View & Using Sensor Data (NXT)

By Sanjay and Arvind Seshan

BEGINNER PROGRAMMING LESSON

LESSON OBJECTIVES

1. Learn how to retrieve and use data from your sensors

2. Learn how to use Port View on the NXT Brick

3. Learn some examples of when and where View would be useful

4. Try to solve some common problems using View

WHY DO YOU NEED SENSOR DATA?

Sensor data can be….

- Used to help program more easily (no more guess and check!!)

- Used to help program more accurately

- Used to debug code as well as build issues

VIEW is an easy way to access SENSOR DATA!

HOW DO YOU GET TO VIEW?

- **Step 1**:
  - Click the Left or Right buttons on the brick until you see "View"
  - Select this with the Orange button
- **Step 2:**
  - Use the Left and Right Buttons to pick the sensor data you want to see
- **Step 3:**
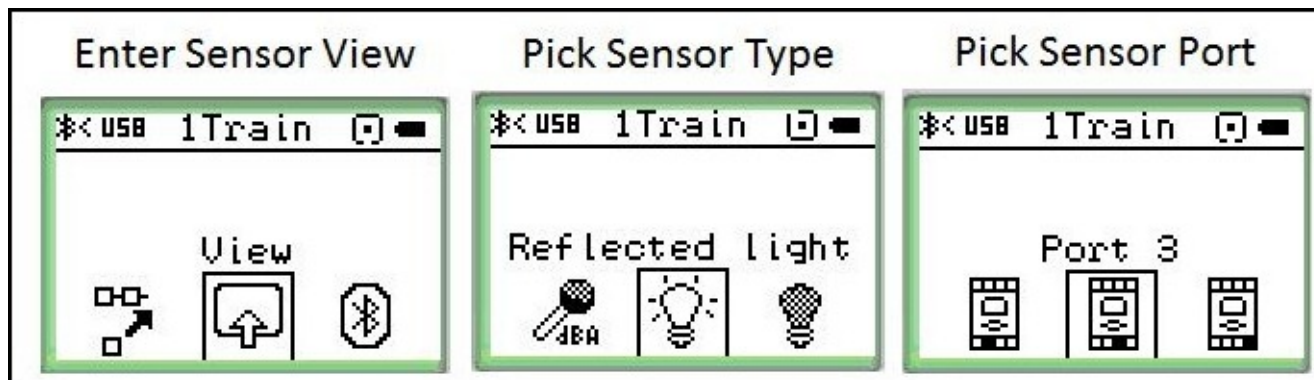 - Use the Left and Right Buttons to pick the Port the sensor is connected to

Image Credit: http://dkc.squarespace.com/waddlebot/

WHAT YOU SEE IN VIEW

- You will be the value of the sensor.

- You can use this value in your program for more accuracy

- Or you can use this value to check if your sensor readings as you hypothesize.
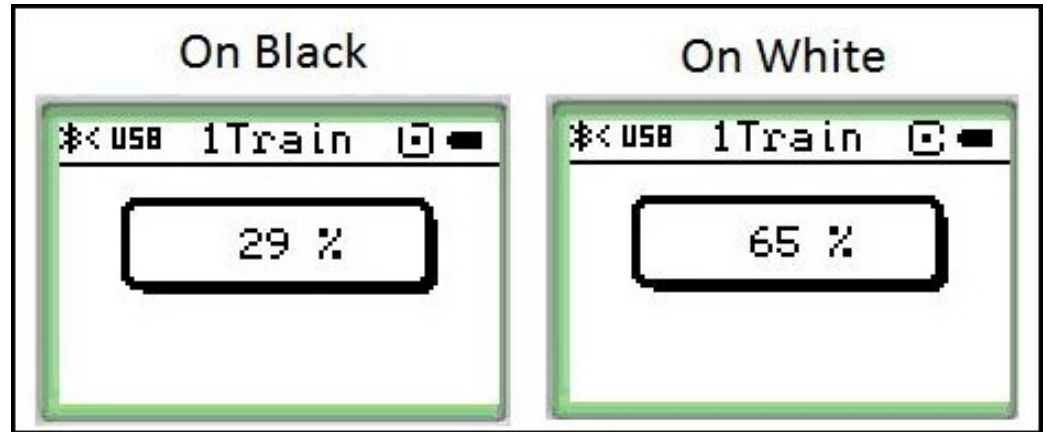

Image Credit: http://dkc.squarespace.com/waddlebot/

In this example, you are viewing the values for Reflected Light on Port 3 for a Light Sensor. The sensor was placed on a black area and then on a white area so that the programmer could have more accurate threshold readings.

VIEW IS POWERFUL

As you go through the rest of the lessons on EV3Lessons.com, you will use View often

As you complete each challenge, think about how View might help you.
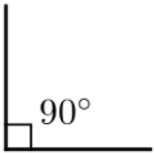
The next page has many several examples to think about.

OTHER PROBLEMS YOU CAN SOLVE WITH VIEW

Challenge 1: Program Easier/More Accurately

I want to go from a starting point up to a LEGO model. I keep having to guess and check. How can I figure out how far away the LEGO model is?

Challenge 2: Program Easier/More Accurately

I want my robot to turn 90 degrees. But 90 degrees in the real world is not 90 degrees in the steering block. So, how much does my robot have to turn to make a 90 degree turn?

Challenge 3: Debug Code

The robot does not folllow the green line like I programmed it to do. Why not? What color does the robot think that green line is? Try placing the robot on different objects or parts of mat/picture – what colors or reflected light values does the sensor read

Challenge 4: Check Builds

I built my robot with the touch sensor a little bit inside the robot. I am not sure that the touch sensor is getting pressed enough. How can I make sure the sensor is getting pressed?

Challenge 5: Test Sensors

I told my robot to stop when the Ultrasonic sensor is 20cm away. But it seems to stop earlier. Is the sensor working correctly? How can I see what the ultrasonic sensor sees?

CREDITS

- **This tutorial was created by Sanjay Seshan and Arvind Seshan**

- **More lessons are available at www.ev3lessons.com**