Calculations: Line Locator Challenge 2

Line Locator Challenge 2

In this challenge, you must report the distance between two dark lines, in centimeters.

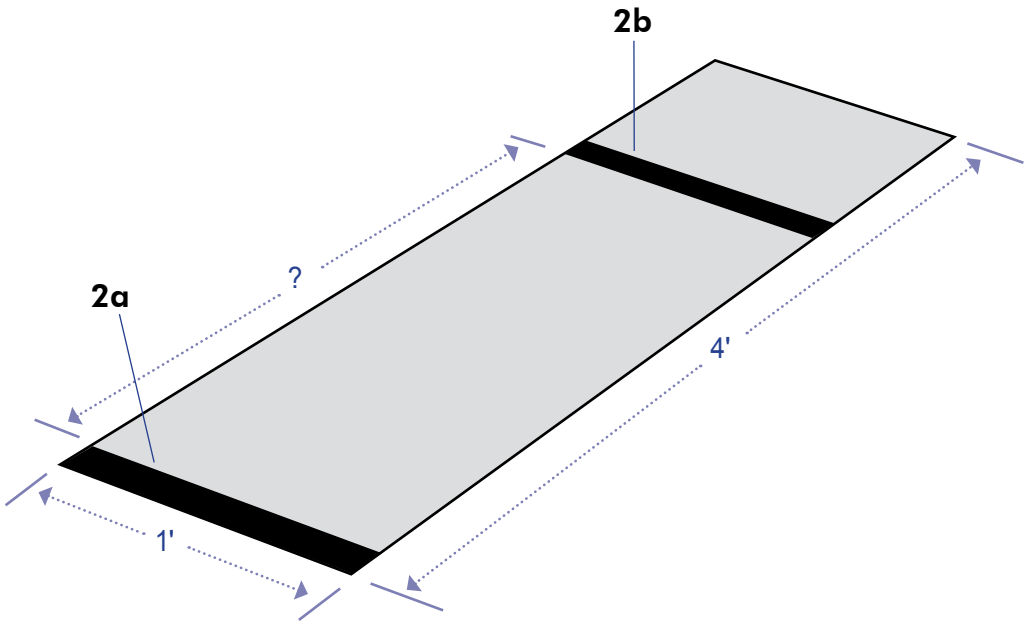
Materials

- 4’ long light-colored smooth playing surface, at least 1’ wide (hard floor, table, shelf, panel)
- Black removable tape to mark locations on playing surface

Playing Field Setup

Note: Diagrams are not drawn to scale

1. Use part of a standard 4’x4’ gameboard or floor space
2. Using the board diagram below:
   a. **Start Line:** Make one dark tape line to mark the start of the measured distance
   b. **Goal Line:** Make a second dark tape line to mark the end of the measured distance
3. Complete the challenge as described in the Rules and Procedure section on the next page!



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Rules and Procedure

Rules and requirements in **bold** below are different from the Line Locator 1 challenge.

1. Load any programs you intend to use onto the NXT
2. **Start the robot behind the Start Line (no parts overhanging)**
3. The robot must travel to the second line...
4. ... then return to its original position.
5. The robot must then display (on its screen) the distance between the Start Line and the Goal Line, in centimeters
   - **To convert a measurement in degrees to centimeters:**
     a. **Start with the number of degrees**
     b. **Multiply by the wheel's diameter in cm**
     c. **Multiply the result by pi**
     d. **Divide by 360**
   - **Each measurement must be verified using a meter stick or tape measure, and accurate to within 0.5 cm**
   - Hint 1: The Rotation Sensor starts at 0, and counts up as the robot moves forward
   - Hint 2: The Rotation Sensor counts backwards as the robot moves backward
   - **For this challenge, the distance to be measured is only the "light" area between the two dark lines – do NOT count the thickness of the black line itself**
6. Move the Goal Line, and run your program again
7. Beat the challenge by successfully reporting the correct distance both times!