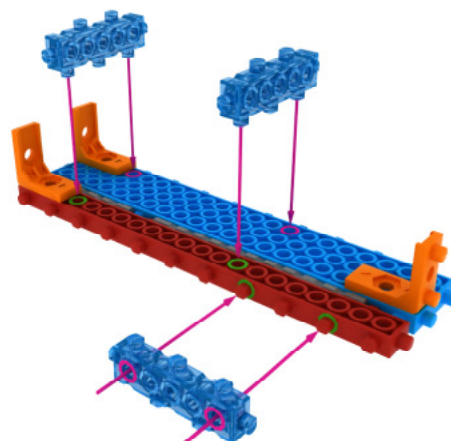
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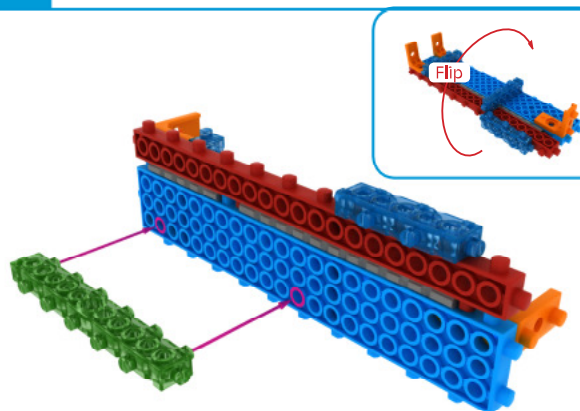
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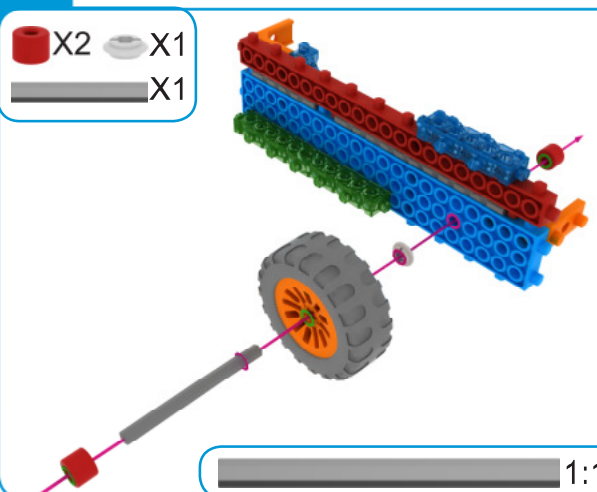
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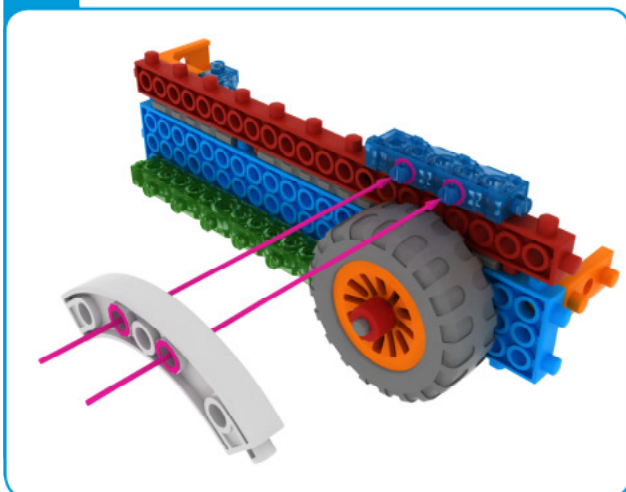
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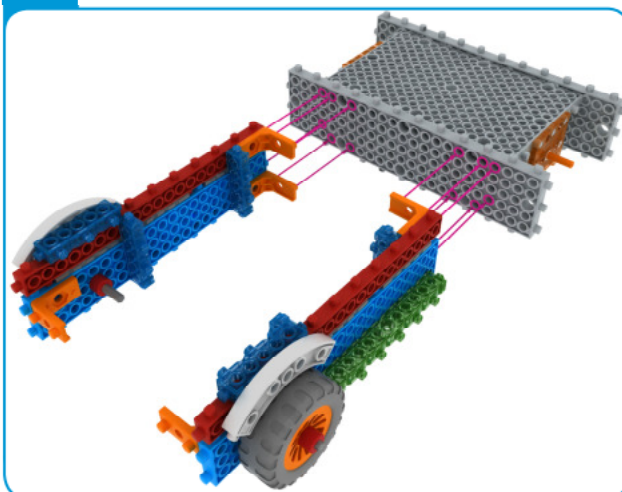
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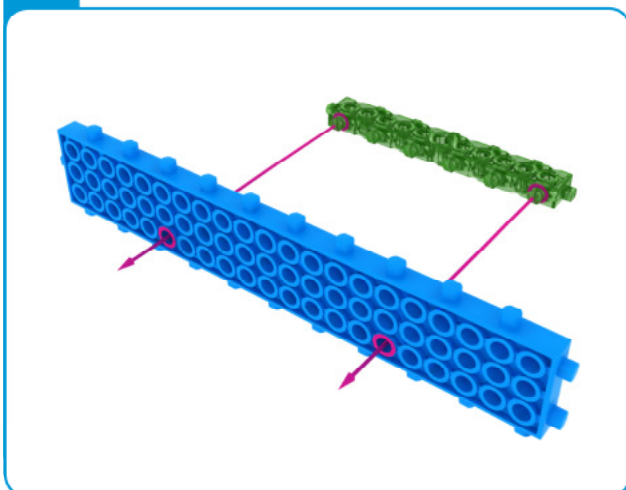
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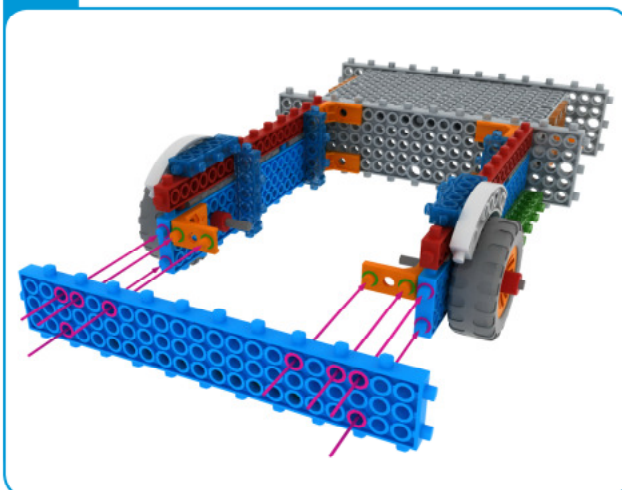
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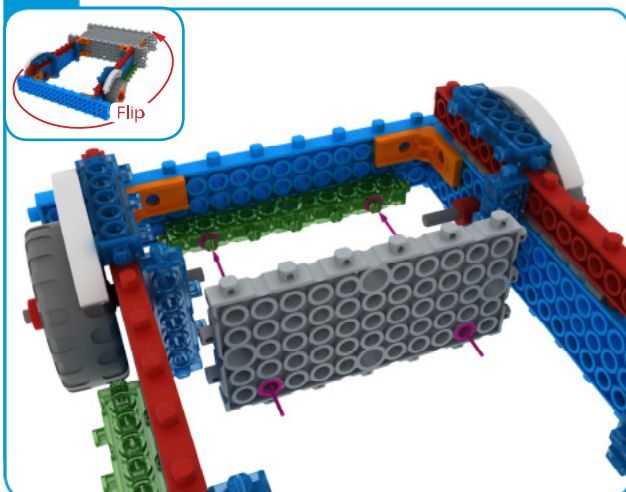
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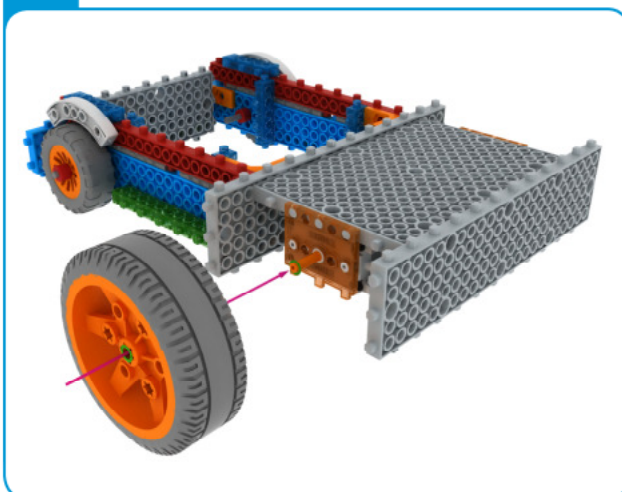
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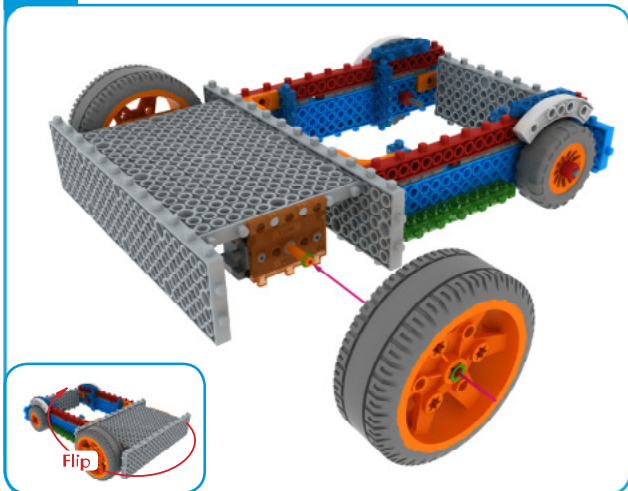
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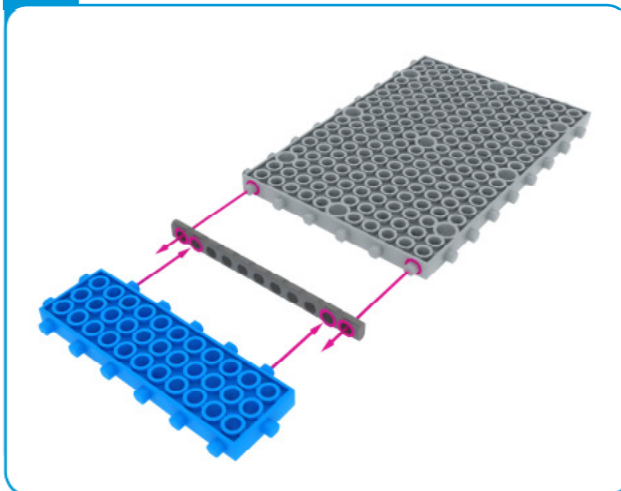
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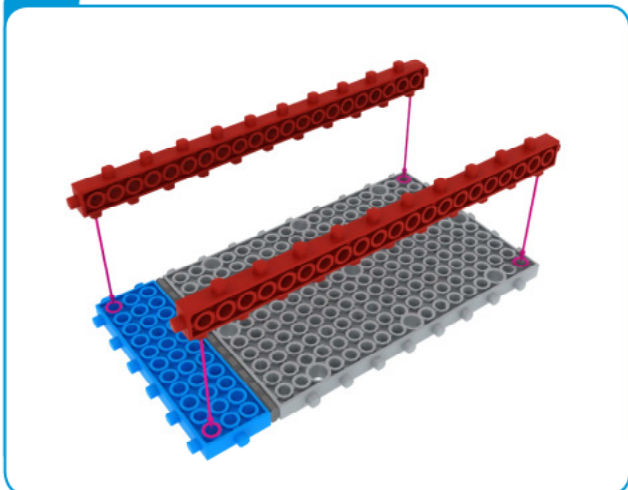
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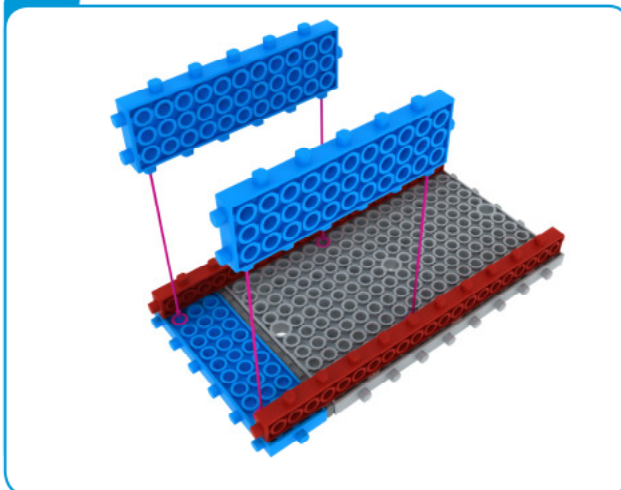
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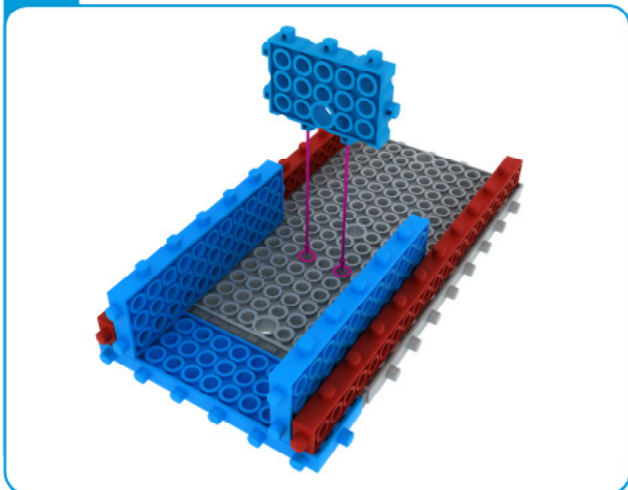
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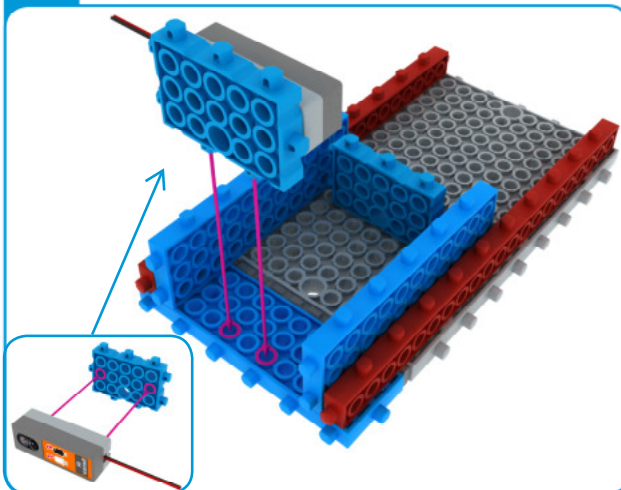
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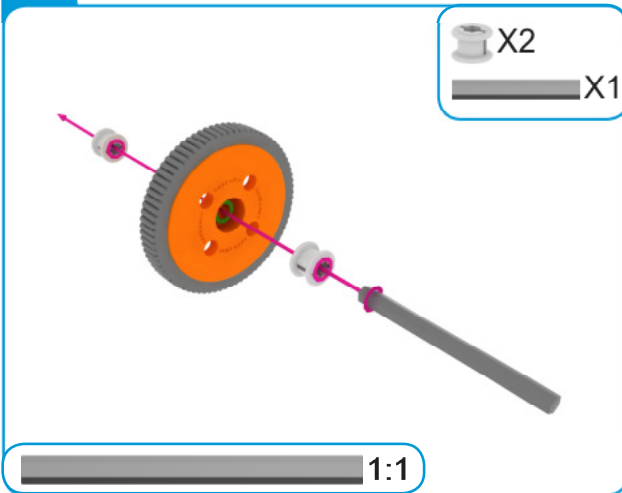
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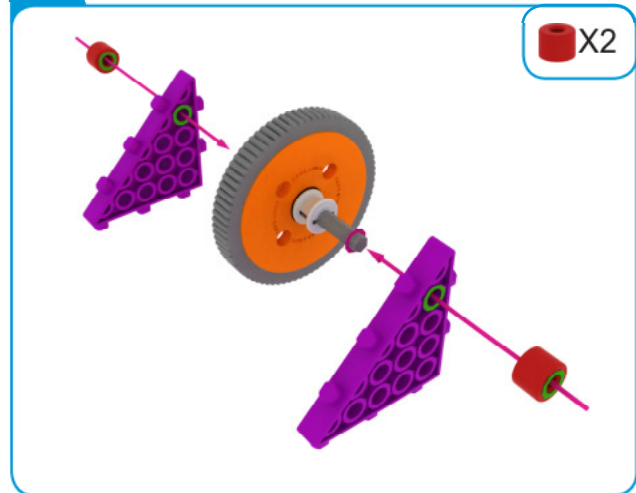
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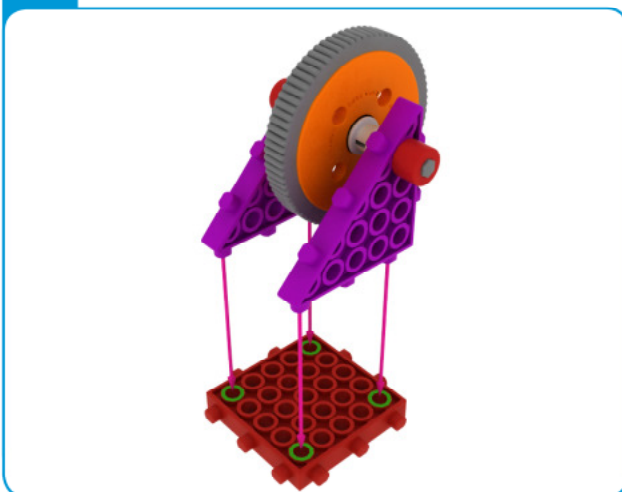
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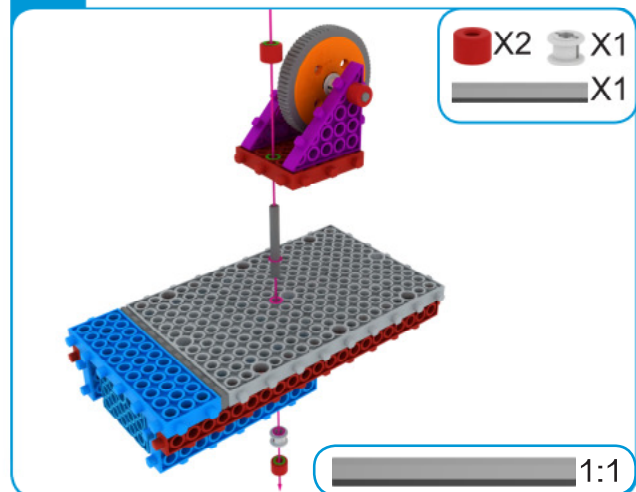
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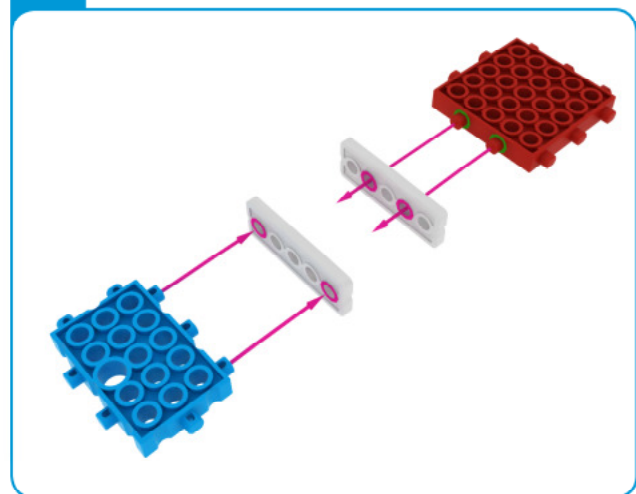
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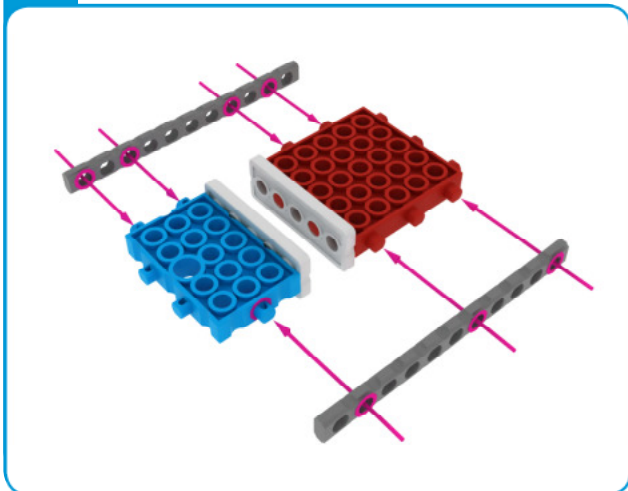
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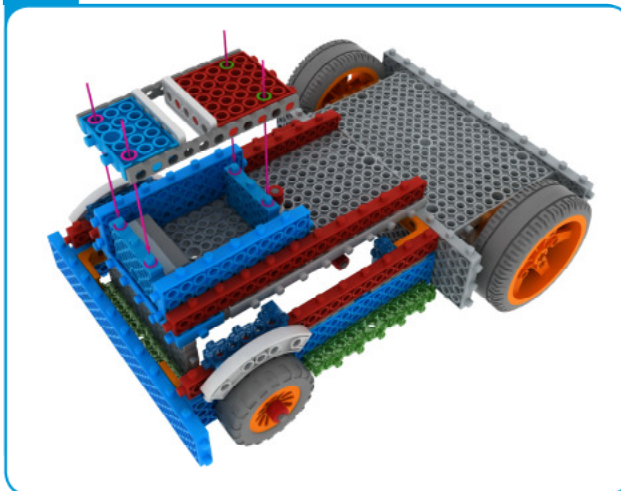
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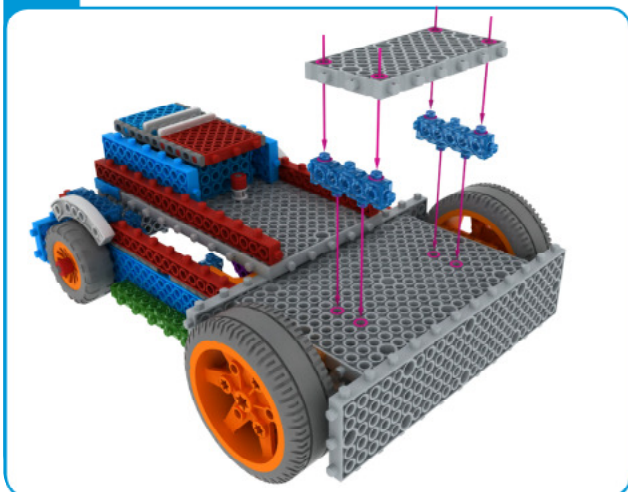
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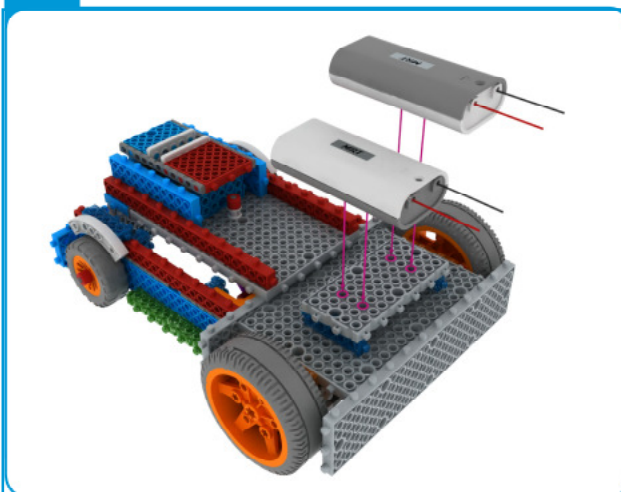
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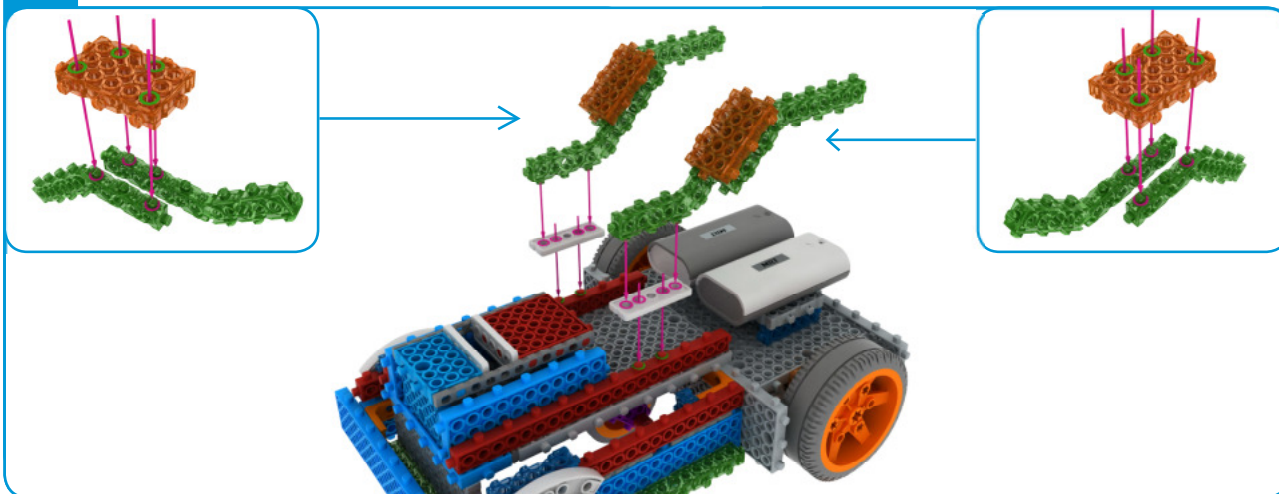
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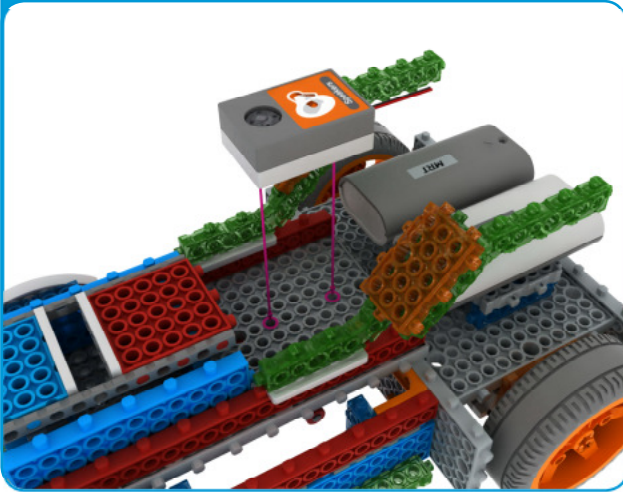
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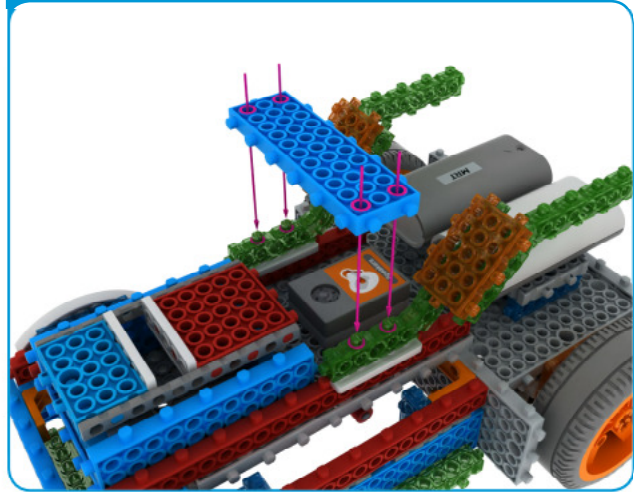
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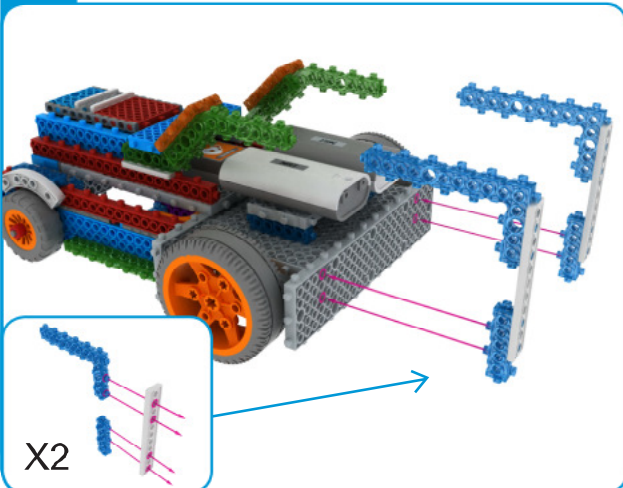
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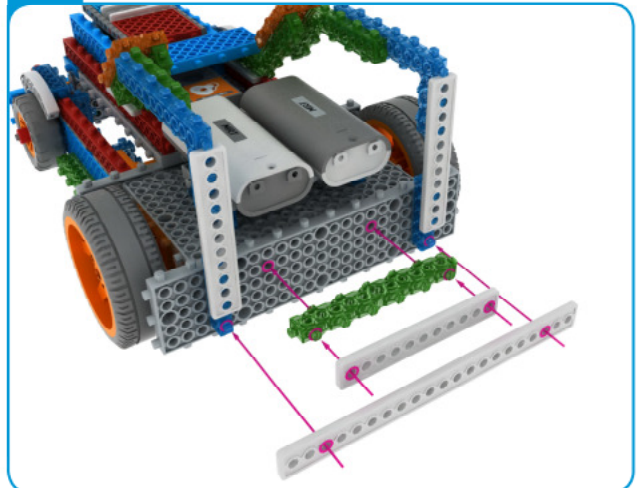
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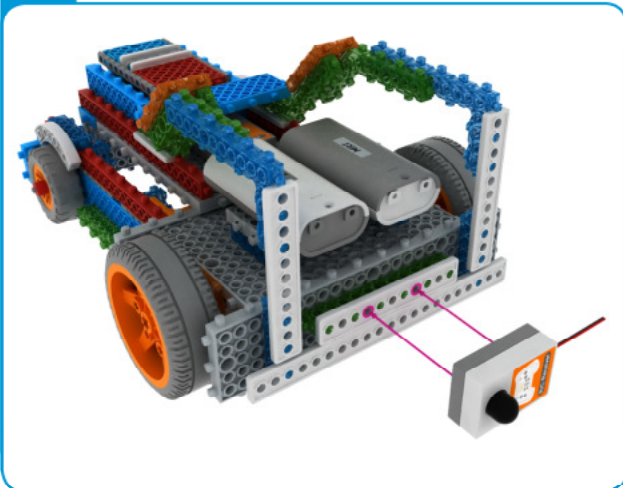
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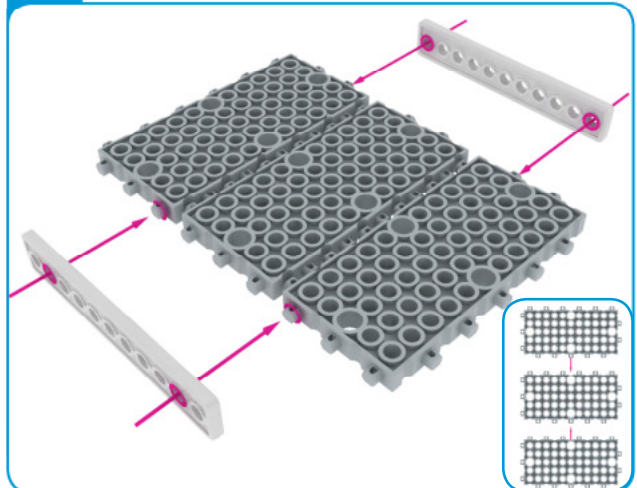
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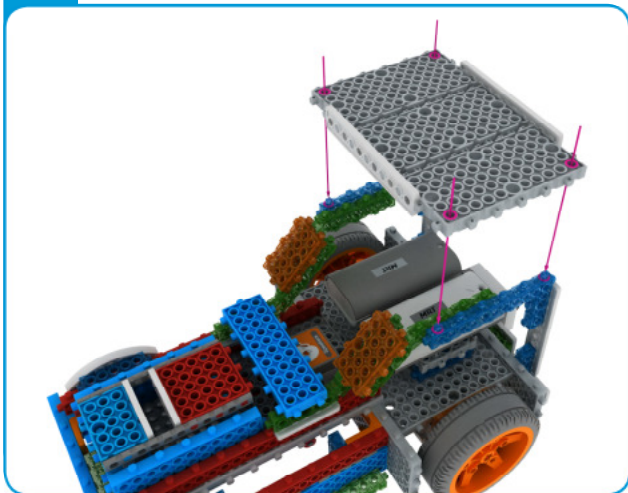
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43



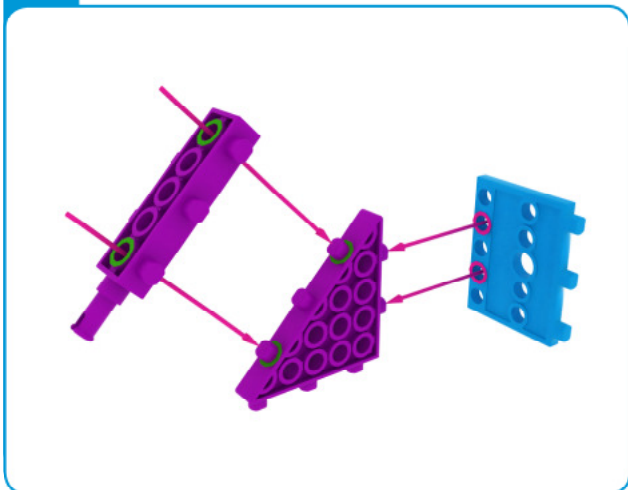
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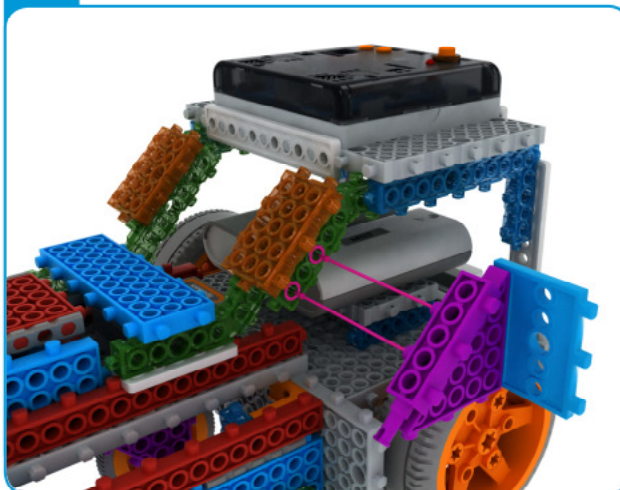
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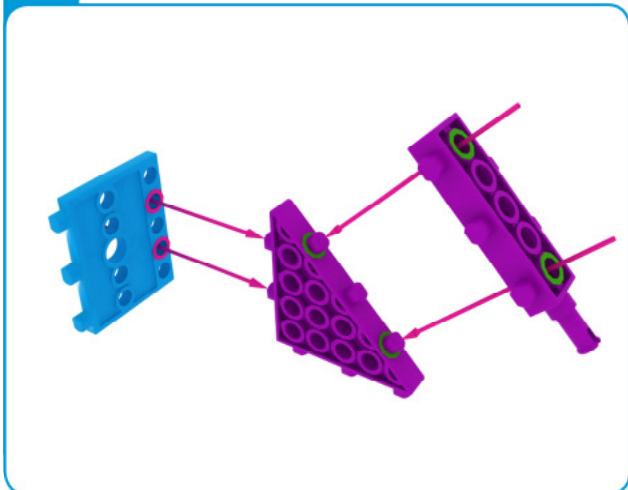
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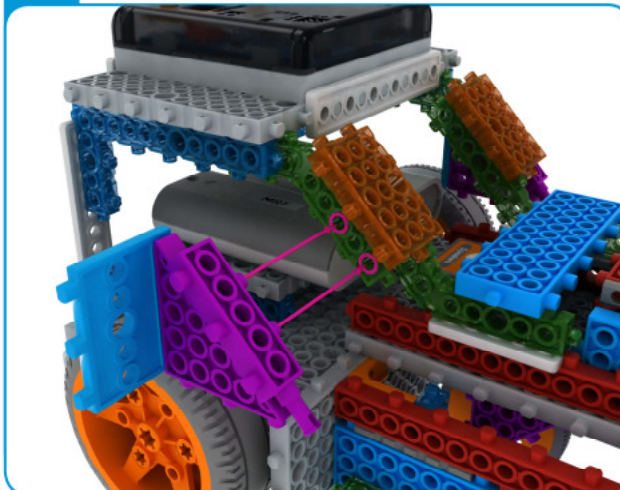
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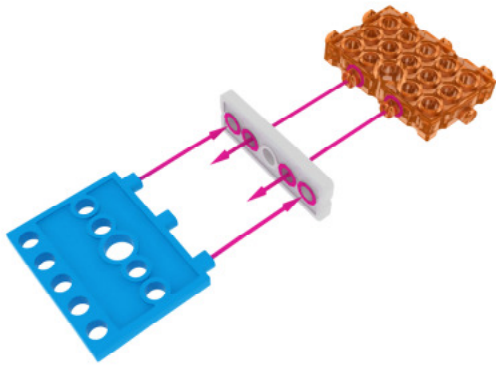
48



49



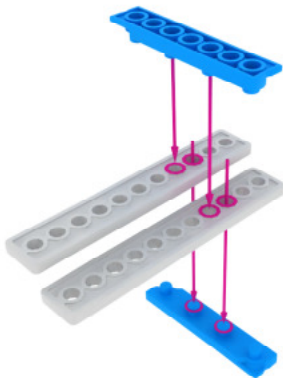
50



51



52



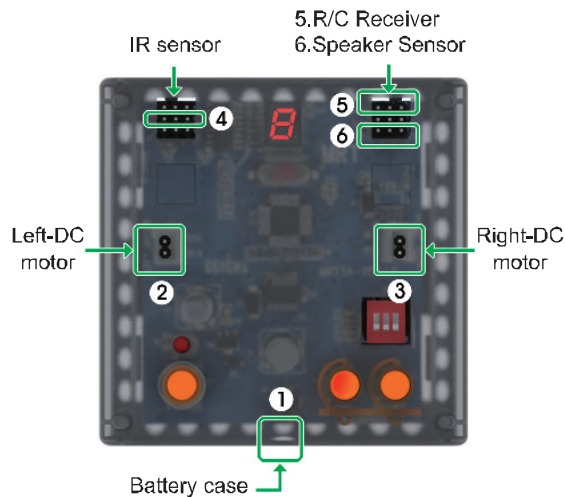
End





How to operate the Car?

Connecting the main board



Connect in this order.

1. Connect Battery Cases to Power connector.
2. Connect Left-DC motor to Left-motor connector.
3. Connect Right-DC motor to Right-motor connector.
4. Connect IR sensor to C connector.
5. Connect R/C Receiver to R/C connector.
6. Connect Speaker Sensor to IN2 connector.

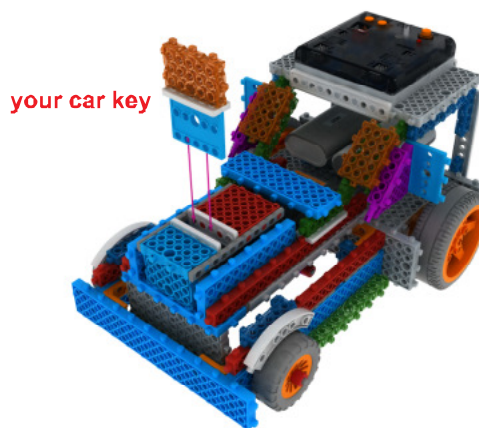
Setting mode

1. Ensure battery case/DC Motor Connector are connected.
2. Turn on the power.
3. Press the MODE button and select as the follow mode.

MODE # 8		Remote Control +IR Mode
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4. Select Remote ID.
5. Press the START button.

How to make it move?



※ Make sure your car key insert into the slot and start with sound.



Science STEM 14. Energy can change back and forth

Huna, is it possible for us to change into each other?

Of course not, how can I change into you?

It would be great for me if I could be change as clever as you.

Ha ha~ did you know that energies change into each other?

Much like light energy that can change into electricity energy through solar batteries?

Right~ In another case, kinetic energy can be changed into potential energy such as in roller coasters! We call this "energy conversion".

Even if energy is changed, the size of the energy will stay unchanged, Isn't that great?

Yeah, so it can maintain the energy as well as changing it. Sounds difficult.



Let's have a look at energy conversion and see what kind of energy it can be changed into.

MRT3-2

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