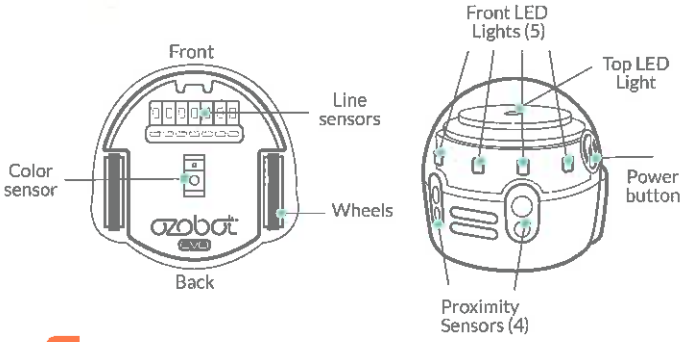
BOT BASICS
GET TO KNOW YOUR ROBOTS

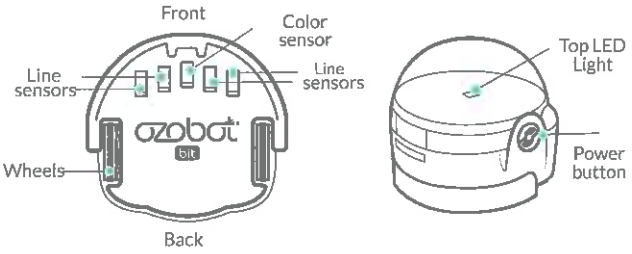
Learn to CHARGE and UPDATE your students' new best bot buddies.

KNOW YOUR BOT

Evo and Bit are robots that help students learn and practice coding. They also build creative confidence!

DO! **Check which bot you have. Just turn your bot upside down and find the logo!**





Evo

- Edu App for extras and updates to grow with your students.
- Programmable LED lights, sensors, speaker, and motor.

Bit

- The original Ozobot.
- Programmable LED light, sensors, and motor.

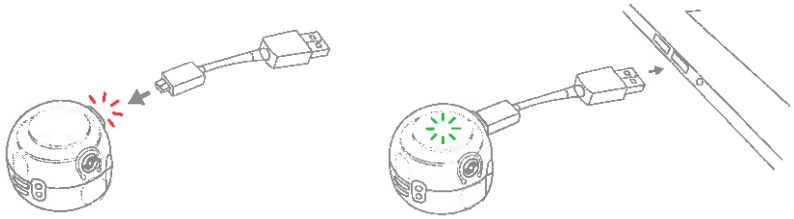
POWER ON & CHARGE

Power on or off with a single click of the bot's button.

DO! **Try turning your bot on.** *Say hi!*

DO! **Charge a bot.**

It a bot's LED lights **blink red**, it needs to charge. LEDs turn **solid green** on a full charge. Bots require up to 60 minutes to fully charge.



GET THE EVO APPS (EVO ONLY)

Edu Utillity Updater

Evo by Ozobot

Download on the App Store

GET IT ON Google Play

Why use an app for Evo?

- Evo's Apps deliver updates which improve functionality, introduce new features, and allow Evo to grow with students.
- Classroom Mode mutes many of Evo's sounds and tricks, which can distract from lessons.
  Evos sold in Classroom Kits default to Classroom Mode.

DO! **Download the Edu Updater Utility app on a tablet or smartphone.**
Follow the instructions, and be sure to select Classroom Mode before installing updates.
To update and enable Classroom Mode for **multiple Evos.**

DO! **Download the Evo app on a tablet or smartphone.**
To update and enable classroom mode for single Evos.

1. Turn one Evo on.
2. Open the app and follow the instructions to create an account, install any updates, and name the Evo.
3. Select the Evo, then select More Info. If your Evo is not in Classroom Mode, select it and tap Apply.

2 WAYS TO CODE

How do Evo and Bit help teach coding *and* build creative confidence? With **two ways to code!**

1. Screen-free with **Color Codes**
   Draw lines and Color Codes with markers, and your bots follow your lines and code commands.

2. Online with the **OzoBlockly editor**
   Drag and drop blocks of code together to program your bots.

DO! **Bookmark the Lesson Library: portal.ozobot.com**
Features 150+ downloadable lessons on Color Codes, OzoBlockly, and STEAM subjects.

GET READY TO CODE!

You're done with Bot Basics! Before you move on...

DO! Bookmark these important URLs.

1. **Getting Started page:** [ozo.bot/edu-get-started]
2. **Educator's Guide:** [ozo.bot/edu-guide]

NOW continue through Bot Camp
to try Color Codes and OzoBlockly!

WELCOME TO THE OZOBOT COLOR CODES BOT CAMP FOR EDUCATORS

This 100% unplugged experience makes coding approachable to learners at all levels. With just the stroke of a marker you start practicing concepts like sequential thinking, syntax and debugging while planting the foundation for more advanced coding and robotics skills. After completing the Bot Camp, you'll be ready to lead and inspire your students with Ozobot's Infinite Learning Possibilities.

SETUP YOU'LL NEED:

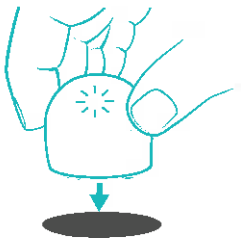
- ✓ **A fully charged Bit or Evo!**
  (For Evo be sure to update using the Evo App or Edu Updater Utility and set to classroom mode.)
- ✓ **A set of Ozobot Markers**
- ✓ **Extra plain white paper (optional)**
- ✓ **About 15 minutes of free time to complete the bot camp**

ABOUT CALIBRATION

The robot needs to know the amount of light coming off the paper to know what contrast and color to look for. If you change paper or your light conditions change, you may need to calibrate again.

DO! **Calibrate your bot to the black spot following steps below.**

1

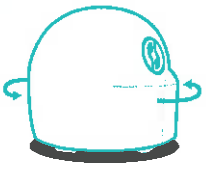


Make sure your bot is powered off, then place your bot on black circle.

2

Press and hold your bot's power button for 2 sec. until the top LED light blinks white. Then, release power button.

3



Your bot will move on the circle.

4

You bot blinks green when calibrated. If your bot blinks red, start over from Step 1.

If calibration is successful, Good Job! You're ready to start coding Ozobot to follow lines.

DRAWING LINES

Evo and Bit are programmed to follow lines they see through their sensors.

Student Prompt Question

Why do Bit and Evo need lines this thickness?

Take a look at the sensor widths under your bot.

Student Prompt Question

What would happen if the line was too thick? Or too thin?

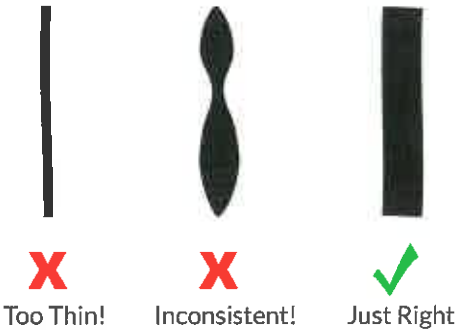
Test out different lines to test the limits of the bit and deconstruct what the bot sees.

Real-world Connection

In text-based coding, your directions should be precise or it won't be read. Giving instructions to your bot is the same way, so keep your drawing precise.

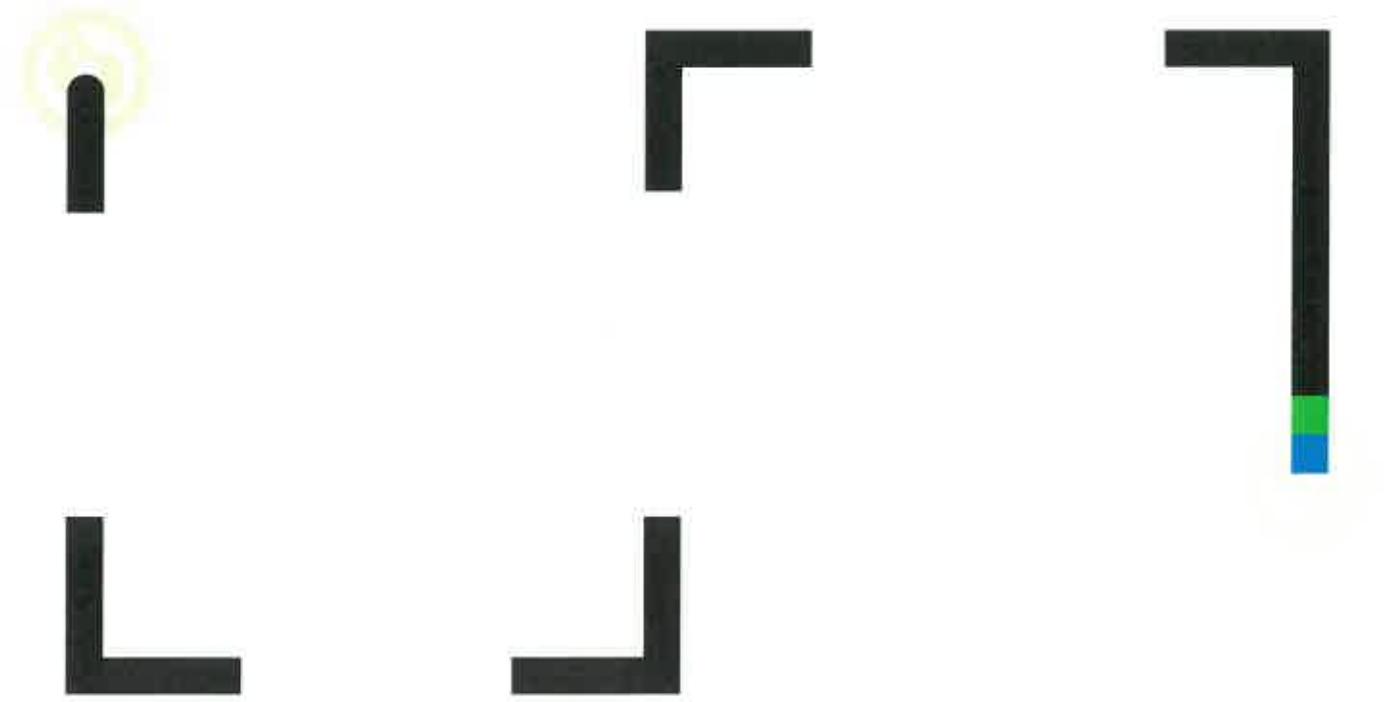
Ozobot Tip

How to hold the marker: the chisel-tip can set down flat to make the right thickness for your lines. Practice holding the marker at the right angle.



DO! Finish the Line

Use black marker to connect the lines. Place bots on the START and the bot will race to the FINISH.



X
Too Sharp!

Just Right

Just Right

X
Too Close!

Just Right

Ozobot Tip
Be sure to keep your line thickness consistent in corners.

DO!

Drawing corners

Complete the corners in this map to get Ozobot from START to FINISH.

EXPLORING COLOR

Evo and Bit can see different colors through their optical sensors.

Ozobot Tip
When Bit and Evo are on a black line, they reflect blue in the LED. They also reflect blue in the LED when on a blue line.

Student Prompt Question
Put the bot on colorful items like clothes, tools, or packaging. What happens?

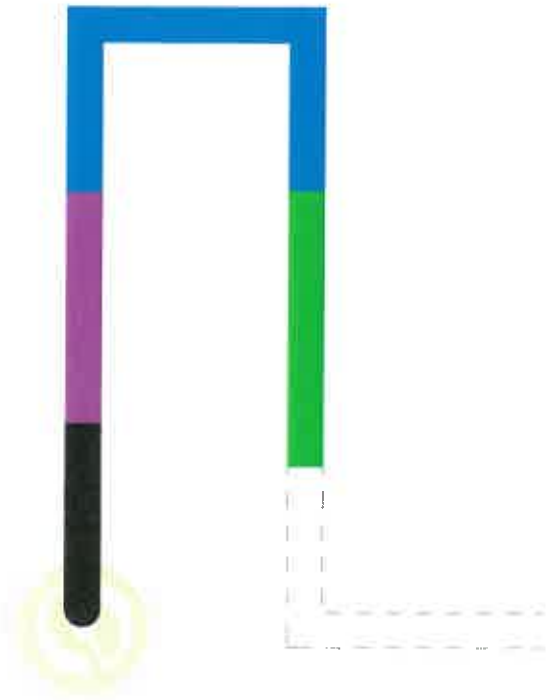
Student Prompt Question
You know how your bot can see black and white with its sensors. Can you use what you know to explain how it can see, and reflect, just about any color?

Student Prompt Question
How does the bot react when you use the different Ozobot marker colors? What happens if you try other color markers like pink, purple, orange or yellow?

Real-world Connection
Computers understand colors in amounts of red, green and blue (RGB). Engineers use number values for each color to tell a computer what color to show.

DO!

Light Show
Try different colored markers to continue this path and create an LED light show.



COLOR CODES

Bit and Evo can read and react to sequences of color, called Color Codes.

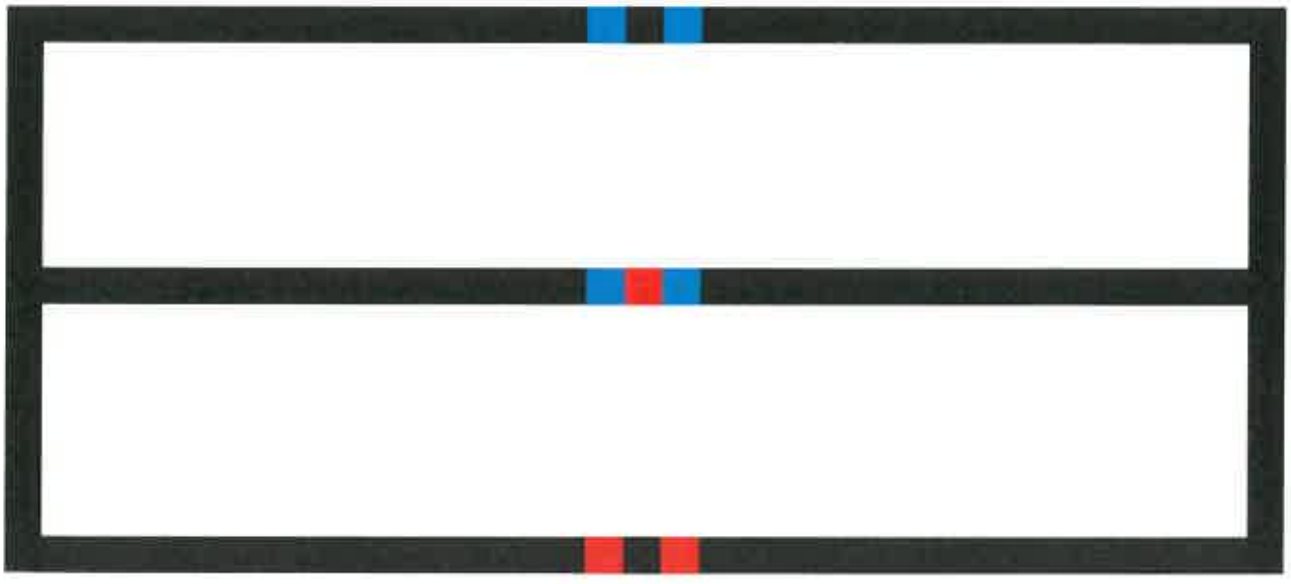
Real-world Connection
Color codes are like 'functions' in programming - a premade chunk of code that does a specific task.

Ozobot Tip
You can give your students codes without the titles to let them investigate and record what each does.

Ozobot Tip
Ozobots can only read color codes when they are within black lines before and after the code.

Real-world Connection
Computers rely on grammar rules to read code. This helps the computer know where code instructions start and stop. For Ozobot, black lines represent start/stop code grammar.

DO! See if you can "crack the code" for Ozobot's color code language by testing the track below. Can you tell which color code means, Slow, Fast and U-Turn?

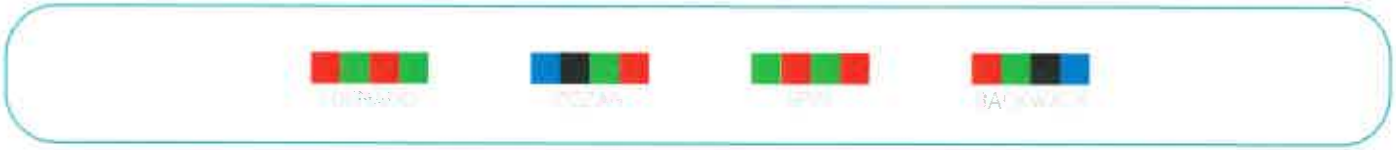


Tips: Code Reference Sheet

SPEED

DIRECTION

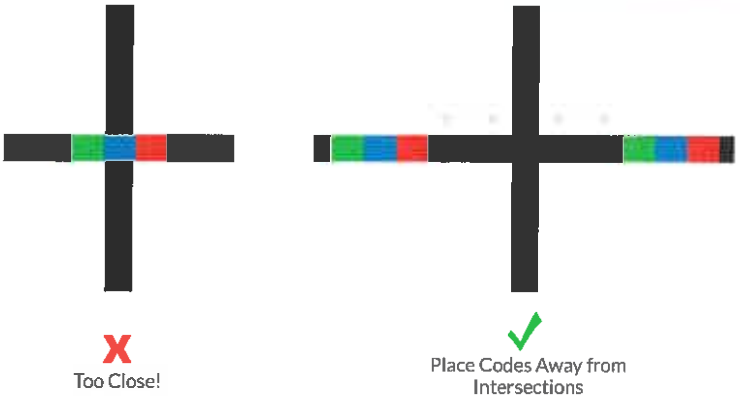
SPECIAL MOVES



TIMERS

WIN/EXITS

Tips: Drawing Codes



COLOR CODES

Real-world Connection
Coding is precise—any extra letters or lost punctuation can break a program. Color Codes and line drawing must also be exact for the robot to understand the instructions correctly.

Real-world Connection
Working with robot sensors is getting more important every day. Today, factories use robots with color and light sensors, Infrared proximity sensors, cameras, accelerometers and more. Learning how to use and care for sensors is a modern skill!

Student Prompt Question + Real-world Connection
Engineers and scientists need to know the limits of what their materials can and can't do, so they test them in extreme conditions. For example, a new engine will be tested at high speeds and extreme temperatures until it breaks. You can test out the limits of the robots code sensing by drawing different code sizes.

DO! Code Creator
Use markers to practice creating the cool color codes below.

COLOR CODES

Ozobot Tip
Some codes mean the same thing no matter which way Ozobot reads them. Other codes have two meanings depending on which direction they are read.

Student Prompt Question
Why is it important to know if a code's direction matters?

Student Prompt Question
Is there a logic behind which codes are the same in both directions (palindromes)?

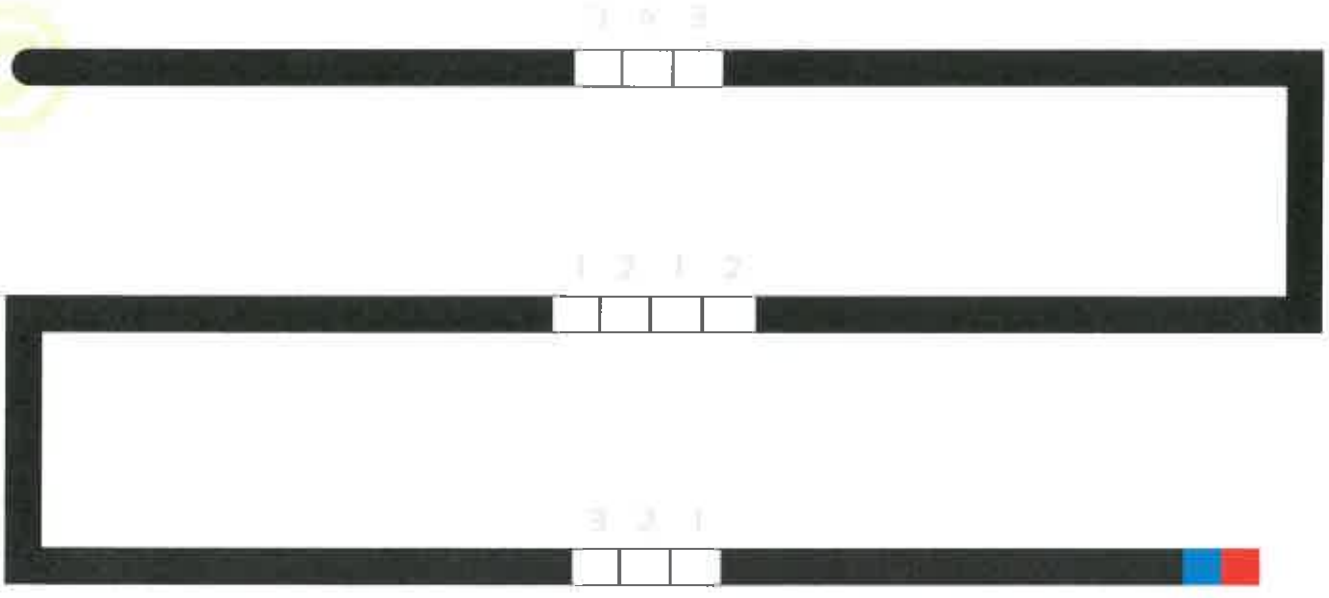
DO!

Code by Numbers

Use the color key to color the codes, then see what Ozobot does in both directions.

Color Key

1 2 3 4



DIRECTION CODES

When Evo or Bit meet an intersection, they bot will randomly choose which direction to go, unless you tell it which way to go with a "direction code."

Student Prompt Question

Which way does Ozobot go? Test it out on the map below and keep track of where it went.

Left	Right	Straight

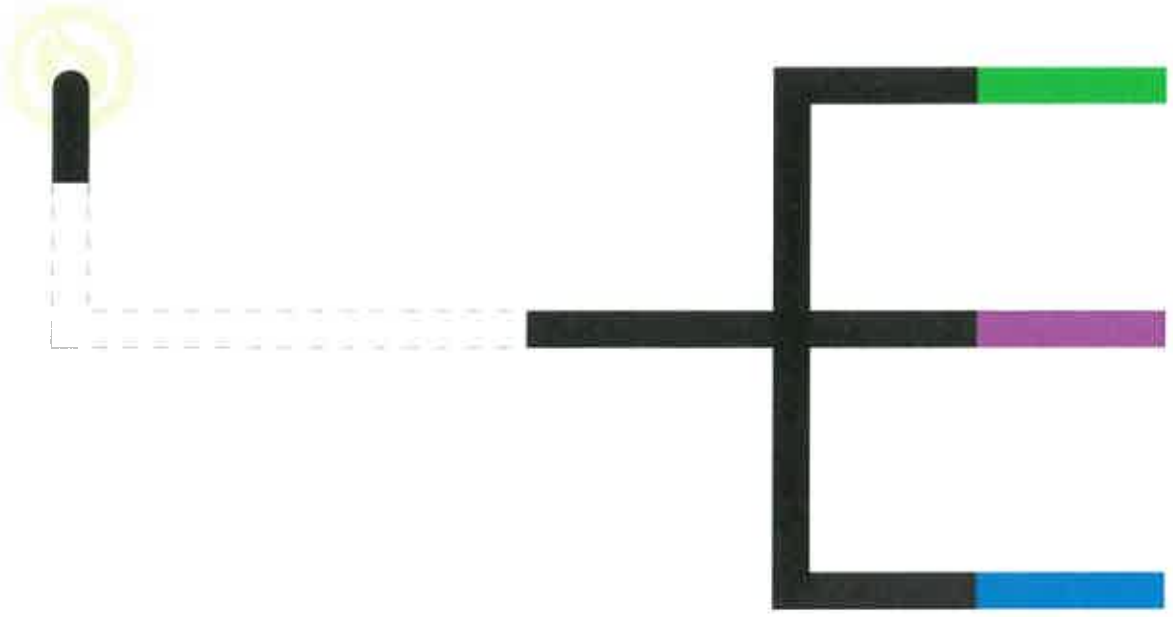
Ozobot Tip

You and your students can use this random choice generator to help make decisions, like choose which activity to do.

DO!

Which Way?

Use black marker to complete your path, then place bots on the START. bots will randomly select a color. Repeat several times.



DIRECTION CODES

Student Prompt Question

How much warning do the bots need?
Test out different distances between directional codes and intersections to find out. (The answer is about 1 inch.)

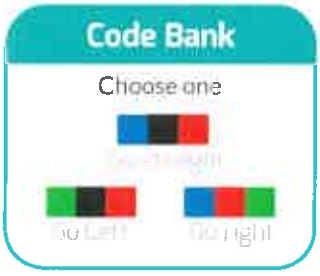
Real-world Connection

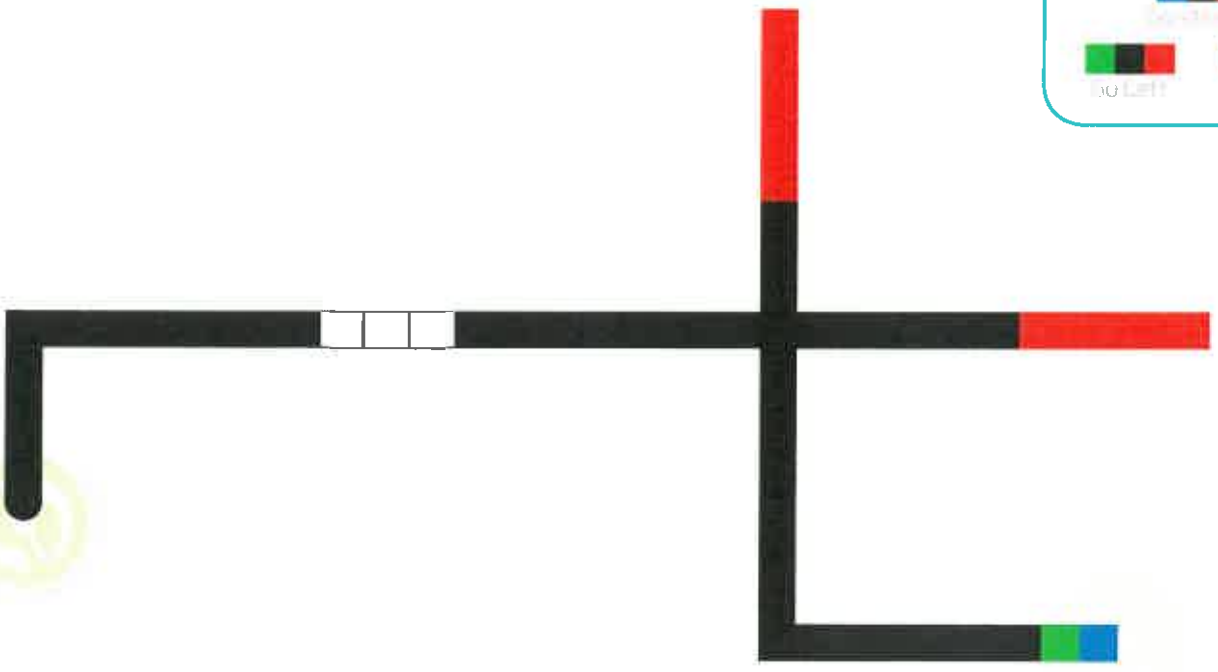
Computers can be programmed to make a random decision. Creating randomness is used in many computer applications like the security systems you use online everyday. Watch how your bot makes random decisions at intersections.

DO!

Wrong Way

You are ready to help bots find the finish line. Color the correct code in the path so bots avoids the dead ends!





JUMP CODES

You can program Ozobot to go "off road" with jump codes. These codes direct the bots to leave the line they are following and seek a new line.

Real-world Connection

Brain teasers like mazes reinforce logical thinking, planning, creating hypotheses—all the skills scientists and engineers use daily!

Student Prompt Question

Can you use directional codes and jump codes to build a maze for Ozobot? What else could you create with Ozobot? Design a story? Build a city? Model the solar system? or an animal habitat? Then present your creation to the class!

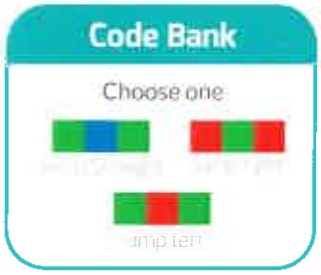
Ozobot Tip

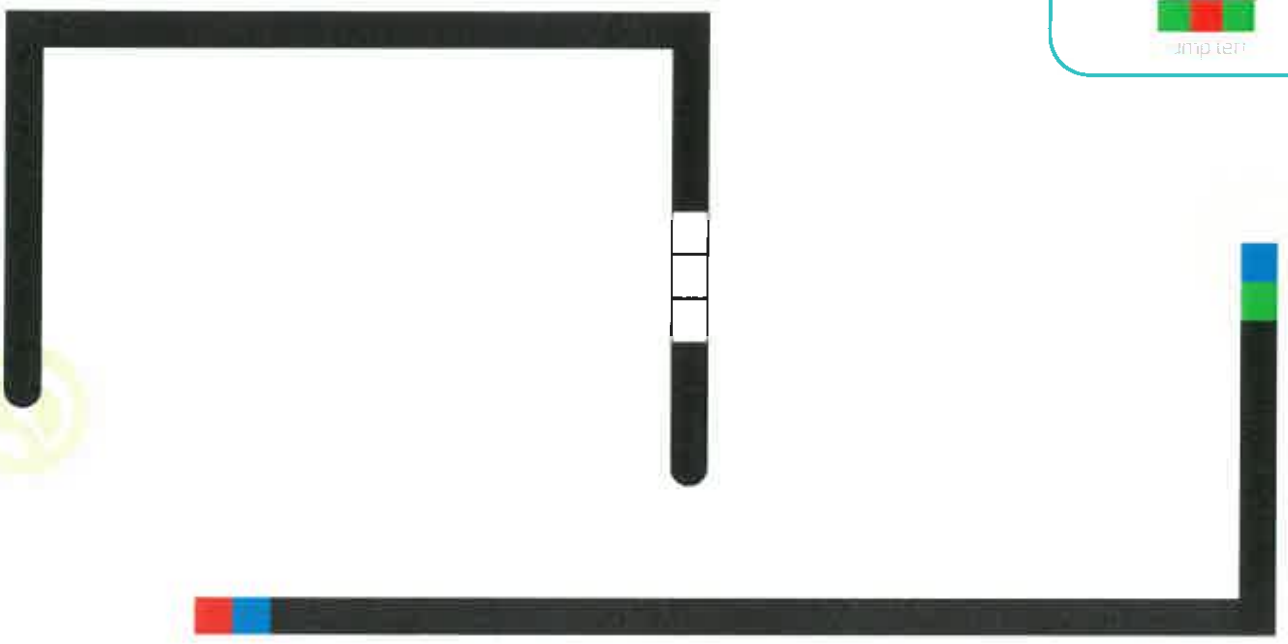
Ozobots come with DIY skins students can decorate to use for integrated STEAM projects, using paper and crafts supplies or recycled materials.

DO!

Jump Codes

With Jump Color Codes you can move from line to line. Choose the correct Jump code to get from START to FINISH in a flash.





Congratulations!

Completing Ozobot Educator Bot Camp for Color Codes.

You're now ready to fearlessly lead your student "troops" in unplugged coding and robotics with Ozobot.

Check out our Basic Training for Color Codes lessons for students at https://portal.ozobot.com/lessons/compilation/color-codes-basic-training

Check out our Lesson Library at www.portal.Ozobot.com for hundreds of FREE lesson ideas including OzoBlockly Basic Training.

Take your skills even further with Bot Camp for OzoBlockly and master coding Ozobot with Computers or Tablets.

Share your classroom's projects on Facebook, Twitter, YouTube or Instagram. (Or check out what other teachers are doing there for inspiration).

Contact us as ozoedu@ozobot.com anytime for a 1-1 consultation.

WELCOME TO THE OZOBLOCKLY BOT CAMP FOR EDUCATORS

Visual-based coding – like OzoBlockly – enables students to learn the creative and conceptual foundation of coding without being bogged down by the details of text-based coding. That's why block-based coding is how major universities, like Harvard and Berkeley, teach coding in the Intro to Computer Science classes.

Even if you have no experience with coding or robotics, this quick course will get you ready to teach and inspire your students with OzoBlockly's Infinite Learning Possibilities!

SETUP

SETUP
YOU'LL NEED:

- ✓ **A tablet, laptop or desktop computer**
- ✓ **A fully charged Bit or Evo!**
  (For Evo be sure to update using the Evo App or Edu Updater Utility and set to classroom mode.)
- ✓ **Internet access**
- ✓ **About 20 minutes of free time to complete the Bot Camp**

Setup

SETUP

1 Set Screen brightness

Set screen brightness to 100%.
(If your device has auto-dim, disable that.)

check box ☐

TIP
Screen brightness located in device setting, display.

SETUP

2 Go to OzoBlockly Editor

DO! Open your browser and go to ozoblockly.com/editor

check box ☐

DO! Close pop-up screen.

☐

TIPS
- If you land of ozoblockly.com instead of ozoblockly.com/editor, click "Get Started" button to get to Editor.
- Access help anytime by clicking the HELP button on the upper right on the OzoBlockly Editor.

If you are sharing a tablet or laptop with others using OzoBlockly, you may need to clear blocks from your workspace.

SETUP

3 Clear your workspace

DO! Click on the trash icon at the bottom right of the page and select "yes" to delete blocks.

check box ☐

✓ Your screen should look like this

DO! **Select your bot (Bit or Evo).**

check box ☐

SETUP

4 Select your bot

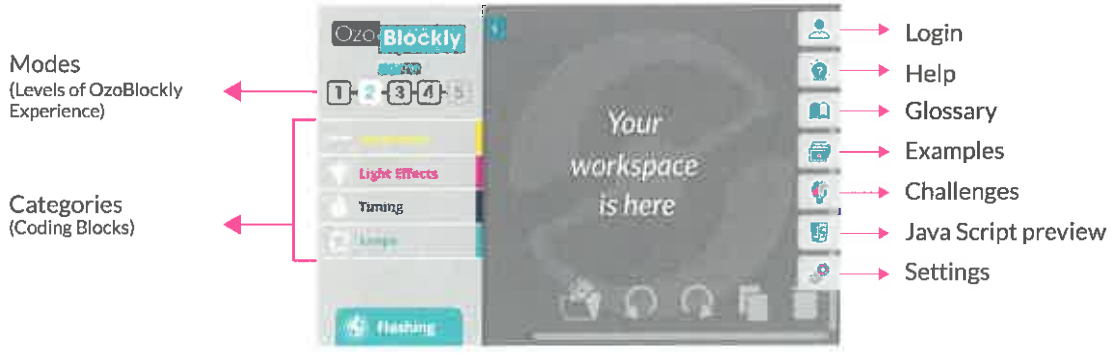
TIP
Bit logo turns Blue when selected and Evo logo turns Orange.

Good Job! You're all done with Setup.
You're now ready for a Fast Tour of OzoBlockly!

FAST TOUR OF OZOBLOCKLY

DO! **Take a minute to explore. Feel free to click on OzoBlockly's different modes, categories and tools.**

check box ☐



Once You've explored a little, you're ready to move on to an Example Program.

EXAMPLE PROGRAMS

Deconstructing and then rebuilding code is a great way to learn programming. That's why we've created some Example Programs to help you get started.

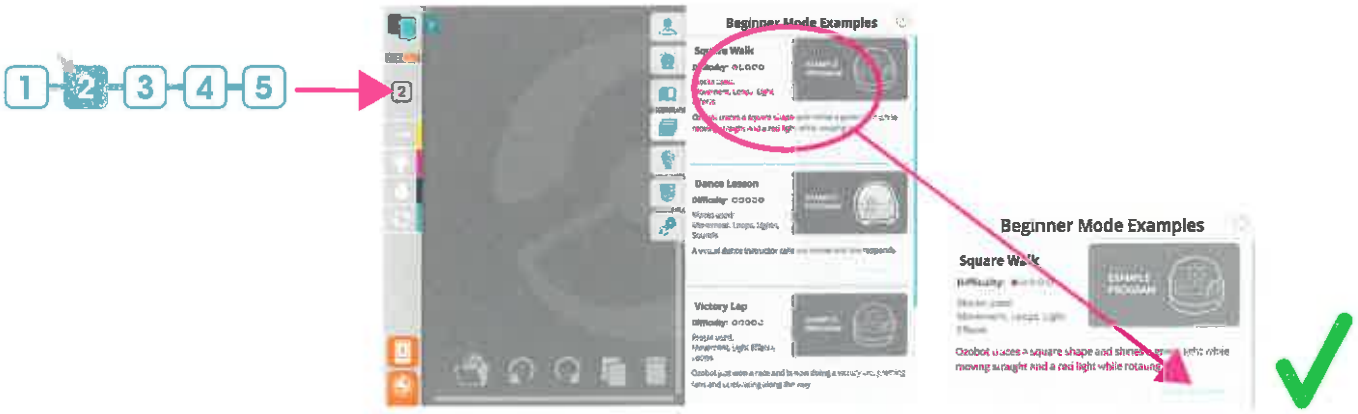
check box ☐

DO! Click on the "Examples" tab here.

check box

DO! Make sure you are in Mode 2. ☐

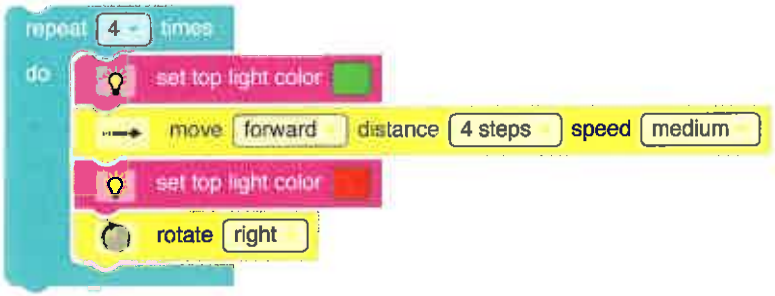
DO! Find "Square Walk" Example and click "Open Example" for square walk. ☐



The "Square Walk" example will now appear in your workspace.

check box ☐

DO! **Read the blocks and try to understand what the example does.**



Understand why the program is called "Square Walk"? Well Done! You are now ready to start Flash Loading to your bot. The first step of Flash Loading is Calibrating to your screen.

CALIBRATE

1. About Calibration
2. [illegible]
3. [illegible]
4. [illegible]

ABOUT CALIBRATION

Calibration prepares your Evo and Bit for Flash Loading. During Flash Loading, your bot will read the program as a series of color flashes through its optical sensors. Calibration makes sure the bot sees the color flashes properly.

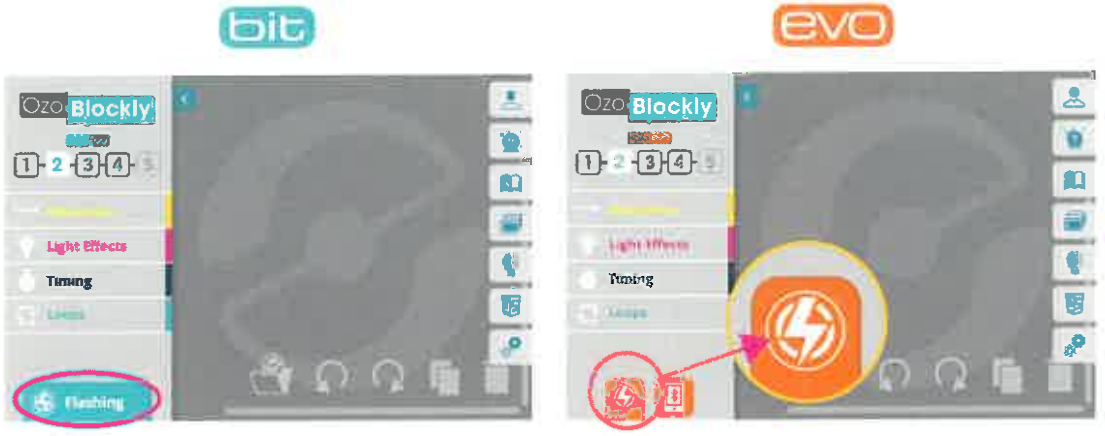
TIP
You only need to calibrate once per session before the first load.

CALIBRATE

2 Prepare to Calibrate

check box ☐

DO! Open Flash Loading tool by clicking on the "Flashing" icon in the lower left of your screen.



CALIBRATE

3 Calibrate Now

check box ☐

DO! Click on BIT EVO or "Get Help" for step-by-step instructions on how to calibrate.

check box ☐

DO! Check to make sure your bot blinked **GREEN** after calibrating. (See calibration video and troubleshooting tips if bot blinked **RED** instead).

Calibrate

DO! If your bot blinks **GREEN,** select "Calibration Complete" in lower left window. This lets OzoBlockly know you are ready to Flash Load your bot and you don't need to calibrate again this session.

check box ☐

CALIBRATE

4 Complete Calibration

Fantastic work calibrating to your screen! Now you are ready to Flash Load.

Fast Tour of OzoBlockly | Example Programs | **Load Programs**

LOAD PROGRAMS

LOAD PROGRAMS

Now, you're ready to Flash Load your program. How is loading different than calibrating?

- **Calibration** adjusts the sensors to your screen.
  You initiate your calibration by PRESSING and HOLDING your bot's power button.
- **Loading** transfers the program from the editor to your bot.
  We will use Flash Loading to upload the program. That means a series of color flashes sends all necessary information via the color sensors underneath the bot.

LOAD PROGRAMS

2 Place Bot on LoadingSpot

DO! **Make sure your bot is powered on.** check box ☐

(Look for a light on top of your bot. If you don't see a light, click the power button once).

DO! **Place the bottom of your bot on the loading spot directly on your screen.** ☐

Bot Loading spot

TIP
You'll want to make sure the loading spots (which are like bot footprints) are white before you use them. If a loading spot is grey, press to activate.

LOAD PROGRAMS

3 Activate Loading

DO! **Click on "Load Bit" or "Load Evo". Make sure your bot blinks GREEN until the progress bar shows loading is complete. If your bot turns RED during loading, something went wrong. Open HELP.** check box ☐

DO! **To get help loading, click** BIT EVO **or Get Help for step-by-step loading instructions** *(Check out the How to Load video and troubleshooting tips if needed).* ☐

TIPS
- A green light on the bot during the loading process signals successful loading.
- The progress bar under the "Cancel" button tells you how much time is left in the loading process.

Did your bot blink green until loading was complete?

check box ☐

DO! **If YES, move on to Run Programs. If NO, try again or check out the Troubleshooting Tips or How to Load Video in the HELP window.**

Did Loading Fail?

TROUBLESHOOTING:

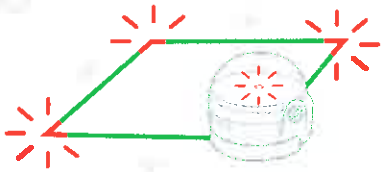
- Make sure to hold your bot steady during the load process
- Make sure that the screen brightness is at 100%
- Turn off auto-dim feature
- Turn off any "blue-light filter"
- Minimize ambient light from windows and overhead lights
- Calibrate again
- Re-start your browser and close all other tabs
- Make sure your Ozobot is sufficiently charged

RUN PROGRAMS

check box

DO! **Check to make sure your bot is still on!** ☐

DO! **Place bot on a table or desk and double-click the power button. (as fast as saying 1-one-thousand, 2-one-thousand).** ☐



Success?

You should see bot go in a square. *The* ***top LED should be green*** *while tracing the sides of the square and* ***red*** *while turning.*

TIP: If you double double click too slow, you might accidentally turn your bot off. If you double click too fast, bot might only sense 1 click. Timing is everything!

CONGRATULATIONS!

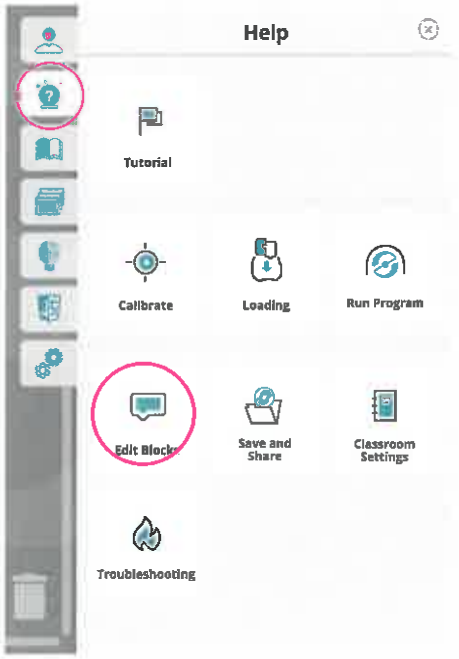
You completed Bot Camp for OzoBlockly.
You're ready to take on the Infinite Possibilities for Ozobot and your students!

*If you'd like to explore more now, check out the **GOING FURTHER SUGGESTIONS.***

GOING FURTHER
EDIT BLOCKS

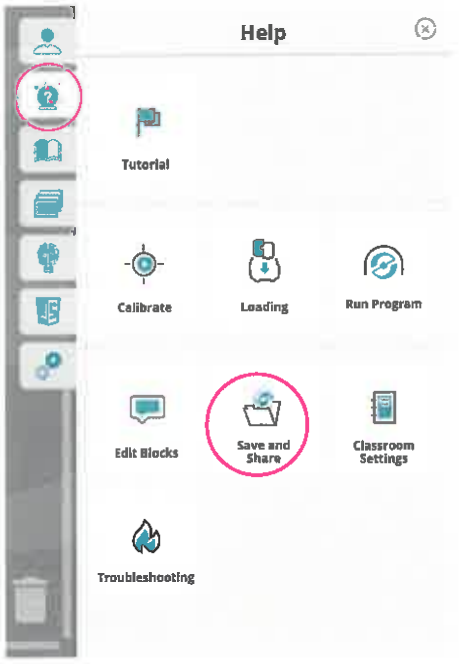
DO! **Open the Edit Blocks Tab in Help for instructions on how to Modify, Add or Delete Blocks to make your own program.**

Remember, bot will store the last program you loaded. (Even if you turn it off). If you create a new program, you'll need to load it to your bot.



GOING FURTHER
SAVE AND SHARE

DO! Open the save and share Tab in Help for instructions on how to save programs to work on later or share programs to collaborate.



Explore the OzoBlockly Example Programs and Challenges in other Modes.

Check out our Lesson Library at www.portal.Ozobot.com for hundreds of FREE lesson ideas including OzoBlockly Basic Training.

Games! Visit OzoBlockly.com/games for more activities including no-robot required challenges.

Share your classroom's projects on Facebook, Twitter, YouTube or Instagram. (or check out what other teachers are doing there for inspiration).

Contact us as ozoedu@ozobot.com anytime for a 1-1 consultation.