

OZOBOT



At the Event
Grades K-12

Group Size	Individual
Duration	Determined by activity selected.
Materials/ Equipment	Educator Tools and Curriculum guide, Evo classroom kit including: 18 Evos in storage box, 18 packages of markers, 3 multi-port charging stations, 18 usb cords, 18 clear DIY skins, Bot Camp for Educators guide, extension cord (if event location has electric for the tables so that bots can be charged at the event), white paper, tablecloth (optional), hand sanitizer (optional), white paper, handouts, pencils
Resources	<p>Bot Camp for Educators (handouts used at the event): https://files.ozobot.com/classroom/2019-Bot-Camp-Printable.pdf</p> <p>Helpful demos on how to use Evo, visit: ozo.bot/trainingvideos</p> <p>Bot Basics: Get to Know Your Robots Bot Basics – Get to Know your Robots https://files.ozobot.com/stem-education/educator-botcamp.pdf</p> <p>Calibrate the Evo instructions found at: ozo.bot/educalibrate</p> <p>Speak to an Ozobot Edu Consultant ozoedu@ozobot.com</p> <p>Color Code Tips: Draw Color Codes and calibration: ozo.bot/colorcodetips</p> <p>Color Code Reference Sheet: ozo.bot/colorcodesref</p> <p>Ozobot Split Second https://play.ozobot.com/print/ozobot-split-second.pdf</p>
Objective	The objective and standards will vary depending on the activity selected. Students will use Ozobot (which is a miniature robot) to learn coding concepts like cause/effect, critical thinking, and debugging.
Preparation	<p>In this activity, the Ozobot will be referred to as bot, Evo, or Ozobot. Before the event, get to know the Ozobot Evo. The Bot Basics is a very helpful resource where in about 15 minutes, you will learn how to calibrate, draw lines, explore colors, and color and direction codes.</p> <p>Print the handouts located in the Bot Camp for Educators. Print the color code tips and color code reference sheet (these will be placed on the table at the event for visual aids).</p> <p>Make sure your bots are charged. The Ozobot can be charged in a computer or outlet and will take 40-60 minutes to fully charge. A fully charged Ozobot will last 60-90 minutes.</p> <p>Gather supplies: bots, handouts, markers. Any marker can be used, it is just the thickness of the line that is important (1/4" thick lines). If using markers other than the provided Ozobot markers, it is best to use washable markers (not sharpies as they can stain clothing or tables).</p>

Procedure

The procedure will vary depending on activity selected.

An Ozobot is a miniature robot, the smallest of its kind, and there are a lot of things Ozobot can do:

1. Ozobot drives on lines – You can draw a line ($\frac{1}{4}$ " thick) and place Ozobot on it and it will follow the line. This is a great activity for younger students. For example, they could write their name with code and watch the Ozobot follow the name. Place something between the paper and the table as the marker can bleed through the paper. Another option would be to have words prewritten on pieces of paper and placed on the table for younger students to use (for example, Hello, STEM, etc). It may be best to have the student start in pencil and go over in marker. To view the activity for this please visit <https://storage.googleapis.com/ozobot-lesson-library/write-your-name/write-your-name.pdf>
2. Another simple activity is to give students a blank piece of paper with the markers to try out some of the codes. For a pdf of the codes visit <https://files.ozobot.com/stem-education/ozobot-color-codes.pdf>
3. An additional activity is the Split Second game where multiple bots can race one another.

How does the Ozobot work?

Turn over the Ozobot to see what is underneath. On the bottom, you can see 5 openings with lights shining out of them. An optical sensor lives in each of these openings. These sensors are Ozobot's eyes. Each of the sensors sees how bright the paper underneath is. This way, Ozobot can see where the white and where the black parts are and therefore knows where the line is. The middle sensor is a color sensor that can detect red, green, and blue colors. You can give commands to Ozobot by using colors. See the color code worksheet for some codes that Ozobot can understand.

When drawing lines, they should be approximately $\frac{1}{4}$ " thick so that the Ozobot can follow the line that they see through their sensors. The markers provided have a chisel tip. Hold the marker so that the chisel-top can set down flat to make the right thickness for your lines. Practice holding the marker at the right angle. When making corners, be sure they are not too sharp. Any marker can be used, but the $\frac{1}{4}$ " thickness of the line is important. If markers other than the provided markers are used, it is best to use washable markers so that clothes and tables are not stained.

The Ozobot can see different colors through the optical sensors and can read and react to a sequence of colors called color codes. Color codes are like "functions" in programming – a premade chunk of code that does a specific task. You can give the students codes without the titles to let them investigate and record what happens, for example, move forward. When drawing codes, the codes need to be on the black line. The code should be the same size, with no white spaces in between and no colors overlapping. Color coding is precise. For example, when coding, 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.

Having copies of the color code tips and color code reference sheet available on the table provides a nice visual aid. This will provide the student with information that they can use such as calibration, the correct way to draw lines and color codes, and color code placement. Use the color code reference sheet to show how to change speed, direction, and even do cool moves like zigzag or backwalk.

Ozobot Troubleshooting:

If you are having any trouble with your Ozobot:

1. Check to see if the bot is fully charged. If the Ozobot blinks red, the battery needs charged very soon. Plug the special USB cable to a computer and plug Ozobot to the cable. When the battery is almost charged fully, Ozobot starts blinking green. Ozobot shows a solid green light when the battery is fully charged.
2. Calibrate your Ozobot (calibration instructions can be found behind classroom handouts tab or online at <https://files.ozobot.com/stem-education/ozobot-calibration-tips.pdf>

It is helpful to calibrate each time you start playing with Ozobot or when the location or type of paper is changed.

	<p>To Calibrate, use a calibration dot. Hold down the power button on Ozobot for 2 seconds until the LED light turns white. Place Ozobot in the middle of the black dot. Ozobot will then blink green. When it blinks green it means that it has successfully calibrated. If it blinks red, start the calibration process over.</p> <ol style="list-style-type: none"> 3. Sometimes calibration will not be enough and the wheels may need to be cleaned. The smallest piece of dust can get into the drivetrain. To clean the wheels, take a clean white sheet of paper and move Ozobot's wheels gently back and forth on the paper. The wheels are now clean. 4. Have the Ozobot software updated and set them to Classroom Mode ozo.bot/ev-classroom-setup <p>Storage: While not in use, Ozobots should be placed in their carrying case or container. This container should be stored out of sunlight in a cool, dark place. When Ozobot is stored for long periods of time, leave the battery at medium charge, since high or low charge can hurt the battery.</p> <p>To reach customer support, contact 844-469-6268</p> <p>At the conclusion of the activity, inventory all materials and place back inside the kit. Materials should be returned on time and in good condition.</p>
Potential Questions	<p>Potential questions will vary depending on the activity selected. Some questions that can be used for any of the activities selected are: How do you think the robots work? Do you have a robot at home that you use? (for example a Roomba). If you could build and design any robot, what would it be? What do the colors represent? What challenges did you face when using the Ozobots and how did you overcome these challenges? How do you think robots in the future will be different from robots today?</p>
Air Force Connection	<p>The Air Force employs countless computers to accomplish each mission. But a computer is only as good as its software, which is where Computer Systems Programming specialists come in. These experts write, analyze, design and develop programs that are critical to Air Force war-fighting capabilities. From maintenance tracking programs to programs that organize and display intelligence data, they ensure we have the software and programs needed to complete our missions efficiently and effectively.</p> <p>https://www.airforce.com/careers/detail/computer-systems-programming</p>

