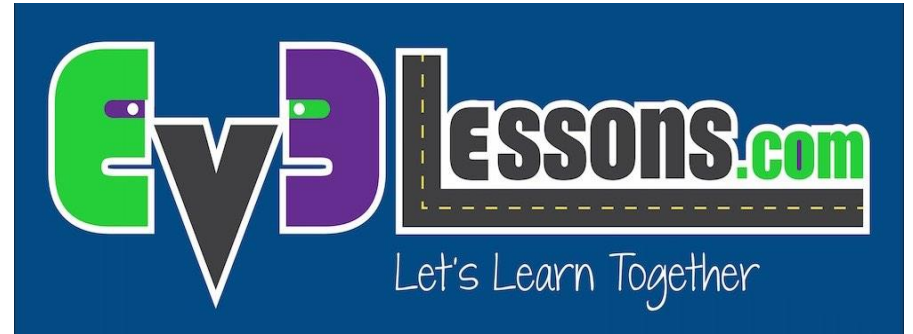
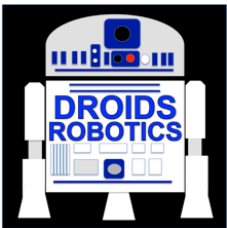


# BEGINNER EV3 PROGRAMMING LESSON



Topics Covered:  
Ultrasonic Sensor



By: Droids Robotics

# LESSON OBJECTIVES

1. **Learn about the Ultrasonic Sensor**
2. **Learn how to use Wait Until Ultrasonic Block**
3. **Learn the difference between the Wait Until Ultrasonic Block and the Ultrasonic Block**

# WHAT IS A SENSOR?

- A sensor lets an EV3 program measure and collect data about its surroundings
- The EV3 sensors include:
  - Color – measures color and darkness
  - Gyro – measures rotation of robot
  - Ultrasonic – measures distance to nearby surfaces
  - Touch – measures contact with surface
  - Infrared – measures IR remote's signals

*Our lessons will cover the 4 sensors in green.*



Image from: [http://www.ucalgary.ca/IOSTEM/files/IOSTEM/media\\_crop/44/public/sensors.jpg](http://www.ucalgary.ca/IOSTEM/files/IOSTEM/media_crop/44/public/sensors.jpg)

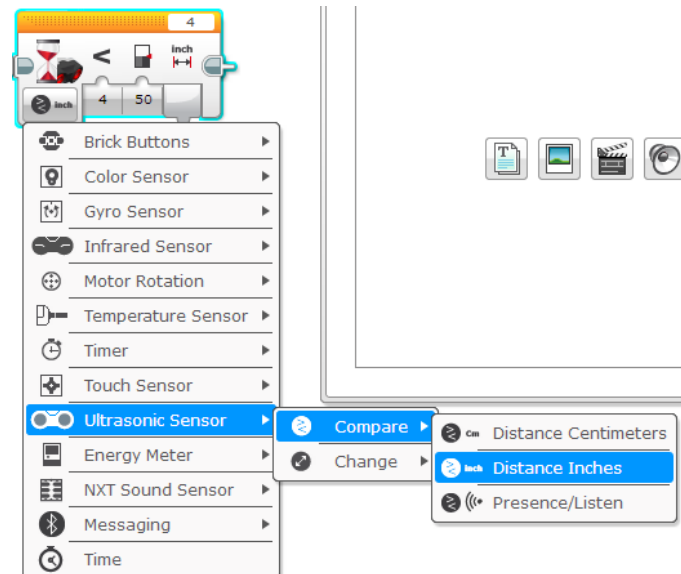
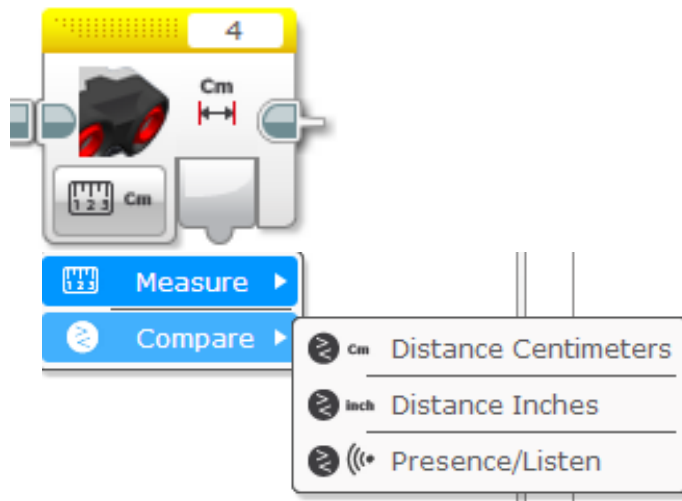
# ULTRASONIC

- An ultrasonic sensor measures distance.
- You use it when you need to make sure you are a certain distance away from a target.
- The distance can be measured in inches or centimeters.
- To read the ultrasonic sensor, you use the Ultrasonic Block. To use the ultrasonic to do an action until a distance, you use “Wait Until”

Read Ultrasonic

VS.

Wait for Ultrasonic



# ULTRASONIC CHALLENGE 1

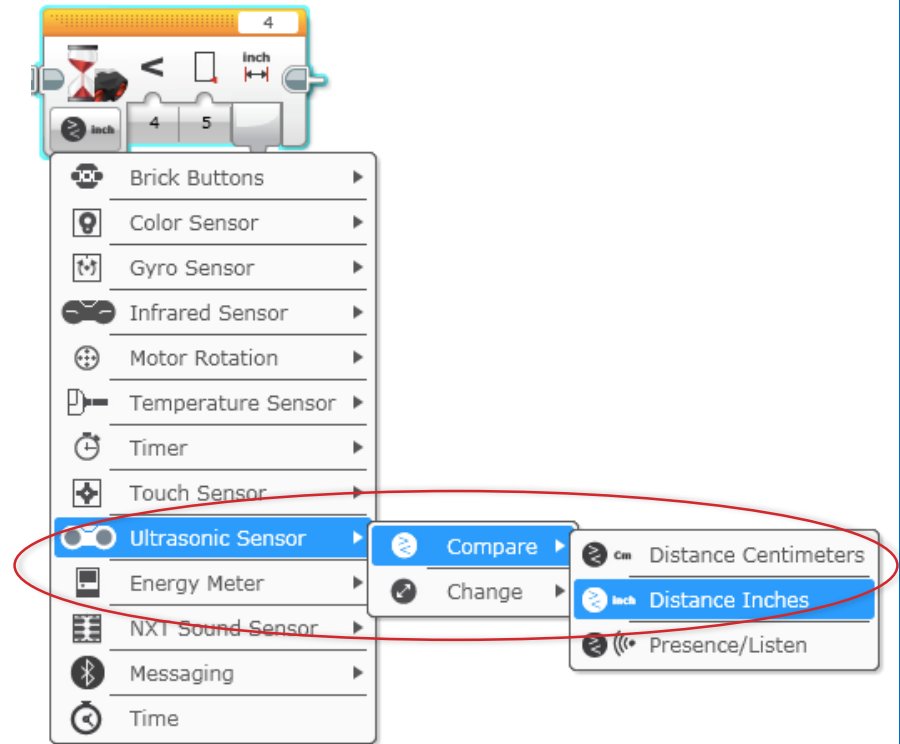
**Challenge:** Make the robot move until it is 5 inches away from the wall.

**Step 1:** Make a new program

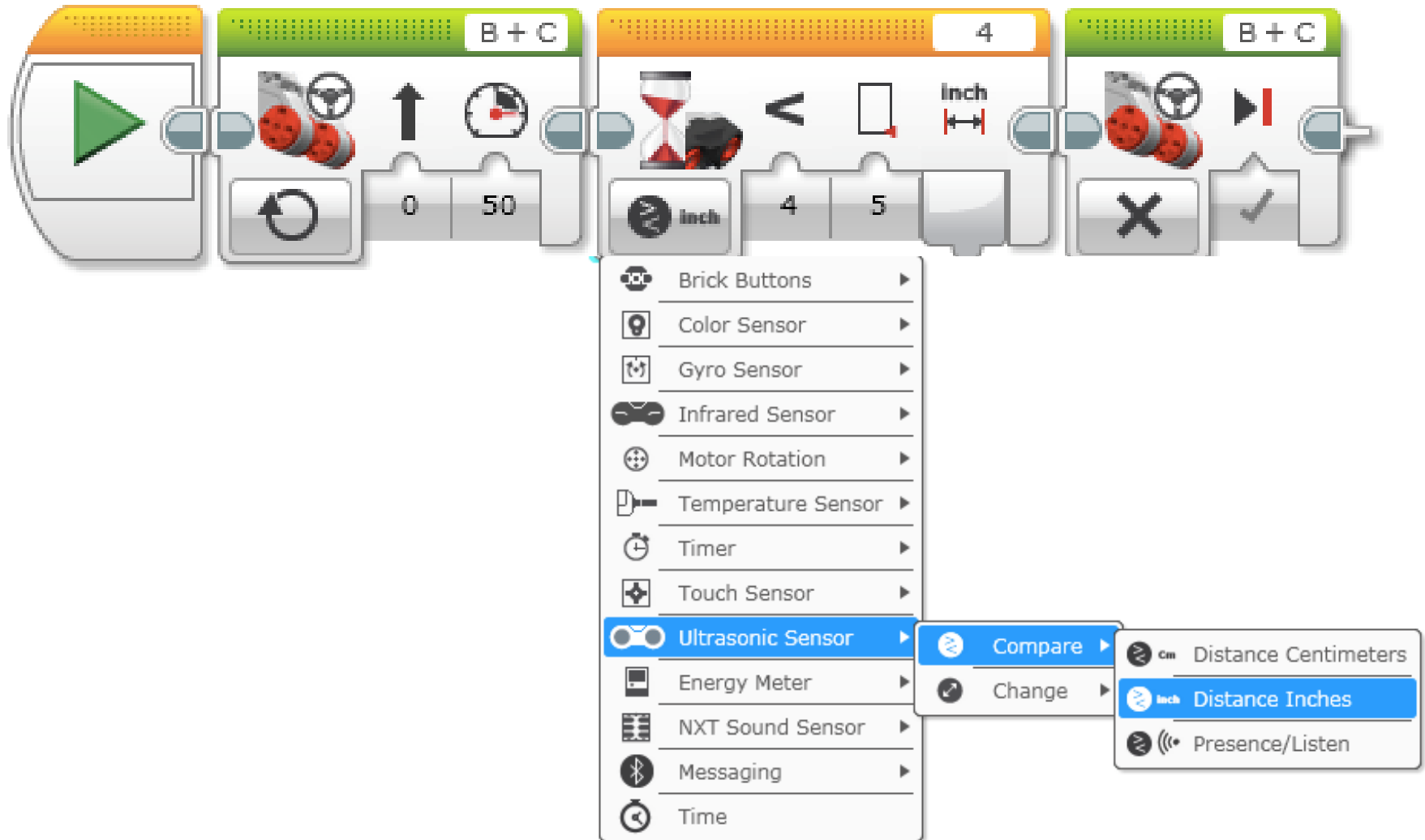
**Step 2:** Set move to “on”

**Step 3:** Set wait block to use the Ultrasonic

**Step 4:** Set move block to “off”



# CHALLENGE 1 SOLUTION



# CHALLENGE 2: DOG FOLLOWER

**If the robot is closer than 5 inches away from your hand move backward, otherwise move forward.**

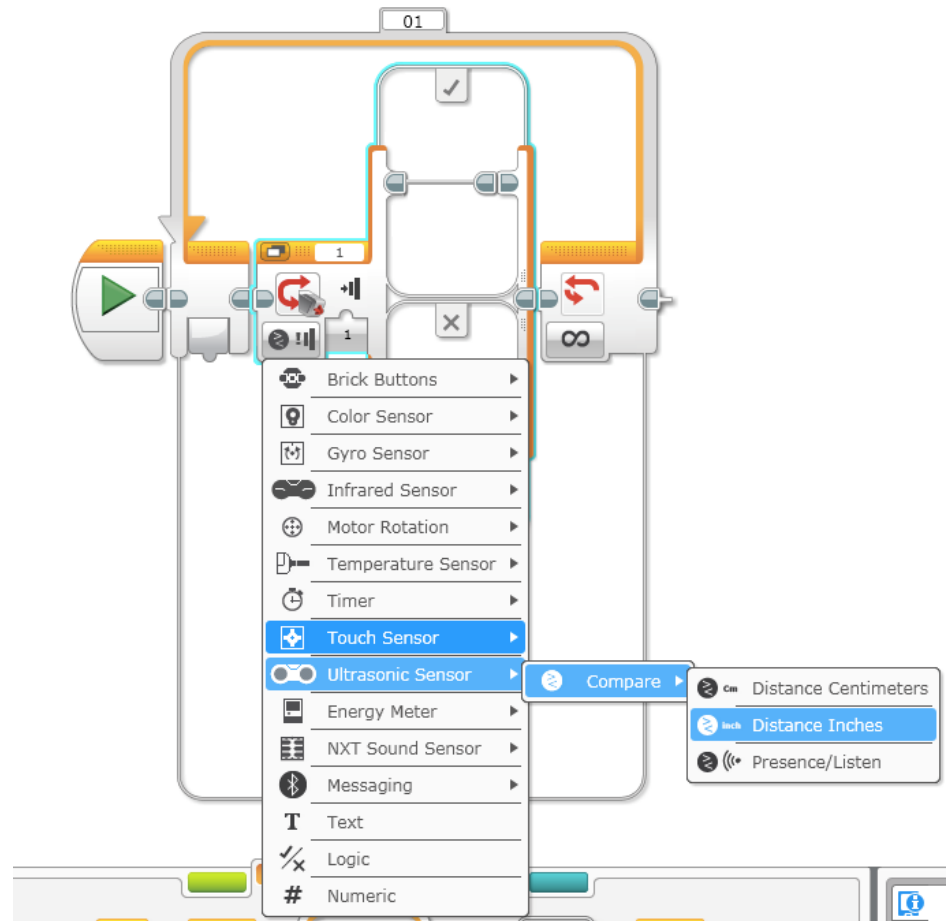
**Step 1: Drag a loop from the orange tab**

**Step 2: Drag switch inside loop**

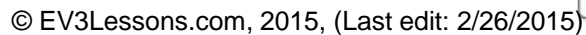
**Step 3: Set switch to Ultrasonic**

**Step 4: Set move steering block to ON and place in TRUE**

**Step 4: Set move steering block to OFF and place in FALSE**



## 8



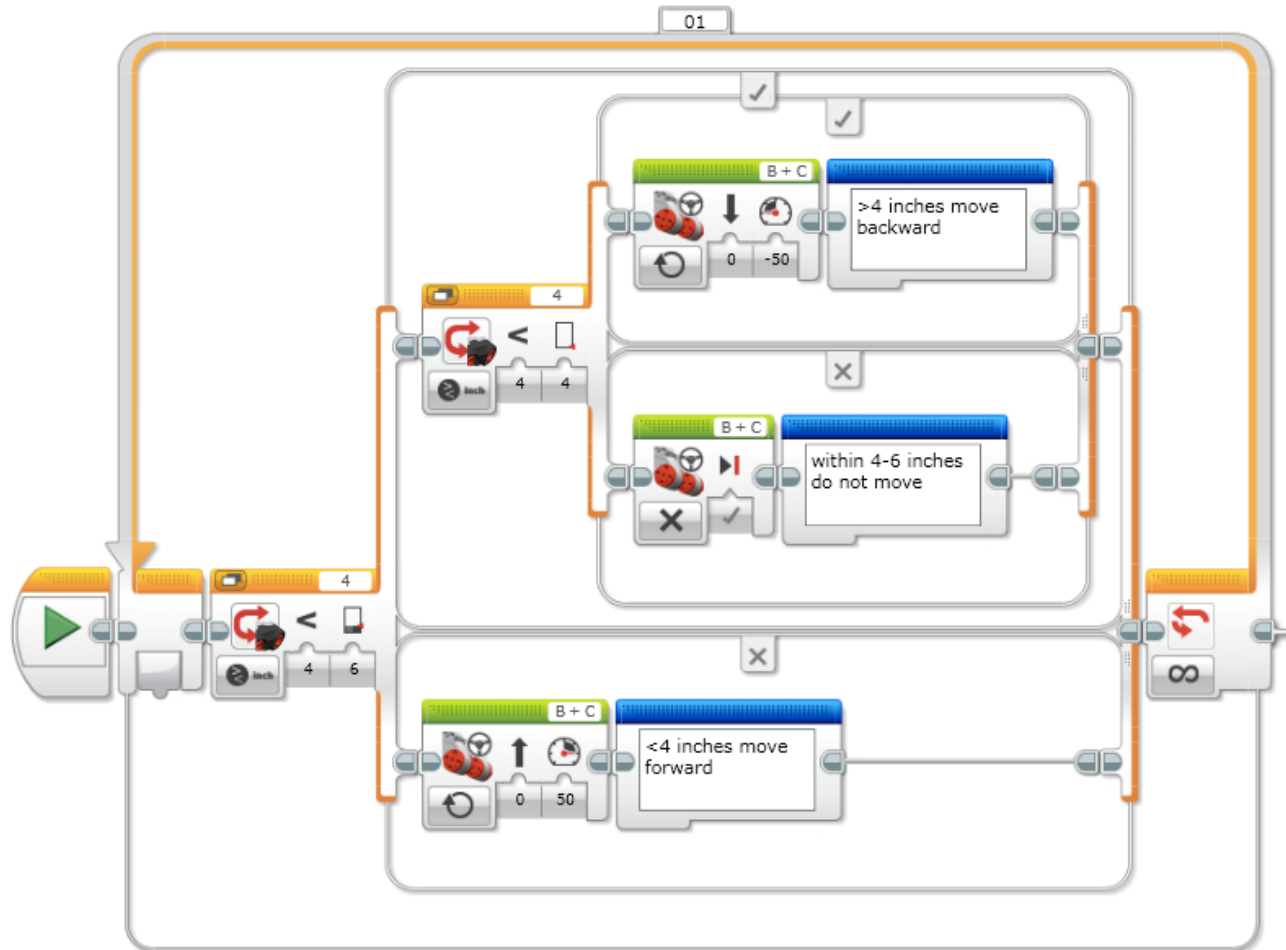


# ROBOTS CAN FOLLOW YOU & EVEN DANCE WITH THIS CODE!



# BETTER DOG FOLLOWER:

The previous dog follower kept the robot moving always. This version lets the “dog” rest if it is between 4-6 inches.



# CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan from Droids Robotics.
- More lessons are available at [www.ev3lessons.com](http://www.ev3lessons.com)
- Author's Email: [team@droidsrobotics.org](mailto:team@droidsrobotics.org)



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