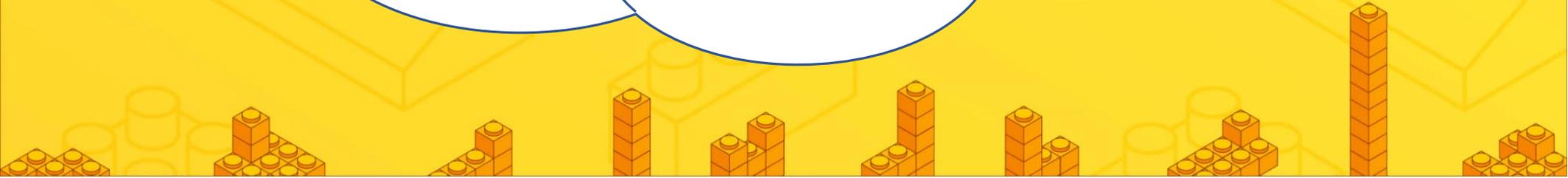
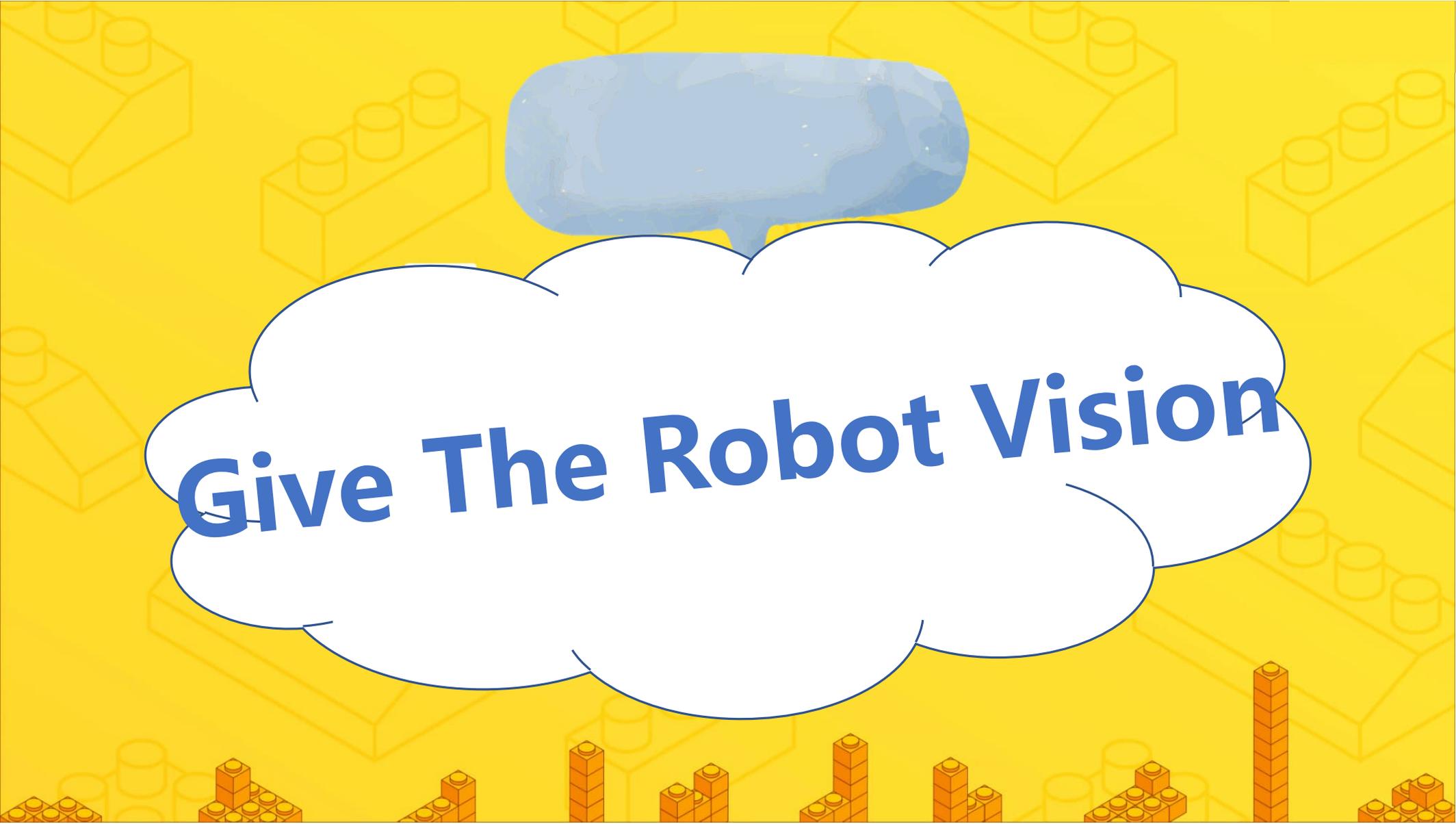
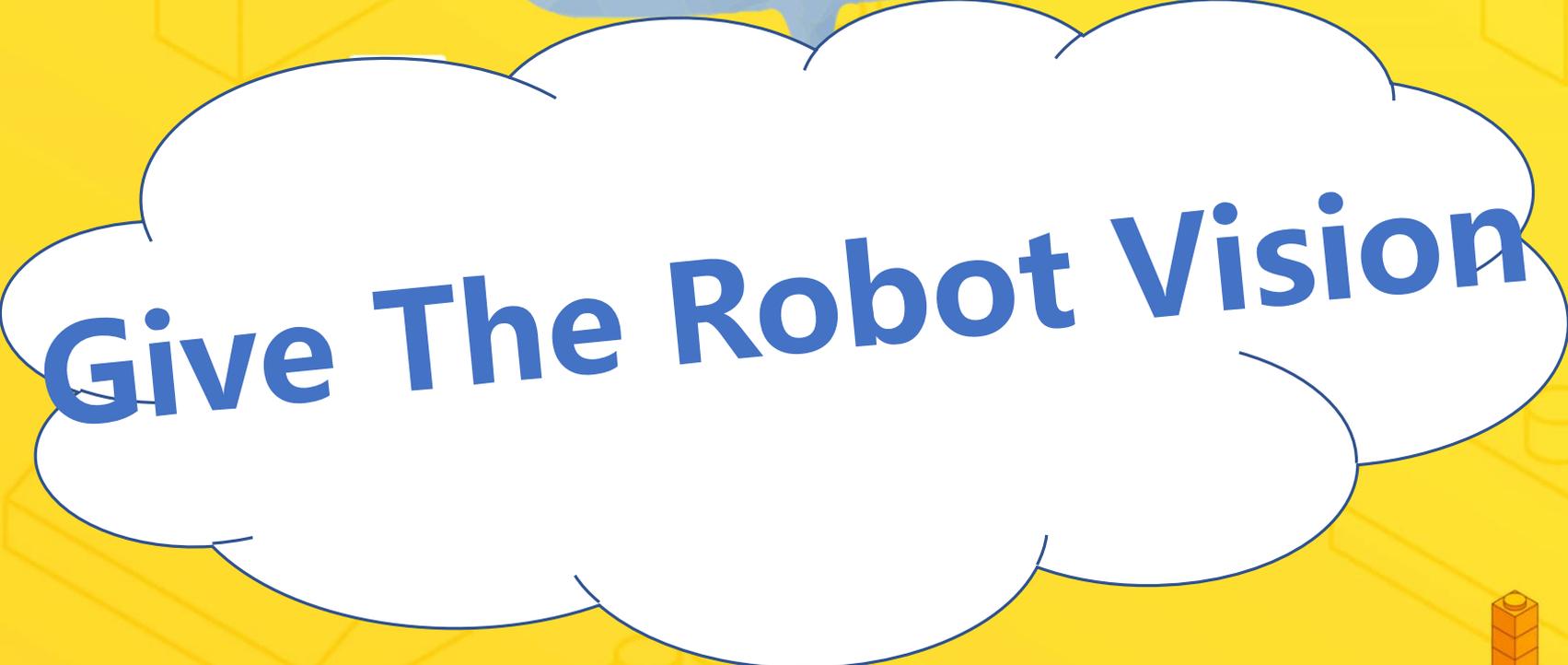




Give The Robot Vision





Target

- Complete the robot design and assembly according to the competition requirements.
- Learn how to install the grayscale sensor.
- Learn to use the grayscale sensor to detect obstacles.
- Learn to use the grayscale sensor to detect objects.



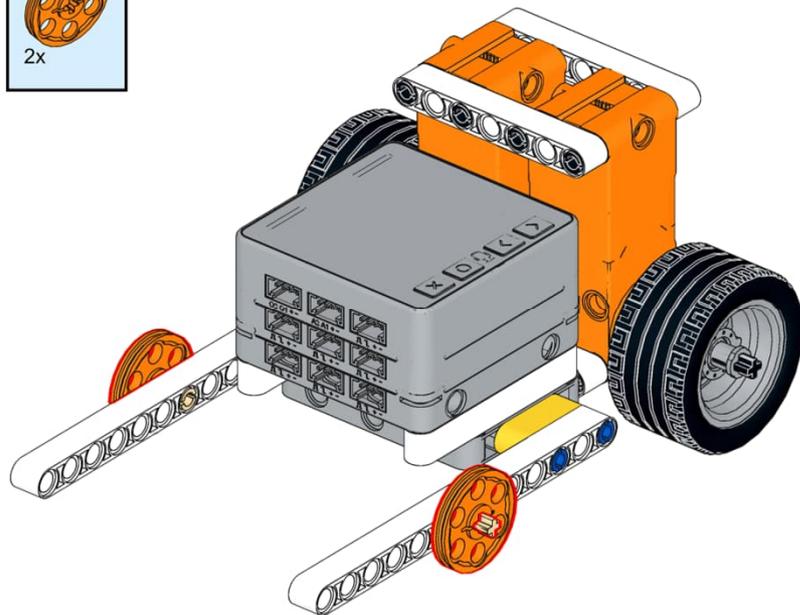
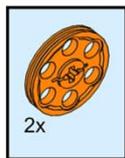


01 Assembly



Assembly

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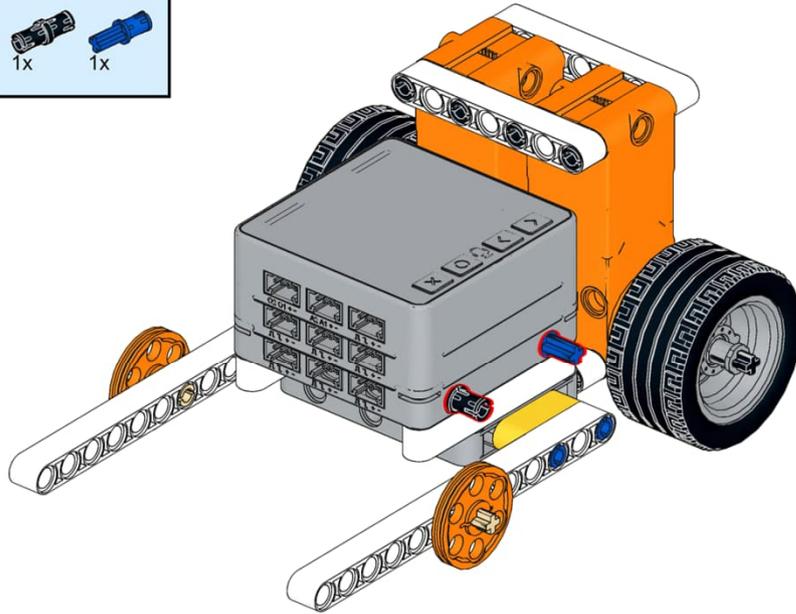
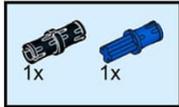


See Lesson 1
for complete
instruction



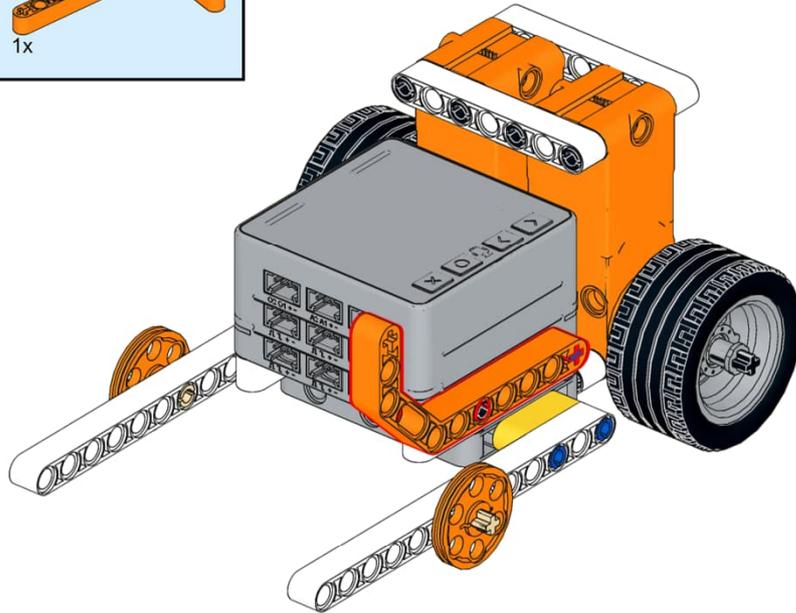
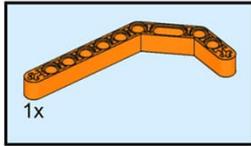
Installing Grayscale Sensor

24



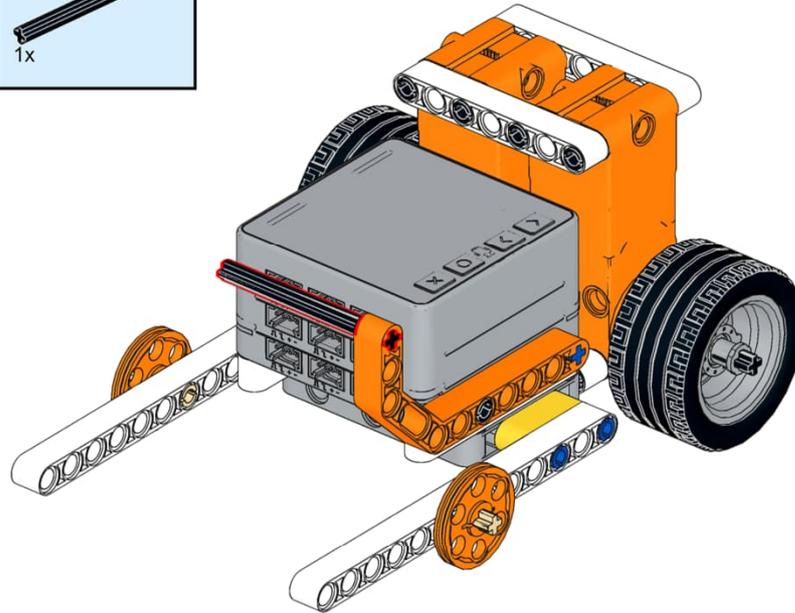
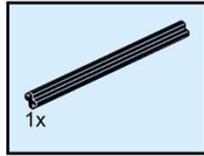
Installing Grayscale Sensor

25



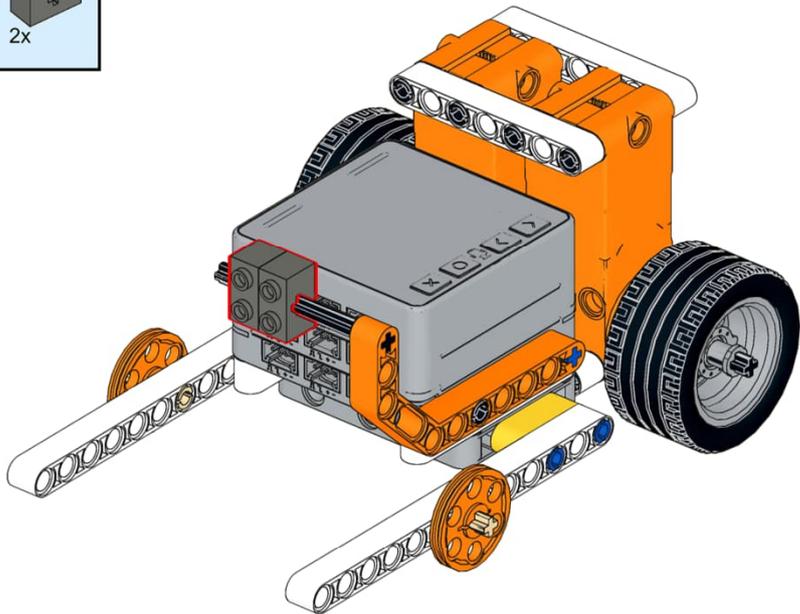
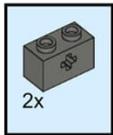
Installing Grayscale Sensor

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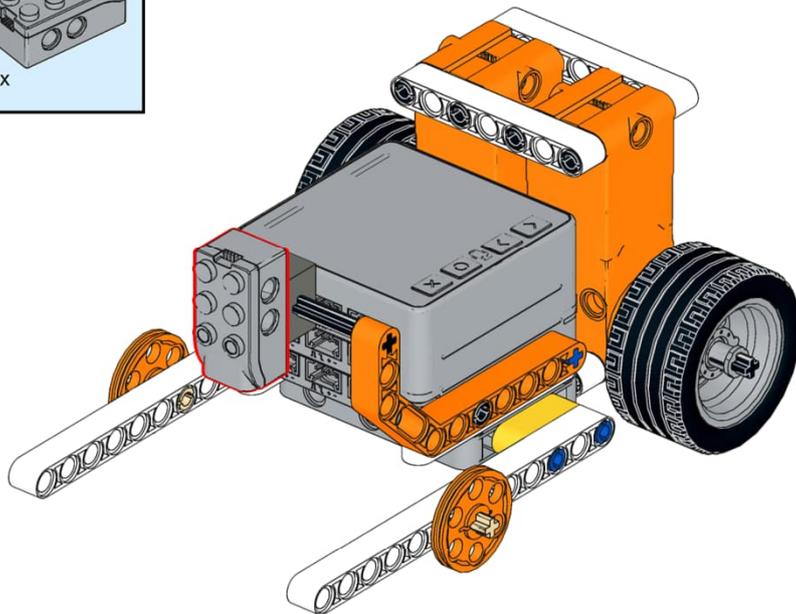
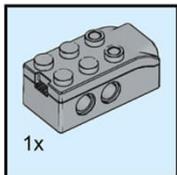
Installing Grayscale Sensor

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Installing Grayscale Sensor

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02 Task

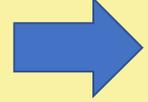
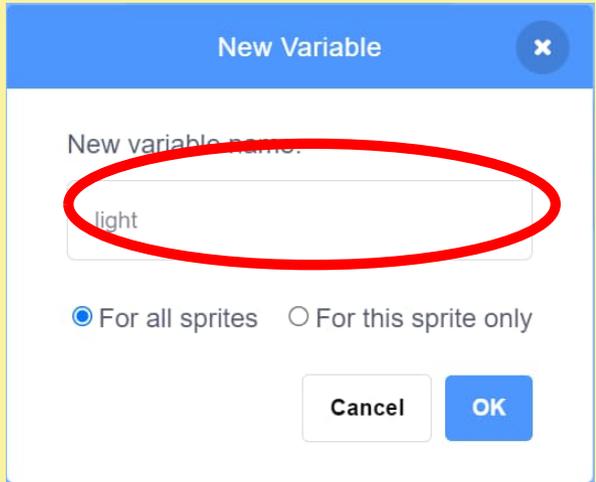
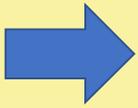
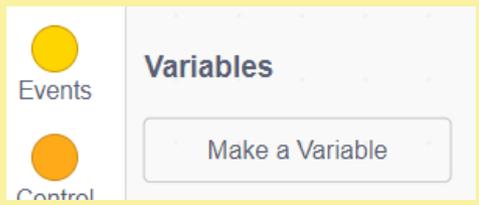




Coding Technique 1

Using Variables and Viewing Sensor Values

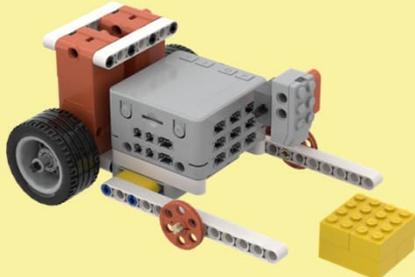
Note: Variable names should use only English letters.





Coding Technique 1

变量使用方式与查看传感器数值



light 18

Pay close attention to the difference between detecting an item and not detecting an item.



light 8

```
when green flag clicked
  forever loop
    set light sensor to single channel line tracker 1's value
```



Task

Task 1: Stop after retrieving the item.



Task

Referrable Program

Using the "repeat until" control block is to synchronize the display of the sensor values.

A simpler approach is to use the "wait until" control block directly.

```
when green flag clicked
  set 1# ext servo's origin
  set 2# ext servo's origin
  wait 0.1 seconds
  repeat until (single channel line tracker 1# 's value > 50)
    set 1# ext servo to keep running at 30 % speed on anticlockwise
    set 2# ext servo to keep running at 30 % speed on clockwise
  set light to (single channel line tracker 1# 's value)
  stop all ext servo(s)
```

The image shows a Scratch script for controlling two external servo motors. It starts with a 'when green flag clicked' event block. The first two blocks are 'set 1# ext servo's origin' and 'set 2# ext servo's origin'. This is followed by a 'wait 0.1 seconds' block. The main logic is contained in a 'repeat until' loop with the condition 'single channel line tracker 1# 's value > 50'. Inside the loop, there are two 'set' blocks: 'set 1# ext servo to keep running at 30 % speed on anticlockwise' and 'set 2# ext servo to keep running at 30 % speed on clockwise'. After the loop, there is a 'set light to (single channel line tracker 1# 's value)' block. The script ends with a 'stop all ext servo(s)' block.



Task

Task 2: After retrieving the item, carry it to the **designated location**.





Task

Try to complete the subsequent actions using my module from the Lesson 4.

Referrable Program

```
define motor speed angle
set 1# ext servo's origin
set 2# ext servo's origin
wait 0.1 seconds
set 1# ext servo to keep running at speed % speed on anticlockwise
set 2# ext servo to keep running at speed % speed on clockwise
wait until abs of 1# ext servo's counted degrees > angle
stop all ext servo(s)
```

```
when clicked
set 1# ext servo's origin
set 2# ext servo's origin
wait 0.1 seconds
repeat until single channel line tracker 1# 's value > 50
set 1# ext servo to keep running at 30 % speed on anticlockwise
set 2# ext servo to keep running at 30 % speed on clockwise
set light to single channel line tracker 1# 's value
stop all ext servo(s)
wait 0.5 seconds
sync 1# & 2# to rotate at 30 speed(0-100) turn right for 215 degrees(offline only)
wait 0.5 seconds
motor 30 500
```



Additional Task

Adjust the sensor to face directly forward, detect obstacles, and try to stop or maneuver around them.

