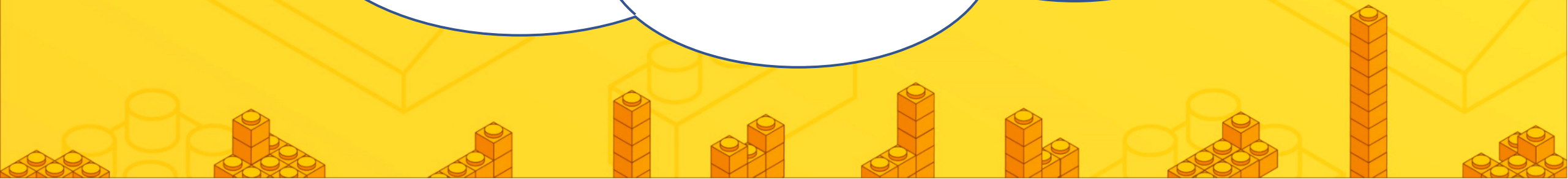




Show Me Some Colors

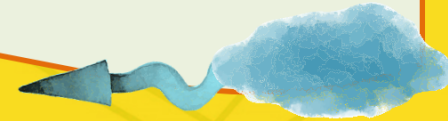


Target

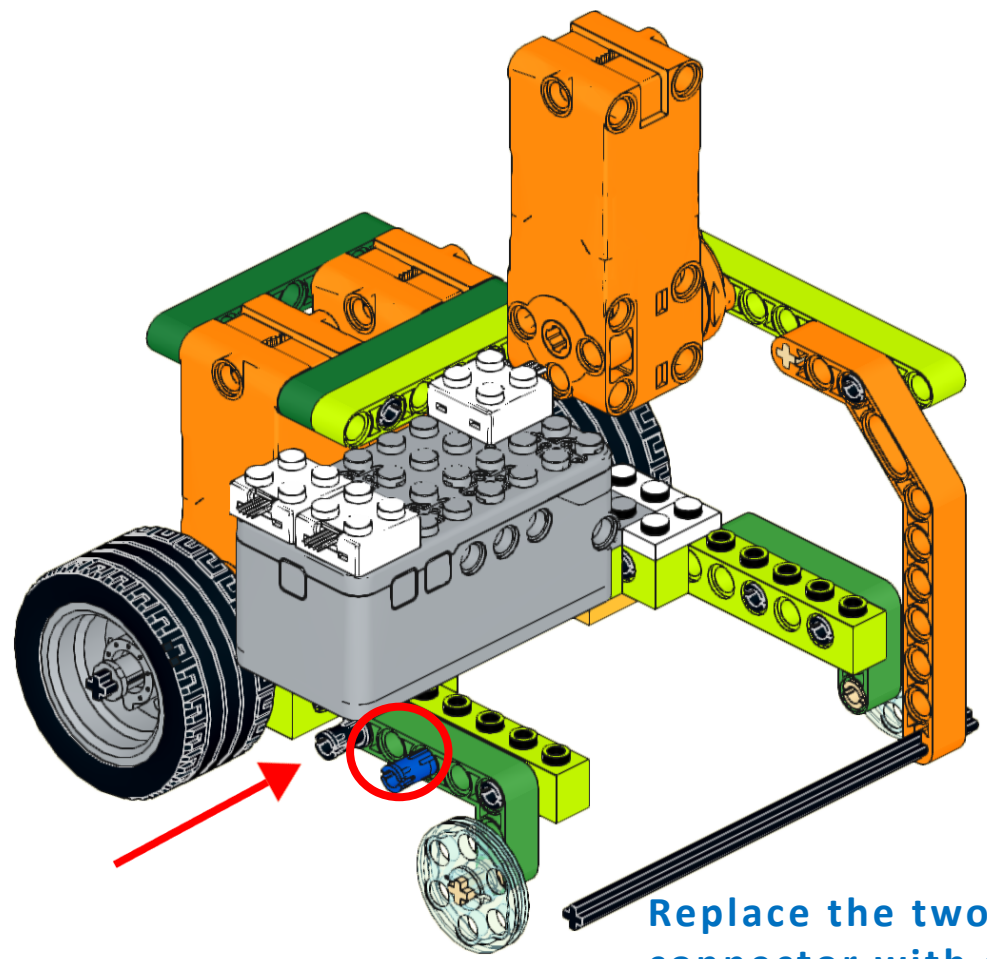
- Learn the basic color detection methods of the color sensor.
- Learn to use the color sensor to detect objects.
- Master the programming pattern for decision-making logic.



01 Assembly



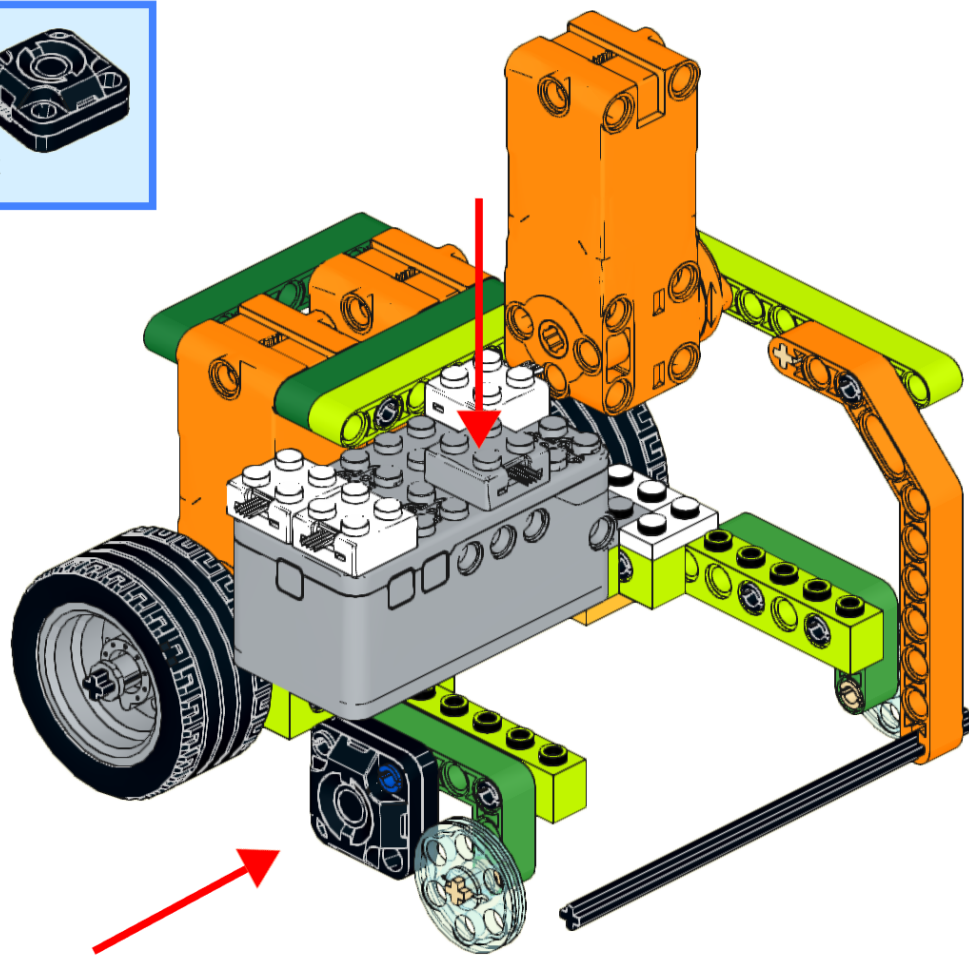
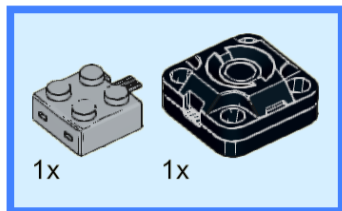
Assembly



Replace the two-pin connector with a three-pin connector.

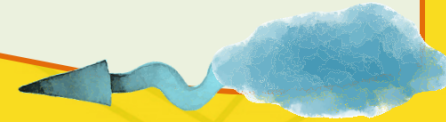


Assembly





02 Task



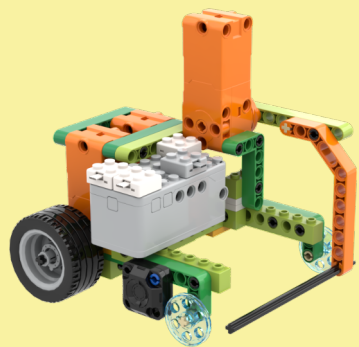


Coding Technique 1

Using variables and checking sensor values

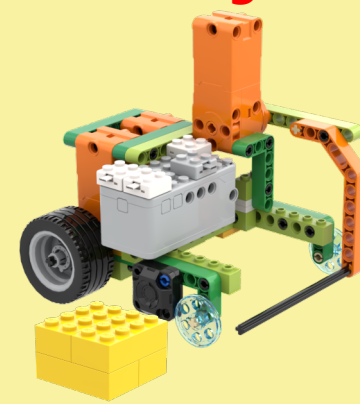
Do you remember how to create a variable?

```
forever loop containing:
  set color to 1# color sensor's color code
```



color 99

Pay attention to the difference between detecting an object and not detecting one.



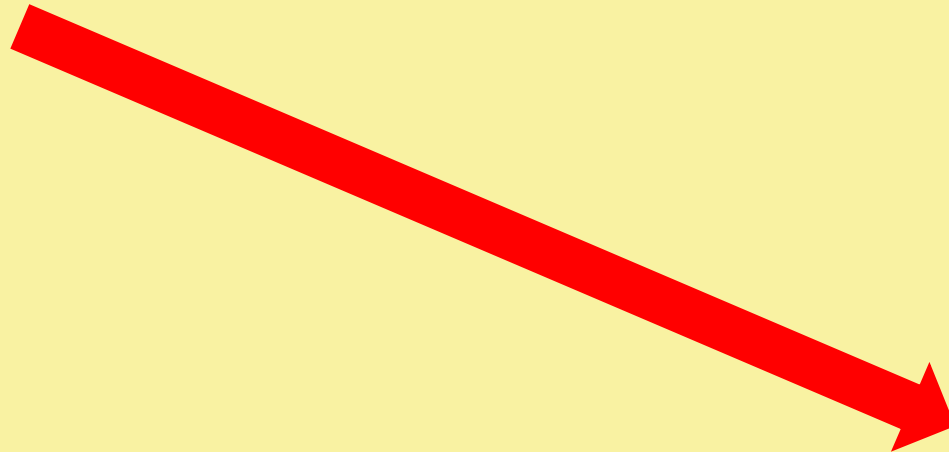
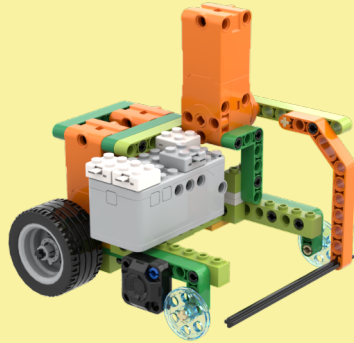
color 7





Task

Task 1 : When outdoors, detect colors from the side. Stop and display the corresponding color light when detected.

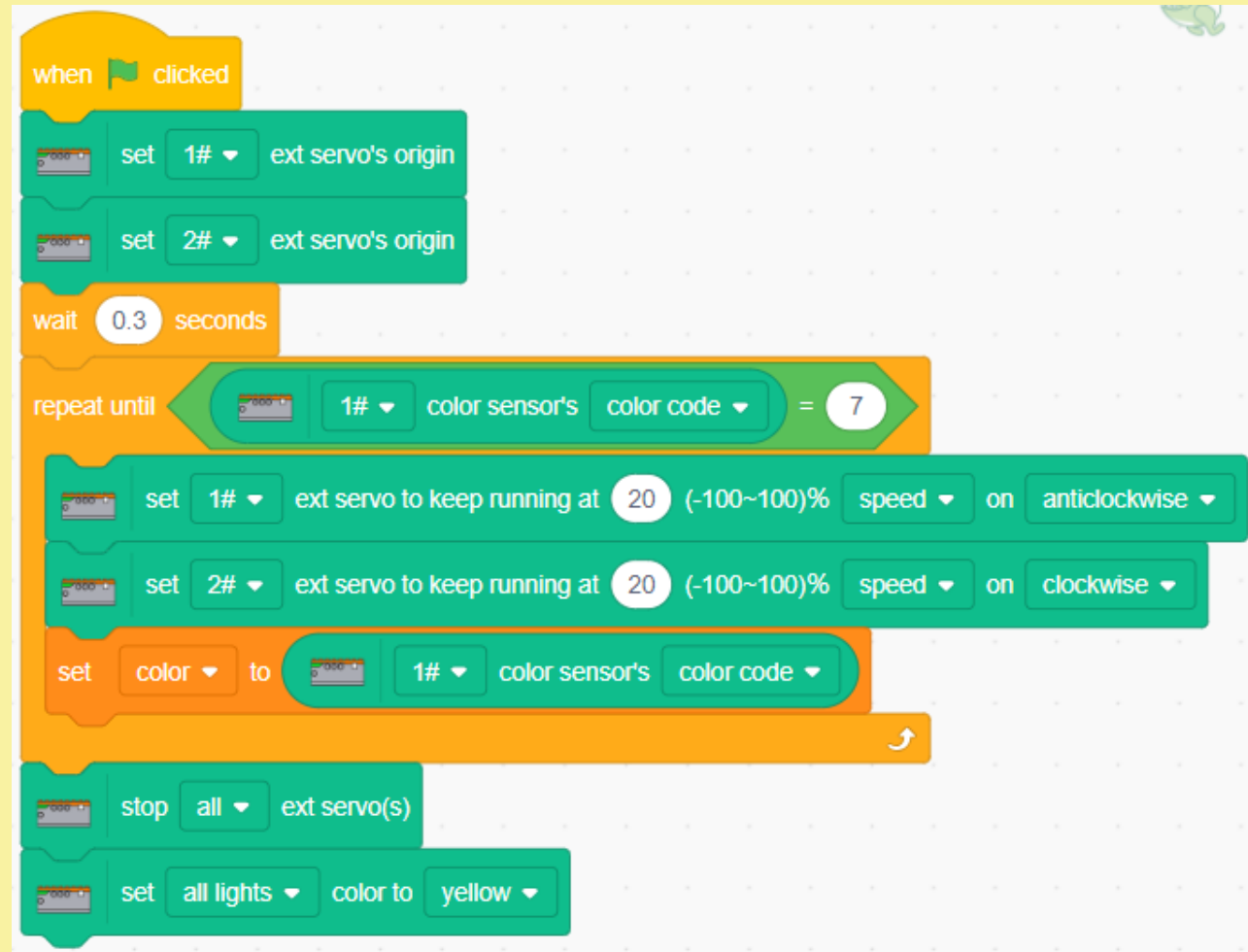


Task

Referrable Program

The use of the "repeat until" control block is to ensure the synchronized display of sensor values.

A simpler way is to use the "wait until" control block

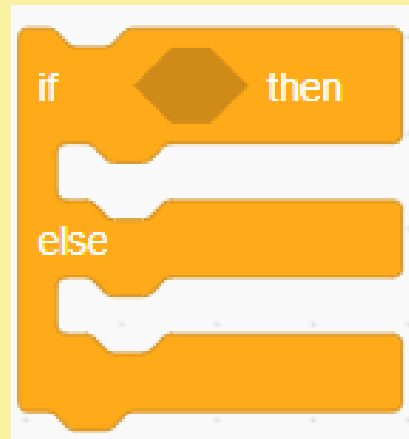


```
when clicked
  set 1# ext servo's origin
  set 2# ext servo's origin
  wait 0.3 seconds
  repeat until (1# color sensor's color code = 7)
    set 1# ext servo to keep running at 20 (-100~100)% speed on anticlockwise
    set 2# ext servo to keep running at 20 (-100~100)% speed on clockwise
  set color to 1# color sensor's color code
  stop all ext servo(s)
  set all lights color to yellow
```

The image shows a Scratch script on a grid background. The script starts with a 'when clicked' event block. It then contains two 'set' blocks for servo origins, followed by a 'wait 0.3 seconds' block. A 'repeat until' loop is used, with the condition '1# color sensor's color code = 7'. Inside the loop, there are two 'set' blocks for servo speeds: '1# ext servo to keep running at 20 (-100~100)% speed on anticlockwise' and '2# ext servo to keep running at 20 (-100~100)% speed on clockwise'. After the loop, there is a 'set color to 1# color sensor's color code' block, a 'stop all ext servo(s)' block, and finally a 'set all lights color to yellow' block.

Coding Technique 2

Let's try using the decision-making (or "if-else") block for programming.



Combining decision-making blocks with loops allows for clear state determination.

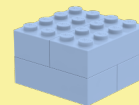
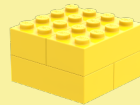
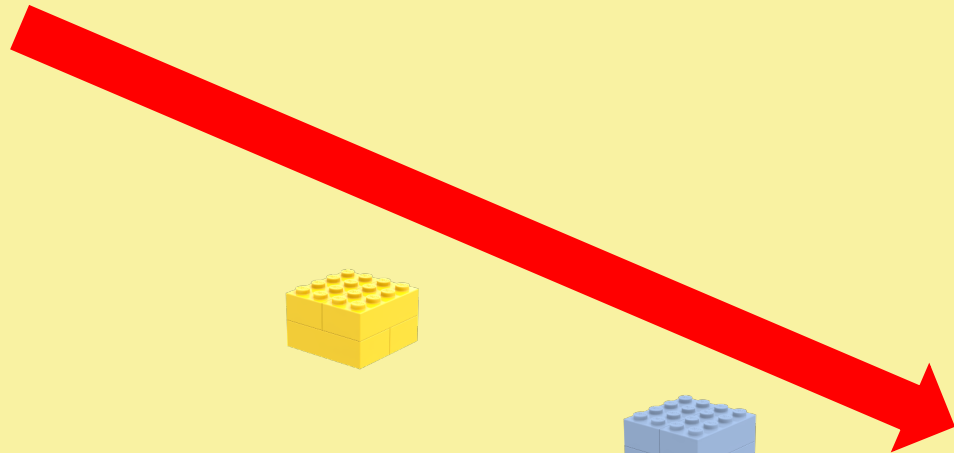
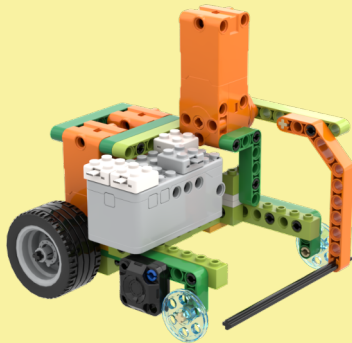
```
when clicked clicked
  set 1# ext servo's origin
  set 2# ext servo's origin
  wait 0.3 seconds
  forever
    set color to 1# color sensor's color code
    if 1# color sensor's color code = 7 then
      stop all ext servo(s)
      set all lights color to yellow
      stop all
    else
      set 1# ext servo to keep running at 20 (-100~100)% speed on anticlockwise
      set 2# ext servo to keep running at 20 (-100~100)% speed on clockwise
```



Task

Task 2: Random Color Blocks

Prepare yellow and blue color blocks. Randomly select one and place it on the side of the robot's path. The robot should light up the corresponding color light based on the color detected.





Task

Referrable Program

In the loop, make three checks: blue, yellow, and no color.

Perform actions based on the corresponding checks

```
when clicked
  set 1# ext servo's origin
  set 2# ext servo's origin
  wait 0.3 seconds
  set all traffic lights to closed
  forever
    set color to 1# color sensor's color code
    if 1# color sensor's color code = 7 then
      stop all ext servo(s)
      set all lights color to yellow
    if 1# color sensor's color code = 4 then
      stop all ext servo(s)
      set all lights color to blue
    if 1# color sensor's color code = 99 then
      set 1# ext servo to keep running at 20 (-100~100)% speed on anticlockwise
      set 2# ext servo to keep running at 20 (-100~100)% speed on clockwise
```



Task

Additional Task: Can you use the "if" decision-making block to handle checks for other colors?