

Users guide for BrailleBot

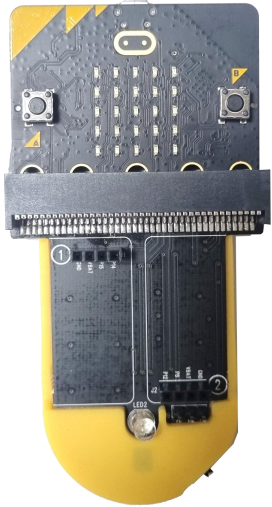
Open platform IoT robotics module



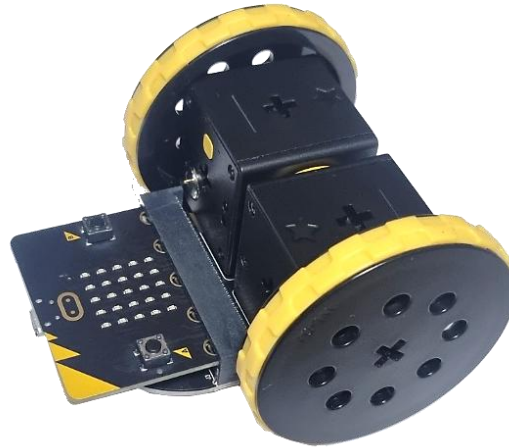
qna@roborisen.com
www.roborisen.com

BrailleBot

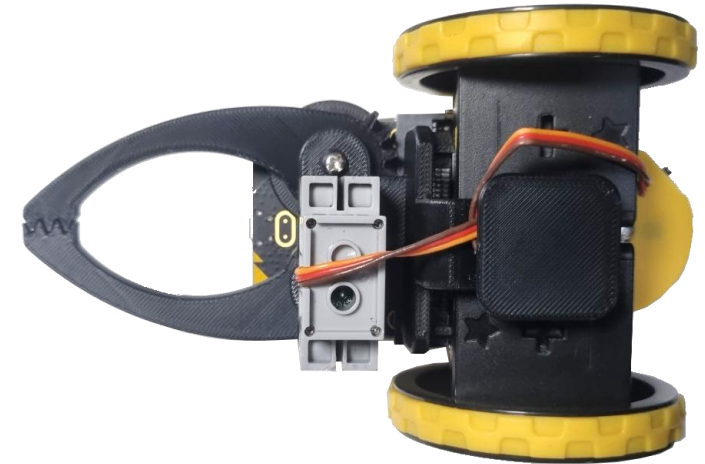
- Braille board : Detect color and lines with color sensor and line sensor
- BrailleBot : Braille board + GCube 2EA
- Braille Gripper Bot : BrailleBot + gripper



Braille board

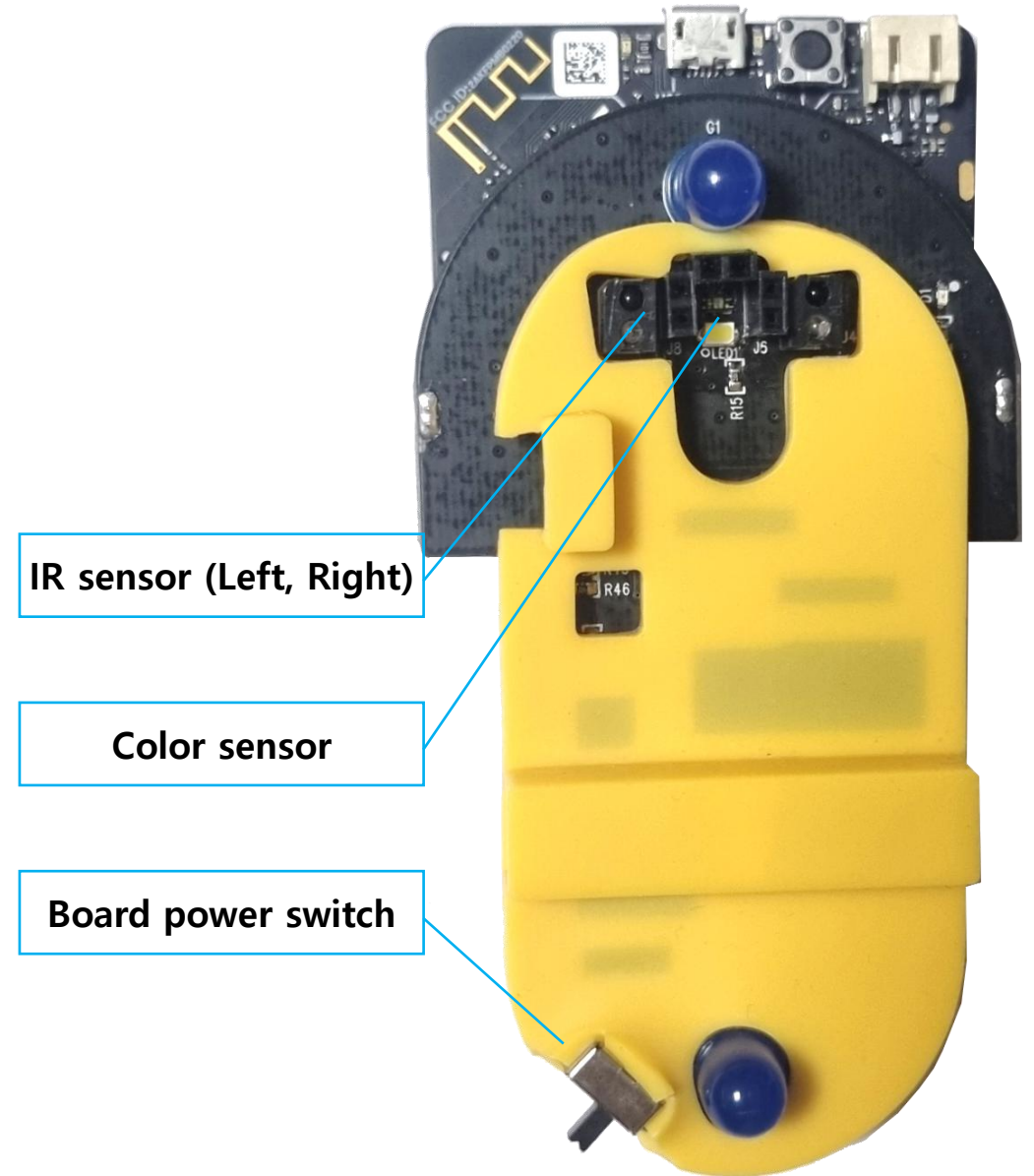
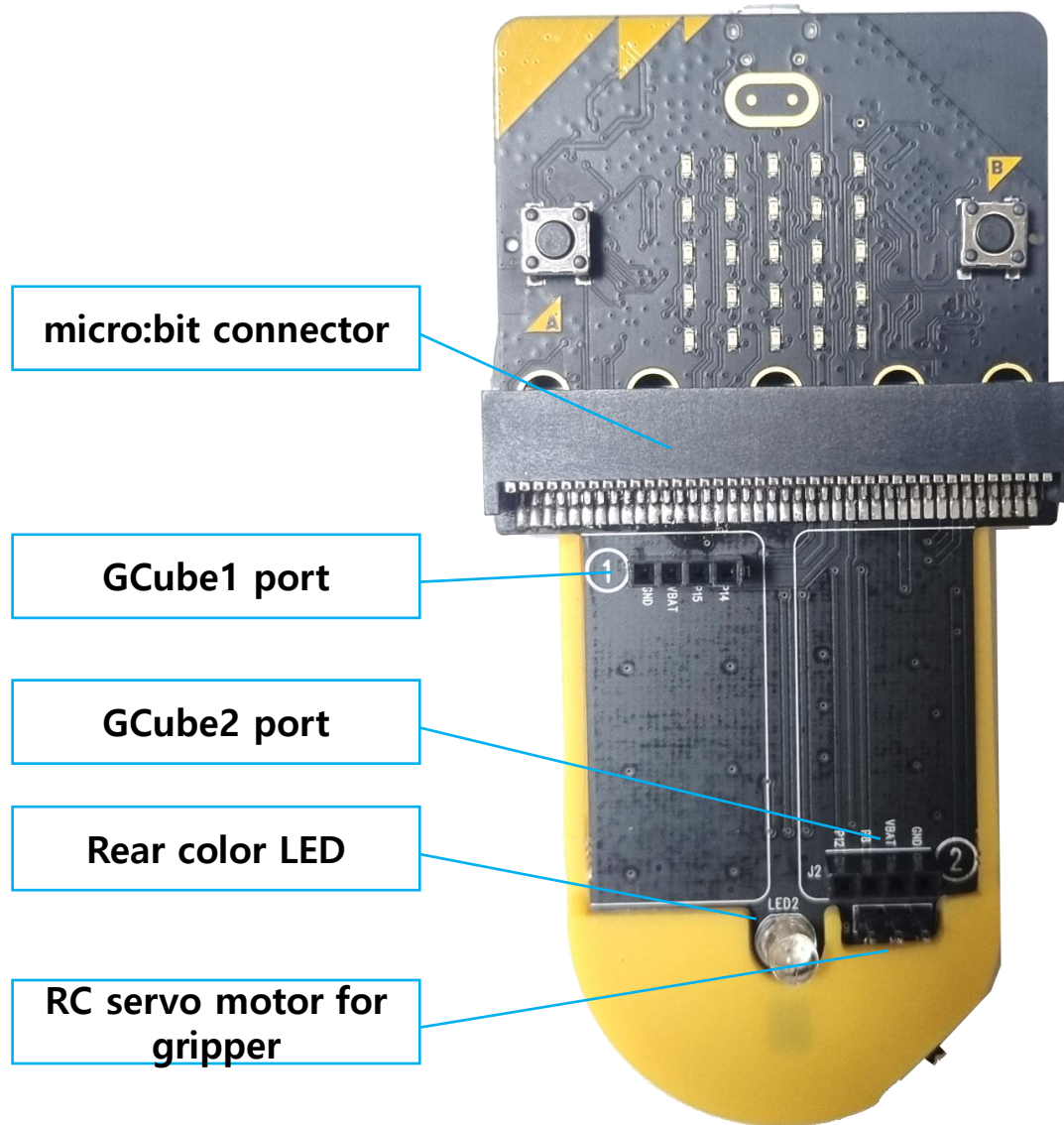


BrailleBot

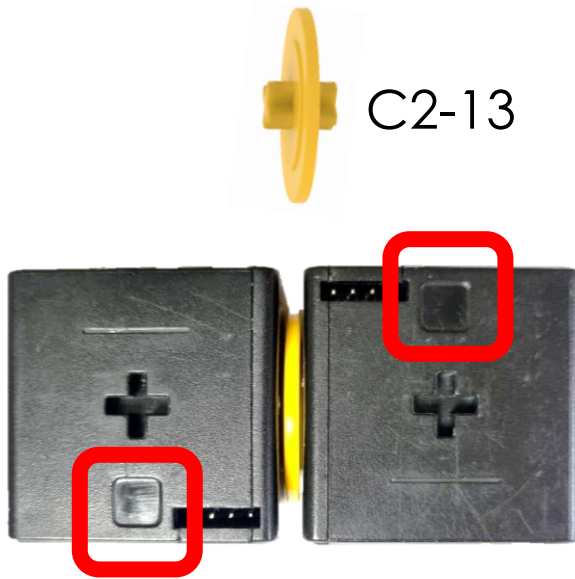


Braille Gripper Bot

Braille board



<BrailleBot Assembly>



GCube Assembly

* Use C2-12 to attach two GCubes.

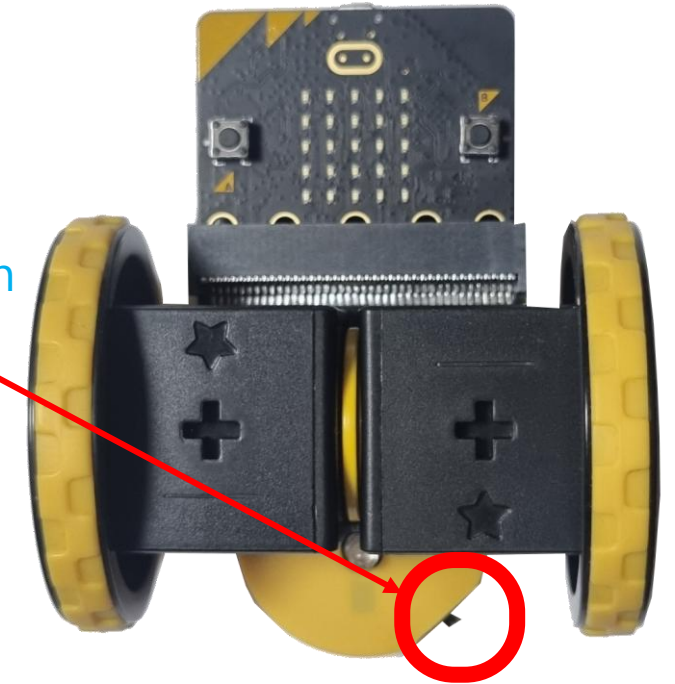
* Assemble so that the square shape faces up and down.



Braille board Assembly

* Insert the Braille board into the two GCubes.

Power switch



Wheel Assembly

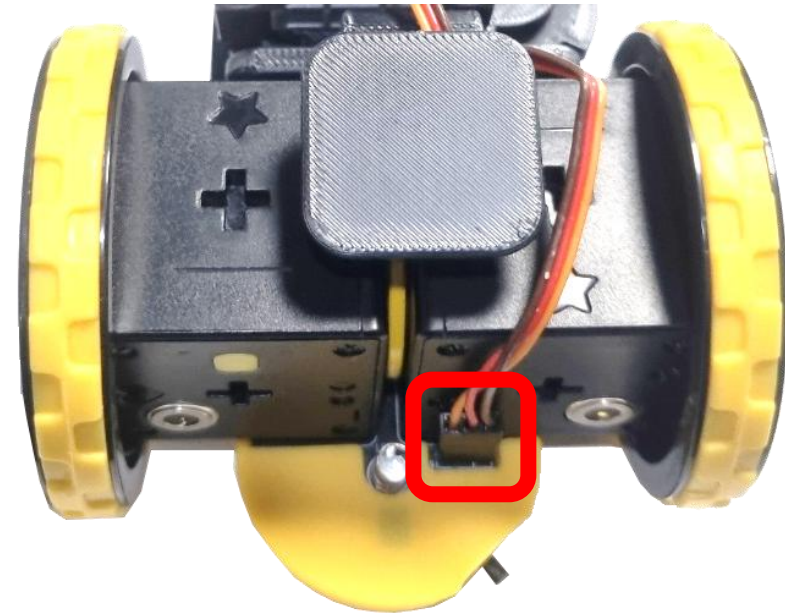
* Assemble two wheels to complete.

<Gripper bot Assembly>



Gripper Assembly

* Assemble the gripper and attach it on top of the BrailleBot.



Connect RC servo motor

* Connect the servo motor to the Braille board.
* Insert it so that the orange wire faces inward.

<Color rules>

Start and ignore
near next color

- * Hold on 0.5sec and start
- * Ignore the near next color

Gripper close

- * Go forward → close → go backward → U turn

Gripper open

- * Go forward → open → go backward → U turn

Left turn

- * Left turn

Right turn

- * Right turn

U turn

- * U turn

Stop

- * Stop

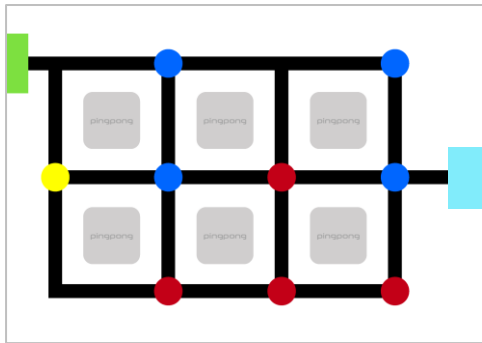
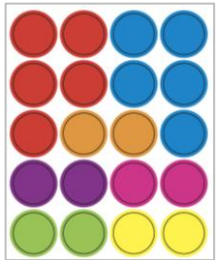
<Color Rules – Unplugged Mode>

BrailleBot RGB color code

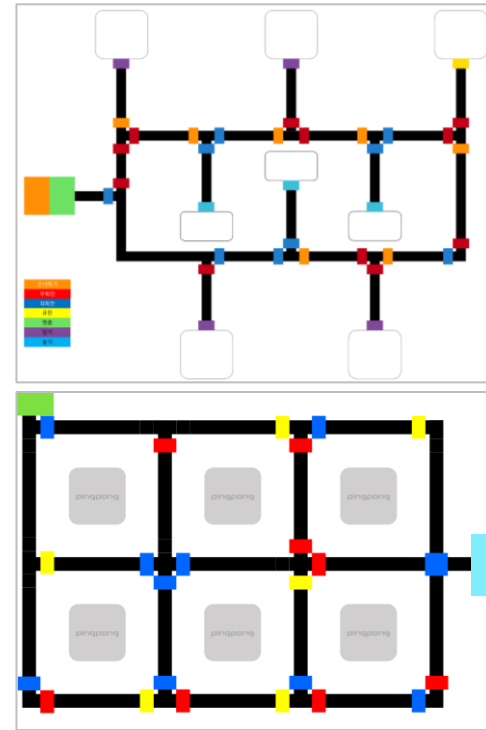
Start & ignore the near next color	# 81ECFB
Right turn	# FF0000
Left turn	# 0066FF
U turn	# FFFF00
Stop	# B4FF00
Gripper open	# FF00FF
Gripper close	# 9600C8

When the sky color is detected, the next color command within 5 cm is ignored.

Types of braille stickers

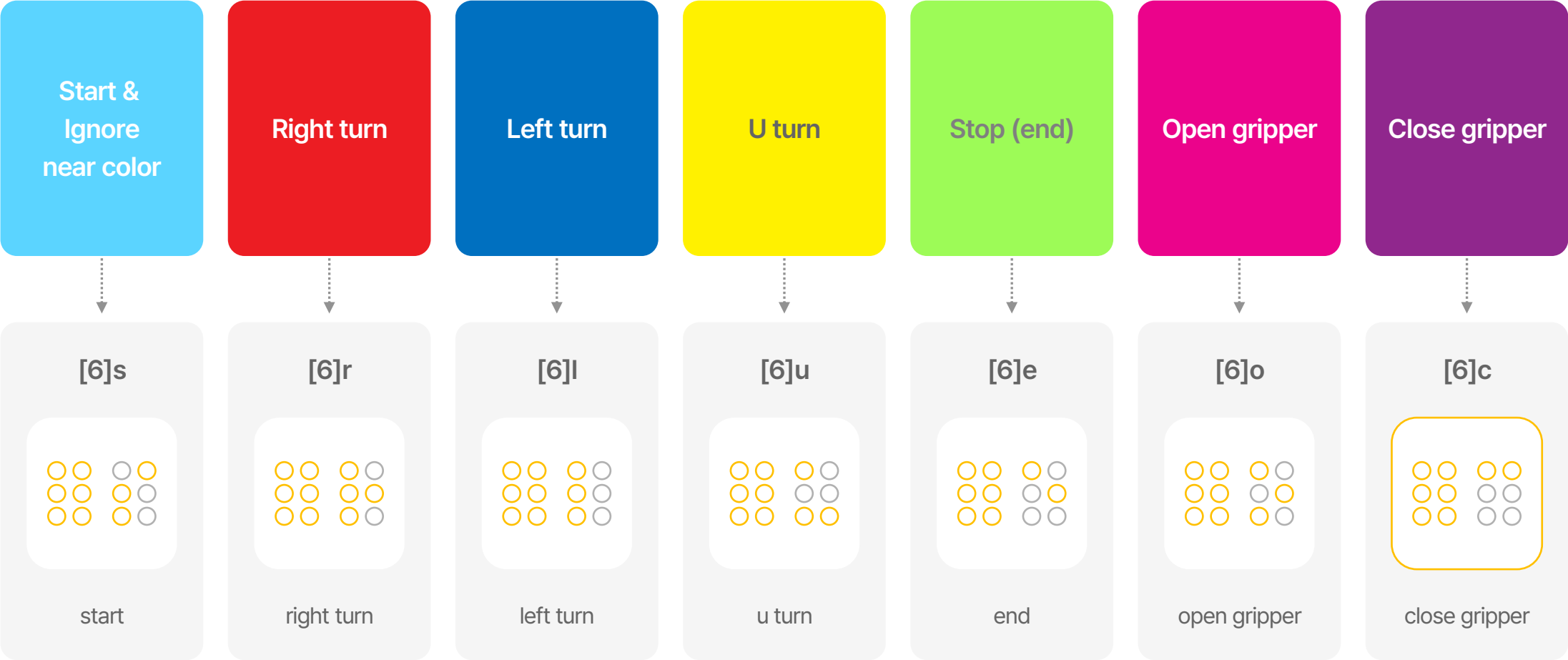


Activities using round stickers



Activities using square stickers

Braille & color matching



Braille map & Braille color coin



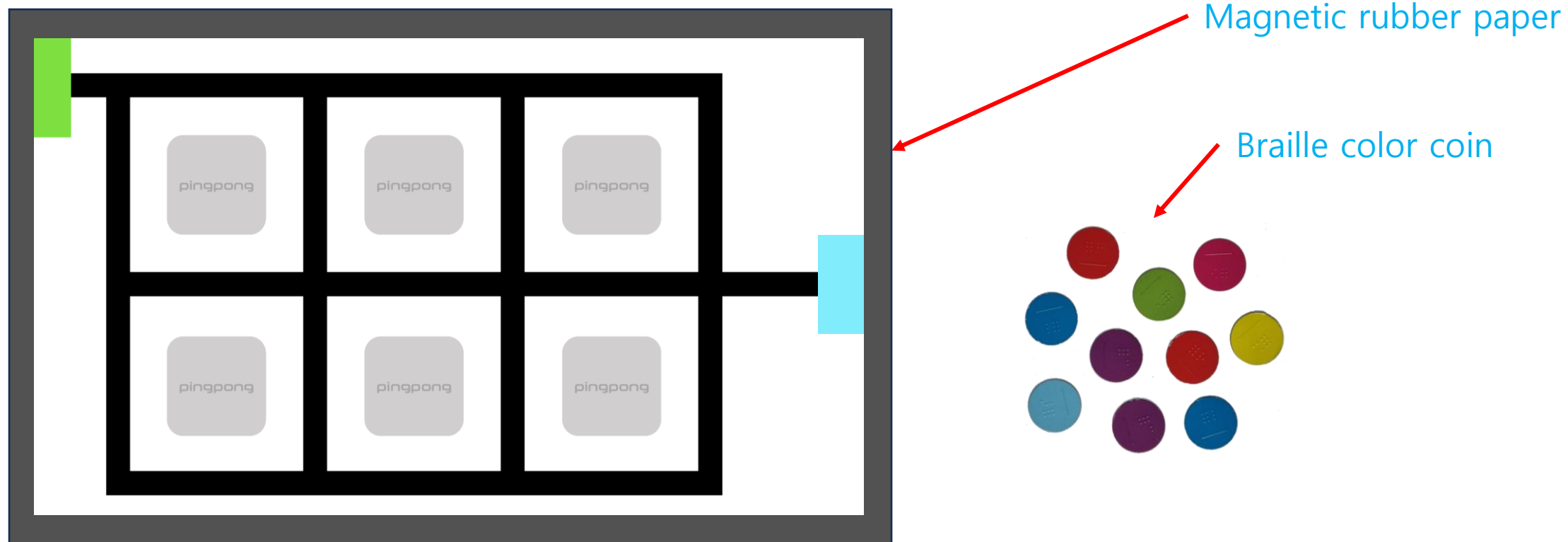
Braille tactile map



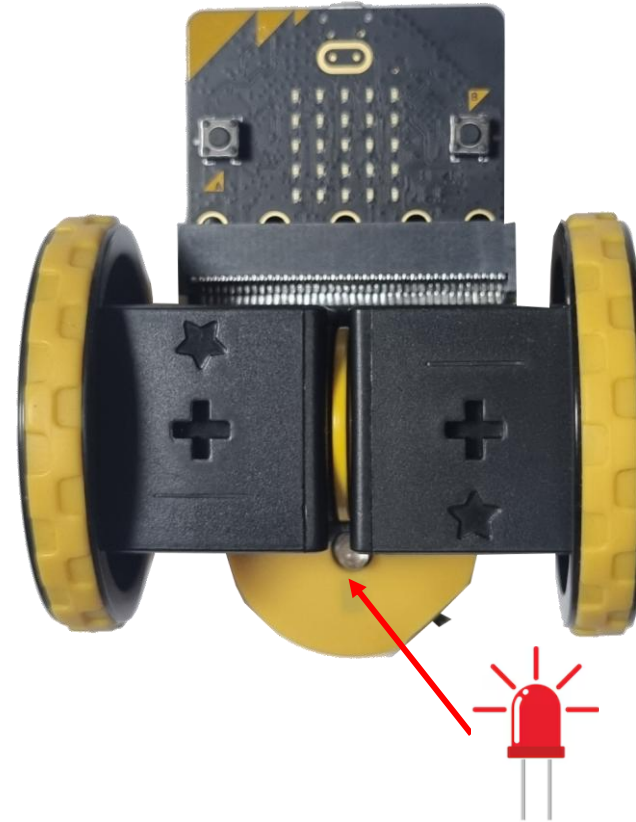
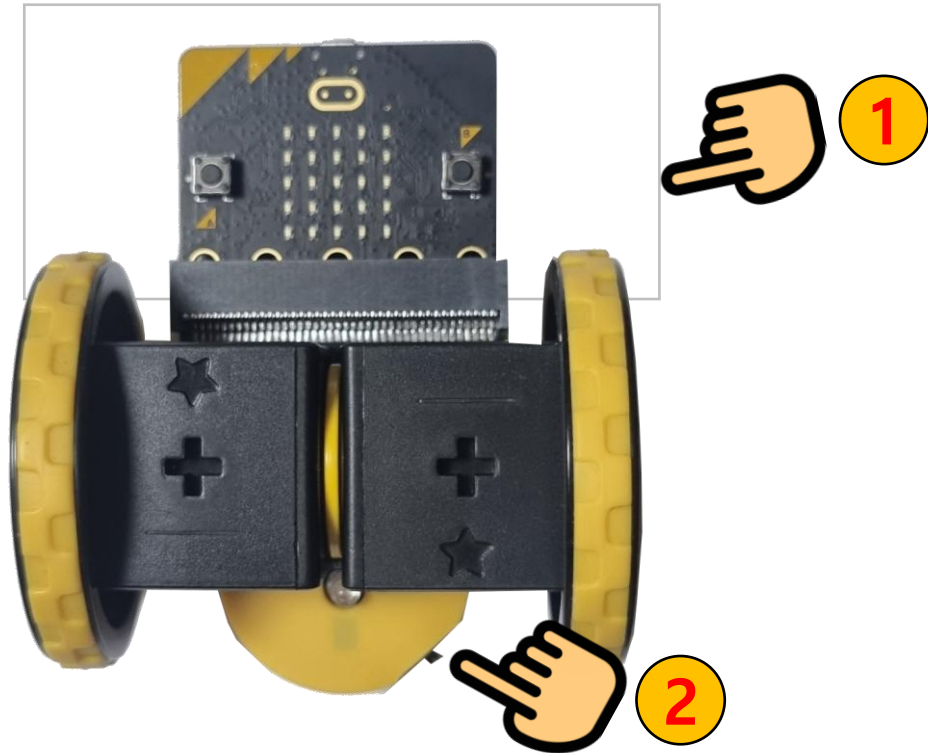
Braille tactile color coin

Braille color coin

If you place the map on magnetic rubber paper, you can use metallic color coins.



<Steps to Turn On and Operate BrailleBot>

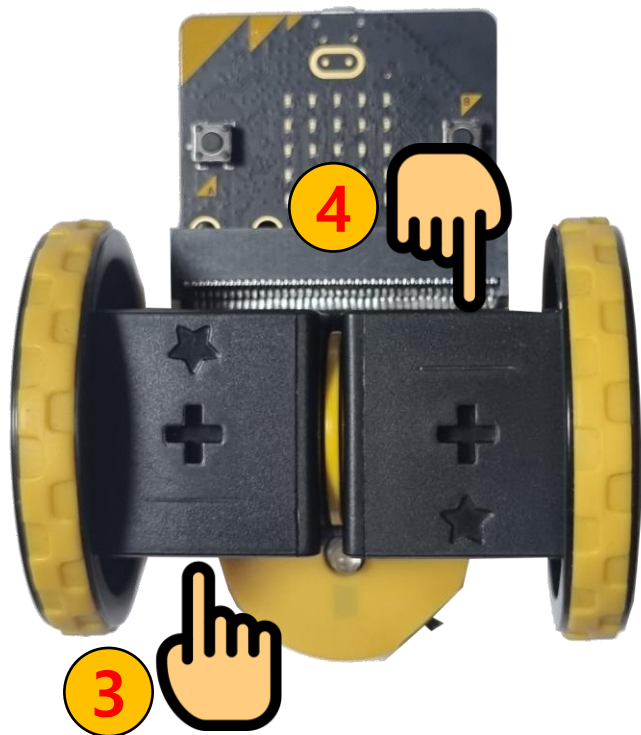


Turn on the board

1. Place the color sensor part of the Braille board on white paper.
2. Turn on the Braille board's power switch.

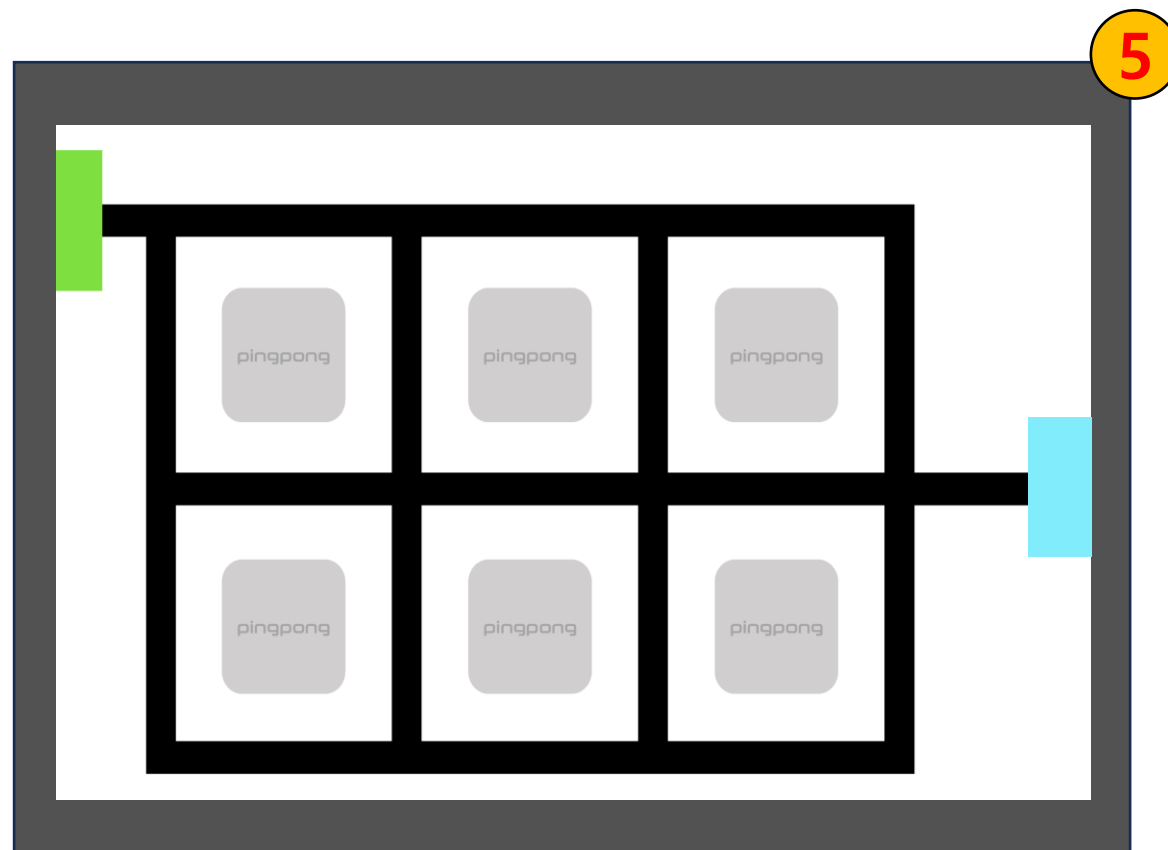
Check white balance

- * After the red LED blinks 3 times
- If calibration succeeds, a short low "Do (C4)" sound plays.
- If calibration fails, a long high "Do (C5)" sound plays.



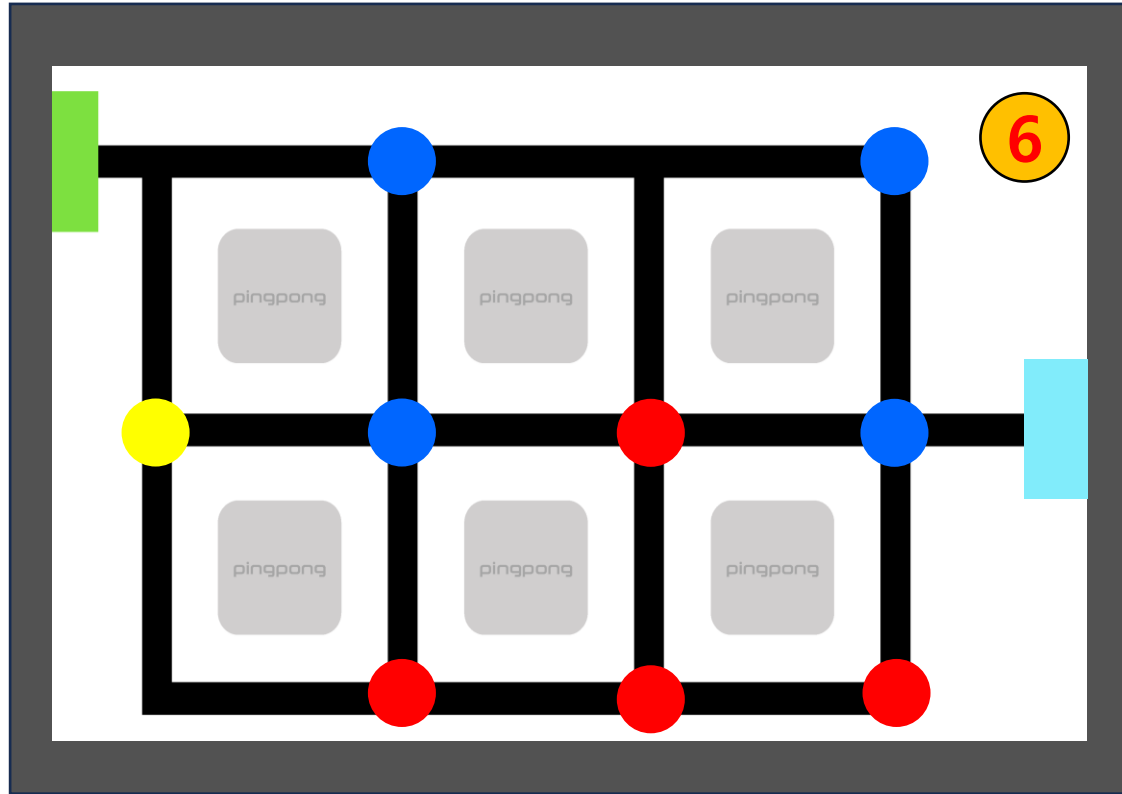
Turn on the board and GCubes

3. Press the power button on GCube #1 once to turn it on.
4. Press the power button on GCube #2 once to turn it on.
- When the two GCubes connect, the Hello melody plays on the micro:bit.



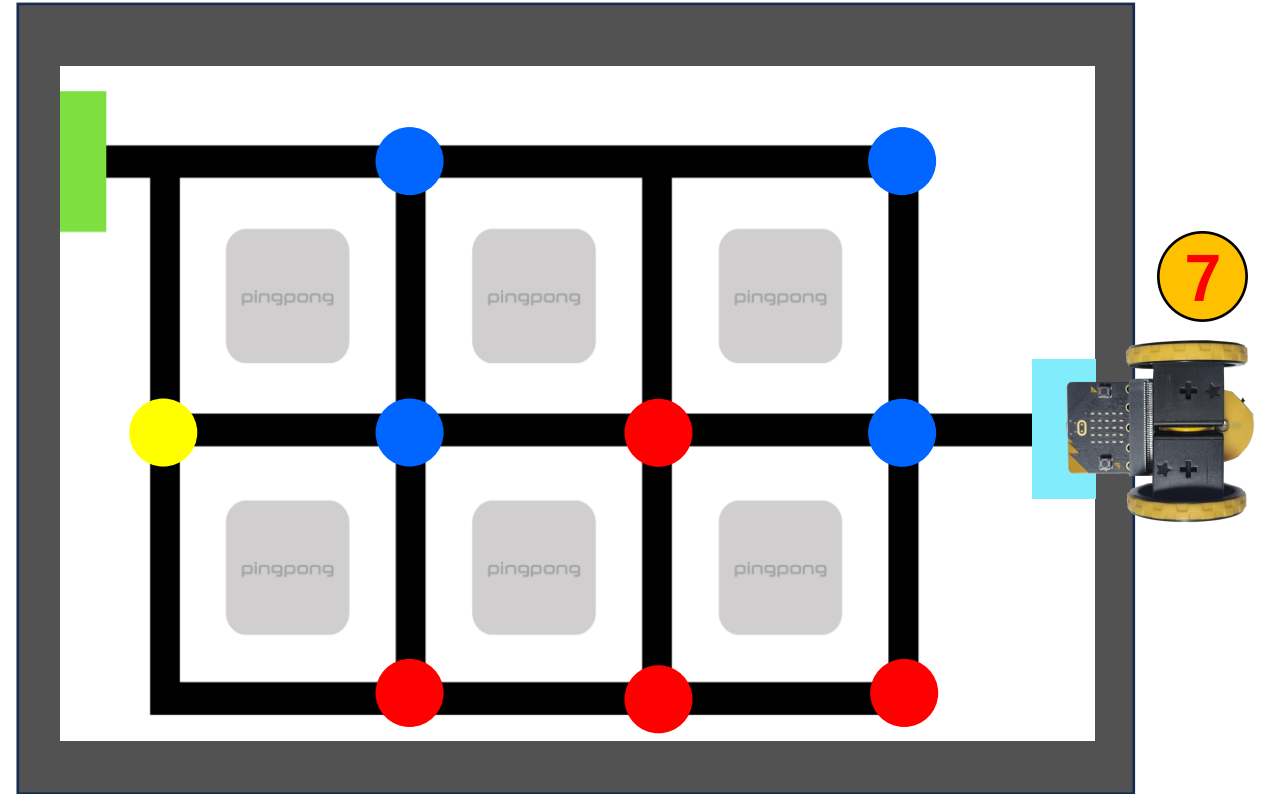
Place the Braille map on the magnetic mat

5. Place the Braille map on the magnetic mat.



Attach color coins to the Braille map

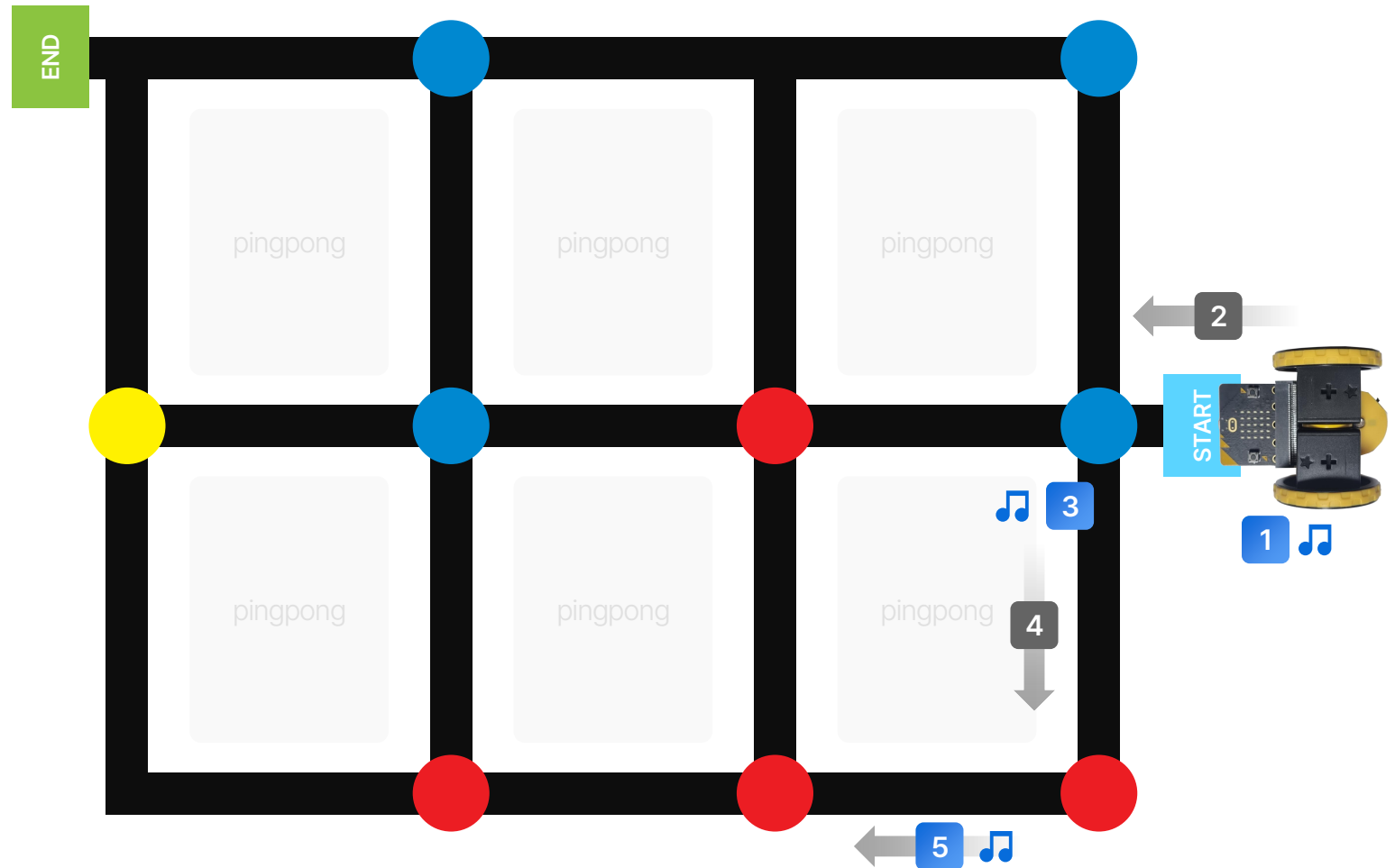
6. Attach the color coin at the desired position on the Braille map.



Place BrailleBot at the starting position

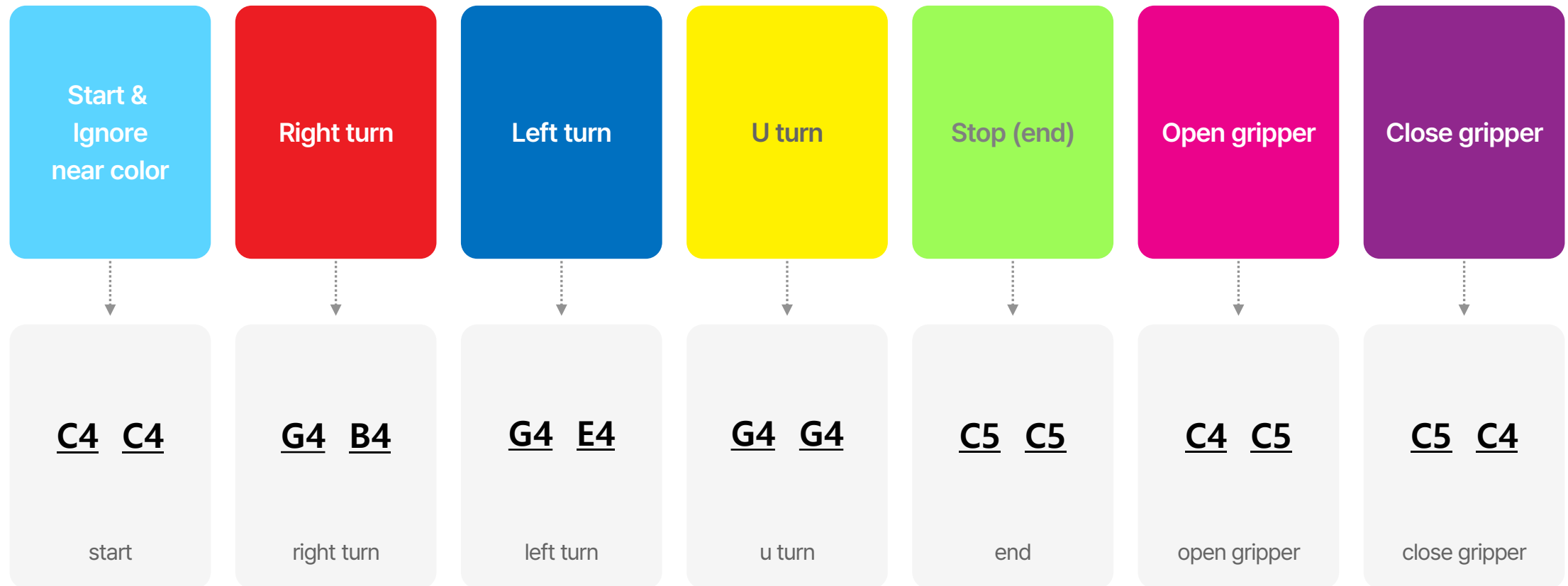
7. Place the color sensor on light blue, and BrailleBot will start.

- 1 Detects the start color and plays the start melody.
- 2 Moves forward and turns left when it detects blue.
- 3 After turning left, it plays a melody indicating the left turn.
- 4 Moves forward and turns right when it detects red.
- 5 After turning right, it plays a melody indicating the right turn.

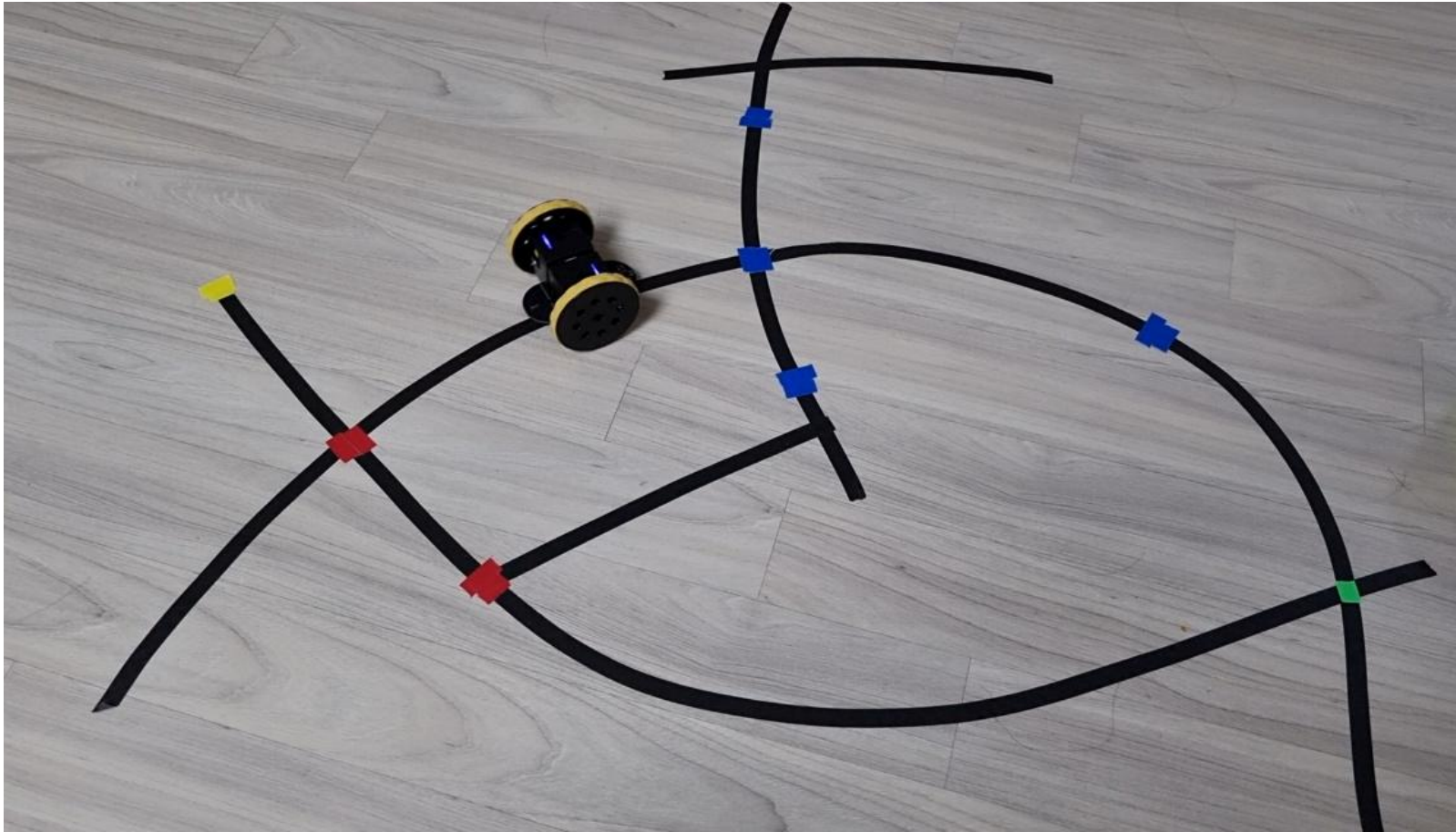


Melody for Braille Bot

Melody & color matching

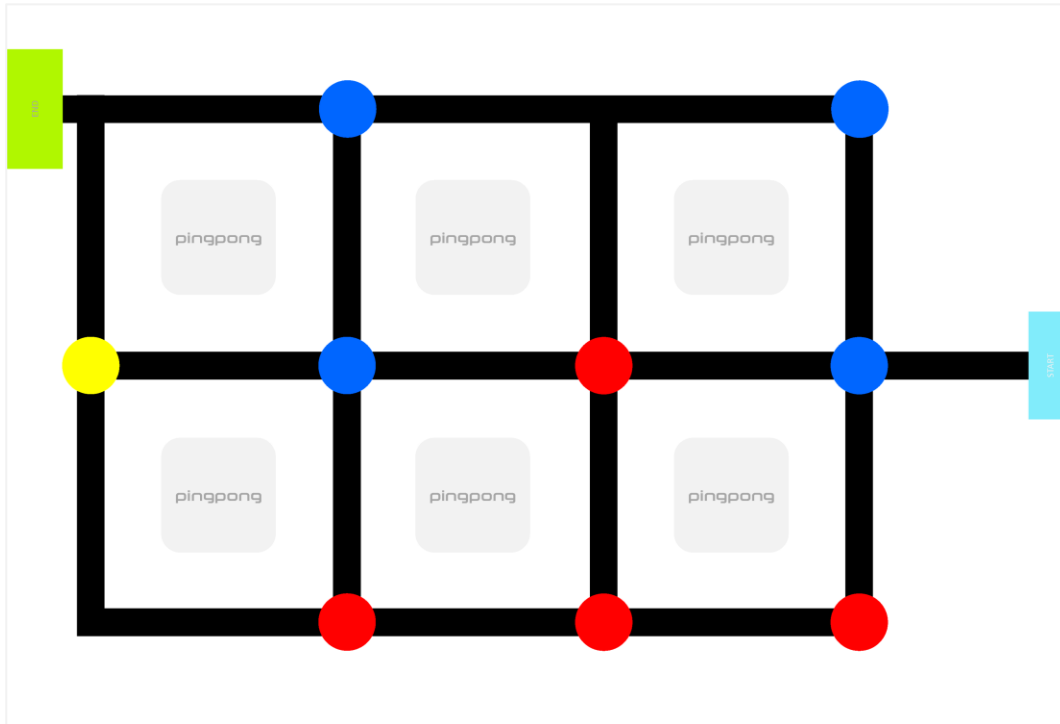


Example #1 - Line Following

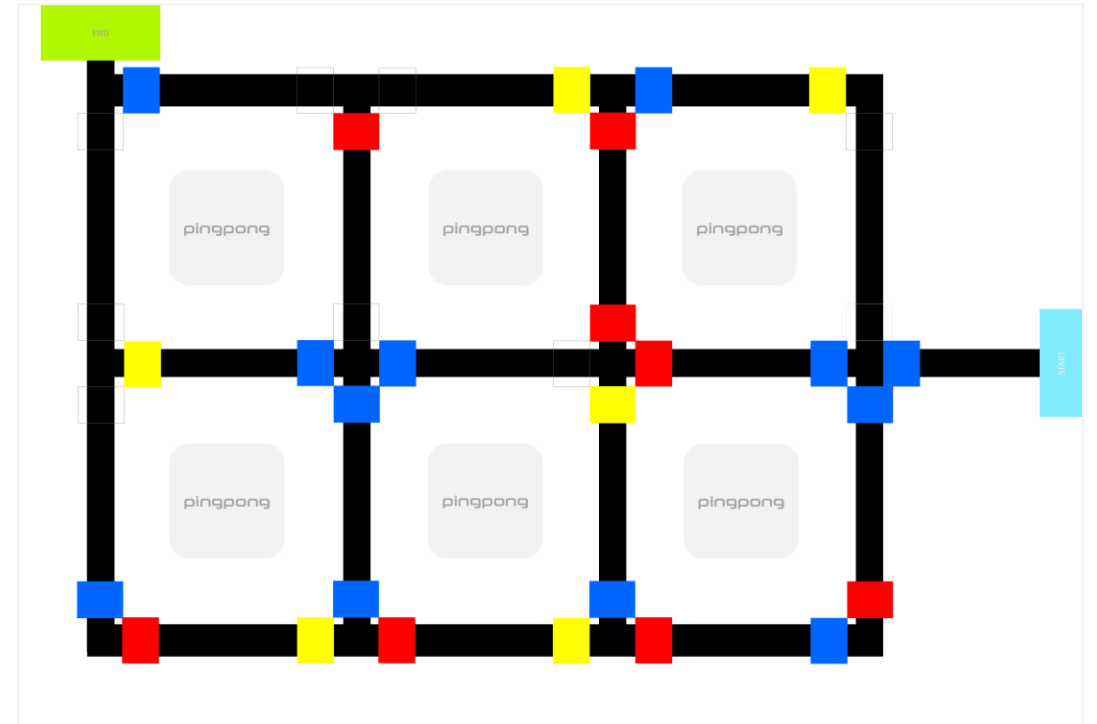


A mission where the robot detects black tape or drawn lines and follows them.

Example #2 - Mission Using Colors



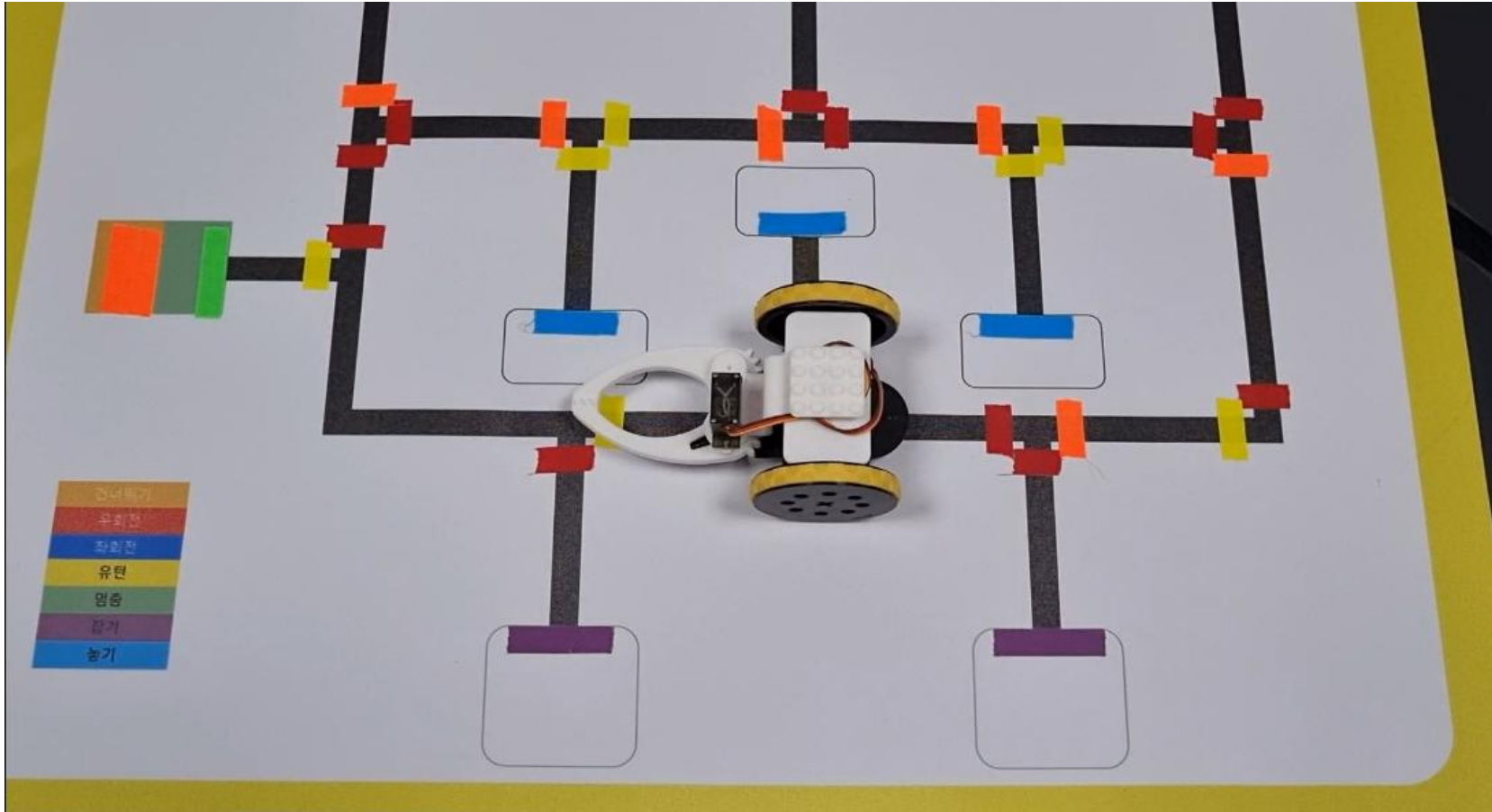
Round type activity map



Square type activity map

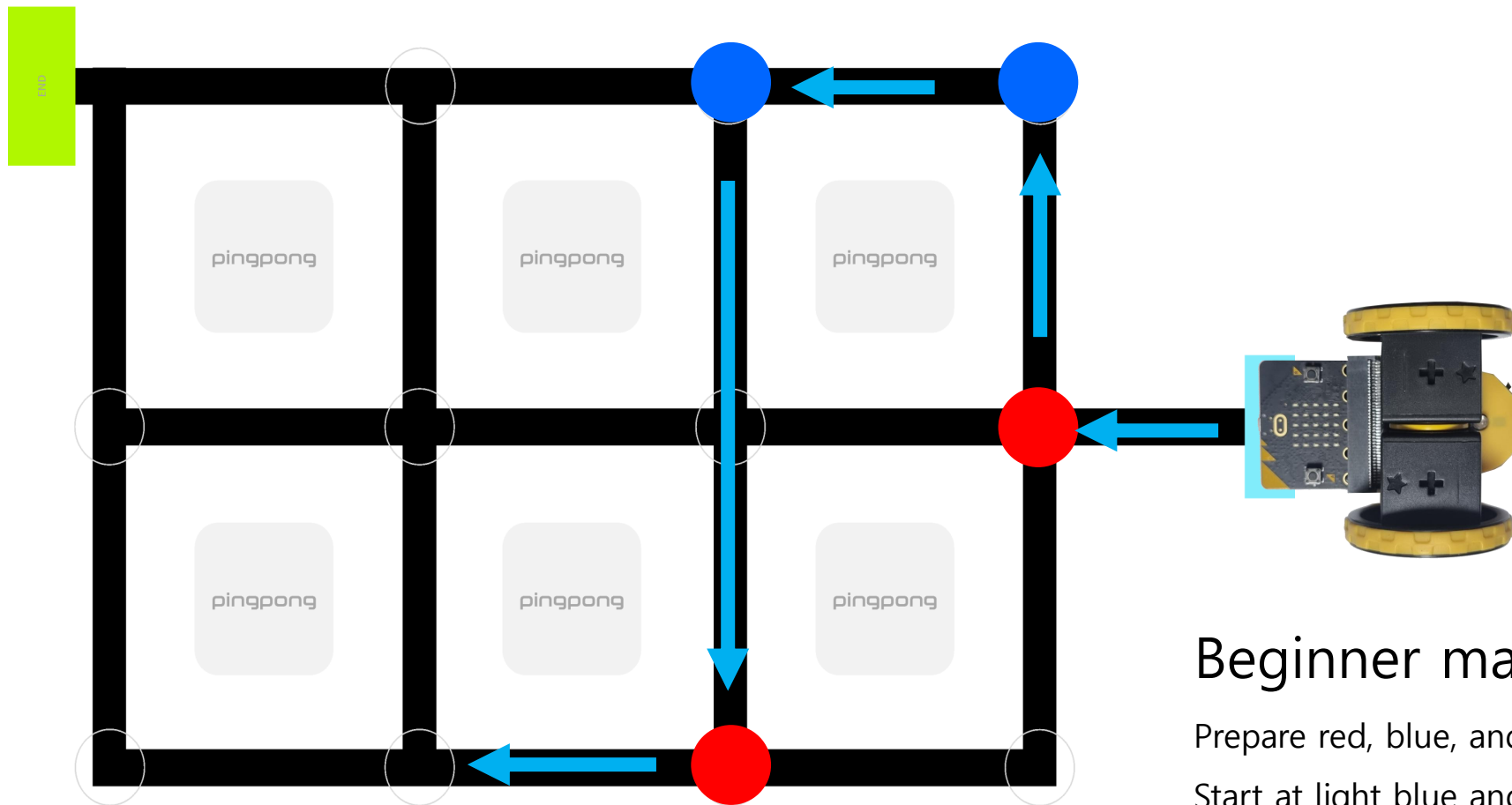
Perform missions by attaching or removing square and round stickers on the map, such as reaching a destination or staying longer in a specific area.

Example #3 – Delivery Mission Using the Gripper



Attach color stickers on the map and use the gripper to move objects to desired locations.

<Placing the round type color coin on the map>



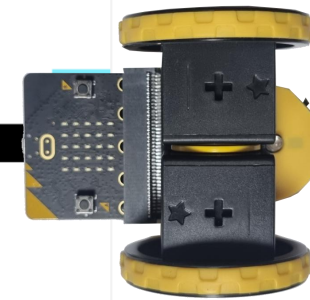
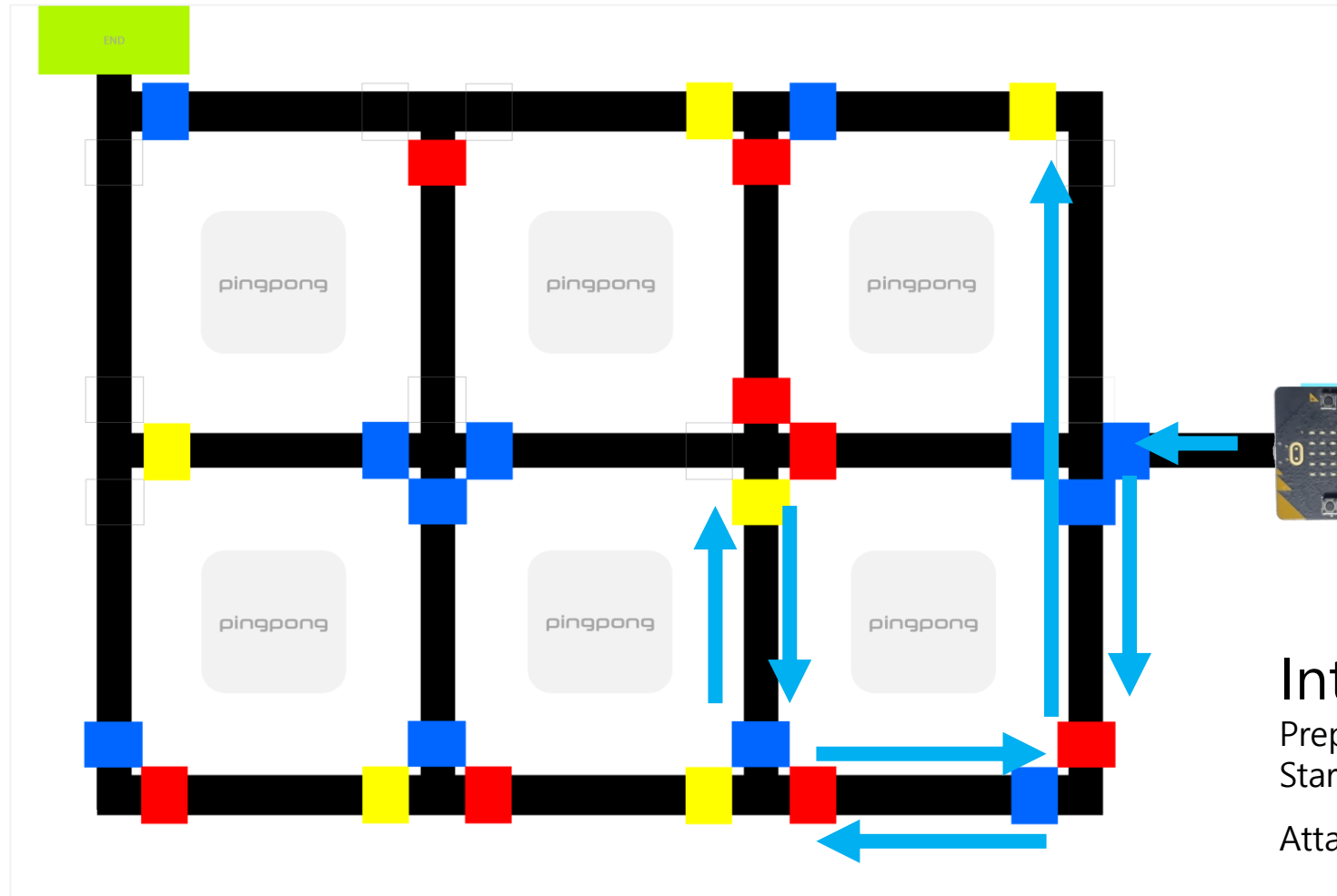
Beginner map mission

Prepare red, blue, and yellow stickers.

Start at light blue and arrive at green.

Attach round stickers according to color rules.

<Placing the square type color coin on the map>



Intermediate map mission

Prepare red, blue, and yellow stickers.
Start at light blue and arrive at green.

Attach square stickers according to color rules.

Free mission

100

pingpong

pingpong

pingpong

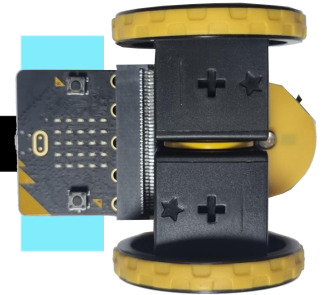
pingpong

pingpong

pingpong

Free mission

Free mission Attach yellow stickers as shown. Start at light blue and reach green by attaching the remaining stickers.



QUIZ



In what order will the robot visit?



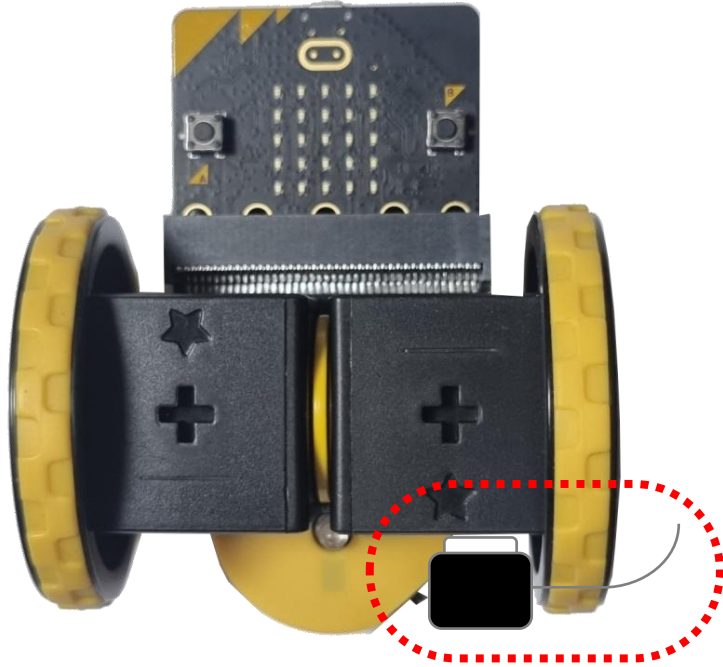
Precautions When Using BrailleBot



Precautions When Using BrailleBot

- After use, always pull the power switch on the front right side of the board backward to turn it off.
- If the robot recognizes blue when placed at the starting point (light blue), hold it briefly until it recognizes light blue, then release it.
- Whenever possible, use the color stickers provided by the manufacturer.

< Charging Method 1: Individual Robot Charging >



1

Attach the charging cable to the back of the right GCube to charge.

*** Since the two GCubes in the BrailleBot are connected via the Braille board, charging one GCube will also charge the other.**

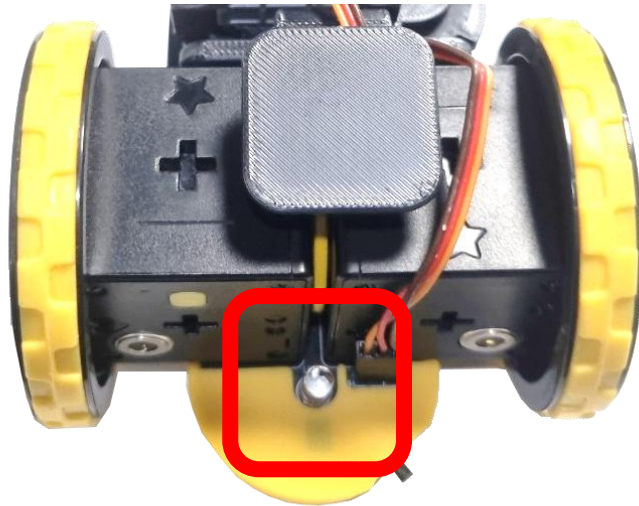
< Charging Method 2: Simultaneous Charging >



- 1 Separate the wheels and Braille board
- 2 Attach the bodies together (magnets attach to each other)
- 3 Attach two magnetic charging cables above and below for charging

- * Dozens of bodies can be connected for simultaneous charging
- * Charging 6 GCubes takes about 1 hour, 60 GCubes about 10 hours

<Detected color display – Read color LED>



Rear color LED

Detected color

Start & Ignore next color
Right turn
Left turn
U turn
Stop
Gripper open
Gripper close



Rear LED color

White
Red
Blue
Yellow
Green
Black
Violet