Microbit Robotics Beginner Level 1

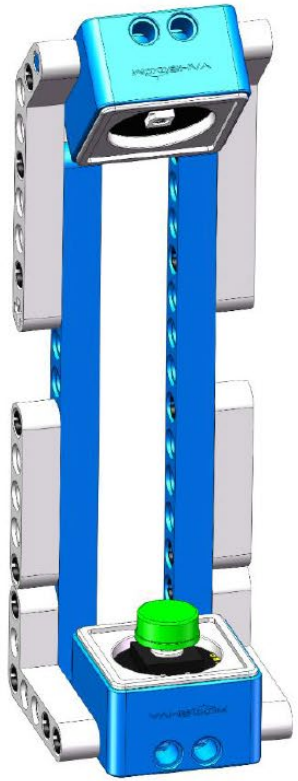
Lesson 5

Rocker Control & Emergency Light

Presented by Advanced Superlogic Team

Review previous lesson

Step 9



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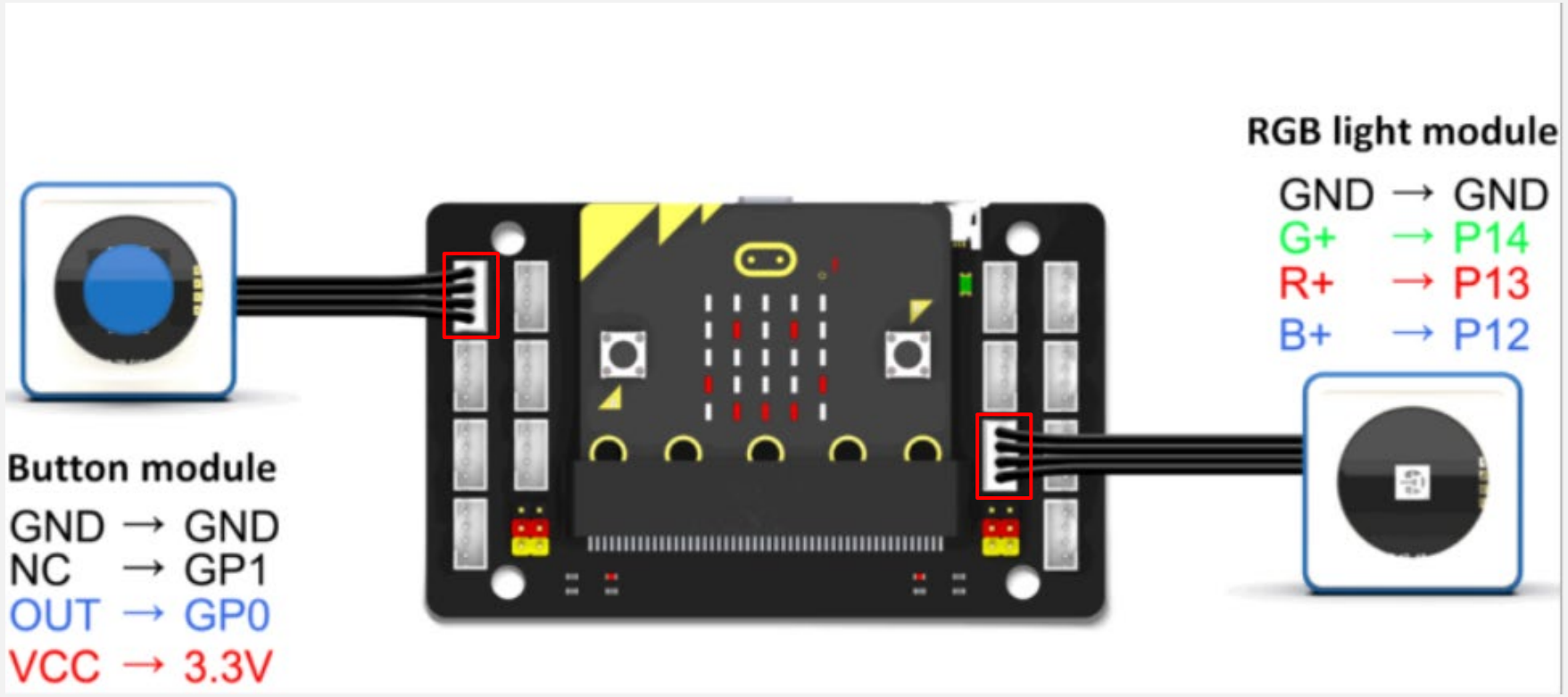
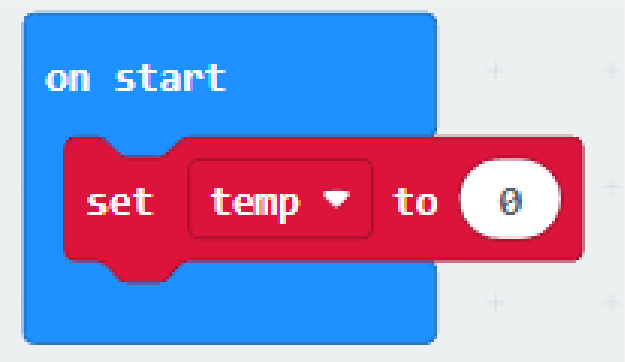
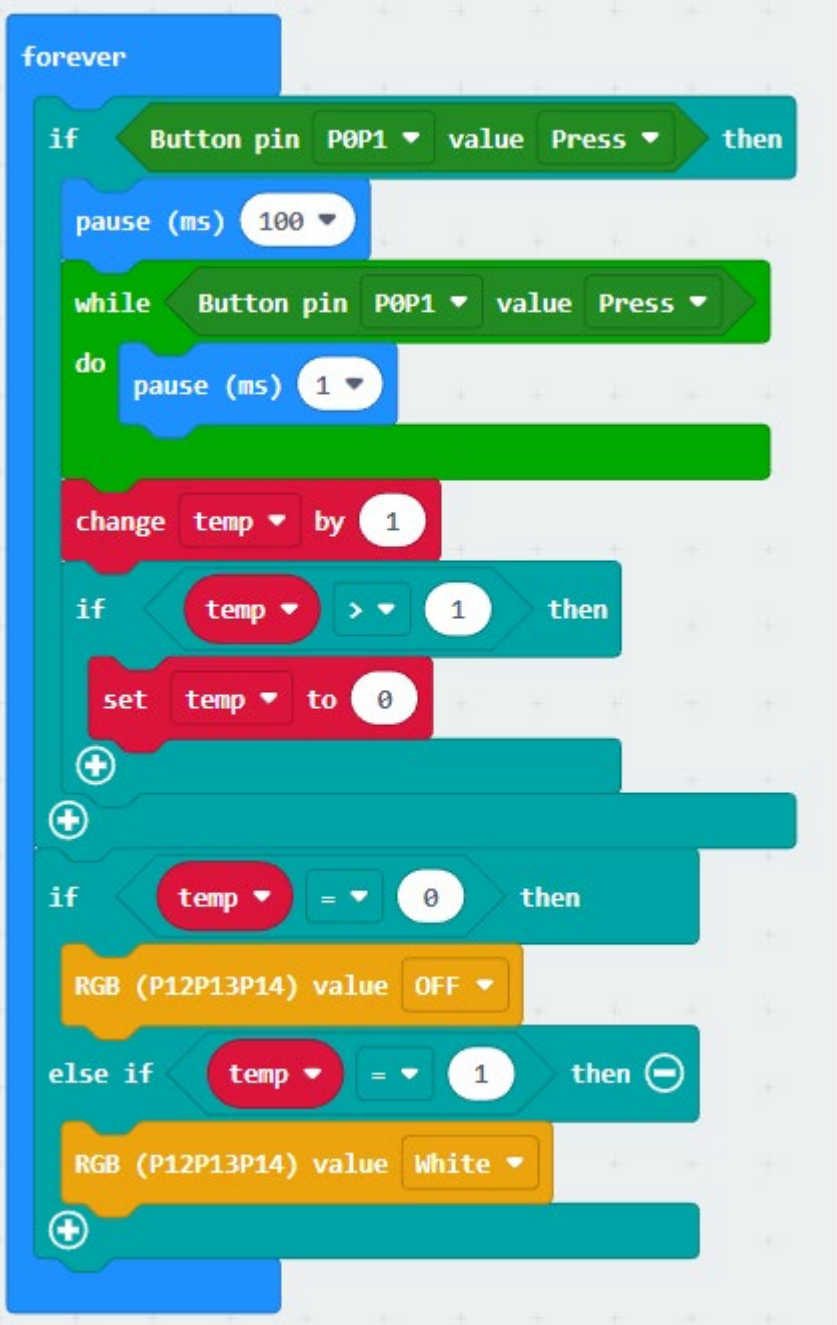
Connect the modules



Let's connect the module like this.

Combine Blocks





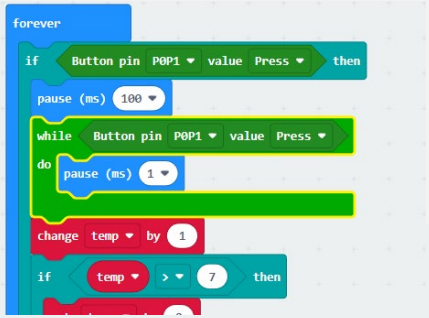
L4 –

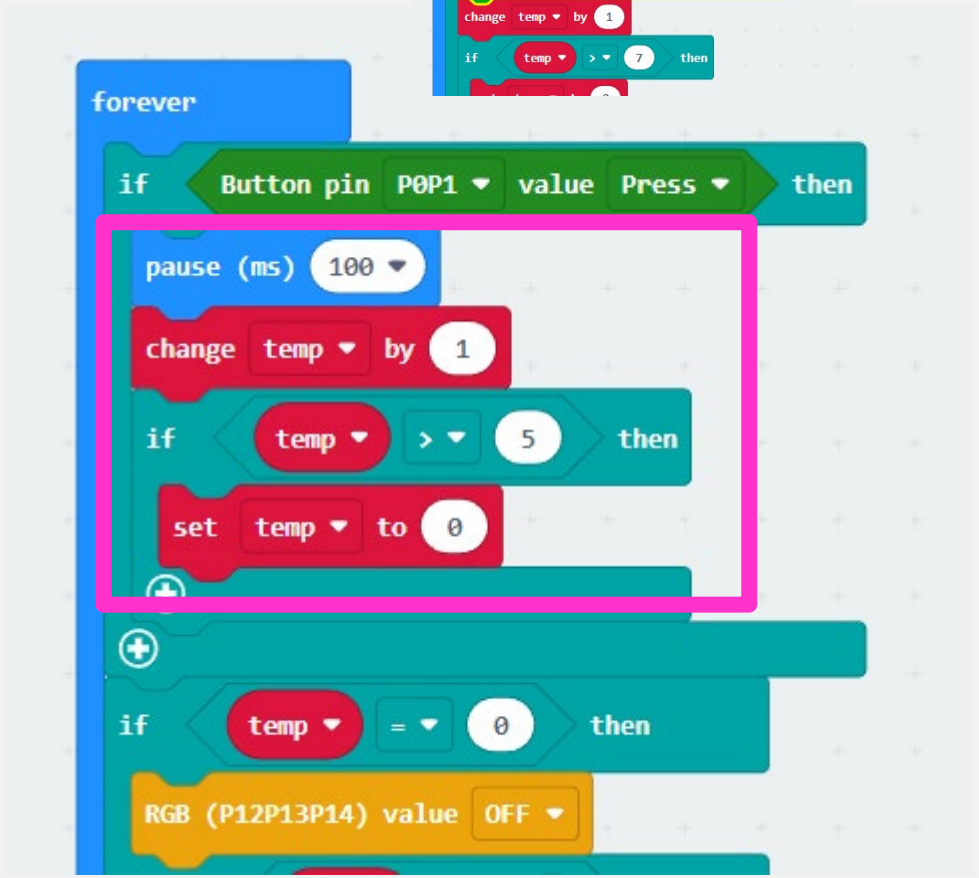
Make the table lamp behaves like below:

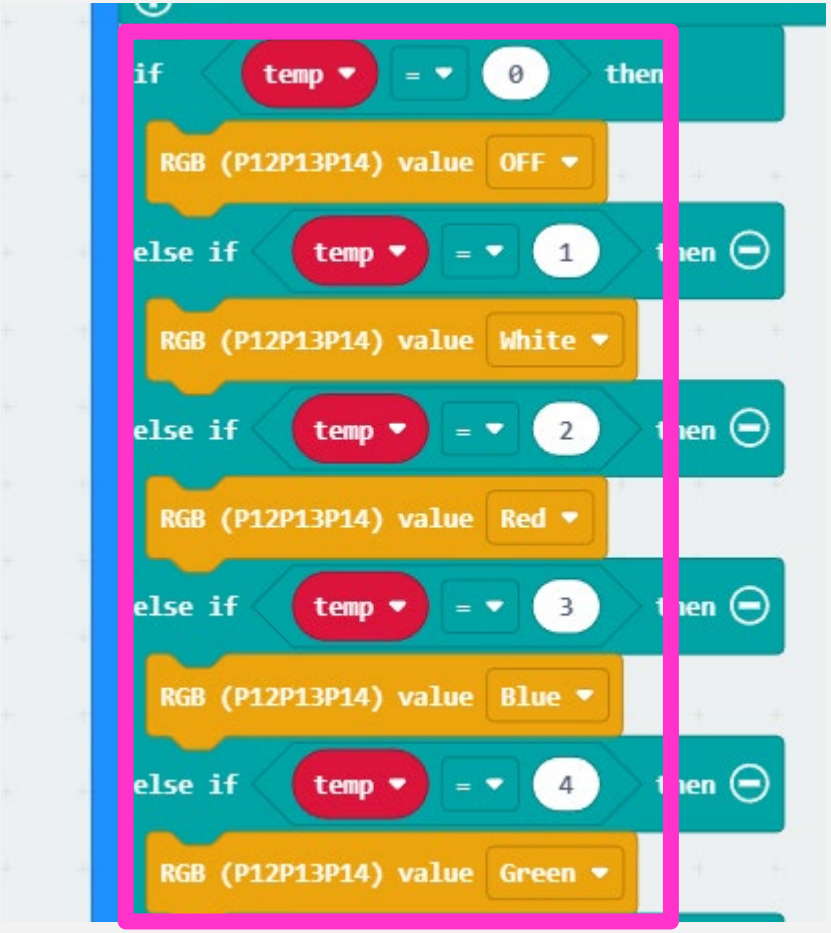
After the program is downloaded successfully.
When we press button module at the first time, RGB light will become white;
when we press button module at the second time, RGB light will become red;
when we press button module at the third time, RGB light will become blue;
when we press button module at the fourth time, RGB light will become green;
when we press button module at the fifth time, RGB light will off;

Condition: If we don't release the button, the light will always keep changing (blink with 100 milliseconds)

Answers







Do a quick self-check of your learning outcome...

1. How to make a toggle switch button to switch on the RGB light?
2. What is a variable?
3. What is the difference between “set variable” to and “change variable by”?
4. How to use conditional (if then else) for different RGB state?

Today's Topic

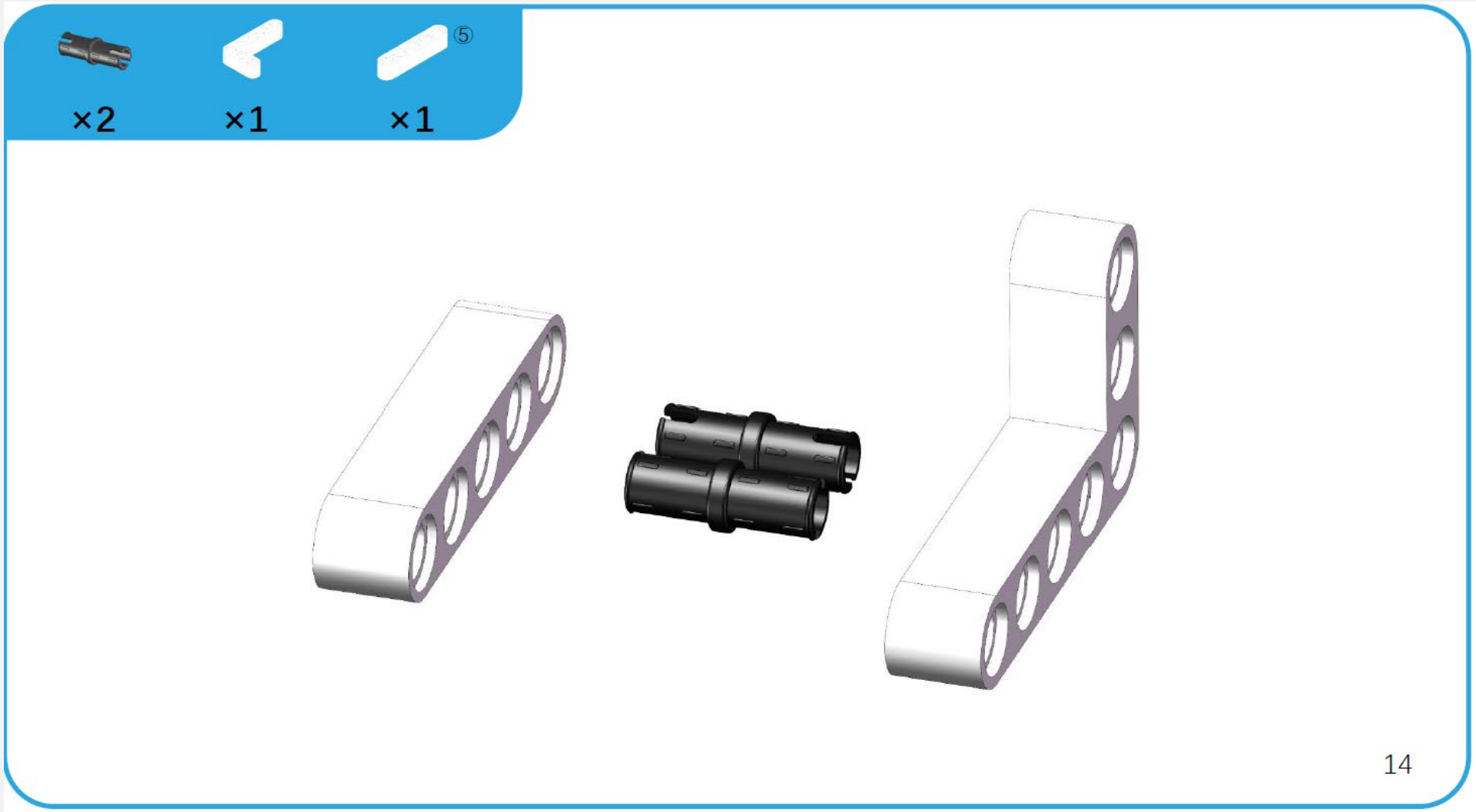
1. Build Rocker Control Light with World of Modules
2. Rocker and RGB module connection method
3. Rocker Programming
4. RGB Light Programming

Learning Outcome

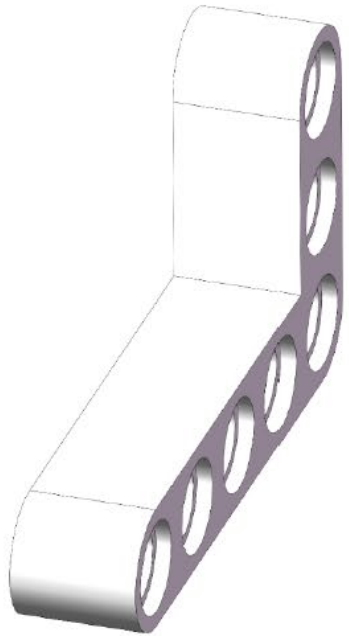
1. Able to build Rocker control light with instruction manual
2. Understand how Rocker programming work
3. Able to program the lamp switching light color with rocker module
4. Able to program photosensitive with RGB

Rocker Control Light

Step 1



Step 2



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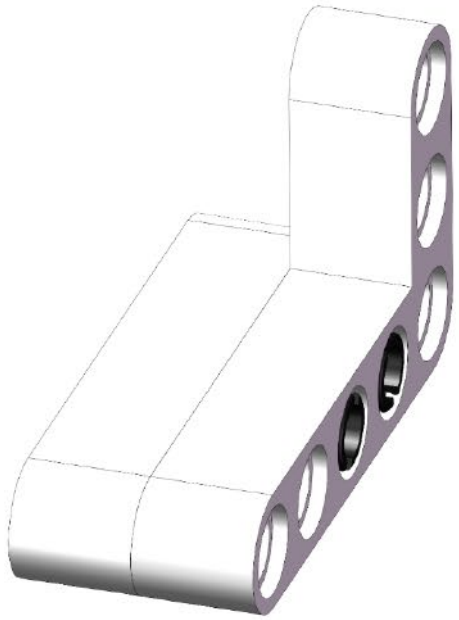
Step 3



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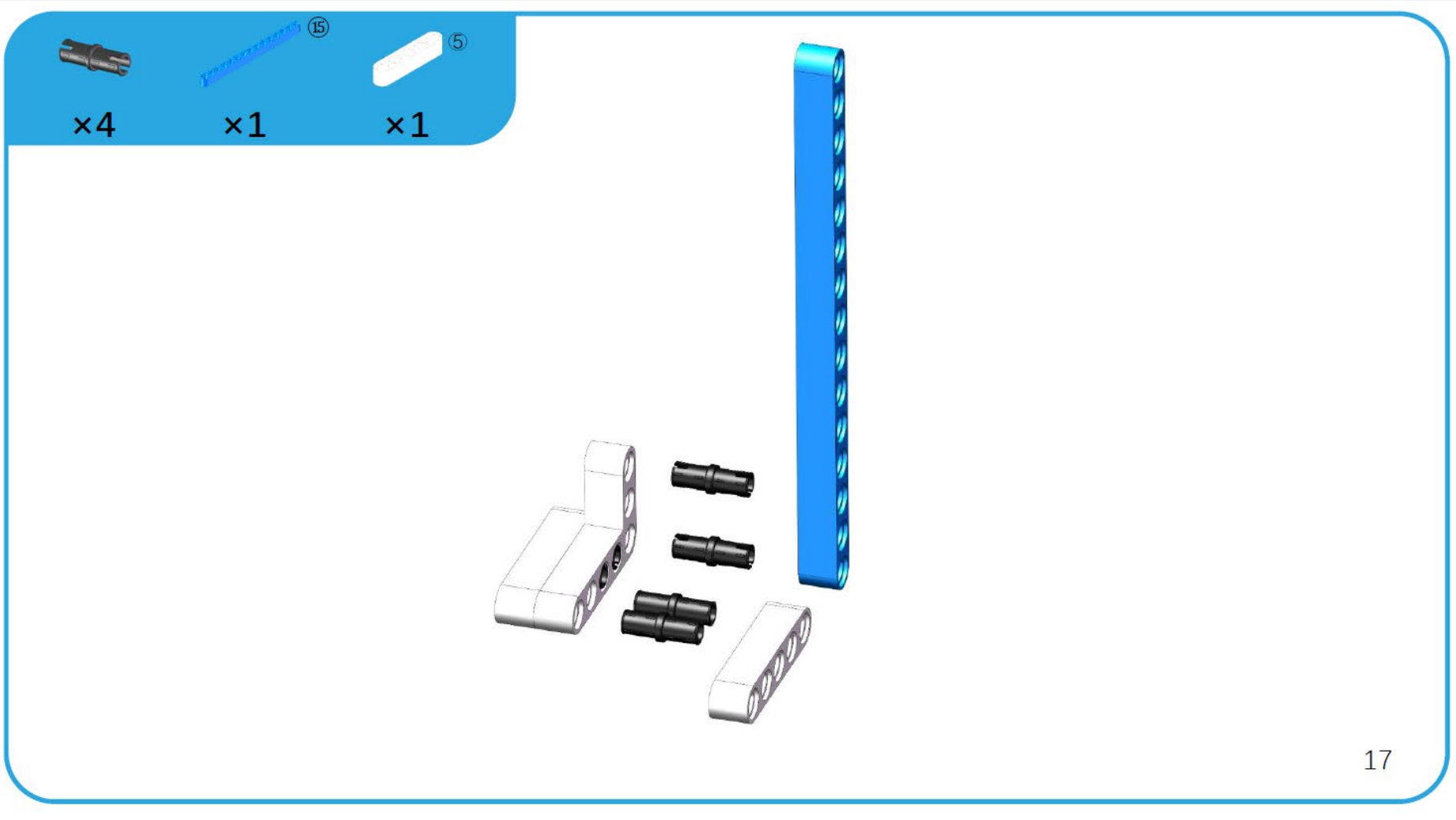
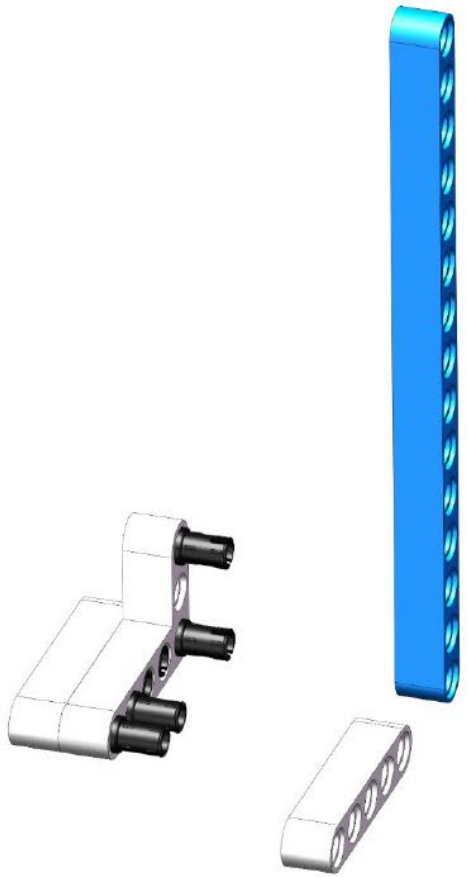
Step 4



Step 5



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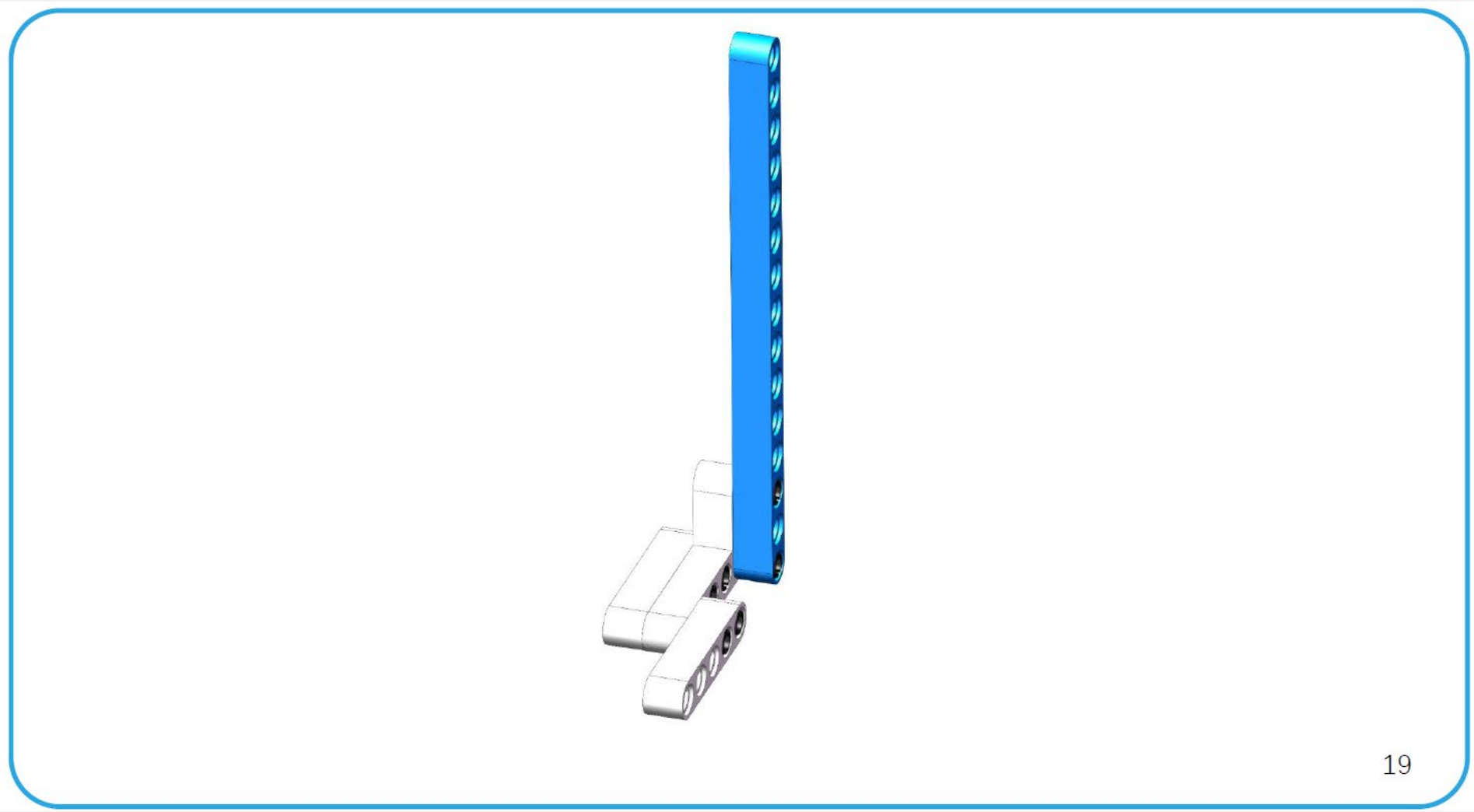
Step 6



Step 7

Step 8

Step 9

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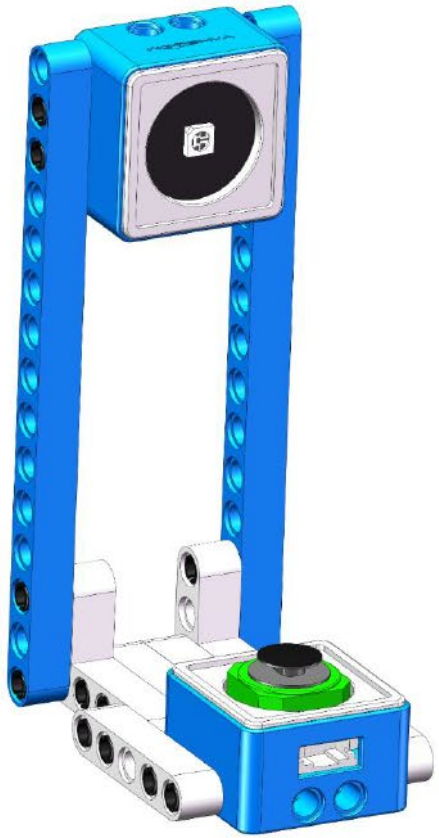
Step 10



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Wire Connection

Connect the modules

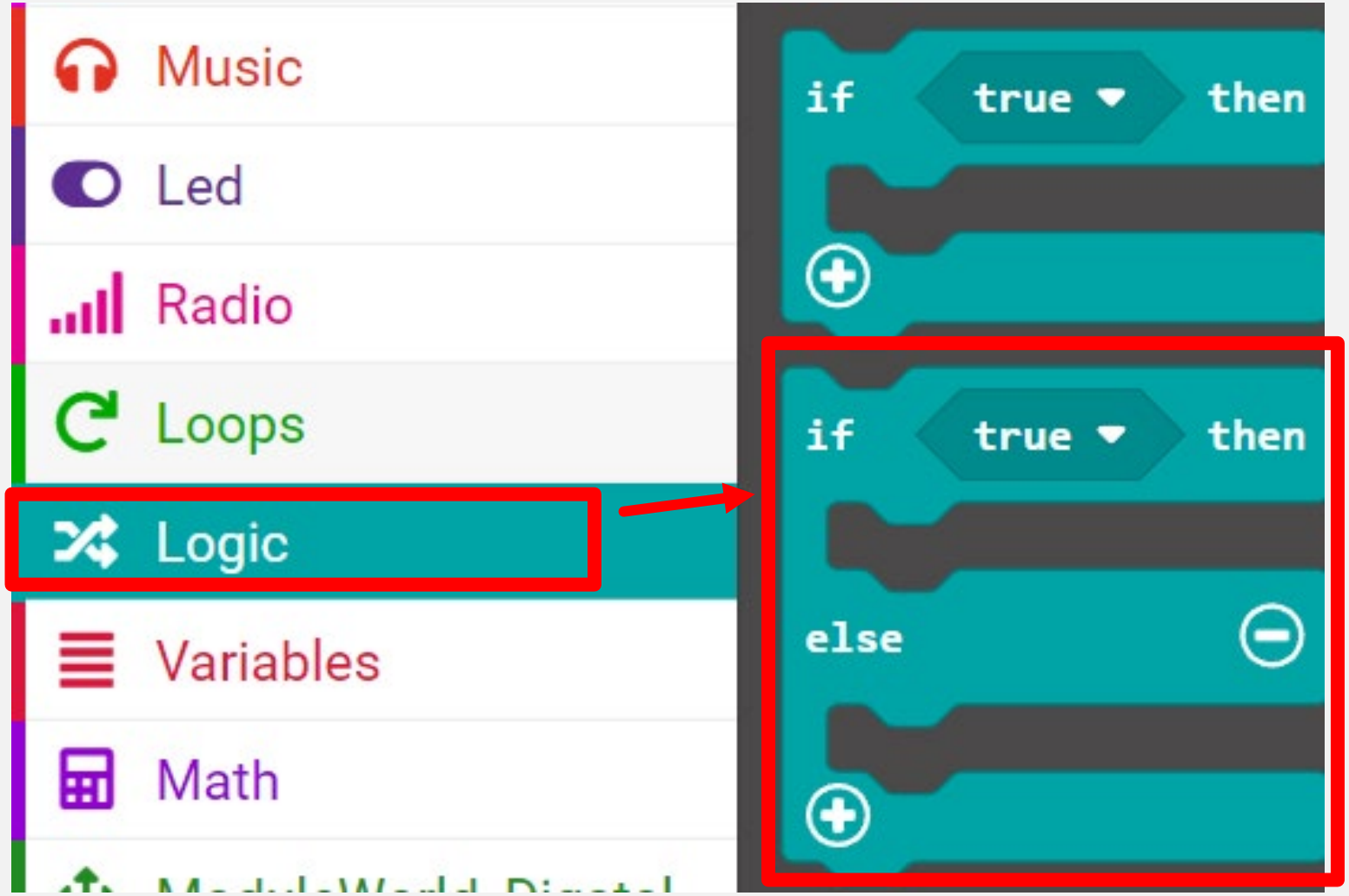
Let's connect the module like this.

MakeCode Programming

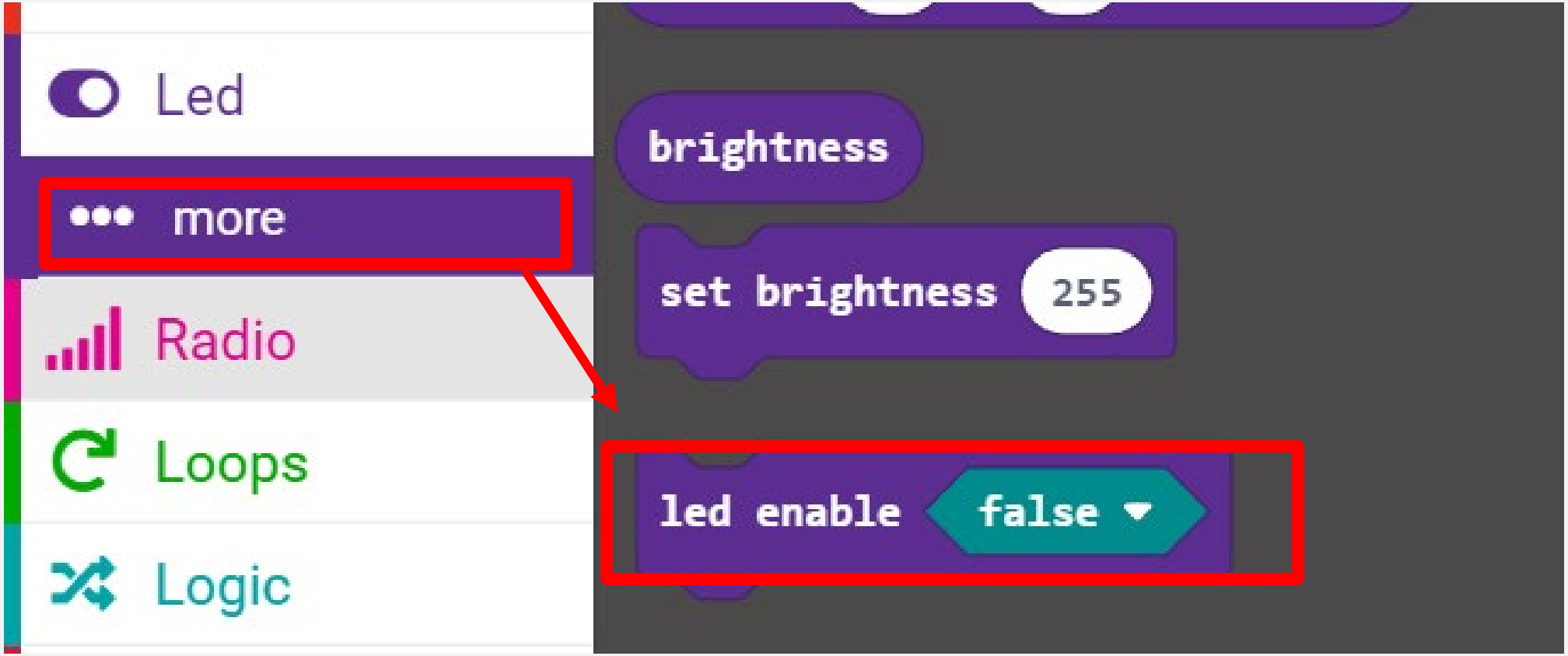
https://github.com/YahboomTechnology/Module-World.

Or search YahboomTechnology/Module-World in the extension block

Coding - Logic

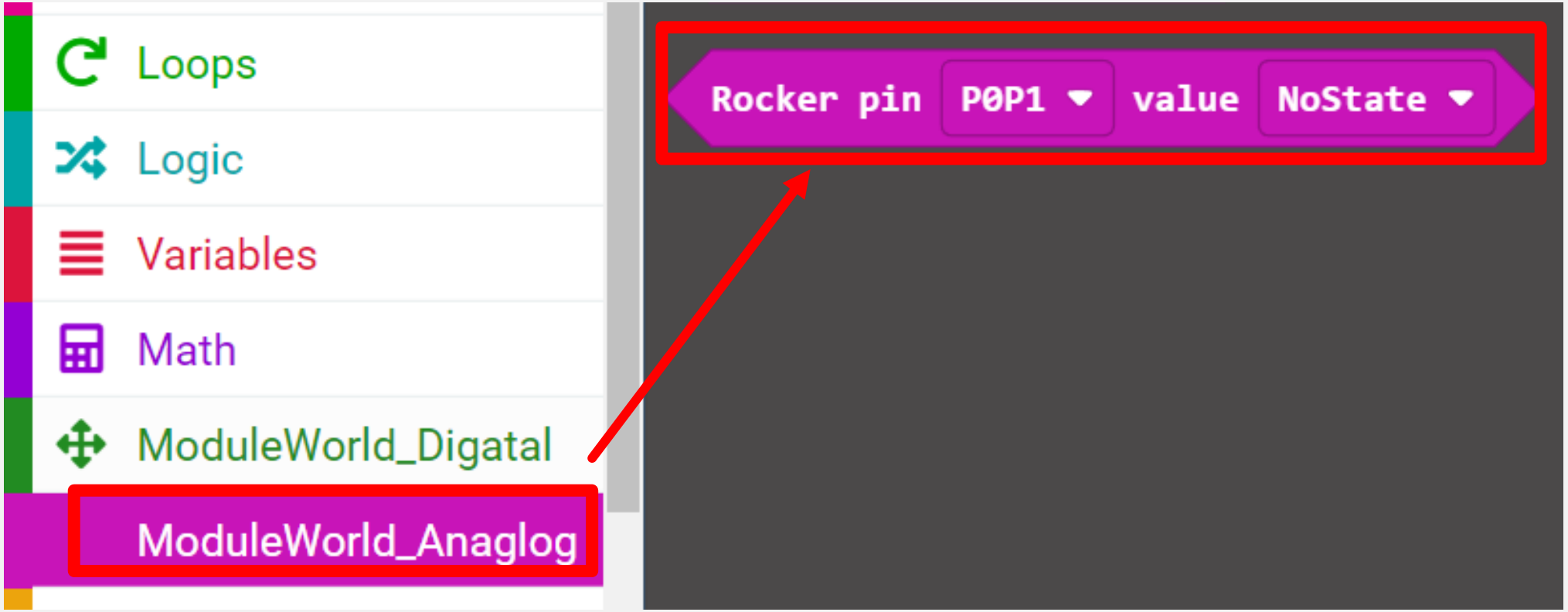


Coding – LED, … more

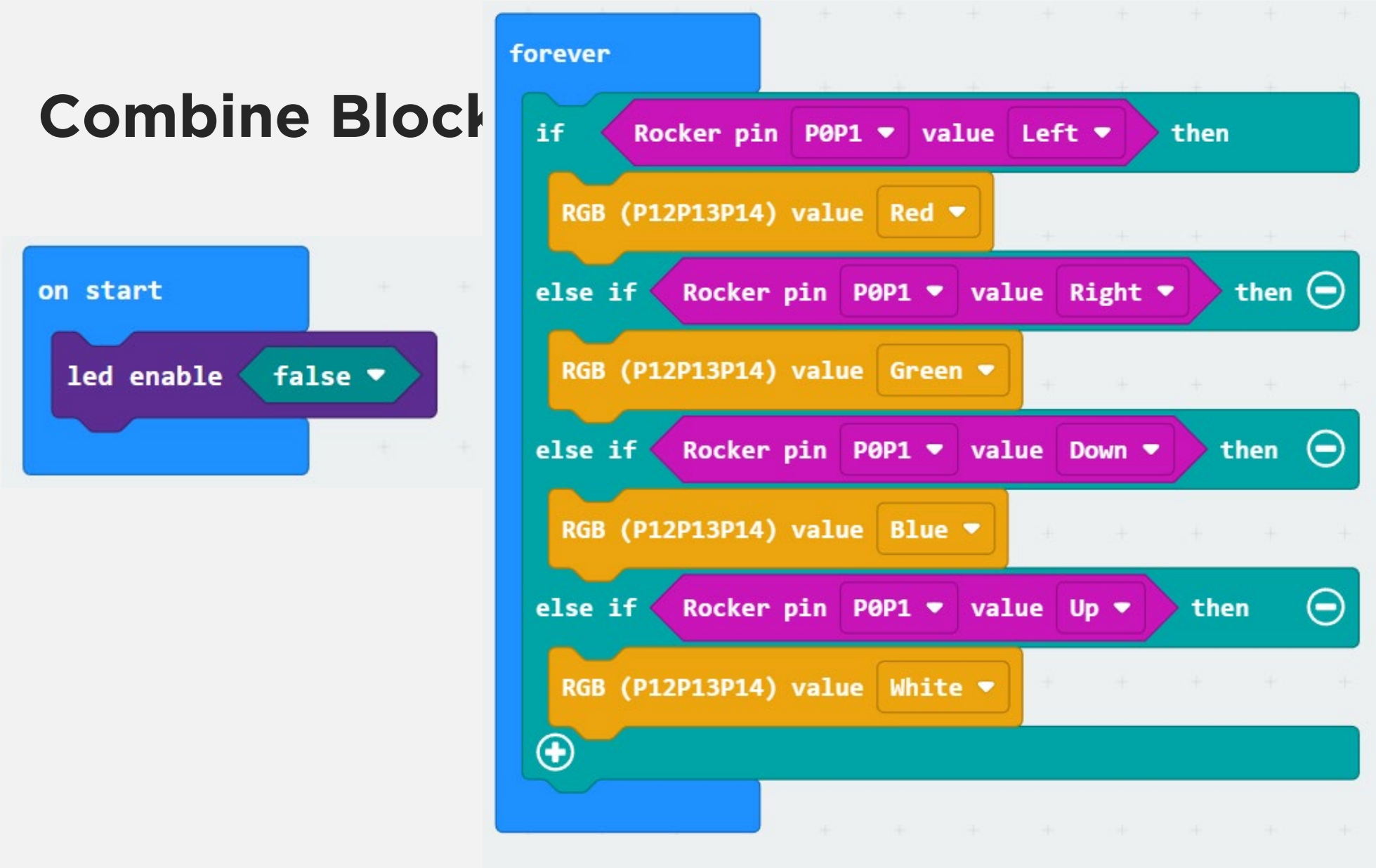


Coding – ModuleWorld_PWM

Coding - ModuleWorld_Anaglog



Combine Block



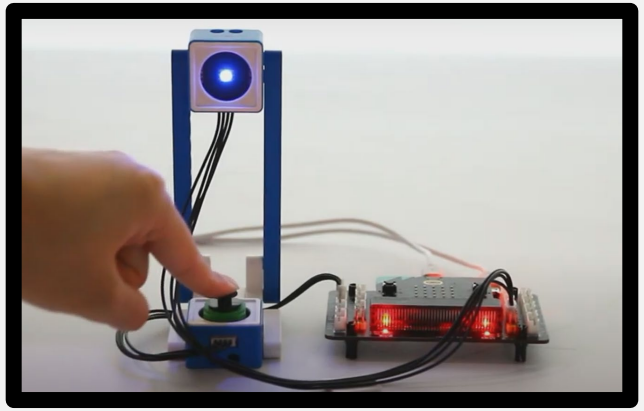
Phenomenon

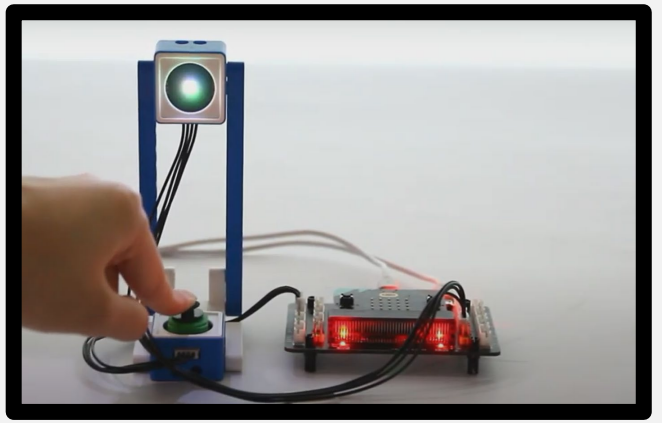
After the program is downloaded successfully.
We can control the RGB light by shaking the rocker. If the rocker moves to the left-most in the X direction, the RGB light become red;

If the rocker moves to the right-most in the X direction, the RGB light become green;

If the rocker moves to the up-most in the Y direction, the RGB light become blue;

If the rocker moves to the down-most in the Y direction, the RGB light become white.





Emergency Light

Step 1

Step 2

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Step 3

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Step 4

Step 5

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Step 6

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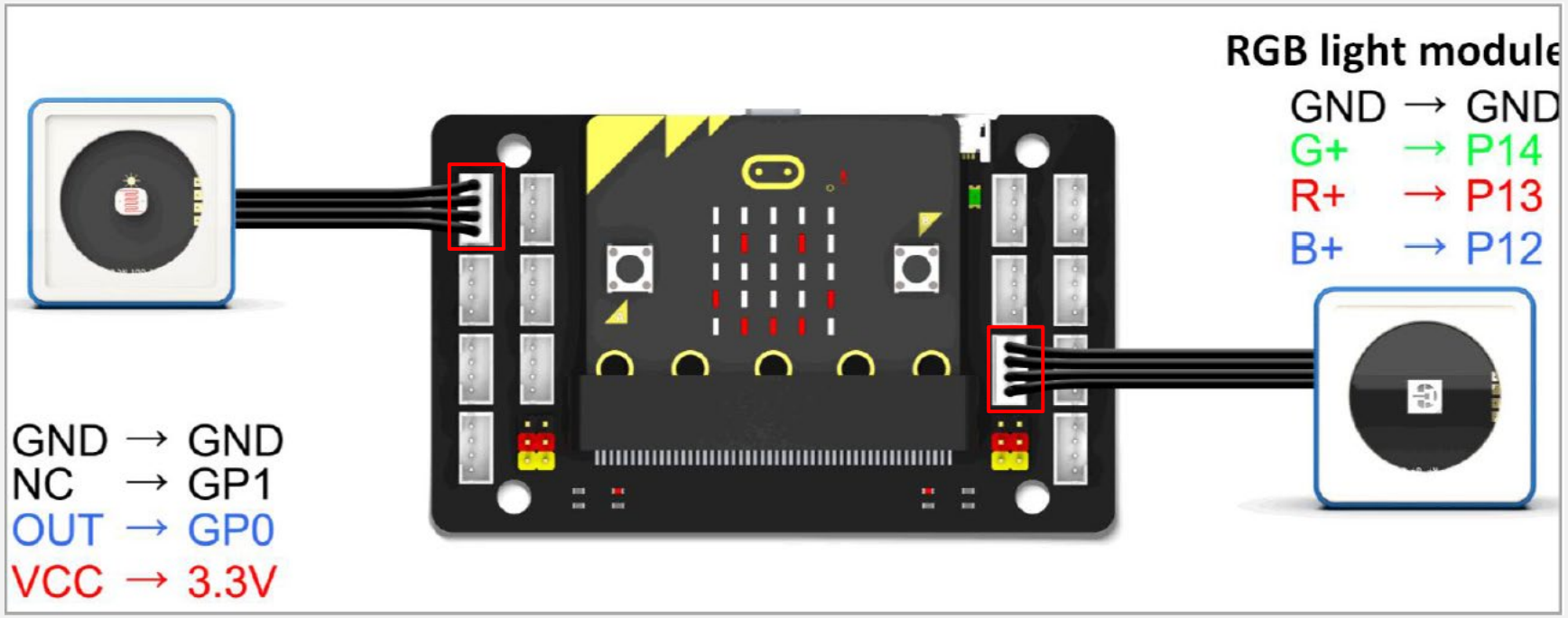
Wire Connection

Connect the modules



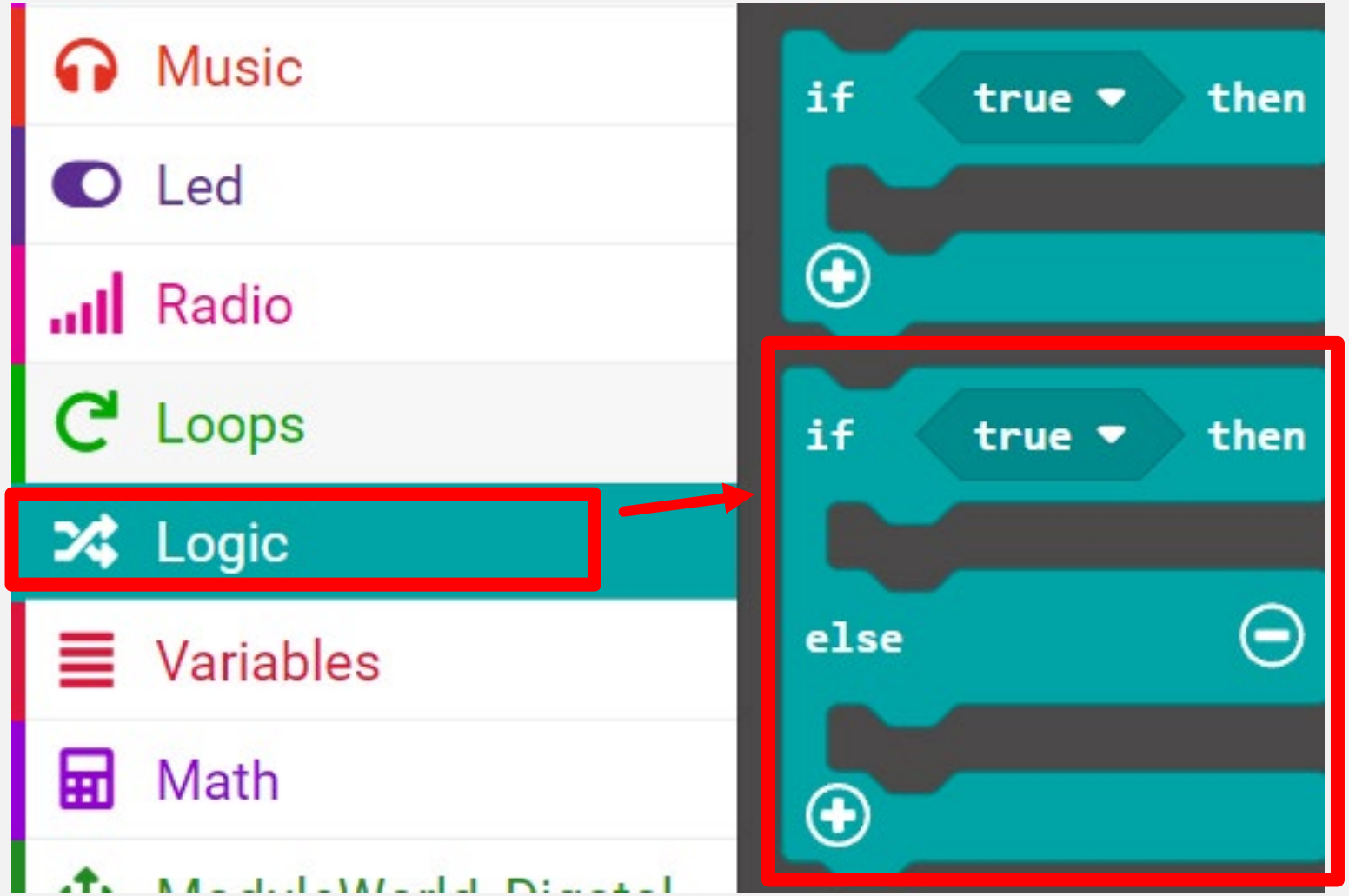
Let's connect the module like this.

MakeCode Programming

https://github.com/YahboomTechnology/Module-World.

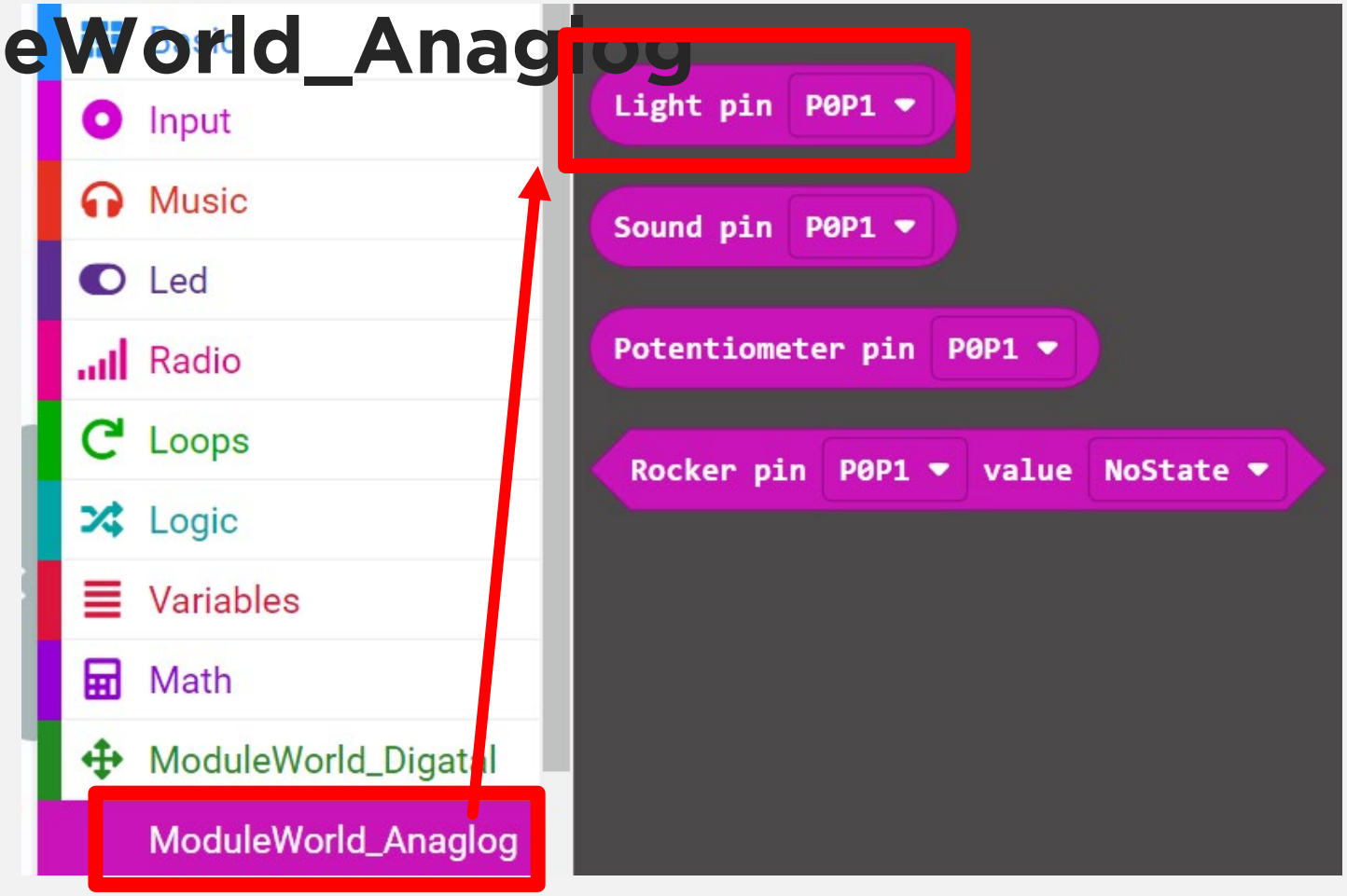
Or search YahboomTechnology/Module-World in the extension block

Coding - Logic

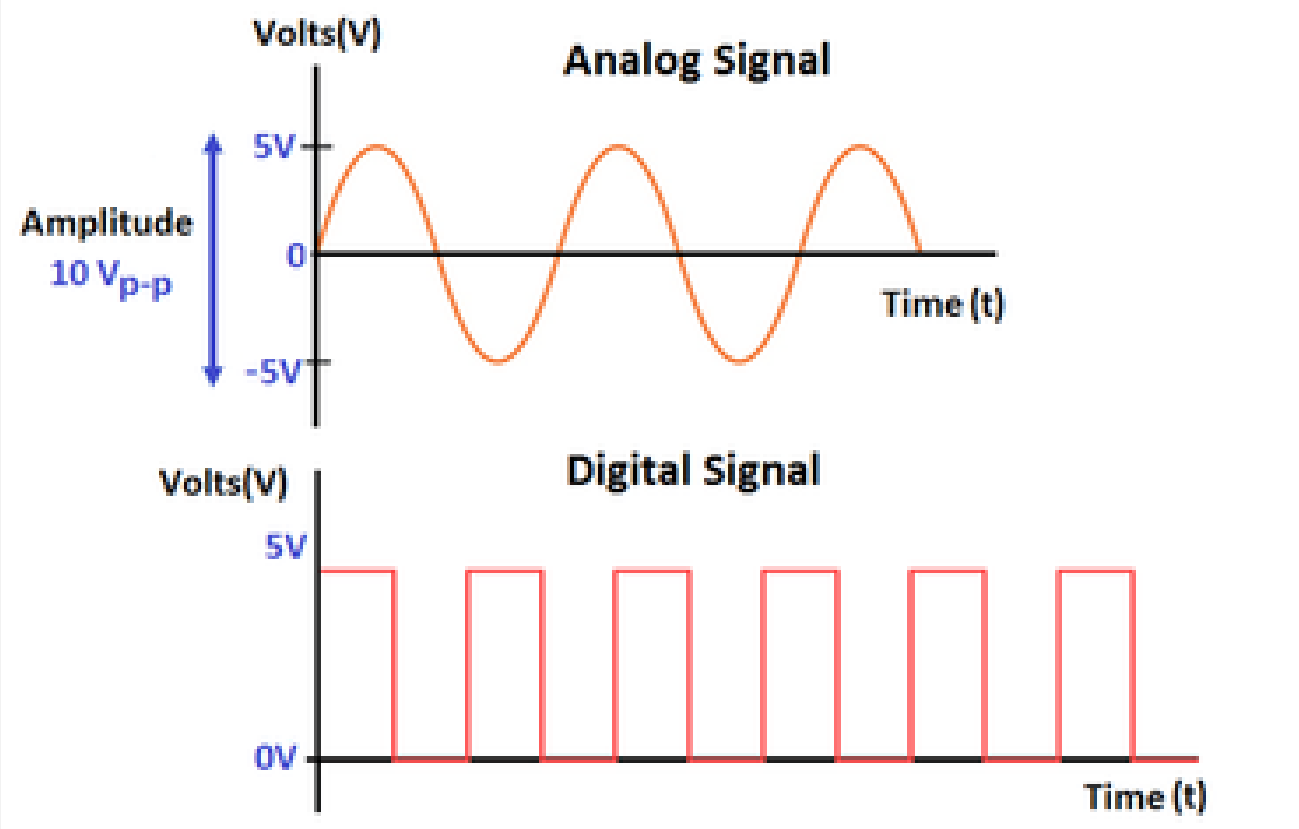


Coding – ModuleWorld_PWM

Coding - ModuleWorld_Anaglog

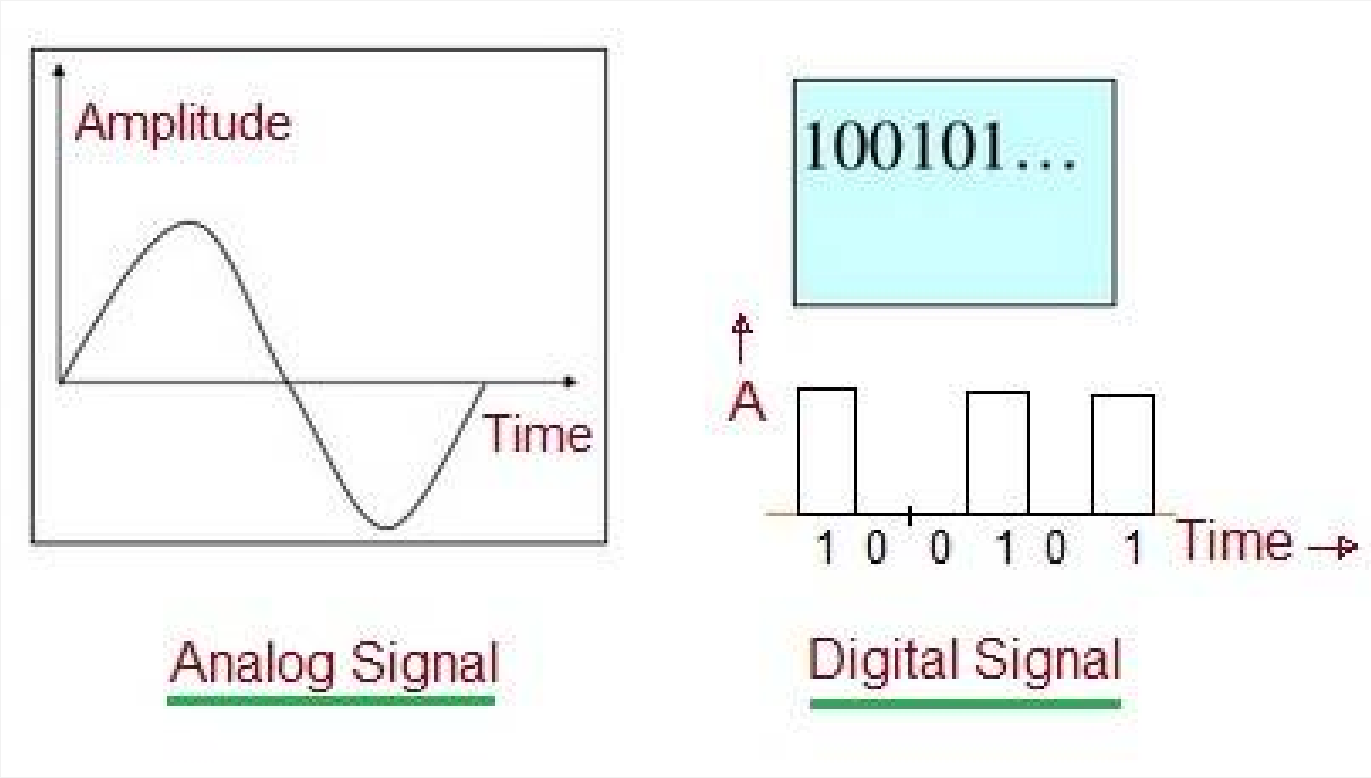


Digital vs Analog Signal



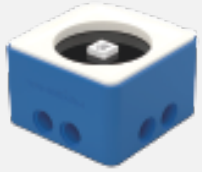
The major difference between both signals is that the Analog signals have continuous electrical signals, while Digital signals have non-continuous electrical signals.

Digital vs Analog Signal



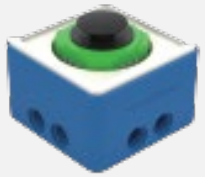
When doing conditional programming, since Analog signal is with range value, we will use more than or less than to do comparison check, while digital signal is with 1 or 0, we will use equal comparison for the conditioning.

Electronic Modules – Which are Digital and Analog?

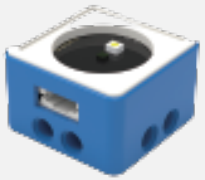


RGB Light Module

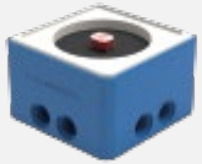
Button Module



Rocker Module



Color Recognition Module

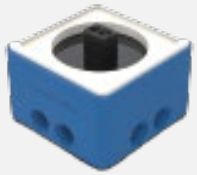


Photosensitive Module

Temperature Humidity Module

Human body Infrared Module

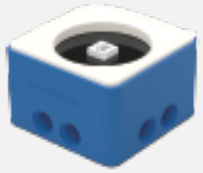
Ultrasonic Module



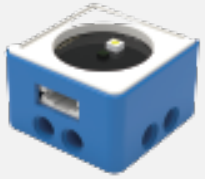
Infrared Module

Digital Tube Module

Digital vs Analog Signal - Module

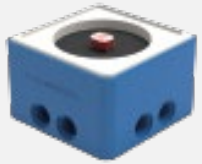


RGB Light Module



Color Recognition Module

Digital Tube Module



Photosensitive Module

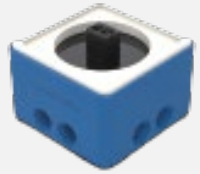
Temperature Humidity Module

Analog Signal

Rocker Module

Ultrasonic Module

Digital Signal

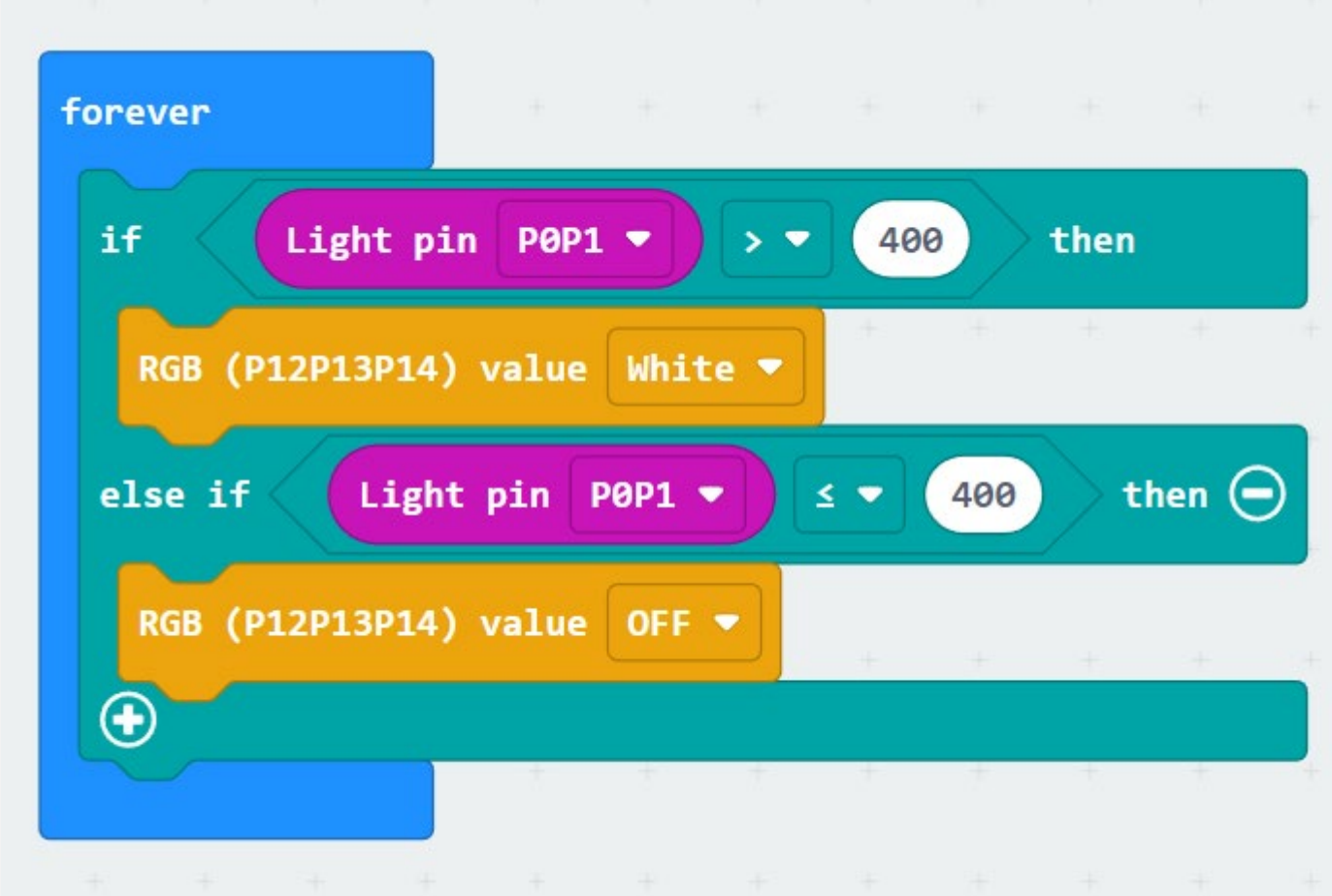


Infrared Module

Button Module

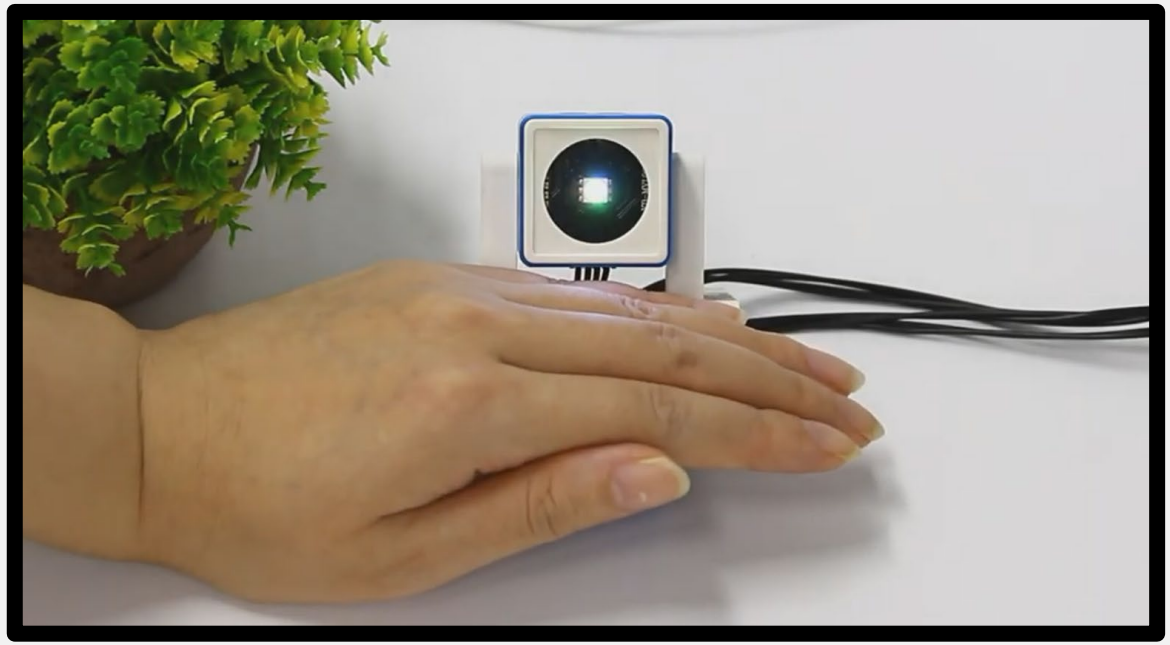
Human body Infrared Module

Combine Blocks



Phenomenon

After the program is downloaded successfully.
When we block the photosensitive module with our hands, the RGB light is on, otherwise the light is off.



CHALLENGE

for : Lesson 5

L5 –

Automatic Light:

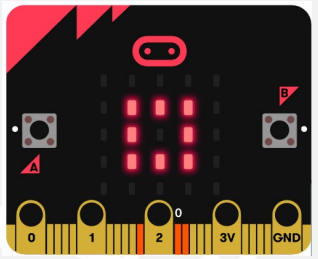
After the program is downloaded successfully.

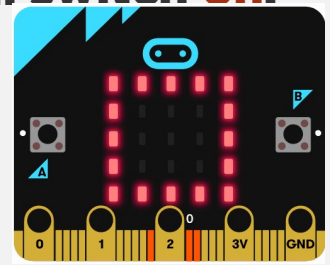
When photosensitive does not detect light,

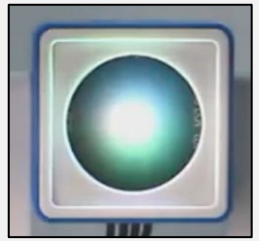
LED will show icon small rectangle and RGB will switch off,

When photosensitive detects light,

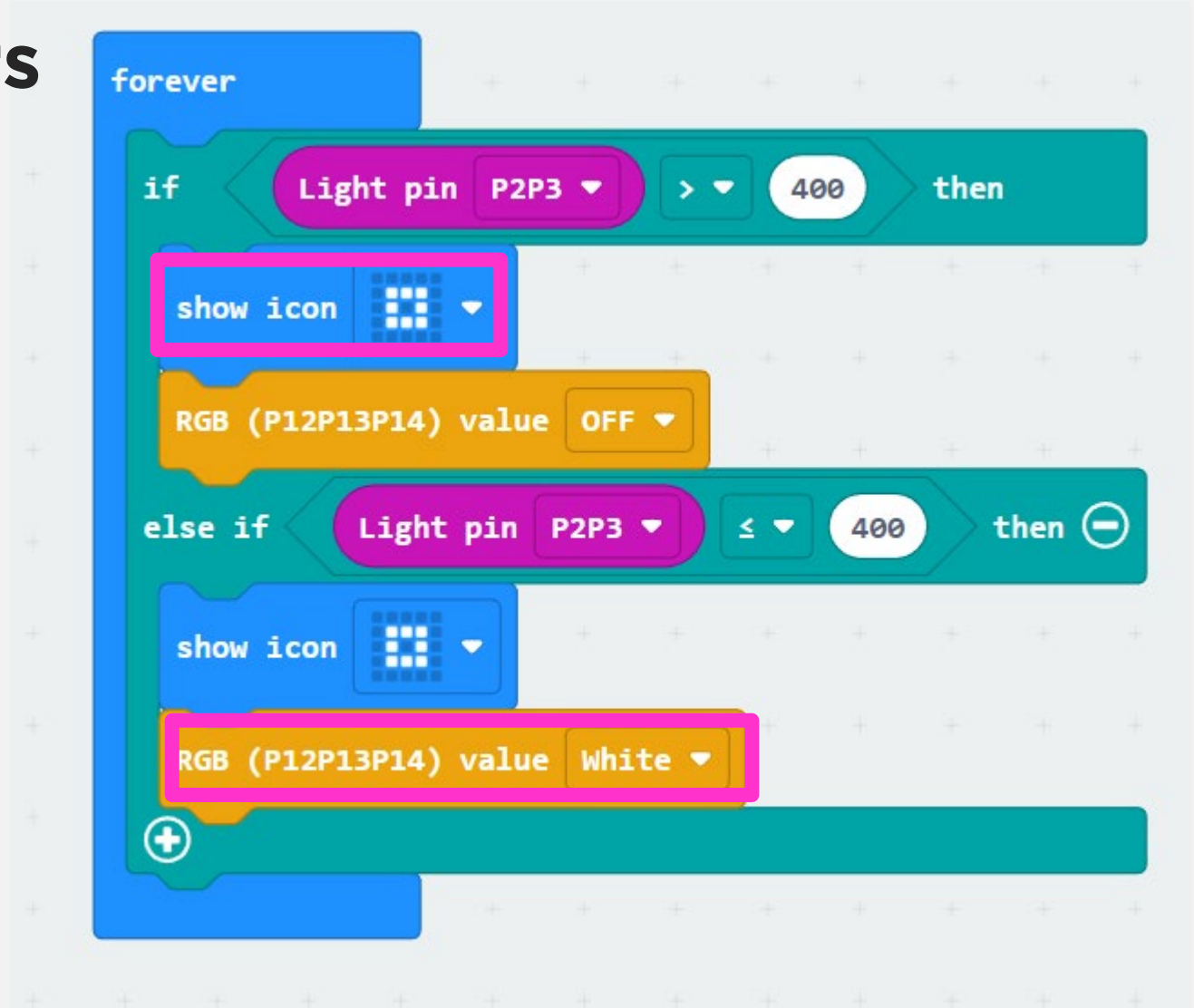
LED will show icon big rectangle and RGB will switch on.







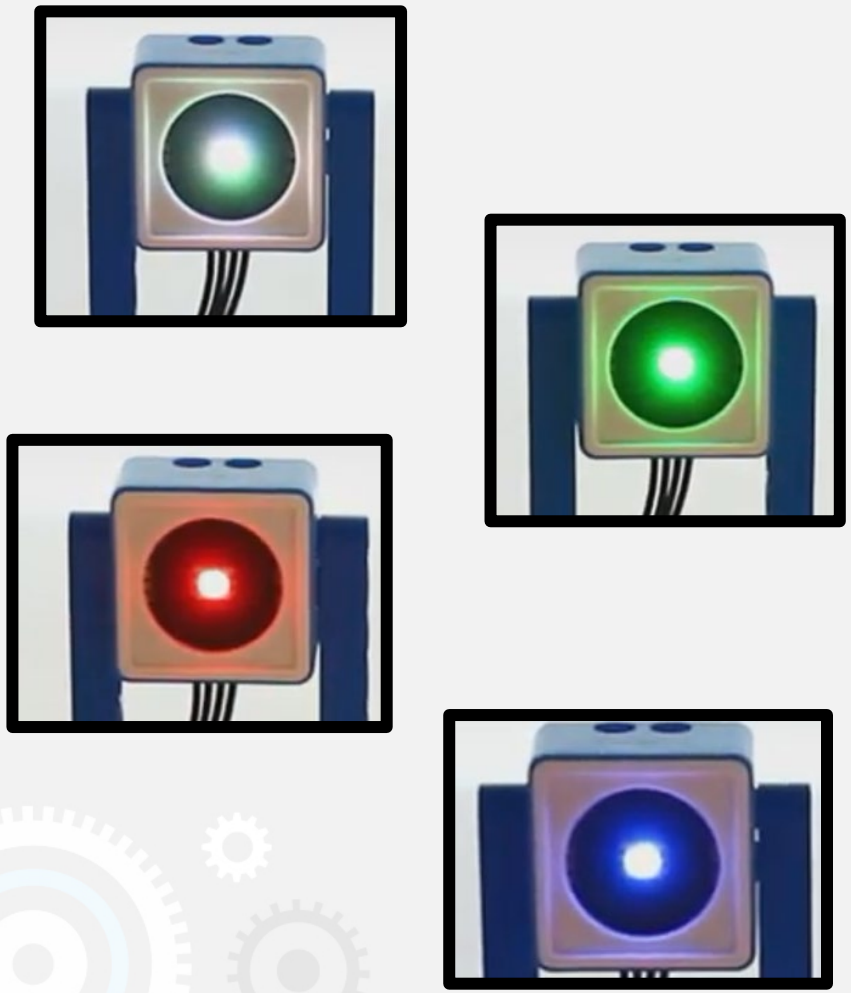
Answers



Do a quick self-check of your learning outcome...

1. What is the possible signals to be received with rocker module?
2. What is the difference between Analog signal and digital signal?
3. Which modules are with Analog signal and which are taking digital signal?
4. Give 2 example of the application of photosensitive module in real-life

L5 – Mission



Using 3 Modules, Rocker, Photosensitive and RGB:

Make an emergency light that can changes color when rocker is moved,
And without changing to the first color.

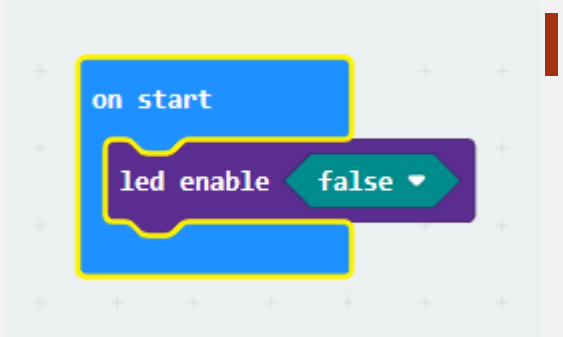
Condition: When there is no light, RGB will lights up automatically.

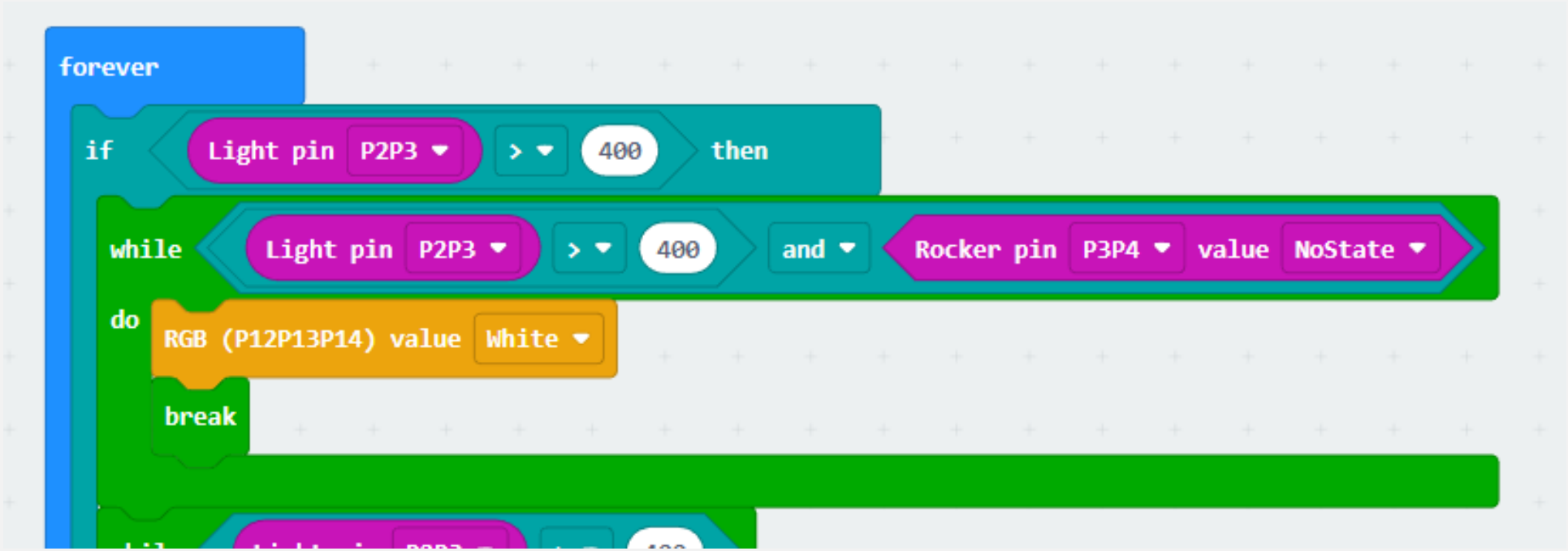
Any Questions?

Thank you :)

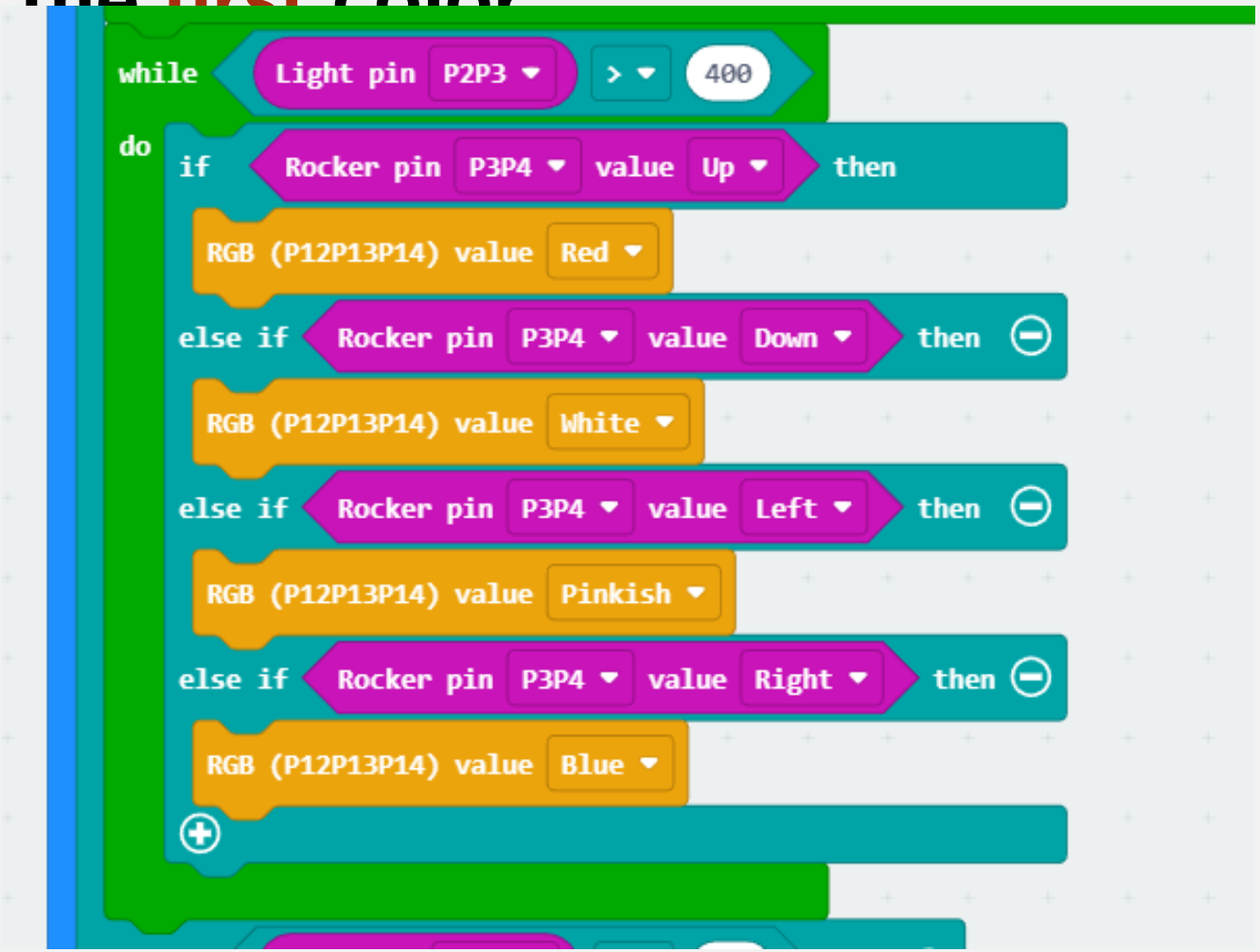
Answers - lights up

ly

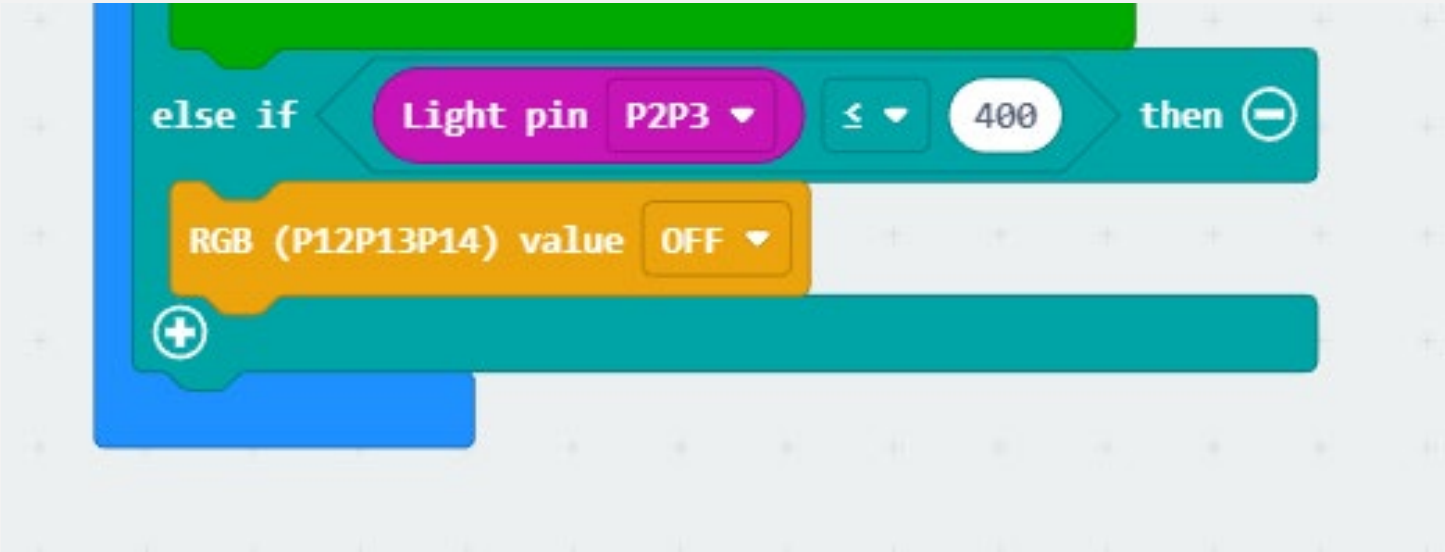




Answers – without changing to the first color



Answers – Off when there is light



Answers