

Direct Instruction Summary

Intro to Color Codes 08: Counters



1. Introduction

Students will be learning about 4 Color Codes that can be used to count different things, the Enable X-ing Counter, the Enable Turn Counter, the Enable Path Color Counter, and the Enable Point Counter with Point +1 and Point -1 codes.

2. Enable X-ing Counter

The Enable X-ing Counter programs Ozobot to stop after it crosses five intersections, either 'T' or '+' intersections. After the fifth intersection, Ozobot rotates right and left, then stops.

Find Start 1. The first Color Code is the Enable X-ing Counter code, G, R, B, G. The second code is Line Switch Right, R, G, R. This will program the bot to cross to the grid in the middle. Count the number of intersections the bot passes. Notice that the bot counts the first contact with the grid in the middle as an intersection.

3. Enable Turn Counter

Find Start 2. Add the Enable Turn Counter, R, B, G, B in the first code space and the Line Switch Right, R G, R, in the second. Have students count the turns Ozobot makes at intersections.

If Ozobot continues straight, either randomly or programmed with a "Straight at Intersection" code, it is not counted. Also, if the bot turns at a corner that is not an intersection, that turn is not counted.

4. Enable Path Color Counter

Find Start 3. Add the Enable Path Color Counter, R, G, B, R and the Line Switch Right, R, G, R codes. Add the colors to the path as indicated. Run the bot and count the color changes in the path. Remind students not to count the change from the black line to the first blue line.

5. Enable Point Counter

The Point Counter activity is optional. This code works with the Point +1 and Point -1 codes. When programmed with the Enable Point Counter, R, B, R, G, Ozobot begins with 5 points, and can never have more than 5 points. Each time Ozobot reads a Point -1 code, it subtracts one. If it reads a Point +1 code, it adds one, unless it already has 5 points.

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Fill in the Enable Point Counter code in the first space after Start 4. Notice that plus one is red, blue, green, and minus one is the opposite, green, blue, red. When the total point count is zero, Ozobot will stop. Inform students that they can reset Ozobot by turning it off and back on again.

6. Lesson Wrap-Up

Have students explain to a partner, in writing, or in a group discussion:

1. the Color Codes they used and why
2. a problem they encountered and how they attempted to solve it
3. how their bot behaved based on the Color Codes used and if the bot demonstrated the correct outcome
4. which counter code they think is the most useful