

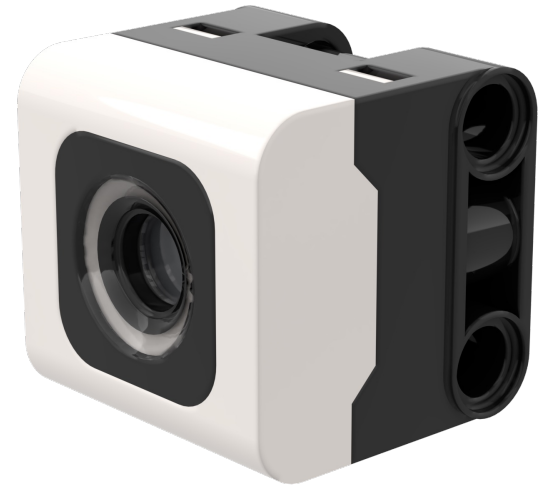
# INTRODUCTION TO COLOR SENSOR

BY SANJAY AND ARVIND SESHAN

This lesson uses SPIKE 3 software

# LESSON OBJECTIVES

- Learn how to use the Color Sensor
- Learn how to use the Wait Until Block
- Note: Although images in this lessons may show a SPIKE Prime, the code blocks are the same for Robot Inventor



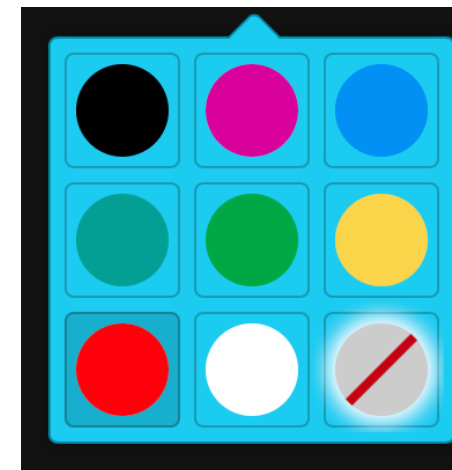
# WHAT IS A COLOR SENSOR?

- In the software, the sensor can detect color or reflectivity
- Unlike the EV3, reflectivity is with white light, not a red light.
- The sensor can detect 8 colors and no color (what those colors are vary between SPIKE Prime and Robot Inventor)
- Optimal reading distance according to the specs: 16 mm (depending on object size, color, and surface)
- Note: In Robot Inventor, the light blue color is replaced with teal



## Detectable Colors

Black (0)  
Violet (1)  
Blue (3)  
Light Blue (4)  
Green (5)  
Yellow (7)  
Red (9)  
White (10)  
No Color (-1)

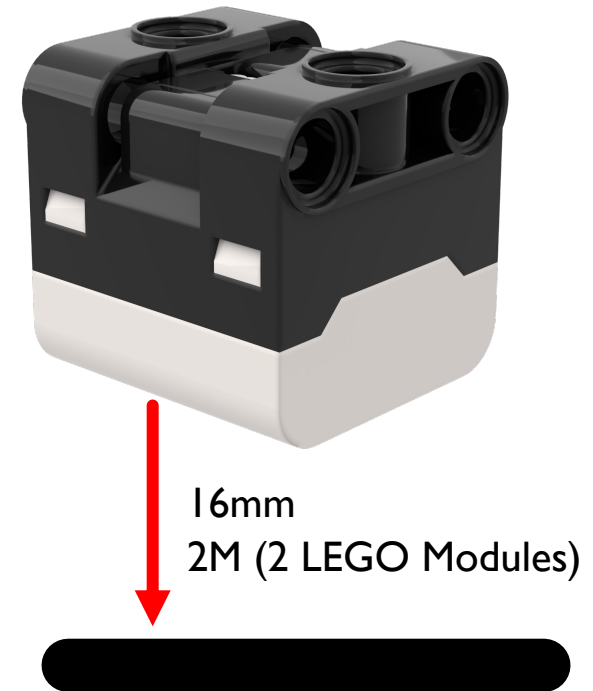


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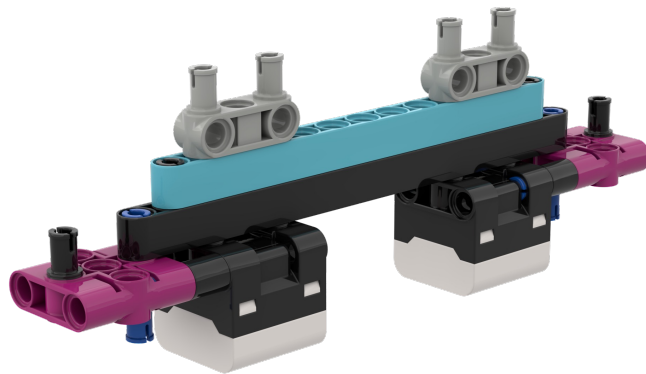
# NOTE: ADB AND SENSING COLOR

- *The color sensor on ADB (Advanced Driving Base in SPIKE Prime) is mounted at about 8mm off the ground, but the optimal distance for mounting the sensor according to the specs is 16mm.*
- When using this robot design, Black does not read correctly in Color Mode using electrical tape lines or a FIRST LEGO League challenge mat.
- See the next slide for modifications. The build instructions are also provided as a separate file on our site.

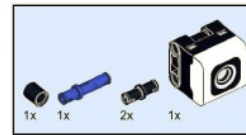


# MODIFICATIONS TO ADB

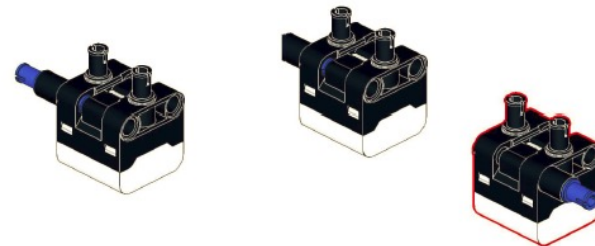
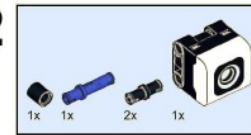
- Build instructions for modifying the front bumper of ADB so that the color sensors are raised one LEGO module up are included on this website



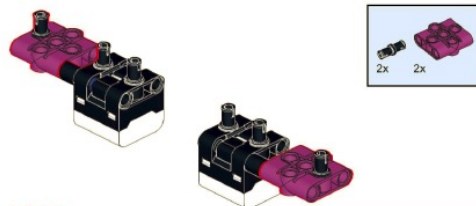
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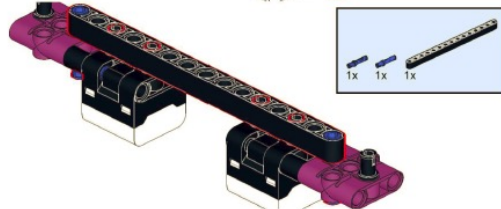
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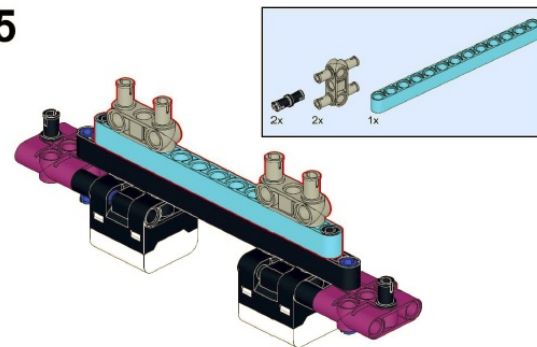
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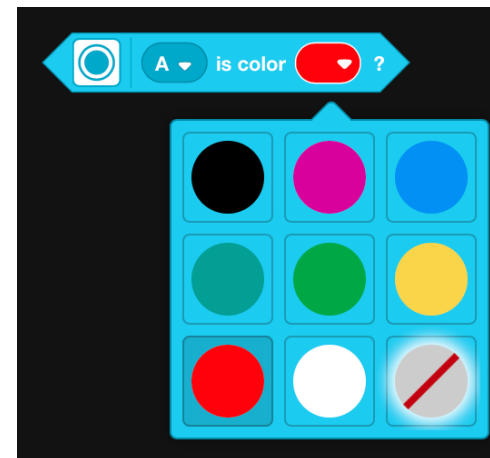
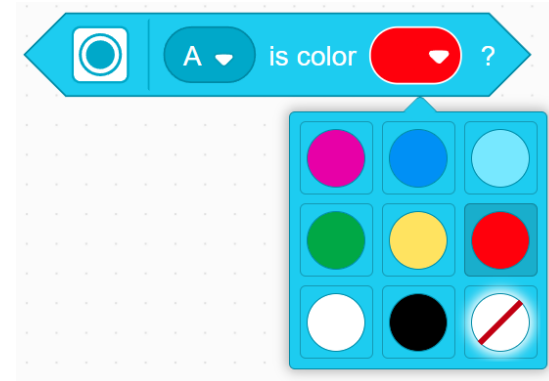
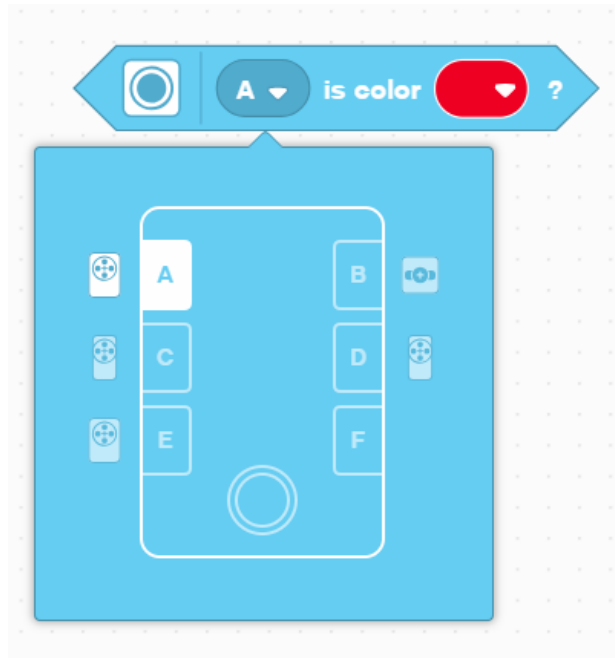


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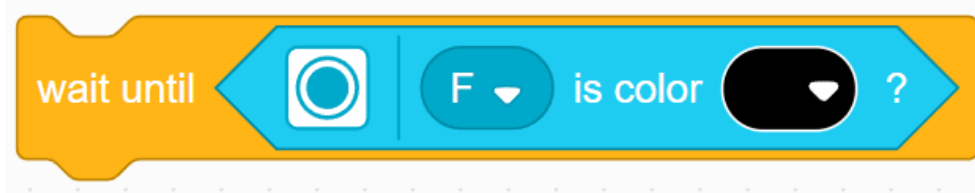
# HOW DO YOU PROGRAM WITH A COLOR SENSOR?

- The two modes you can program the color sensor in: Color Mode and Reflected light mode
- We will use color mode in this lesson



# CHALLENGE I

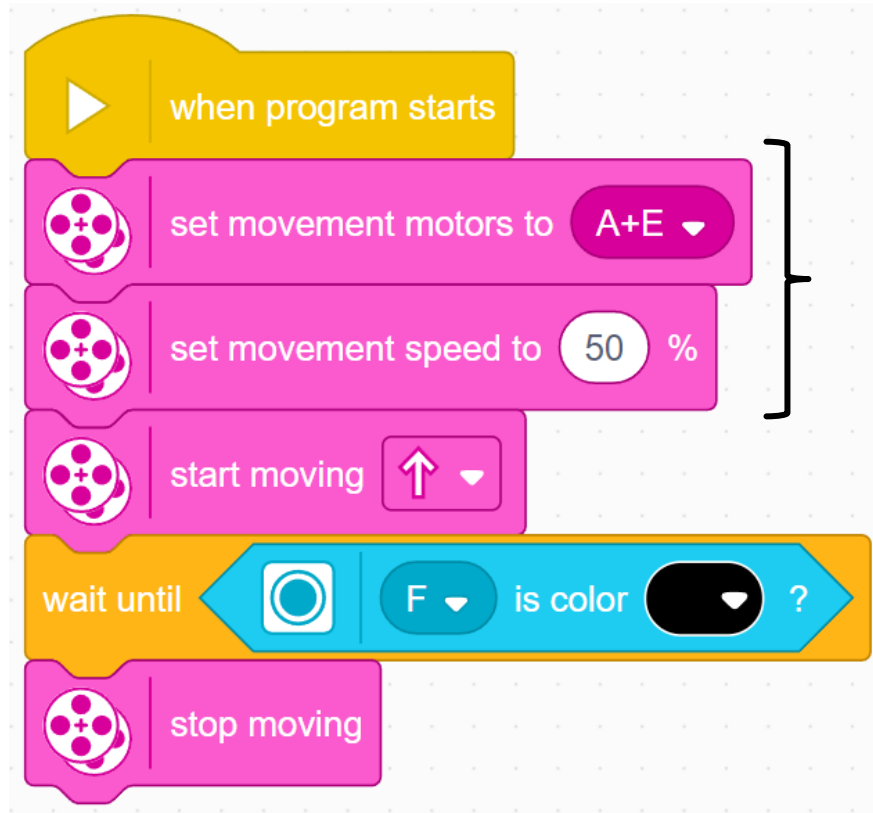
- Program your robot to move forward until the color sensor sees black
- You will need to use the Wait For block and the Boolean block of the color sensor



- **Basic steps:**
  - Set the **movement motors** for your robot (A and E for Droid Bot IV and ADB robot)
  - Set the **movement speed** for your robot
  - Start **moving forward**
  - Use the **wait until** block to detect when the color sensor sees black
  - **Stop moving**

# CHALLENGE 1: SOLUTION

In previous lessons, you learnt how to configure your robot. The first set of blocks sets the movement motors and speed. (See Configuring Your Robot Lesson)



**Note:** 50% is the default speed so the set movement speed block can be omitted in this case. It is provided so you can adjust the speed as needed.

Configure robot

Start moving

Wait until the color sensor sees black

Stop moving



# CREDITS

- This lesson was created by Sanjay Seshan and Arvind Seshan for Prime Lessons
- More lessons are available at [www.primelessons.org](http://www.primelessons.org)



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