ozobot

OzoBlockly Basic Training
FOR GRADES 2-5

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, 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 will plan and create a dance for their bot, which will teach **planning, computational thinking, debugging,** and, **design process –** fundamental skills in engineering and computer science. 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. Finally, students plan then code a dance for their Ozobot

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 2-5

DURATION
25 minutes, 50 with optional task

OZOBLOCKLY PROGRAMMING TOPICS
Free Movement, Lights, Loops

OZOBLOCKLY MODE
Modes 2-3

QUESTIONS ABOUT THIS LESSON?
Please contact us at 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 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

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.

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.
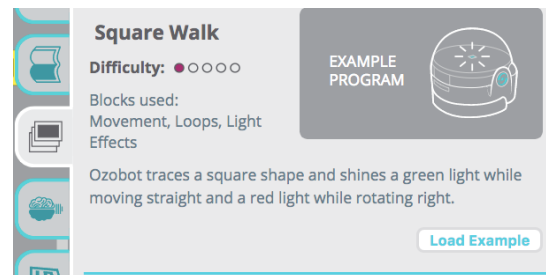
STEP 2 LOAD A PROGRAM – 15 MINUTES

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**; drag blocks to move them.

Square Walk

Difficulty: ●○○○○

Blocks used:
Movement, Loops, Light Effects

EXAMPLE PROGRAM

Ozobot traces a square shape and shines a green light while moving straight and a red light while rotating right.

Load Example

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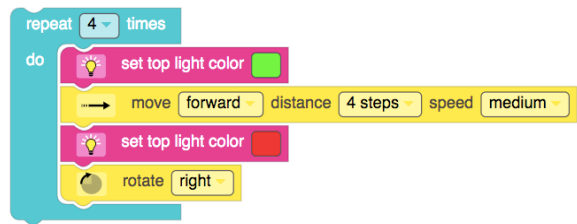
Another way to understand this is to read a-d 4 times.

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 <u>let go</u> 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.

Rectangle Walk

Mode: 2 or higher

Program Ozobot to walk in a rectangle. The challenge is to make Ozobot move and its LED light up at certain points during the walk.

Show Instructions

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 repeating dance for their bot.
The only requirements are:

1. to use Modes 2 and 3, using Movement blocks, Loops (repeat) and Lights,
2. only 1 light animation (police lights, rainbow, disco, etc). The reason is, these take a very long time to load when there are many!

Hand out the worksheet to each group for planning their dance.

Students will use **Pair Programming** (Driver and Navigator roles) to have one member write out the dance plan (Driver), while the whole group discusses a plan (about 5 minutes). Then, another member of the group will write the program in OzoBlockly (Driver) while others explain how to code it from the plan (Navigator(s)) (about 10 minutes). Students must test their program by loading their bot, watching it, and making any edits needed to **debug** it.

Students code for 15 minutes, then each group demonstrates their dance!

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
The Snow Plow portal.ozobot.com/lessons/detail/ozo-plow
Easter Egg Activity portal.ozobot.com/lessons/detail/easter-egg-activity
Magellan's Journey portal.ozobot.com/lessons/detail/magellans-journey
Multiplication Practice portal.ozobot.com/lessons/detail/multiplication-table-practice
Coordinates portal.ozobot.com/lessons/detail/cartesian-coordinate-practice
Pythagorean Theorem portal.ozobot.com/lessons/detail/pythagorean-theorem
Velocity and Slope portal.ozobot.com/lessons/detail/position-vs-time

Or find more with our Lesson Filter 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

OZOBOT DANCE
Student Worksheet

NAME:_____

Create a dance for your robot using **Loops**, **Movement**, **Lights**, and **Sounds** (for Evo).
Use Modes 2 and 3.

STEP 1 - DESIGN YOUR PROGRAM

IDEA #1 – draw a dance outline	PROGRAM
	_____ _____ _____ _____ _____
IDEA #2 – draw a dance outline	PROGRAM
	_____ _____ _____ _____ _____

STEP 2 – PROGRAM!

Write and test the program in ozoblockly! Remember to load the program with Flash Loading every time you edit the program. You don't need to calibrate (press and hold power button) before loading; you just need to do that once a day, or if loading isn't working right.

TIPS

MOVEMENT	Check out Modes 2 through 3 for different ways to move your Ozobot. Your Ozobot may not go exactly straight – it's due to the hardware. You can try to fix this using Mode 4 Movement's "Set Wheel Speeds", edit each wheel's speed, and put a time after (like 1 second).
LINE NAVIGATION	Don't use these! They only work when your bot is walking on a black or colored line.
LOOPS	These blocks are for repeating a set of code a chosen number of times. You can put loops inside loops! Try it out.
LIGHTS	Evo has 6 programmable LEDs!

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