



## OZOBLOCKLY BASIC TRAINING FOR GRADES 6+

### SUMMARY

This is the quickest orientation to using OzoBlockly with an Ozobot; students will open a premade program, edit it, then load it to their bot, all while learning the features of the code editor. You can follow this lesson to learn OzoBlockly yourself!

### OVERVIEW

If your class is ready to use subject-based OzoBlockly lessons and don't have time to go through basic training, including the Shape Tracer games [games.ozoblockly.com](https://games.ozoblockly.com), or you simply want students prepared to use the editor itself, this 30-50 min interactive orientation is just what you need. It's also great for the educator to learn OzoBlockly!

Students begin by watching the OzoBlockly Tutorial video, then load an example program to practice **screen calibration**, **flash loading**, and **running a program** on an Ozobot. Next, students do the Rectangle Challenge where they edit the Square Walk program. This gets students comfortable with **creating**, **editing**, and **deleting** code blocks, and mixing blocks from other **Modes** in OzoBlockly.

Finally, students, have groups compete in a Drag Race by exploring **Mode 4 blocks** (the most customizable and detailed blocks in OzoBlockly), and practice **planning**, **computational thinking**, **debugging** and **design process**. If you need any help during this lesson, use the **Tutorial** on the right side bar of the editor.



TUTORIAL  
BUTTON

### LESSON OUTLINE

1. Students watch the OzoBlockly Tutorial video on their computer or device.
2. Students load the "Square Walk" program from **Examples in Mode 2**.
3. Students undertake the "Rectangle walk" **Challenge** by editing the code.
4. (*Optional task*) Students plan and execute a drag race program to compete.

### PREREQUISITES

None

### GROUPING

Groups of 2-3 students to 1 bot, or 1-to-1

## **MATERIALS**

- Tablets or computers, 1 per group.
- Ozobot Bit or Evo, 1 per group
- Pencil, colored pencils
- 1 Printout of Student Handout per group
- *(Optional) 1 Printout of Rectangle Challenge per group*
- *(Optional) 1 Printout of OzoBlockly Getting Started Guide per group*

## **GRADE LEVEL**

Grades 6-12

## **DURATION**

25 minutes, 50 with optional task

## **OZOBLOCKLY PROGRAMMING TOPICS**

Free Movement, Lights, Loops, (plus, Sounds for Evo, Logic for Drag Race)

## **OZOBLOCKLY MODE**

Modes 2-4

## **QUESTIONS ABOUT THIS LESSON?**

Please contact us at [ozoEdu@ozobot.com](mailto:ozoEdu@ozobot.com)

# LESSON

## STEP 1 DISCOVER OZOBLOCKLY - 5 MINUTES

**Are your students working pairs or in groups?** We recommend that groups have a max of 4 students per device and robot. Allow students to take turns at the device for each step of the lesson. It's up to you if each student tries calibration and loading.

For more on how students can make the program together, check out this Code.org video on pair programming: [www.youtube.com/watch?v=vgkahOzFH2Q](http://www.youtube.com/watch?v=vgkahOzFH2Q) You can even share this video with students at the beginning. We also have a lesson that teaches Pair Programming: [portal.ozobot.com/lessons/detail/ozoblockly-basic-training-3](http://portal.ozobot.com/lessons/detail/ozoblockly-basic-training-3)

We advocate for students getting into Driver and Navigator mentalities when working together. For the programming portion of this lesson, use a timer to have all students swap roles and each get a chance, or find natural breaking points to swap.

**Hand out** tablets or computers to students. Send students to [ozoblockly.com](http://ozoblockly.com).

Have each student watch the tutorial video on the page with low volume or muted. All of the information is written on the screen.

After students have watched the video, have them **click on Get Started** at the top part of the page. Point out the grey space, where code is placed or moved around freely, the icons in the bottom right: **save, undo, redo, duplicate, trash**. Next, students will load an example program to get coding quickly.



## STEP 2 LOAD A PROGRAM - 15 MINUTES

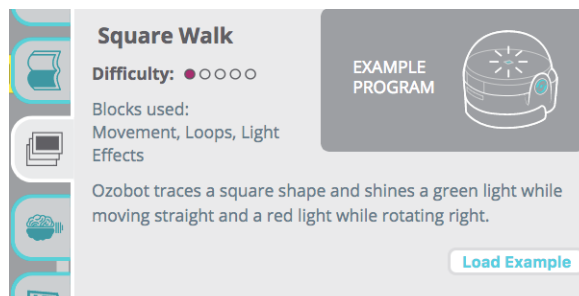
**Direct** all students to the logo. Select **Bit** or **Evo**, then **Mode 2** (see right) and **Examples** on the right side. Everyone will use "Square Walk" at the top (see below).



**Students click** 'Load Example'.

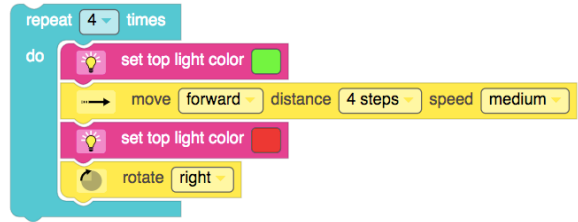
All students will now have a program where their bot draws a square with different colored sides. They should not edit this program.

Let students know, especially if they are using iPads and iPad minis, that they can move the program around by **clicking and dragging on the background only**; dragging the blocks will



move them.

**Walk through** the program for what the bot will do, and the logic behind loops:



1. **Repeat 4 times** means everything in the turquoise block will happen 4 times
  - a. The top LED goes green
  - b. The bot walks 1 step (about a centimeter) 4 times
  - c. The top LED changes to red
  - d. The bot turns 90° to the right

Another way to understand this is to read a-d 4 times.

Get ready to load this program into your bots!

**Walk through** calibration, flash loading and running the program on the bot as a class:

### CALIBRATION

1. Make sure all students have 100% brightness and turned off auto-dim on their devices.
2. Click 'Flashing' or the lightning on the bottom left.
3. **Hold** the bot's power button for two seconds, until the LED blinks, and **let go**.
  - a. For Evo, the wheels will spin quickly before the sensors are ready to calibrate.
4. Immediately place the bottom of the bot on the white outline (see right) and wait until the bot's LED flashes green.
  - a. If it flashed red, try it again. Students may have tilted their bot away from the screen. Calibrate again as a class or let students follow the 'Help' instructions until all bots are green.



*You and/or your students can also use the OzoBlockly Getting Started Guide*

5. Tell students that they can click 'Help' for the steps in the future.
6. You only need to calibrate to the screen **once per day!**

**TROUBLESHOOTING TIPS:** If calibration failed, make sure brightness is 100% and students let go of the power button after two seconds!

### FLASH LOADING

1. Make sure you chose **Bit** or **Evo** on the top left of the editor.
2. Your bot turned off. **Turn it back on.** (New updates keep Evo on.)
3. **Set the bottom** of the bot on the white outline for Flash Loading.
  - a. Only one outline should be activated (tap outlines to deactivate).
4. **Click on 'Load'** above the outline. This begins the flashing.

- a. **Hold the bot steady** on the colors until flashing is complete.
- b. The bot will **blink green** continuously, or it will blink red if it failed.
- c. If students need to do it a second time, let them do so following 'Help' or remembering the steps, or do it again as a class.

**TROUBLESHOOTING TIPS:** If loading failed, make sure calibration worked (flashed green afterwards), that the program isn't broken (look for random blocks hidden under the program or on the edge of the screen, and students don't tilt the bot from the screen while loading).

## RUN THE PROGRAM

1. The bot is still on, so double-press the power button to run the program.

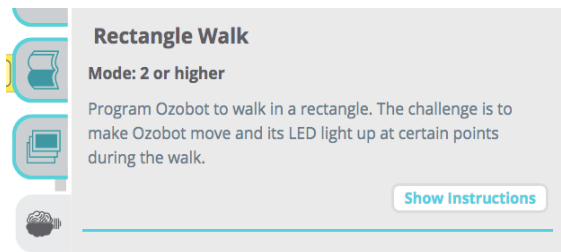
**TROUBLESHOOTING TIPS:** If running failed, make sure loading completed (students held the bot to the screen the whole time), that the bot is ON before double-pressing, and that double pressing is as fast as saying "one, two".

Students observe the program that their bots are performing – is it what they expected? They can run it multiple times; just turn it on again after the program completes and double press ("one, two")

## STEP 3 RECTANGLE CHALLENGE - 5 MINUTES

Students keep their square walk program and **should not** edit it yet.

All students navigate to the 'Challenges' tab on the right and open 'Rectangle Walk'. They will click on 'Show Instructions' to open a one-page PDF with the steps for the challenge.



Or, hand out a printed challenge page. A copy is attached to this lesson.

## Challenge

1. Students complete the challenges on the handout.
2. The challenges should be quick to complete. Have all students show you that they accomplished the challenge.
3. When students have completed the handout, they can explore OzoBlockly.

**NOTE** students are often interested in the orange Line Navigation blocks – we will not be using any of those today.

Now it's time to get creative!

### OPTIONAL STUDENT PROJECT - 15 MINUTES + 10 FOR SHARING

Students are challenged to plan and build a drag race for their bot. Give students the template program link: <https://ozoblockly.com/editor#t7yfuc>. **In this program:**

1. "repeat forever" keeps Ozobot moving until "break out of loop",
2. when Ozobot sees red underneath, it will 'break out of loop' and end program.
3. at first, Ozobot gives you time to place the robot on the paper.
4. **Example Solution:** <https://ozoblockly.com/editor#s2sx9b>

**Hand out** the worksheet to each group for planning their program. This sheet also explains why their bot might swerve from a straight line, and how it can be fixed.

**Students build** a drag race track on a long white sheet of paper by coloring one end red (about 1 inch thick down the side of the page). Their bot stops when it sees red.

After 15 minutes of coding and testing, set up each group to compete against each other in heats. That is, the winner of a 2 way race will compete against the winner of the other 2 way race.

### END OF LESSON

## **NEXT STEP: SUBJECT-BASED LESSONS**

Students know all about OzoBlockly now! They should be proud. This easy-to-use programming language has everything they need to program their robot, just like a text-based language. The editor will help them build detailed programs, such as for modeling animal behavior, vehicle traffic with line following, or react to colors beneath it for fun games, and for Evo, program the proximity sensors to do anything!

You and your students can now explore some fun OzoBlockly-based lessons from the Ozobot Lesson Library. The only thing we haven't explored yet is how to program Ozobot while it's line following. Look out for a future mini lesson on line following!

### **Check out**

Growing Patterns Challenge [portal.ozobot.com/lessons/detail/bit-growing-patterns](https://portal.ozobot.com/lessons/detail/bit-growing-patterns)

The Snow Plow [portal.ozobot.com/lessons/detail/ozo-plow](https://portal.ozobot.com/lessons/detail/ozo-plow)

Easter Egg Activity [portal.ozobot.com/lessons/detail/easter-egg-activity](https://portal.ozobot.com/lessons/detail/easter-egg-activity)

Magellan's Journey [portal.ozobot.com/lessons/detail/magellans-journey](https://portal.ozobot.com/lessons/detail/magellans-journey)

Multiplication Practice [portal.ozobot.com/lessons/detail/multiplication-table-practice](https://portal.ozobot.com/lessons/detail/multiplication-table-practice)

Coordinates [portal.ozobot.com/lessons/detail/cartesian-coordinate-practice](https://portal.ozobot.com/lessons/detail/cartesian-coordinate-practice)

Pythagorean Theorem [portal.ozobot.com/lessons/detail/pythagorean-theorem](https://portal.ozobot.com/lessons/detail/pythagorean-theorem)

Velocity and Slope [portal.ozobot.com/lessons/detail/position-vs-time](https://portal.ozobot.com/lessons/detail/position-vs-time)

**Or find more with our Lesson Filter** [ozo.bot/lessons-filter](https://ozo.bot/lessons-filter)

## **OZOBOT COMPUTER SCIENCE**

To study Computer Science with Evo or Bit in a quick, fun and motivating way, go to **Ozobot's Computer Science Lessons!** These lessons teach students coding the way real engineers learn – by examining a complete program, seeing programming concepts like variables at work, then remixing to create their own fun game or demo.

**Go to** [ozo.bot/cs-lessons](https://ozo.bot/cs-lessons)

# OZOBOT DRAG RACE

## Student Worksheet

NAME: \_\_\_\_\_

Open this Drag Race Template Program: <https://ozoblockly.com/editor/#t7yfuc>  
Explore **Mode 4 Loops**, **Movement**, **Lights**, and **Logic** to make your robot fast and competitive!

### STEP 1 – SPEED \*see tips below!

What is the best block to use?	TEST RESULTS _____ _____ _____
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### STEP 2 - STRAIGHT

How can you make the bot as straight as possible?	TEST RESULTS _____ _____ _____
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### STEP 3 - VICTORY

How do you know your bot saw red? Give it a fun victory dance.	TEST RESULTS _____ _____ _____
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## TIPS

- MOVEMENT** Check out Modes 2 through 4 for different ways to move your Ozobot. Mode 4's **set wheel speeds** requires a time block after it, so use a blue block from **TIMING**. **FIX THE SWERVE** If a bot swerves towards the right, then the right wheel is going too fast. Make the right wheel slower. Test how straight your bot is by drawing a straight line with pencil and running your bot on top of it.
- LINE NAVIGATION** Don't use these! They only work when your bot is walking on a line.
- LOGIC** Is your bot seeing red at the end? Make sure your bot is checking the color often by making tiny movements. Also make sure the bot is calibrated to see paper. Calibrate on a black circle drawn on white paper.
- LIGHTS** Evo has 6 programmable LEDs!