

# Introduction to ROKIDS Plus and the Electronics

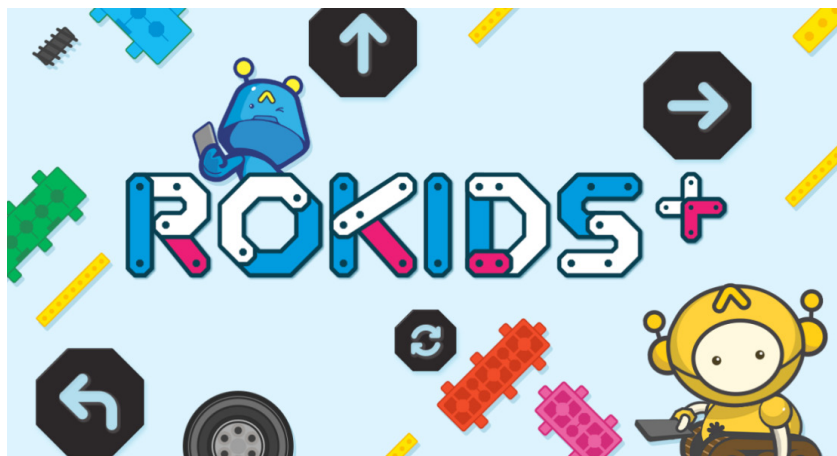
## Chapter 1

## What is ROKIDS Plus?

ROKIDS Plus is a mobile app that lets you study coding in-depth by using a variety of buttons and sensors. Using basic coding, you'll be able to send commands to your robot to make it move forward, backward, left or right using DC motors.

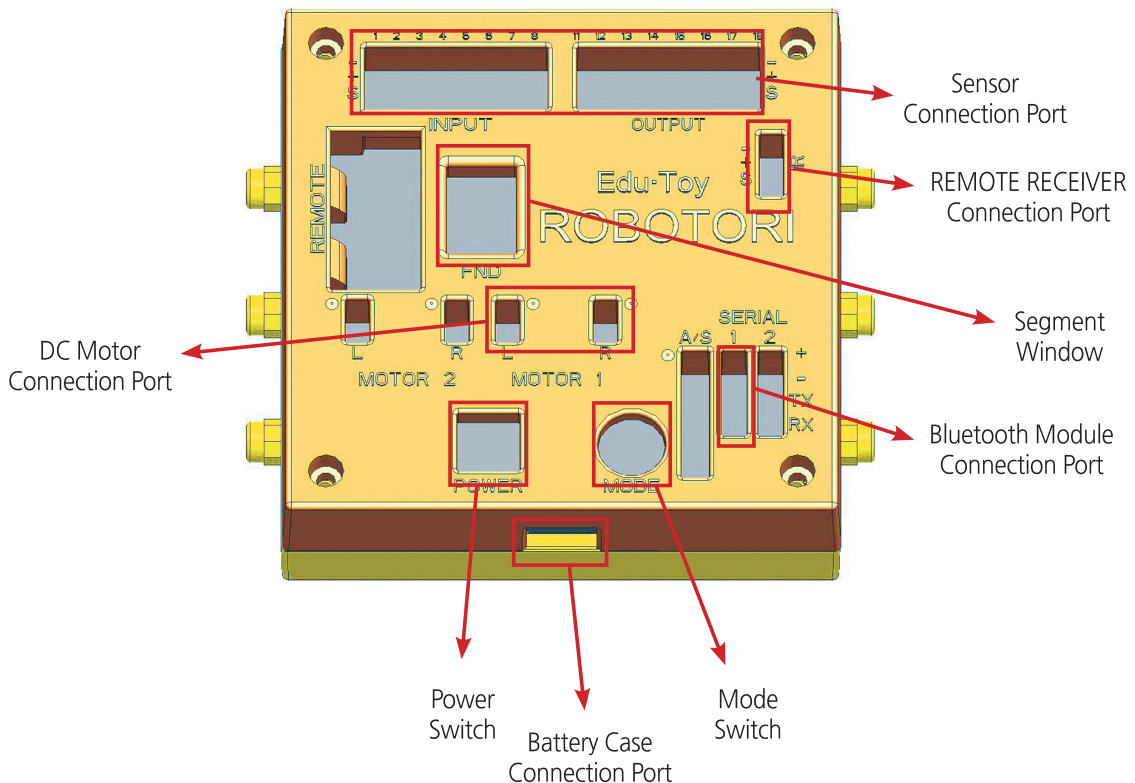
In addition to this, you'll also be able to program your creations to various other things, like blink a light, react to light and darkness, and even both of those at the same time! You'll even be able to program your creations to play music.

The ROKIDS app is available for free download in that Apple App Store. Simply search for ROKIDS Plus! Note: Make sure to download ROKIDS Plus, not ROKIDS.



# Introduction to the Mainboard

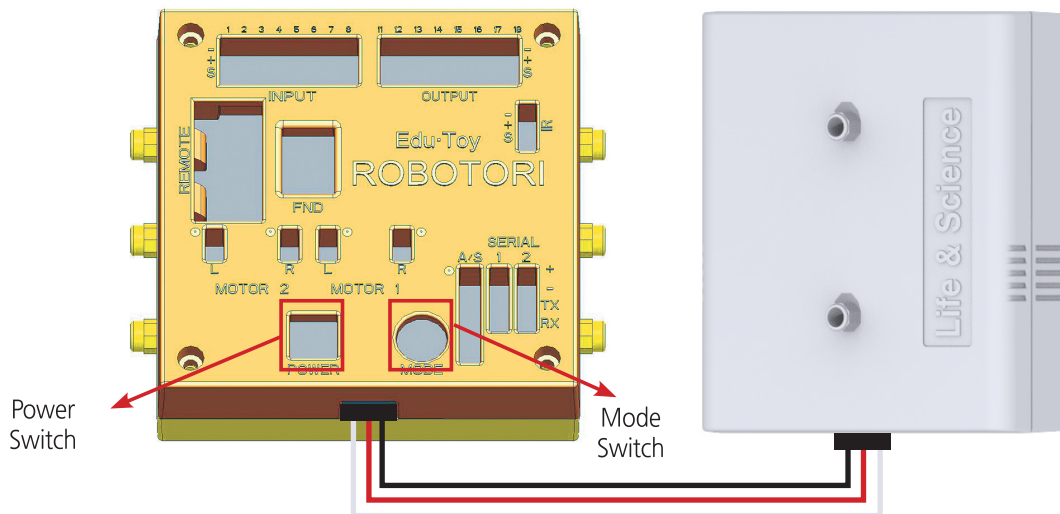
The mainboard is essentially the brain that controls the robot. Without the mainboard, your robot will be unable to function. This board enables the robot to move when it receives commands via the mobile app or Bluetooth.



- Power Switch: Turns on or off the power
- Mode Switch: Changes the mode
- Segment Window: Displays operation mode for mainboard
- Battery Case Connection Port: Connects to the battery case
- Bluetooth Module Connection Port:: Connects to Bluetooth module
- Sensor Connection Port: Connects to Sensors
- DC Motor Connection Port: Connects to DC Motor

# Introduction to the Battery Case

The battery case supplies the mainboard with power using the connection jack. You can turn on the power by pressing the power switch after connecting the battery case.



## ※ How to Set the Mode on the Mainboard

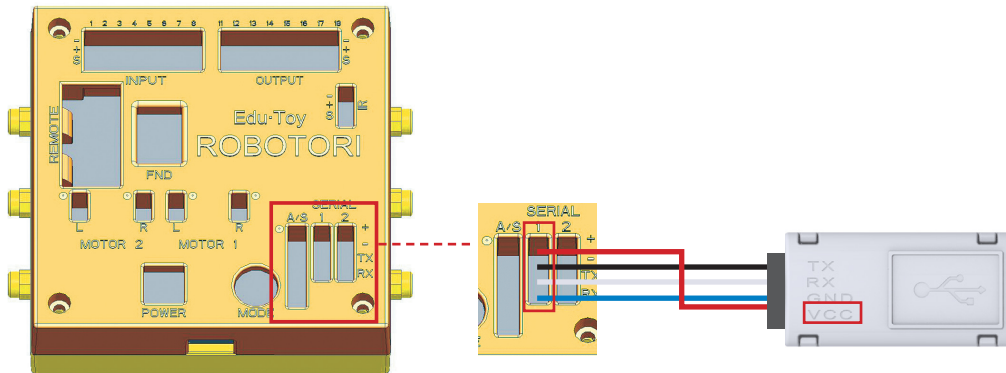
Setting the mode on the mainboard is simple. Each of the mainboard modes has its own special function, but only one will be important when using ROKIDS Plus.

1. Power on the mainboard and press “Mode” switch multiple times.
2. If “J” is displayed on the segments window, pause and wait for the LED to stop blinking.
3. After the screen blinks three times, the mainboard will be set to whichever setting is displayed.

※Caution : When using the ROKIDS Plus app, make sure that your mainboard is set to “J”!

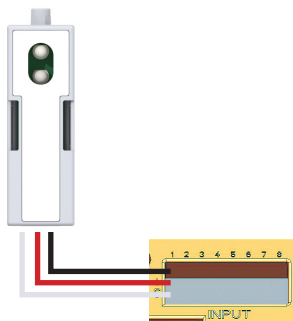
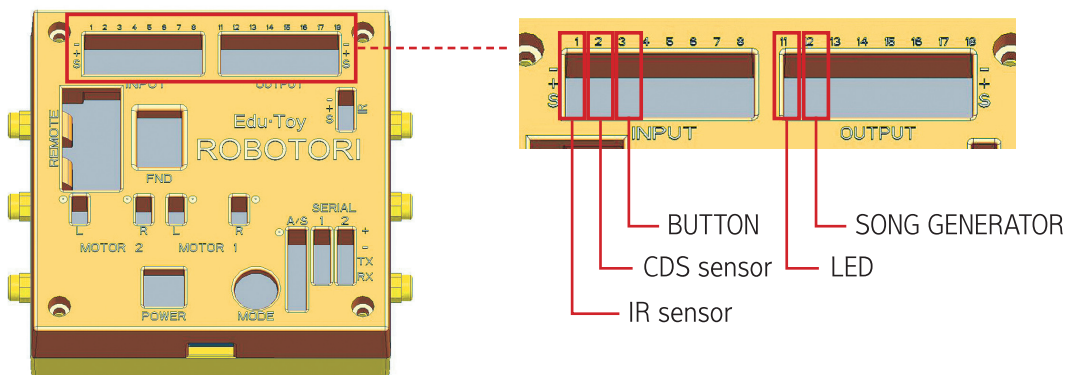
# Introduction to the Bluetooth Module

This module connects the mobile app to the robot. This is how you control the robot from the app, don't forget to include it in your build!



# Introduction to Sensors

A sensor will input or output signal to or from the mainboard. For example, there is a sensor that detects light, but there's also a sensor that outputs an LED light.

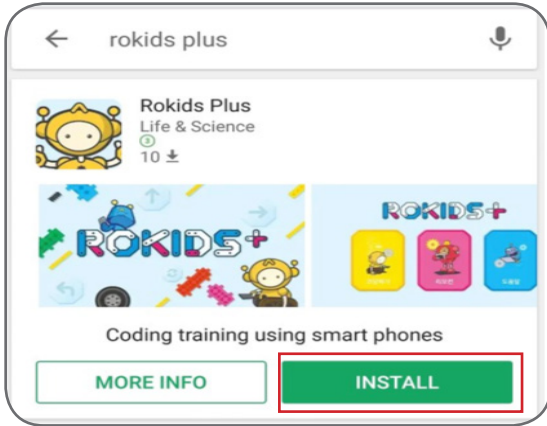


When connected into the sensor, the wires should be arranged:  
White - Red - Black

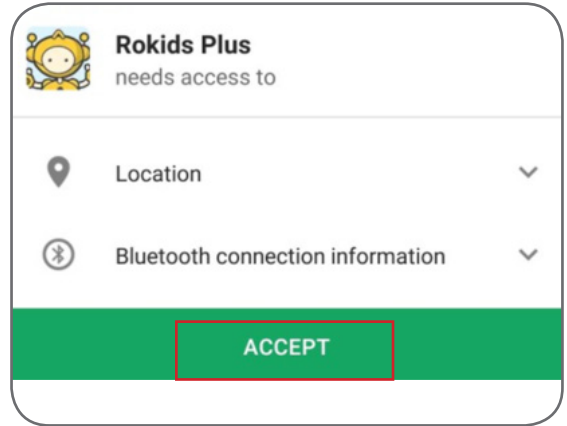
When connected into the mainboard, the wires should be arranged:  
Black - Red - White

Remember: Always connect sensors and the mainboard so that the white cable is always in the S-slot.

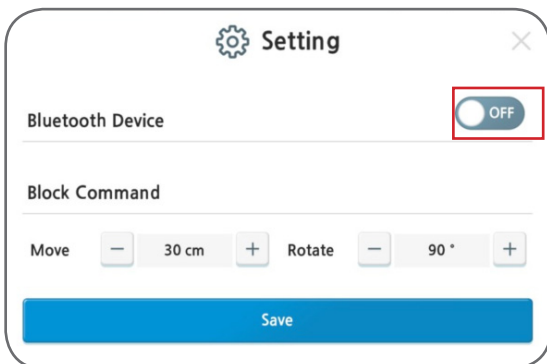
# Installing the ROKIDS Plus App



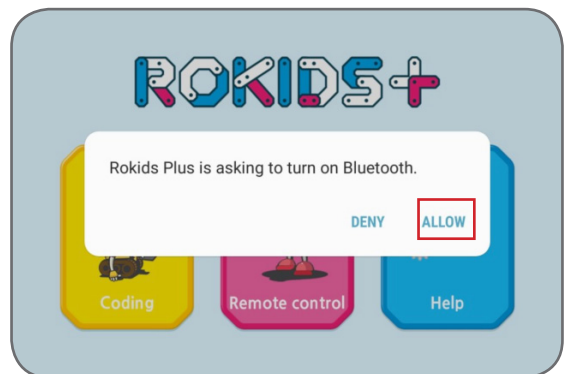
1. Search 'ROKIDS Plus' from the Apple App Store



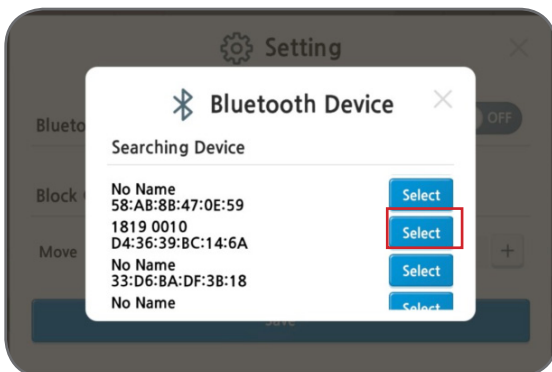
2. Confirm and install the app



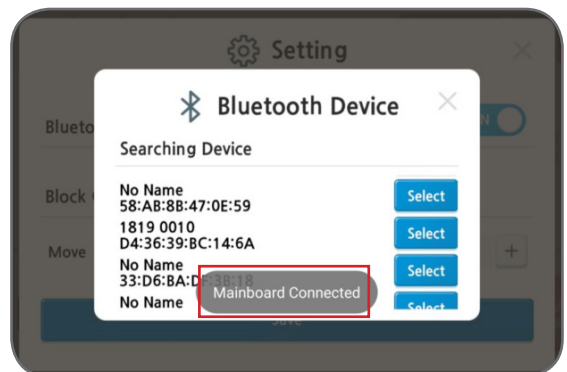
3. Turn on the Bluetooth in the settings menu by pressing the button in the top corner of the app



4. Activate the Bluetooth function



5. Make sure that the correct Bluetooth module is synced up to the ROKIDS Plus app



6. The Bluetooth connection should be complete

# HOME MENU OPTIONS



Coding: This is the menu you use for “free” coding

Remote Con: This menu allows you to adjust the robot’s position, forward backward, left or right using a remote control

Help: This menu will help explain how to use the ROKIDS Plus app

# Learning the ROKIDS Plus Menu

The screenshot shows the ROKIDS Plus app interface with several annotated elements:

- Home Icon:** This will take you back to the home screen of the app.
- Setting Icon:** This is where you make sure your robot is connected to the Bluetooth. In addition, this is where you adjust the values for the Move and Rotate commands.
- File:** This is where you’ll save and retrieve coding data you’ve made.
- Clear:** This will delete your commands.
- IR Sensor Icon:** This will take you to the IR menu.
- CDS Sensor Icon:** This button will take you to the CDS menu.
- Button Icon:** This will open the button menu.
- Coding Area:** This is where you will drag and drop the icons from the Command Area. One code fits in each slot, and the codes will always be executed from left to right.
- Command Area:** This is where you can find all the commands that you can make your creation perform.

# Learning the ROKIDS Plus Menu



Forward Button:  
Commands your robot to move forward



Backward Button:  
Commands your robot to move backward



Left Rotation Button:  
Commands your robot to turn left, counter-clockwise



Right Rotation Button:  
Commands your robot to turn right, clock-wise



Repeat Button: Commands your robot to repeat a specified set of commands



Pause Icon: Commands your robot to halt for a set period of time.



Turn On LED Button: When the LED Sensor is installed, this will turn the LED on



Turn Off LED Button: When the LED Sensor is installed, this will turn the LED off



Turn On Song Generator:  
When the Song Generator is installed, this will turn the Song Generator on



Turn Off Song Generator:  
When the Song Generator is installed, this will turn the Song Generator off



Finish Button: Commands your robot to stop performing whatever actions are programmed.

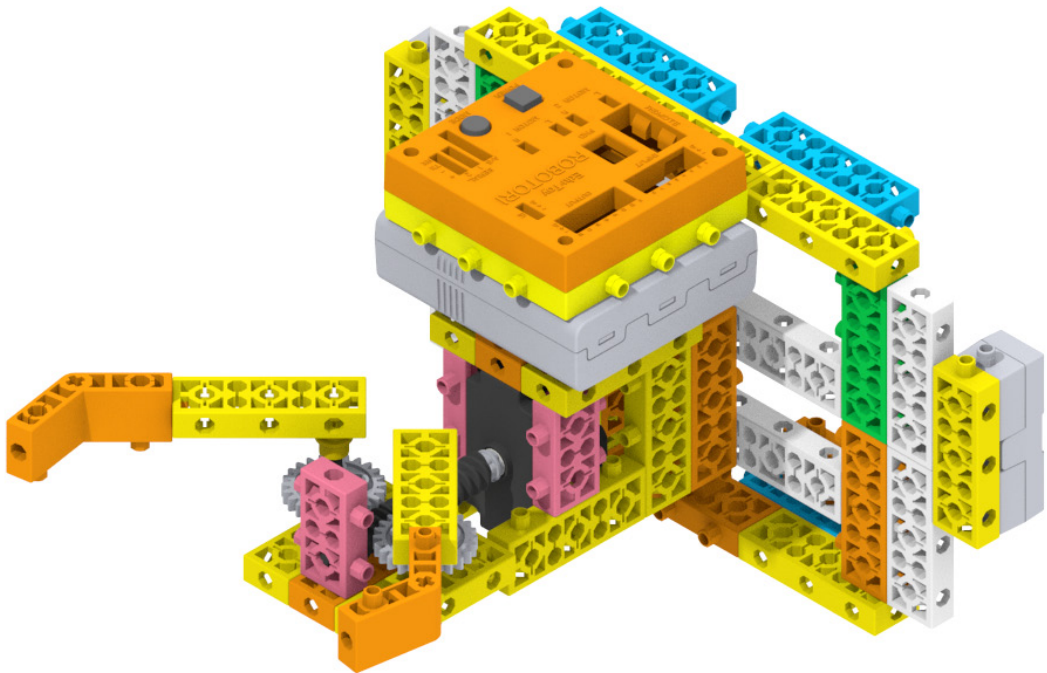


# The Gripper

## Chapter 8

# 07

# Gripper

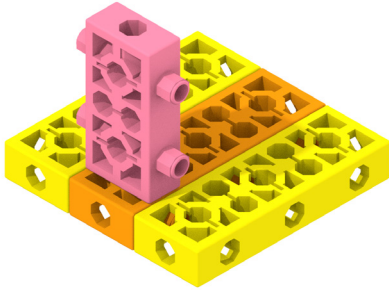


## Assembling the Gripper

Rubi 8 (3)	Rubi 7 (3)	Rubi 4 (10)	Rubi 6 (5)	Rubi 2 (4)	Rubi 0 (8)	Rubi 0 (7)	Mini 2 (2)	Mini 2 (3)	Mini 1 (2)	Curve (2)	Sawtooth 24 (2)	Worm (3)
Middle Connector(4)	Short connector(1)	Motor connector(2)	A45 (2)	A64 (1)	DC motor (1)	IR SENSOR (1)	BUTTON SENSOR(1)	LED SENSOR (1)	Connector (4)	Main board (1)	Battery case (1)	Bluetooth module (1)

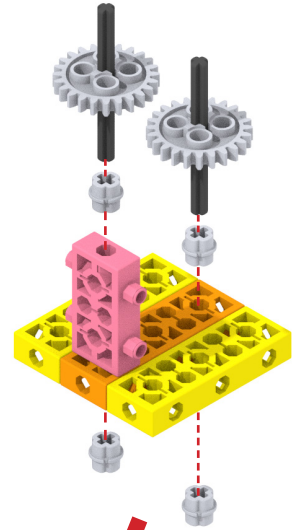
1

-  x1
-  x2
-  x1



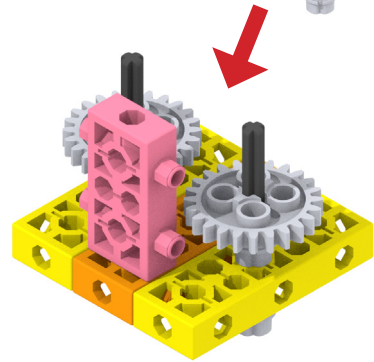
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-  x2
-  x2 A45
-  x4

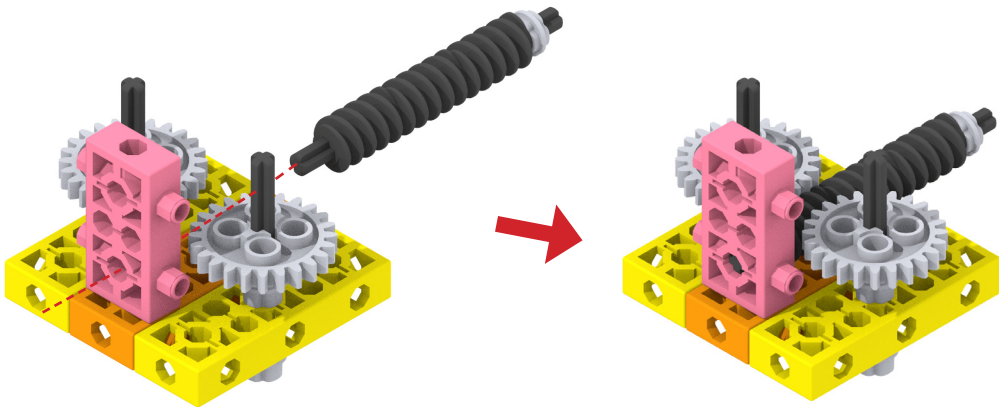


3

-  x3
-  x1
-  x1 A64

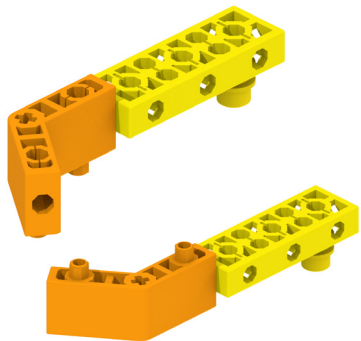


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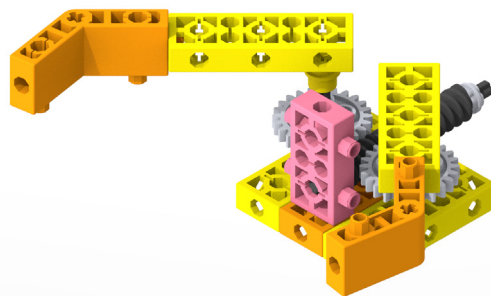
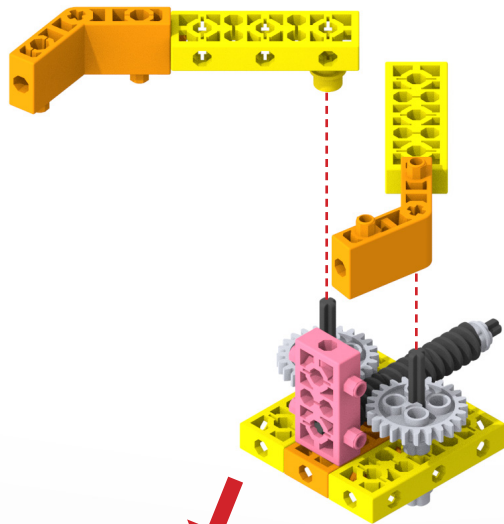


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-  x2
-  x2
-  x2

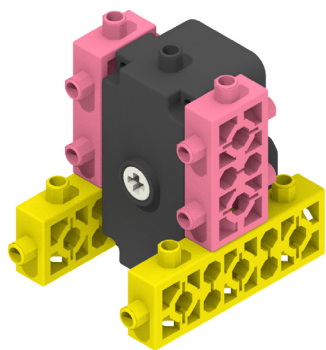


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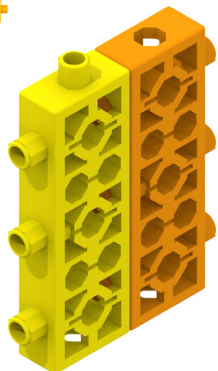
7

-  x1
-  x2
-  x2



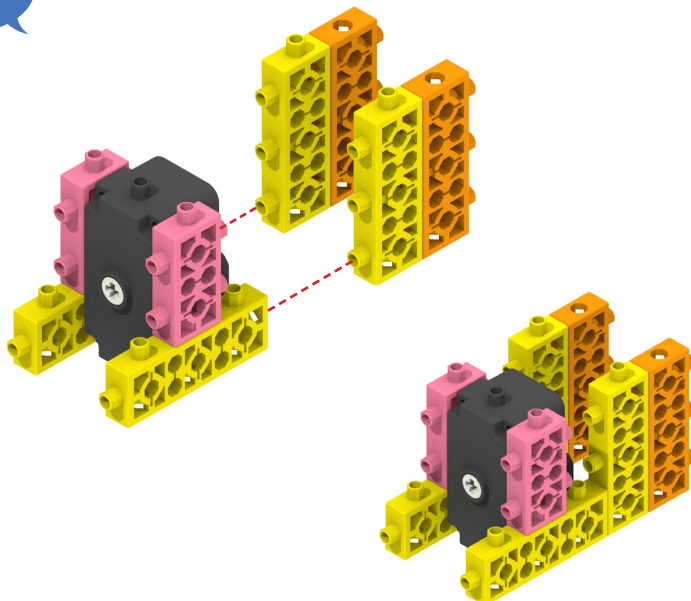
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-  x2
-  x2



x2

9



10



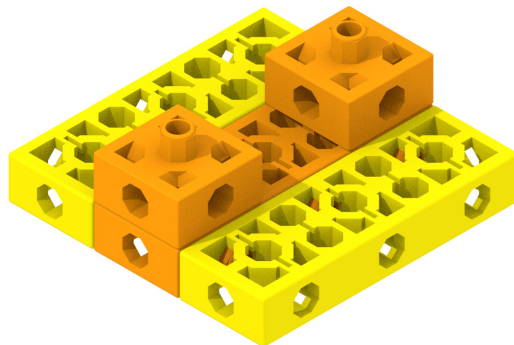
x1



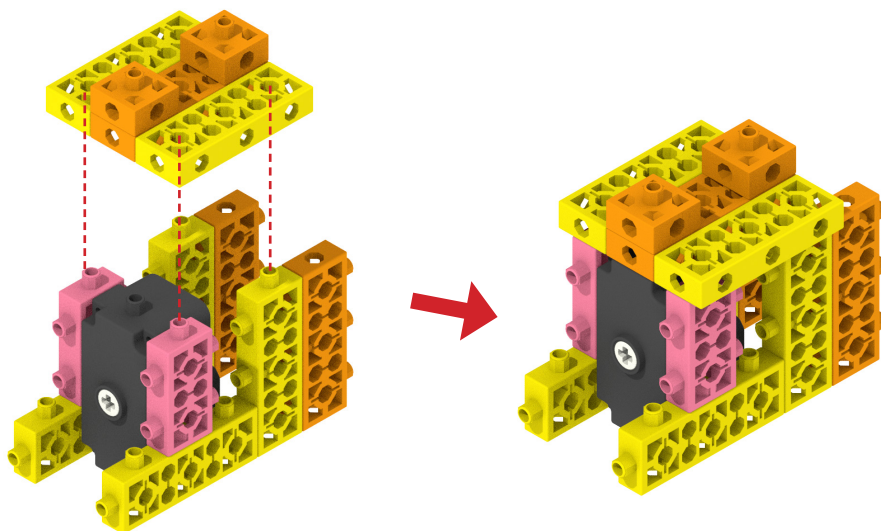
x2



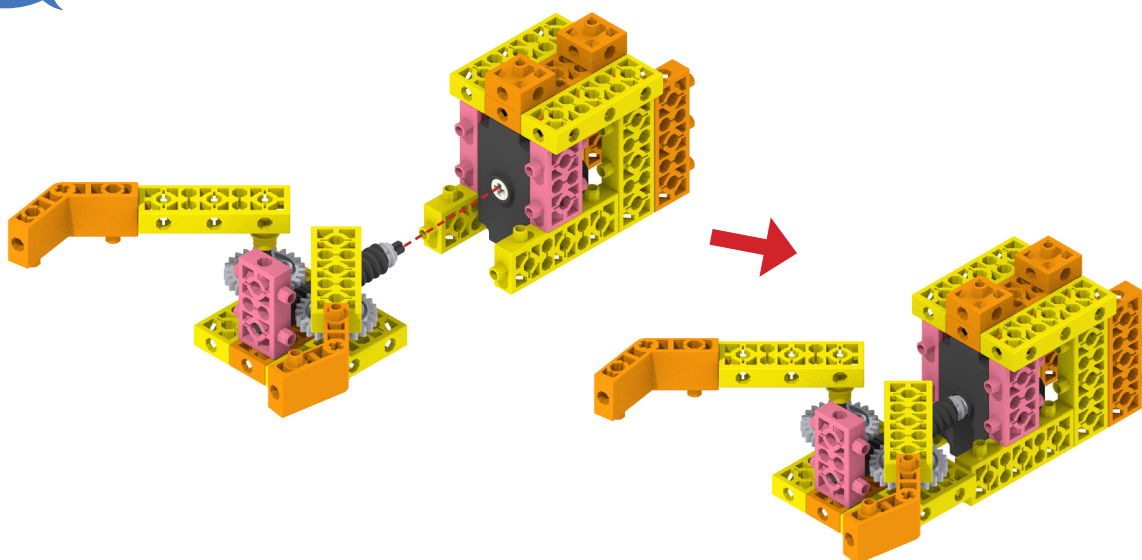
x2







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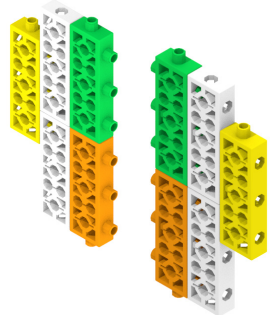


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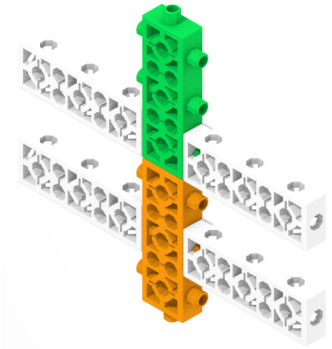
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-  x2
-  x2
-  x4
-  x2

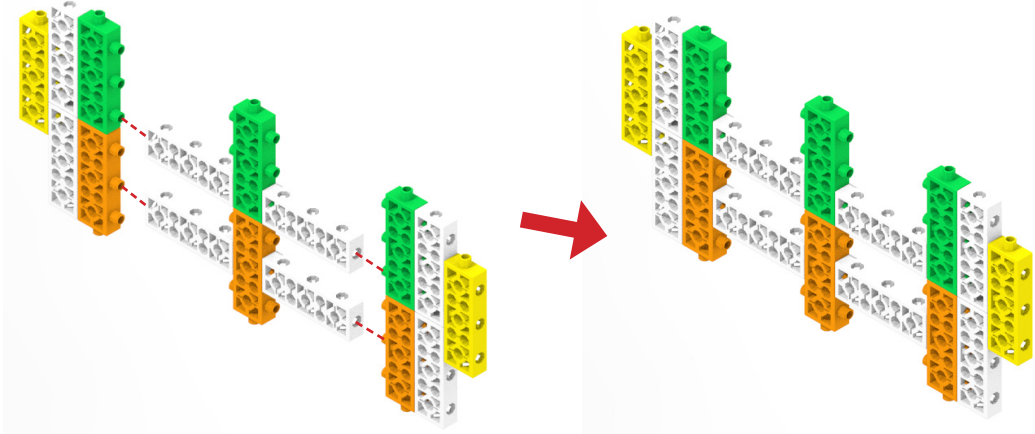


14

-  x1
-  x1
-  x4

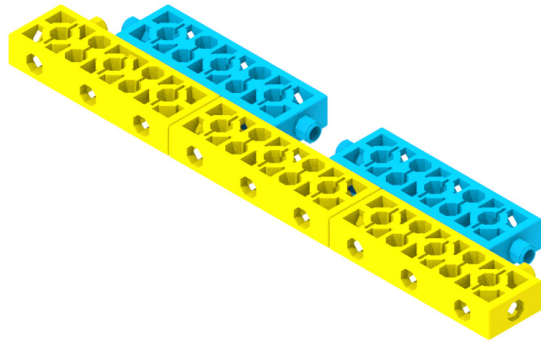


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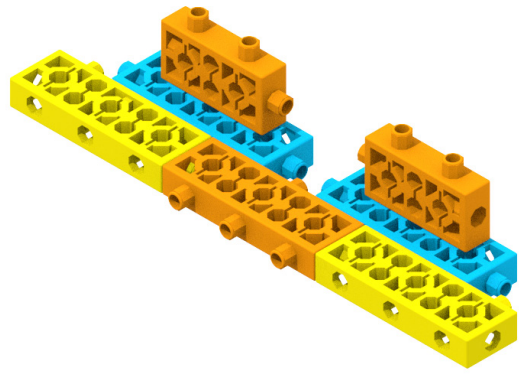
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-  x2
-  x2
-  x1

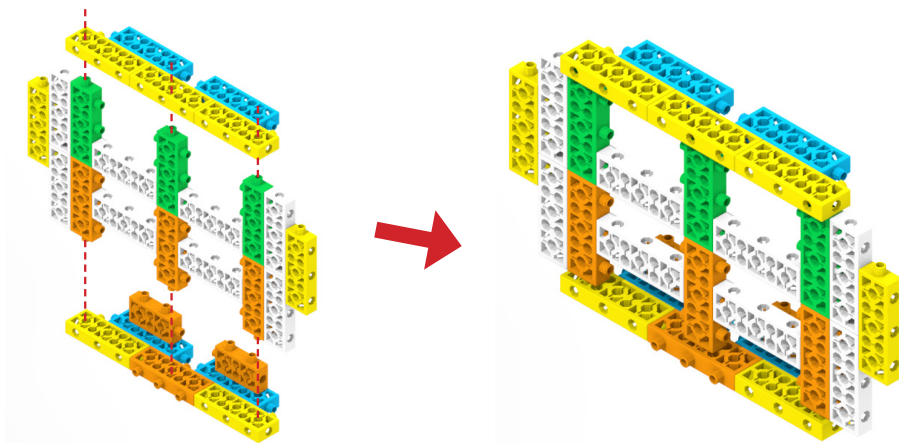


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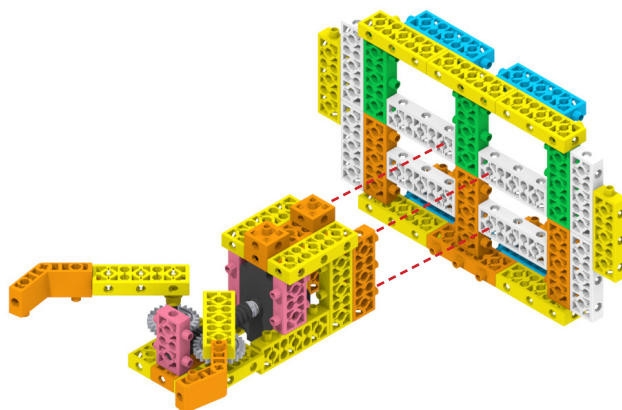
-  x1
-  x2
-  x2
-  x2



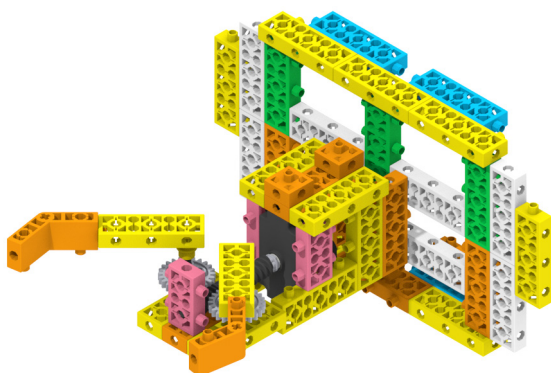
18










19

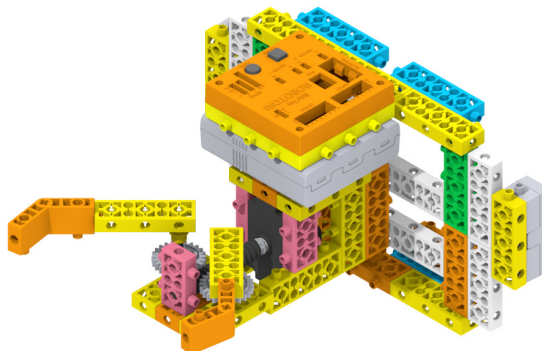


20



21

-  x1
  x1
  x1
  x4
  x1
-  x1
  x1



First, construct the gripper. Then, attach the electronics in the following order:

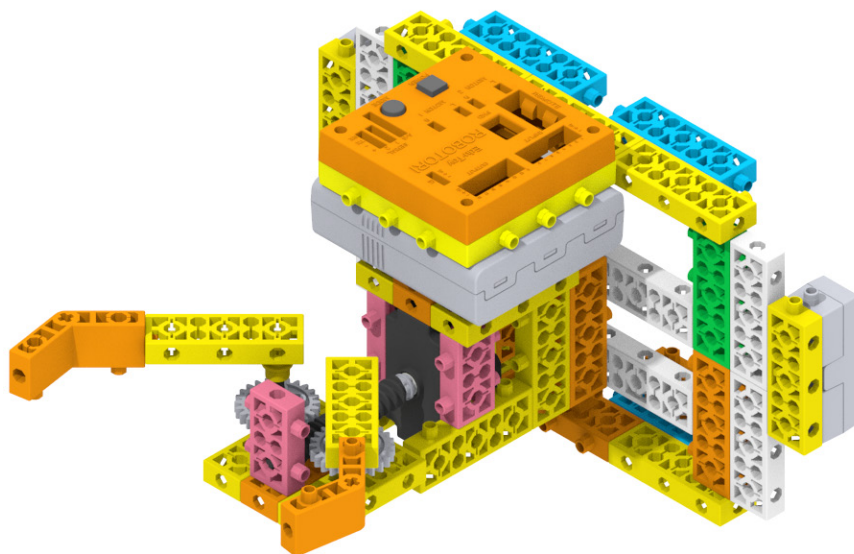
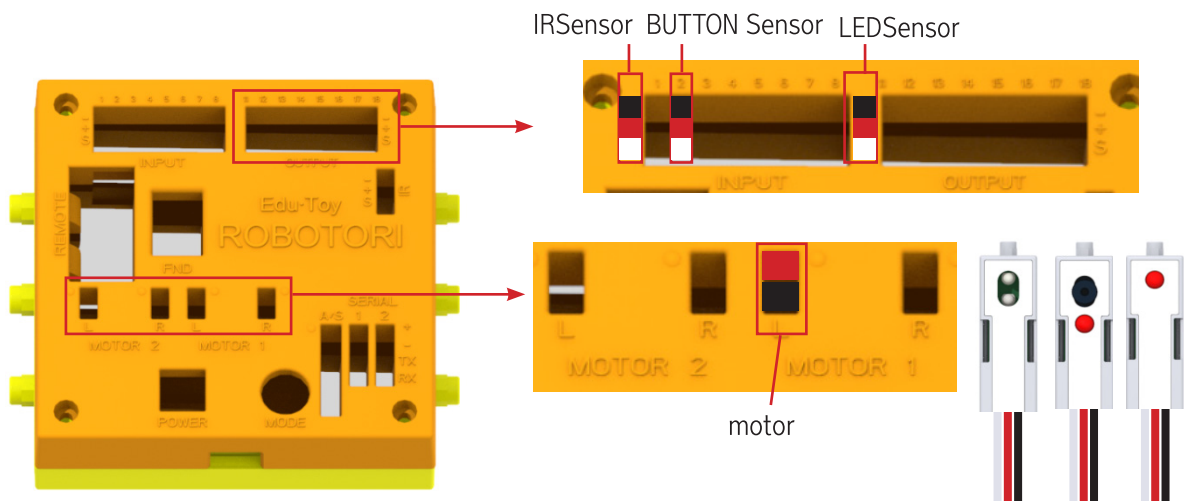
Step 1. Connect mainboard, battery case and Bluetooth together.

Step 2. Plug in one DC motor so that its red wire is facing the top of the mainboard and the black wire is facing the bottom.

Step 3. Plug the IR sensor into the first section of the INPUT using a connection jack.

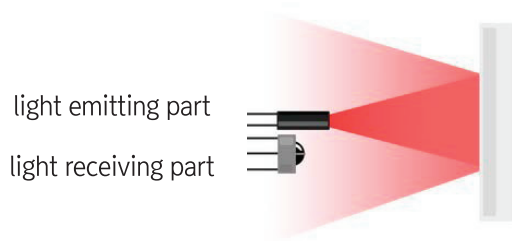
Step 4. Plug the button sensor into the third section of the INPUT using a connection jack.

Step 5. Plug the LED sensor into the first section of the OUTPUT using a connection jack.

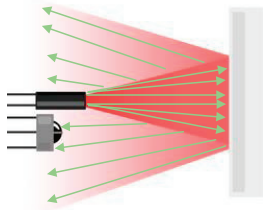




The infrared sensor consists of two parts: a light emitting part and a light receiving part.

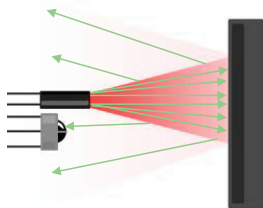


Infrared sensors detect objects by illuminating invisible infrared rays. It consists of a light emitting part that illuminates infrared rays and a light receiving part that detects reflected light. The amount of light reflected is different for each object. If an object reflects a lot of light, the light-receiving part will detect it as a bright object.

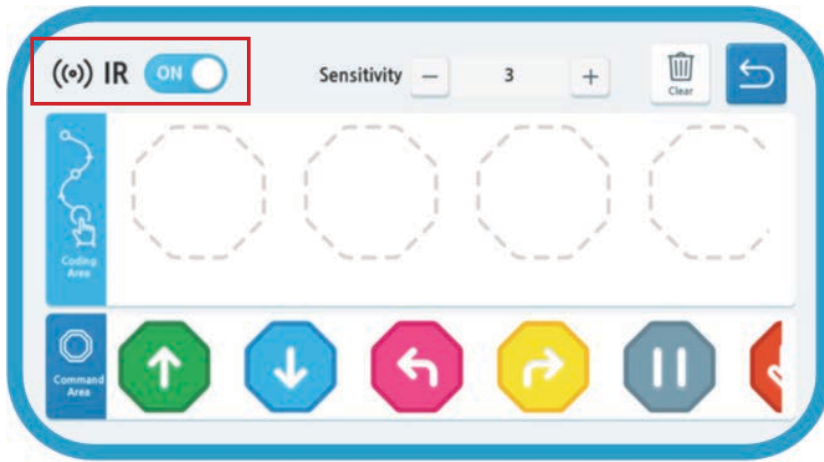


An object with a white color reflects a lot of light again. The receiver recognizes a lot of light and judges that this object reflects a lot of light.

If the object is dark, the light will be absorbed by the object and the light-sensing part will perceive it as a dark object.



Dark objects rarely reflect light. The receiver recognizes that there is little light, and judges that this object is dark.



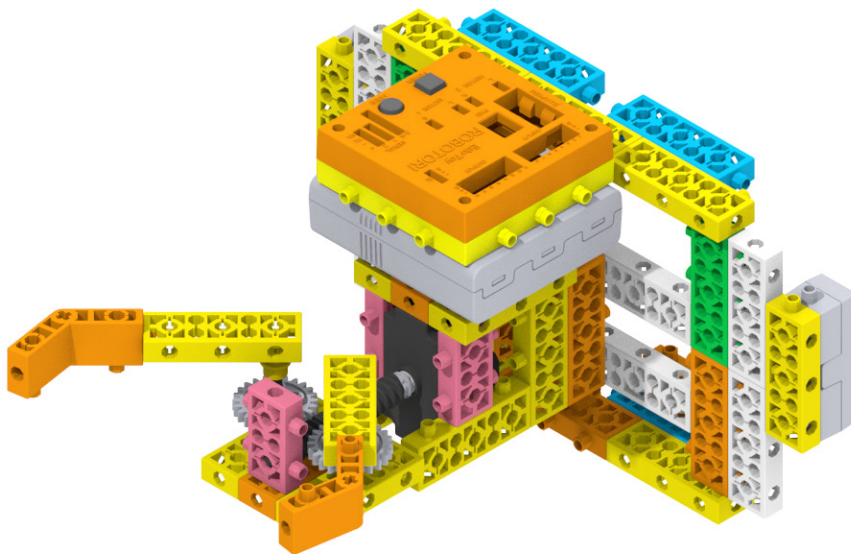
Similar to the CDS and Button menus, the IR sensor menu is in the top right corner of the ROKIDS Plus app.

Here's how to set it up in the ROKIDS Plus app:

In the top right corner of the app, you'll see an icon with the letters "IR" below it.

Tap that to open the IR menu

Change the "IR" setting from OFF to ON



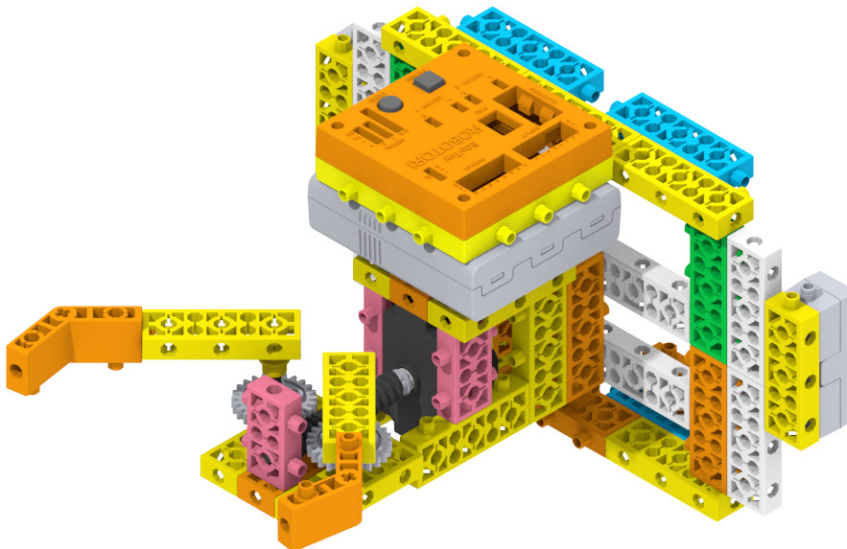
Notice how the gripper uses the IR sensor, LED sensor and button sensor together to function properly. When you press “PLAY”, you’ll notice that the gripper’s grab is loosened when the LED is turned off. However, when the LED is turned on, the IR sensor is able to detect the light and the gripper’s grasp will tighten. Take a few moments to play around with this and see how the gripper works!

Once you’re comfortable, program your gripper to perform the following actions:

- Program your gripper so that when the “PLAY” button is pressed, the LED light blinks continuously and the grip is tightened.
- Program your gripper so that when you press the button sensor that the LED will turn off and the grip will be loosened.

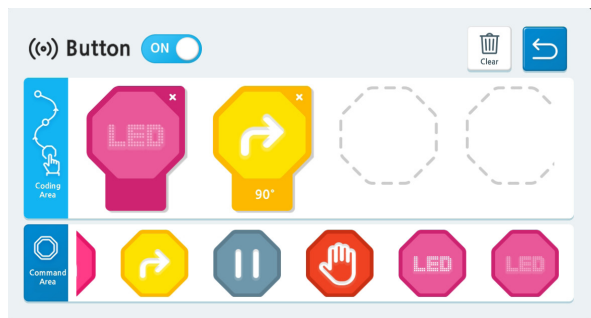
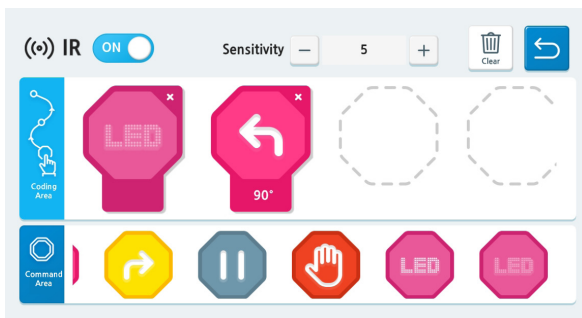
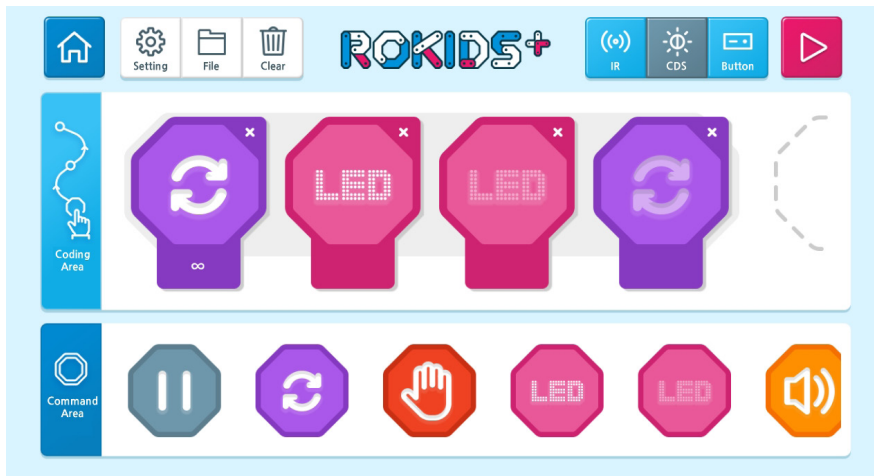
Now here’s another challenge:

- Program your robot so that when you press “PLAY”, the gripper will tighten and loosen its grip twice.



Let's solve following problems using gripper

Make codes that when IT sensor is pushed, LED is turned off and gripper is tightened while LED blinks continuously if play is pushed and if BUTTON sensor is pushed, then LED is turned off and gripper is loosened. (But use block rotating to the right/left)



Let's make codes as below using gripper

When play is pushed, let gripper be tightened twice and loosened twice using forward / back ward movement block. In addition, make codes that LED is turned on whenever IR sensor and BUTTON sensor is pushed.

