

OzoBlockly Editor—**Lesson: Ozobot Measures Inches**—Student Guide

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One of the tools in Ari's toolkit is its *Distance* tool. This tool makes use of Ari's *Time of Flight* sensor. Distance is determined by calculating the time it takes for light to travel between Ari and an object in front of Ari. This distance can be up to one meter, or about 39 inches. Evo does not have a time-of-flight sensor so cannot measure distances by using this technology.

In this lesson you will learn how to design an Ozobot Editor program that allows both Evo and Ari to measure distances in inches and not limited to 39 inches. The key block for accomplishing this is the movement block shown in Figure 1. This is a free movement block that does not make use of line following. Since 25.4 mm equals 1 inch, this block tells Ozobot to move a distance of 1 inch at a speed of 1 inch/s. So, if this block is inside a loop, each iteration of the loop will make Ozobot travel 1 inch.

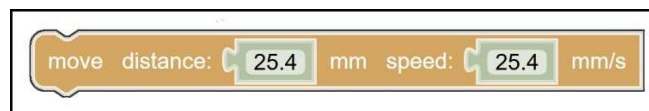


Figure 1

The complete program is shown in Figure 2, with a code review on the next page of this lesson.

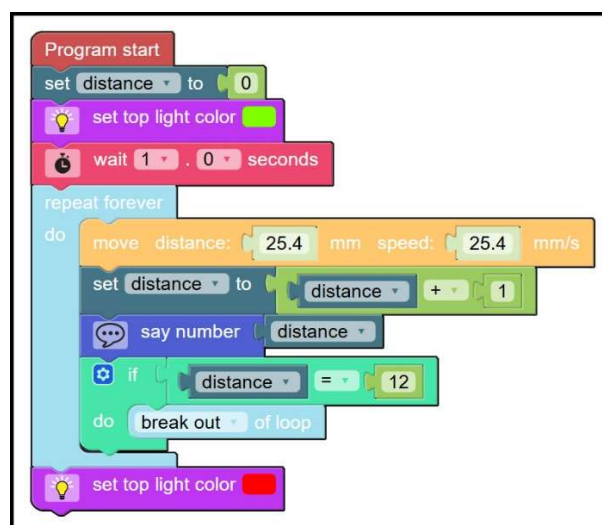


Figure 2

The program begins by setting the *distance* to 0 inches, the top light color to green, and then pausing program execution for 1 second.

A repeat forever loop is used to contain the *move* block. This program shows that you can actually stop a *repeat forever* loop with a *break out of loop block*.

Each iteration of the loop begins with Ozobot moving 1 inch. The distance variable is increased by 1, and Ozobot says the current value of distance traveled. We want Ozobot to stop after traveling 12 inches *i.e.*, 1 foot. So, if the distance is 12, we break out of the loop, set the top light to the color red, and the program stops.

If we had wanted to measure up to 5 feet, *i.e.* 60 inches, then the *if* block would have checked to see if the distance was 60, rather than 12.

Exercise 1

With the program set to measure 12 inches, place Evo or Ari alongside a 12-inch ruler as shown in Figure 3. Then start the program and watch Ozobot move inch by inch until stopping at the end of the ruler. Was Ozobot accurate? If not, how could you tweak the program to improve its accuracy?

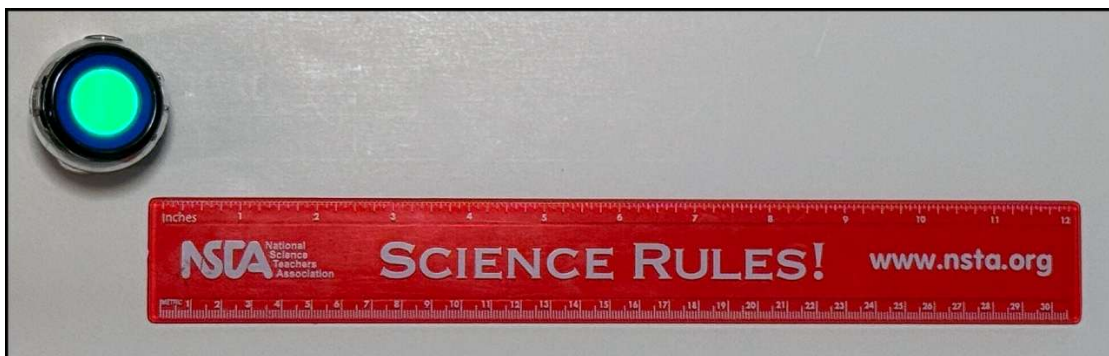


Figure 3

Exercise 2

Adjust the maximum number of inches Ozobot can measure in the program so that Ozobot could measure the length of a table. **But be sure to catch Ozobot so that it doesn't fall off the edge of the table!** Compare Ozobot's table length to that obtained with a tape measure. Was Ozobot reasonably accurate?