COLOR CODE Guide

What is a Color Code?

A Color Code is a short sequence of 2 to 4 colors that Ozobot Evo can read and responds to. Evo uses optical sensors and respond with pre-programmed behaviors–by speeding up, slowing down, changing direction, or making cool moves (see Color Code Chart).

RGB: 73/183/73
CMYK: 72/0/100/0
HEX #49B749

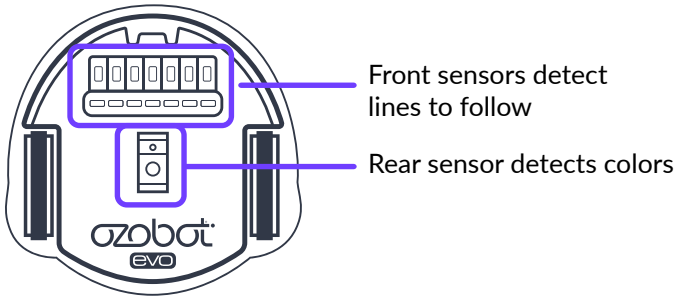
RGB: 17/131/198
CMYK: 82/40/0/0
HEX #1183C6

RGB: 236/32/39
CMYK: 0/99/97/0
HEX #EC2027

RGB: 0/0/0
CMYK: 30/30/30/100
HEX #000000

Ozobot Evo's Optical Sensors

Evo's optical sensors can read colors and line widths, enabling the bot to perform different movements.



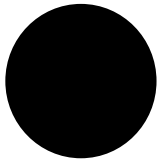
Getting Started

It is important to calibrate your Evo before each session, when you change surfaces or when Evo is not following lines or reading codes as expected. Calibration helps improve code and line reading accuracy.

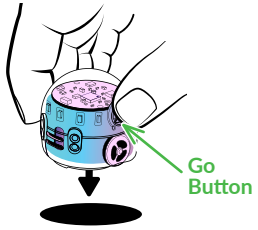
Evo will calibrate on a black circle (about the size of the robot's base). When drawing, you can create your own black circle with markers.

PSST! Helpful Hint:
Print out the 5x5mm graph paper on the last page for practice!

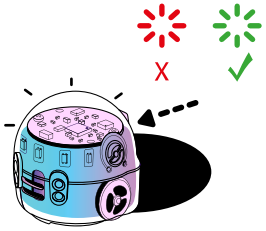
How to Calibrate



Step 1:
Draw a black circle, slightly bigger than your bot. Place Evo on it.



Step 2:
Press and hold Evo's Go Button for 2 seconds (or until its top LED flashes white), then release.



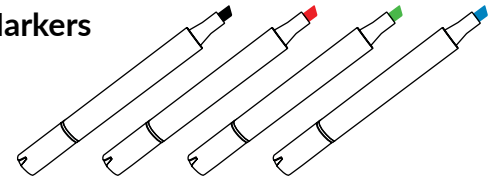
Step 3:
Evo will rotate left, right move outside the circle, and blink green when calibrated. If Evo blinks red, start over from Step 2 then release.

Markers & Paper

To draw Color Codes, you'll need black, red, green, and blue markers (included with your Evo).

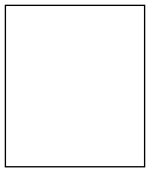
YES

Ozobot Markers



Paper

- White paper (multipurpose, non-photo/glossy)



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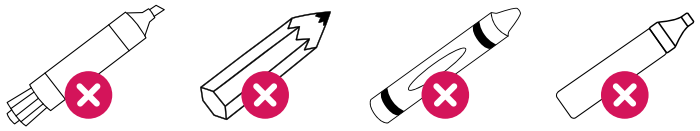


Dry-Erase | Color Pencil | Crayon | Highlighter

Color Paper | Construction Paper | Glossy or Photo Paper

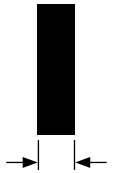
Lines

YES

Draw a line Ozobot can follow

Line Thickness:

- Best: 0.2" (5mm)
- Min: 0.18" (4.5mm)
- Max: 0.24" (6mm)

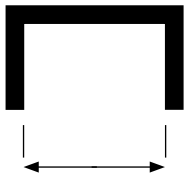


0.2in (5mm) Best

Tip: The flat side of your Ozobot marker's chisel tip is the perfect thickness.

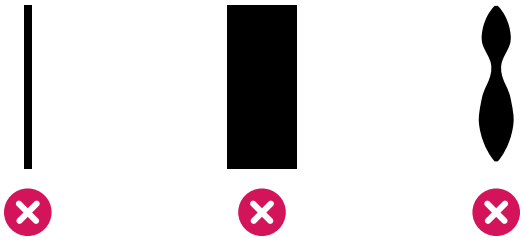
Line Spacing

Lines should be at least 1" (25mm) from another line.

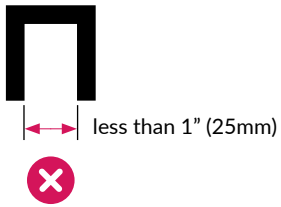


1" (25mm) minimum

NO



Too thin | Too thick | Inconsistent line thickness

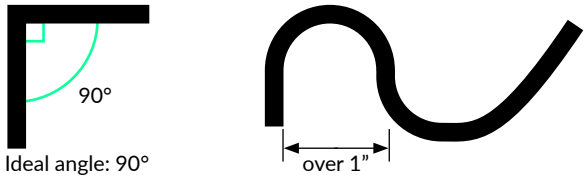


less than 1" (25mm)

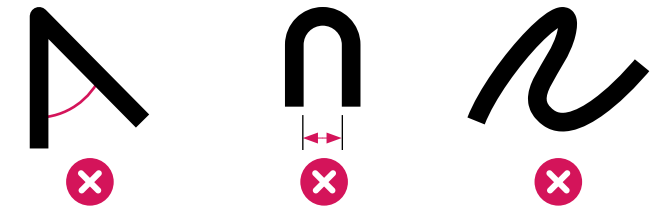
Corners & Curves

YES

Corners & Curves



NO

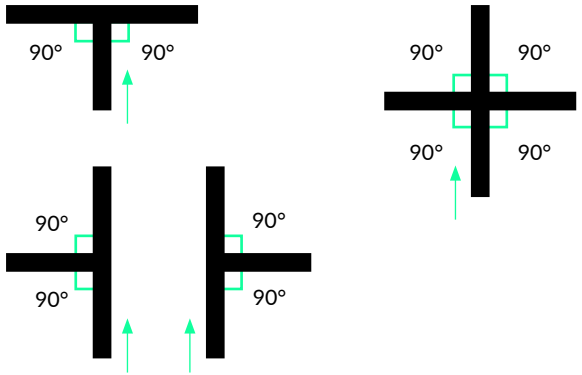


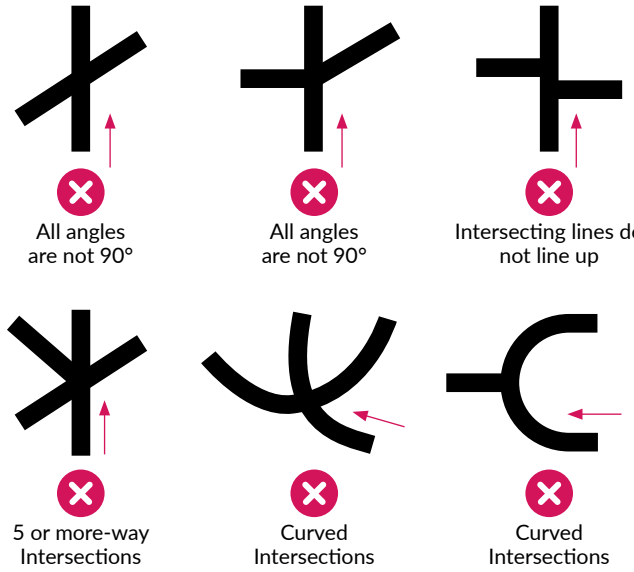
Intersections

Intersections

Ideal angle for all intersections: 90°

- 3-Way intersections
- 4-Way intersections





Track Creation and Printing Guidelines

Track Creation

When creating maps using programs like Illustrator, Google Sheets, etc., follow the guidelines above to create your optimal map. We suggest adding a calibration circle that will match the black track when printed.

Printing

- White paper (multipurpose, non-photo/glossy)
- Color
- 100% scale
- Normal or High quality

COLOR CODE Guide

ozobot

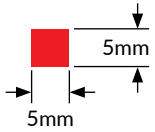
YES

NO

Draw Color Codes

YES

- Color Code square size:
  - Best: 0.2” x 0.2” (5mm x 5mm)
  - Range: 4.5mm — 6mm



NO

Squares should be approximately the same size

Line Thickness

YES

Min: 0.18” (4.5mm)

Max: 0.24” (6mm)

NO

Lines should be consistent in height

Codes should be in the same height as the line

Line Color

YES

Do not include space between Color Codes with black lines before and after each Color Code, except for the Line-End Color Code (e.g., U-Turn, Win/Exit).

Nitro Speed

U-Turn

Win/Exit

NO

Black lines before and after each Color Code only

Too dark

Squares should not have space in between them

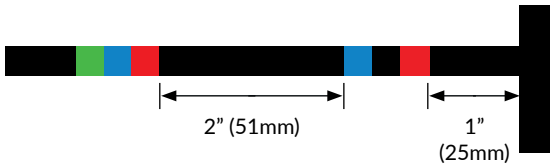
Squares should not overlap

Two-color codes need to be at the line end

Spacing

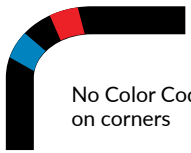
YES

Keep a minimum of 2” (51mm) between Color Codes and 1“ (25mm) from an intersection.



NO

Codes should be at least 2” (51mm) apart



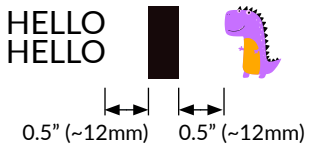
No Color Codes on corners

Color Codes should be at least 1” (25mm) from intersections

Safe Area

YES

Leave 0.5” (~12mm) of white space on each side of the line.



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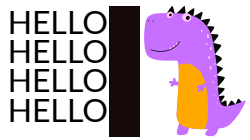
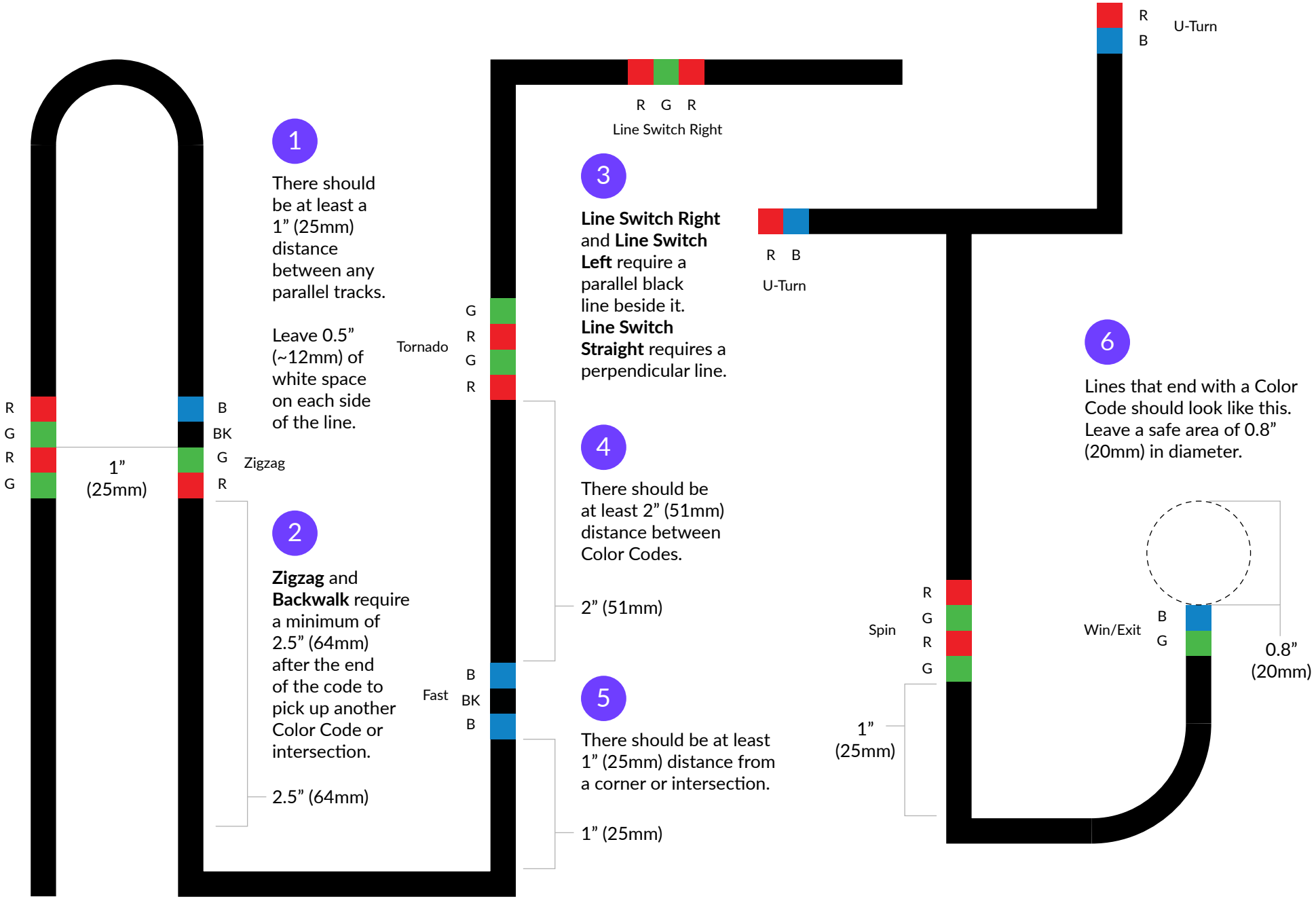


Not enough white space on each side of the line

COLOR CODE Lessons Map Guide



COLOR CODE Chart

Speed

Short Super Slow	Slow	Cruise	Fast	Turbo	Nitro Boost
R G B	R BK R	G BK G	B BK B	B G B	B G R

Direction & Special Moves

Left at Intersection	Straight at Intersection	Right at Intersection	Line Switch Left	Line Switch Straight	Line Switch Right
G BK R	B BK R	B R G	G R G	G B G	R G R

U-Turn	U-Turn (line end)	Tornado	Zigzag	Spin	Backwalk
B R B	B R	R G R G	B BK G R	G R G R	R G BK B

Timers

Pause (3 sec.)	Timer on (30 sec. to stop)	Timer off
R B R	R BK B G	G B BK R

Wins/Exits

Win/Exit (Play Again)	Win/Exit (Game Over)
G B	G R

Counters

Enable X-ing Counter	Enable Turn Counter	Enable Path Color Counter	Enable Point Counter	Point +1	Point -1
G R B G	R B G B	R G B R	R B R G	R B G	G B R

Key: **BK** = Black **B** = Blue **G** = Green **R** = Red

COLOR CODE Defined

Speed

Speed codes change your Ozobot's velocity from Short Super Slow (slowest) to Nitro Boost (fastest).

Short Super Slow R G B
A three–second dose of super slow speed.

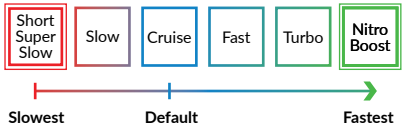
Slow R BK R
A slow speed command is effective until the bot reads a new speed code or is turned off.

Cruise G BK G
The default speed command.

Fast B BK B
A high speed command effective until the bot reads a new speed code or is turned off.

Turbo B G B
An extra high speed command effective until the bot reads a new speed code or is turned off.

Nitro Boost B G R
A three–second dose of Ozobot's highest speed.



Direction

Direction codes tell your Ozobot what to do at an intersection.

Left at Intersection G BK G
A command to turn left at the next intersection.

Straight at Intersection B BK R
A command to continue straight at the next intersection.

Right at Intersection B R G
A command to turn right at the next intersection.

Line Switch Left G R G
A command to immediately turn 90-degrees to the left, move forward to a new line, then make a random turn to follow along the new line.

Line Switch Straight G B G
A mid–line command to continue straight after the line ends. The code will not work if Ozobot encounters an intersection before the line ends.

Line Switch Right R G R
A command to immediately turn 90-degrees to the right, move forward to a new line, then make a random turn to follow along the new line.

U–Turn B R B
A mid-line command to turn around 180-degrees and follow the same line in the opposite direction.

U–Turn (Line End) B R
A line–end command to turn around 180-degrees and follow the line in the opposite direction.

Ozobot's default intersection behavior is random. If a given turn, i.e. 'Go Left' is not possible, Ozobot defaults back to random behavior.

Counters

Counter codes tell your Ozobot to count five intersections, turns, or line color changes.

Enable X–ing Counter G R B G
A command to make your Ozobot stop following lines after it crosses five intersections ('T' or '+' intersections). After the fifth intersection, Ozobot executes a "done" maneuver, stops following the line, and blinks red.

Enable Turn Counter R B G B
A similar command to the Enable X–ing Counter, except that Ozobot only counts intersections where it makes a turn. It will not count intersections where it continues straight. Ozobot can randomly choose to go straight at an intersection, or be commanded to go straight with a "Straight at Intersection" code.

Enable Path Color Counter R G B R
A command to make your Ozobot stop following lines after it reads five color changes in the line. If the line Ozobot is following transitions from red to green, it counts as one color change. Transitions to and from black lines are not counted, and color segments less than two centimeters in length are not counted.

Enable Point Counter R B R G
A command that tells your Ozobot to count point codes down from five. Each time Ozobot reads a "Point –1" code it counts down. After the fifth "Point –1" code Ozobot will make a "done" maneuver, stop following lines, and blink red. You can add more to the total count (not to exceed five) with "Point +1" codes. You can reset Ozobot by turning it off, then on.

- **Point +1** R B G
- **Point –1** G B R

Timer

Timer codes tell your Ozobot to pause or count seconds.

Pause (3 sec.) R B R
A command to stop moving for three seconds, then continue with default behavior.

Timer On (30 sec. to stop) R BK B G
A command to make your Ozobot countdown from 30 sec., but continue to move and read codes while counting down. Ozobot will flash its light(s) at a rate of one flash/sec., flash rapidly to signify time is up, then shut off.

Timer Off G R B G
A command to stop counting down seconds and return to default behavior.

Wins/Exits

Win/Exit codes tell your Ozobot to celebrate its success, then either start over or stop.

Win/Exit (Play Again) G B
A command to perform a "success" animation, then continue to follow the line.

Win/Exit (Game Over) G R
A command to perform a "success" animation, then stop following the line.

Cool Moves

Cool Move codes tell your Ozobot to bust a move!

Tornado R G R G
A command to spin around four times at increasing speed, then continue following the line in the same direction.

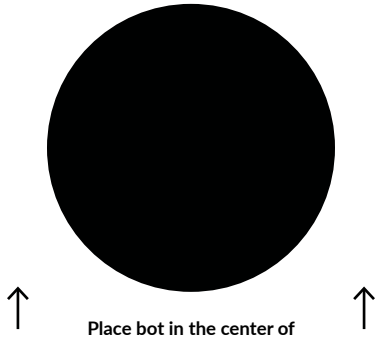
Zigzag B BK G R
A command to sway right-left-right-left while moving forward, then continue moving straight.

Spin G R G R
A command to spin around twice at a consistent speed, then continue following the line in the same direction.

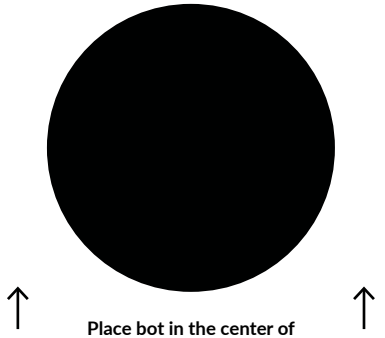
Backwalk R G BK B
A command to quickly turn 180-degrees, wiggle backwards for one second, then turn 180-degrees again and continue following the line in the same direction.

Calibrate Your Bot!

Use these circles to calibrate bots when using them on pre-filled, printed tracks.



Place bot in the center of the circle facing this direction.



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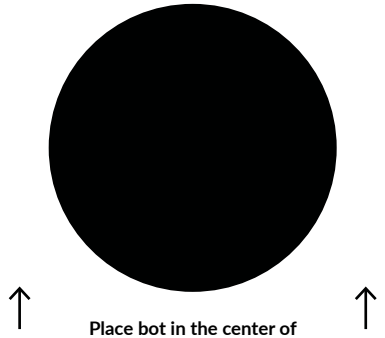
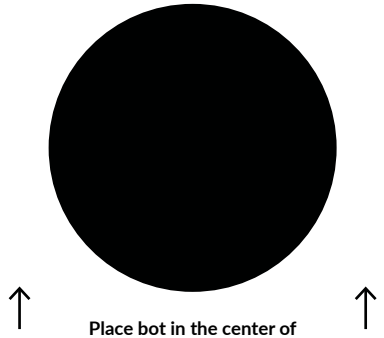
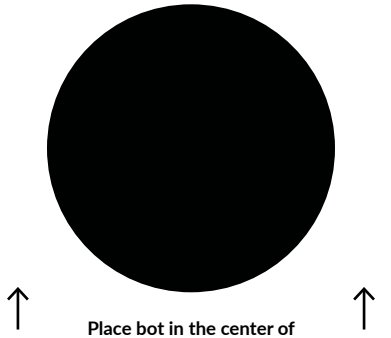


Place bot in the center of the circle facing this direction.



Place bot in the center of the circle facing this direction.



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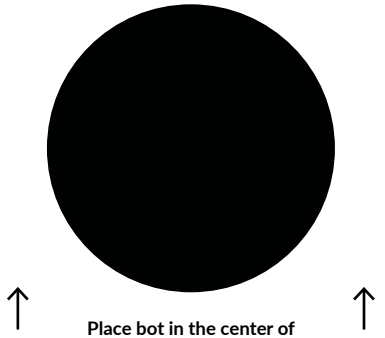

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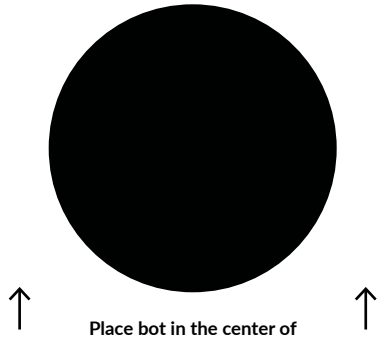
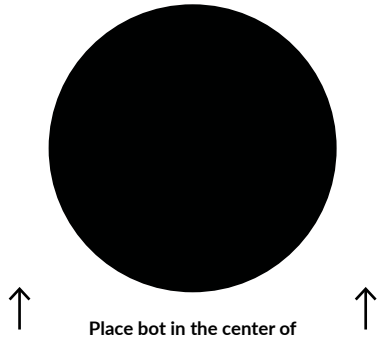
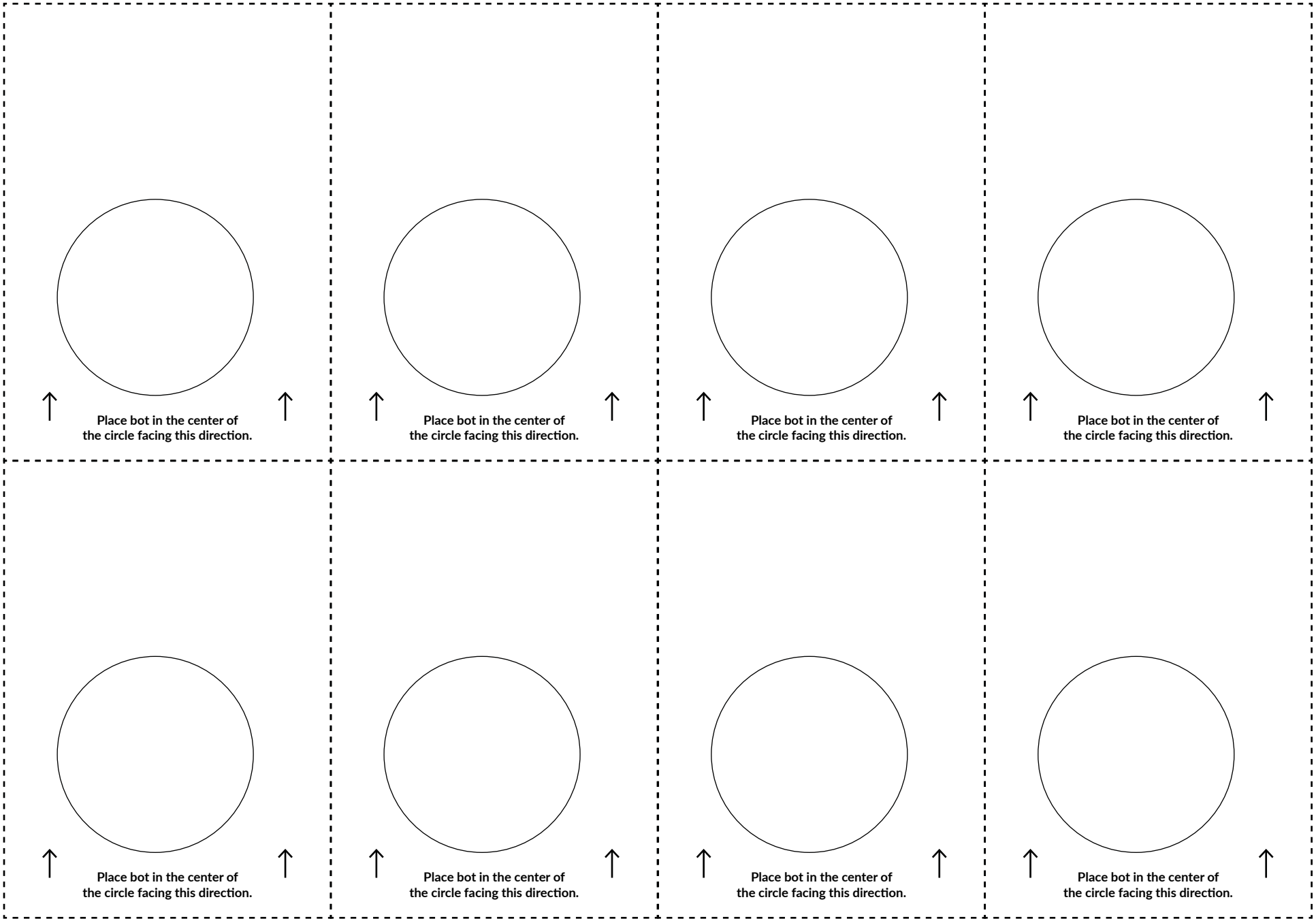


Place bot in the center of the circle facing this direction.



Place bot in the center of the circle facing this direction.

Calibrate Your Bot!

Fill in the circles with black Ozobot marker. Use these circles to calibrate bots when using markers to create your own tracks.