



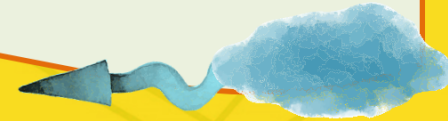
# Setting Up Fiber Optic Cables

## Target

- **Study the rules for Task 2: Fiber Optic Cable Installation.**
- **Combine what you've learned previously, using color detection, movement, and the robotic arm to handle task items, to complete the content of Task 2.**



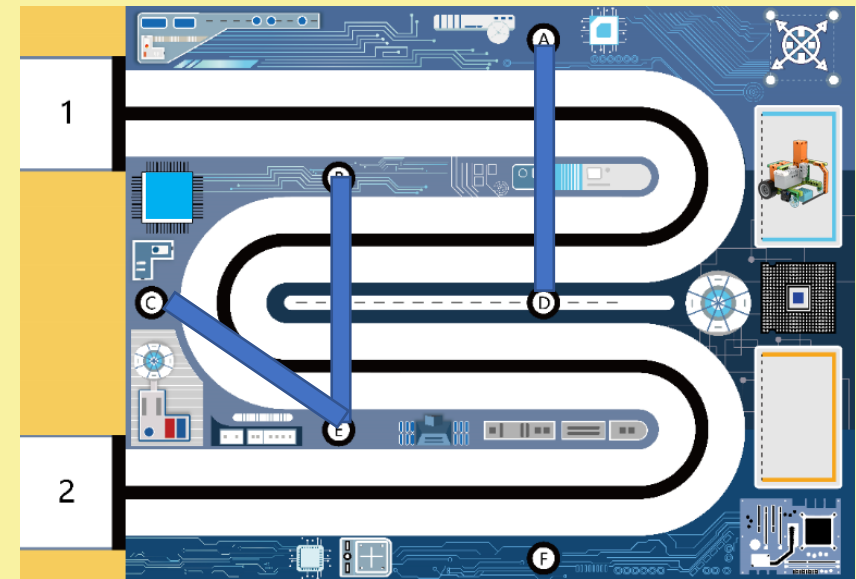
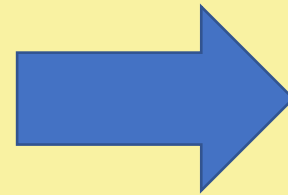
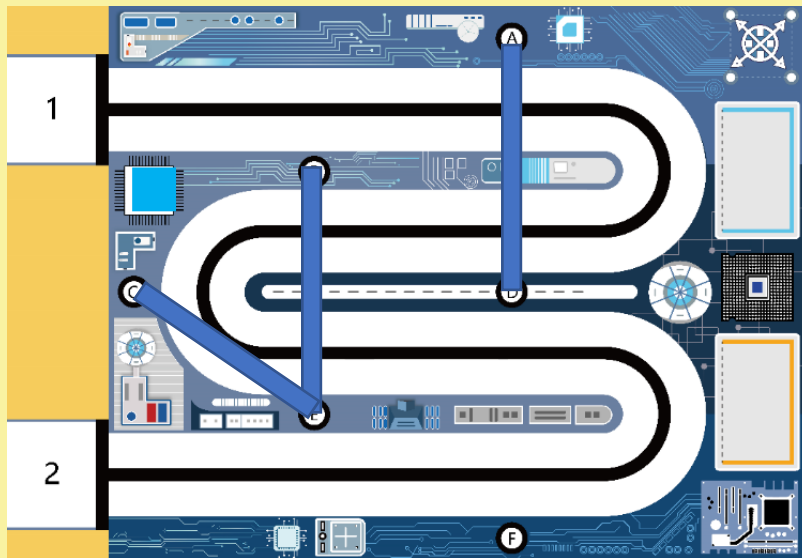
# 01 Task





# Task

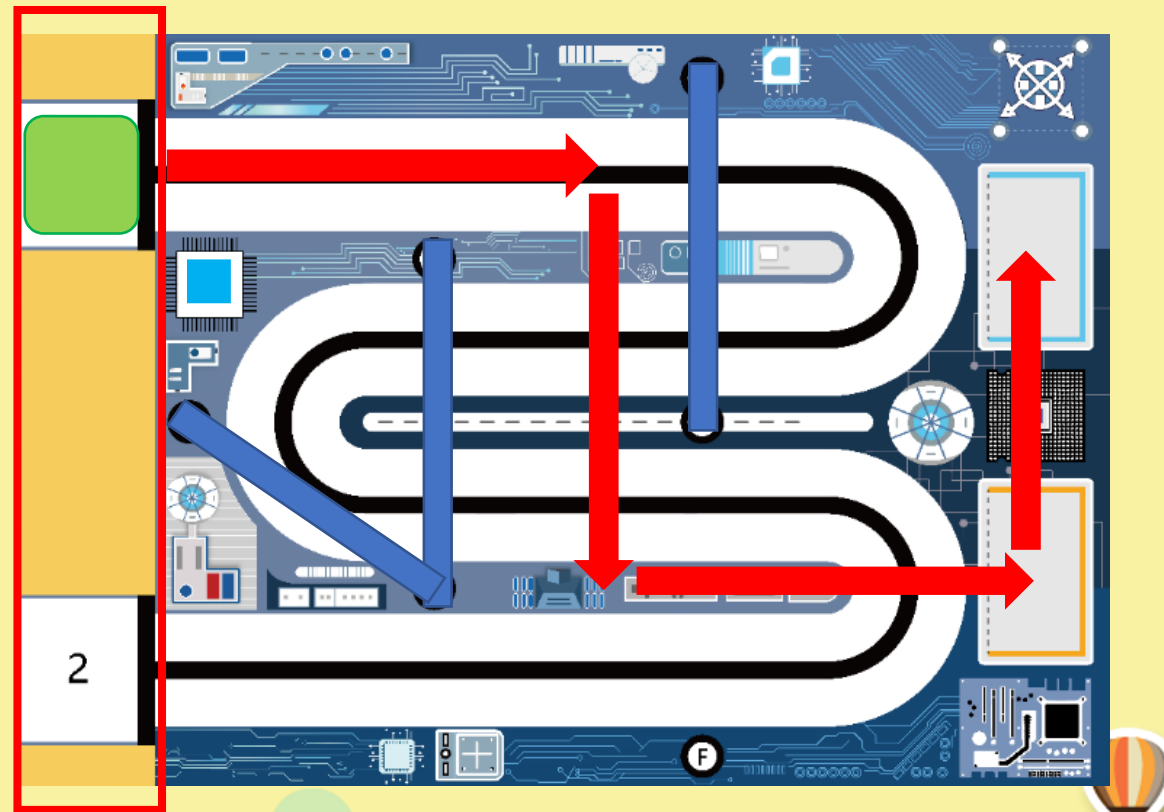
- The device starts from the **preparation area** and must navigate over randomly placed obstacles to reach a specific location and install fiber optics in a narrow passage.
- At the start of the competition, a random combination of up to 3 barriers from positions A, B, C, D, E, or F will be selected. After each round, color information will determine the endpoint—either the yellow or blue relay station.
- For example, if blue is chosen as the endpoint, the robot must overcome the obstacles and reach the blue relay station.



# Task Analysis

- The device starts from the preparation area and select the route.

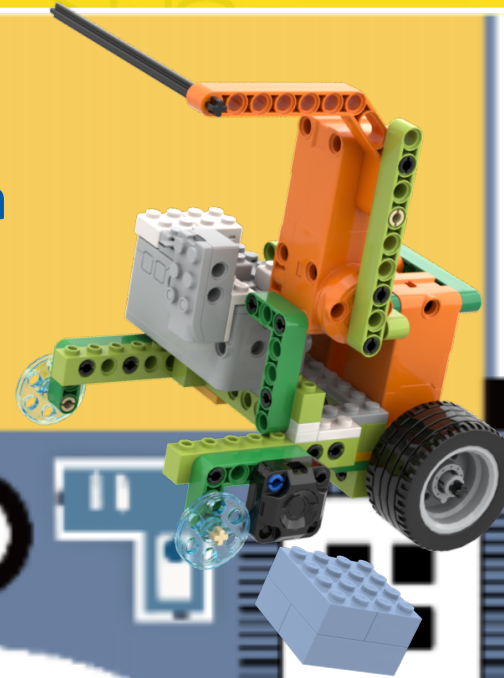
Route A





# Task Segmentation

**Task 1: Complete color detection and confirm the subsequent program (try Route B).**

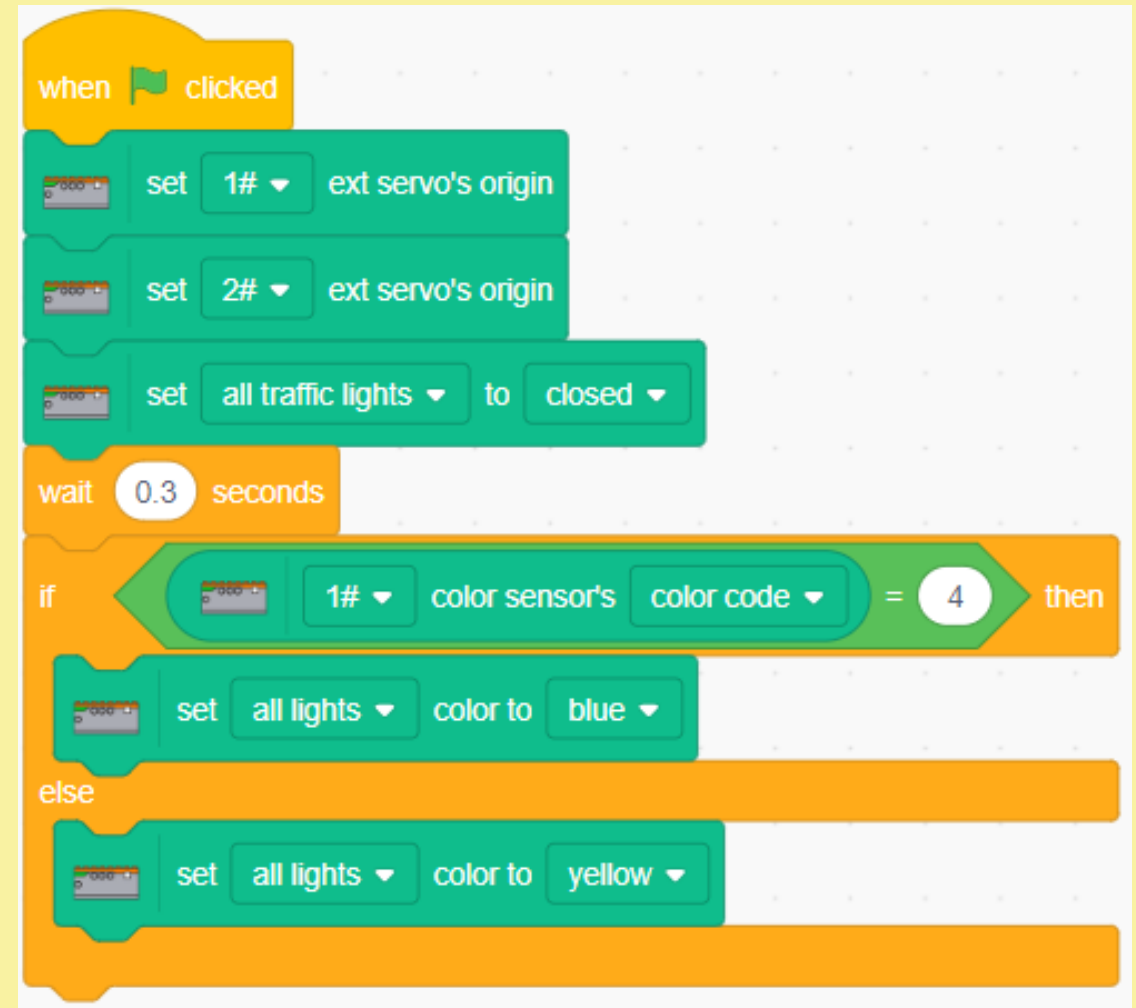


**This starting position can detect the endpoint color right from the beginning.**

# Task Segmentation

## Referrable Program

You can quickly complete the color detection test.



```
when green flag clicked
  set 1# ext servo's origin
  set 2# ext servo's origin
  set all traffic lights to closed
  wait 0.3 seconds
  if 1# color sensor's color code = 4 then
    set all lights color to blue
  else
    set all lights color to yellow
```

The image shows a Scratch script on a grid background. The script starts with a 'when green flag clicked' event block. It contains three 'set' blocks: 'set 1# ext servo's origin', 'set 2# ext servo's origin', and 'set all traffic lights to closed'. This is followed by a 'wait 0.3 seconds' block. Then, there is an 'if' block with the condition '1# color sensor's color code = 4'. The 'then' branch contains 'set all lights color to blue', and the 'else' branch contains 'set all lights color to yellow'.





# Task

## Referrable Program

Define the movement module.

```
define move a b
  set 1# ext servo's origin
  set 2# ext servo's origin
  wait 0.3 seconds
  set 1# ext servo to rotate relative angle a degrees at 30 (0~100)% speed
  set 2# ext servo to rotate relative angle b degrees at 30 (0~100)% speed
  wait until is 1# ext servo done
  wait until is 2# ext servo done
```

```
when clicked
  set 1# ext servo's origin
  set 2# ext servo's origin
  set all traffic lights to closed
  wait 0.3 seconds
  if 1# color sensor's color code = 4 then
    move -1000 1000
    move 215 215
    move -2500 2500
    move 215 215
    move -1000 1000
  else
    move -1000 1000
    move 215 215
    move -2500 2500
    move 215 215
    move -500 500
```



# Task

**Additional Task: Try using other modes to complete the task shown in the diagram. You can experiment with a grayscale sensor to measure distance.**

