LESSON 1: GETTING TO KNOW OUR BOTS

...LINES...

TRY IT OUT.

You can draw a line, place Ozobot on it and it will follow the line.
Draw a black line (1/4" in width) on a white piece of paper. Turn Ozobot on by pressing the button on the side. Place Ozobot on the line.

HOW DOES IT WORK?

Turn Ozobot over and see what's 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.

...TAKING CARE OF THEM...

It may happen that Ozobot starts behaving strangely. For example, Ozobot may stop to be able to follow lines. To prevent this from happening, do the following maintenance every time you start playing with Ozobot or whenever you change your location or type of paper:

CALIBRATE.

What does this mean? Ozobot's "eyes" (the sensors) are very sensitive to the surrounding light. So much so that, if the paper changes or if you go closer to the window, it affects how Ozobot sees what's underneath. To let Ozobot know what his surroundings are, you need to calibrate:

1. Press and hold the ON/OFF button until Ozobot blinks white.
2. Place Ozobot on the black dot on the plastic calibration zone card that came with your packaging (If you are playing with markers on white paper, you can also draw a 1 1/2 inch solid dot with a black sharpie and place Ozobot at the center of it to calibrate).

3. When Ozobot blinks green, it means that it has successfully calibrated. Start over if Ozobot blinks red.

Like this, Ozobot knows how white the paper in the background of the lines is and how much light is in the room.

If this still doesn't make a difference, try the following:

CLEAN THE WHEELS.

Ozobot is very small, so just a bit of dust or grease can get into the drivetrain. It's like driving through a dirty, muddy field with a car. You would certainly want to give the car a good cleaning afterwards. But don't try to clean Ozobot with soap and water, this would most certainly break Ozobot.

1. Instead, take a clean white sheet of paper and move Ozobot's wheels gently back and forth on the paper. Done, Ozobot's wheels are clean!

Lastly, you will have to charge Ozobot periodically:

CHARGE THE BATTERY.

Ozobot's motor is fueled by a tiny battery, much like cell phones, but smaller. If Ozobot blinks red, then the battery needs charging very soon.

1. 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 completely charged.

...COLORS...

Continue drawing lines with different color segments: blue, green, red. Let Ozobot drive on these lines and see how Ozobot reads those colors and the LED in Ozobot's dome shines in that color.

HOW IT WORKS.

The middle sensor is actually a color sensor. It can detect red, green and blue colors. And, since every color can be mixed using these three colors, Ozobot can see all of them.

...COMMANDS...

You can give Ozobot commands by using colors.
Use printout Lesson 1. No. 1
In any of the slots, mark (blue, black, blue) and (red, black, red) and (blue, green, blue). Place Ozobot on the line and see how Ozobot understands the codes.

What you drew on the paper are codes that Ozobot can understand. As Ozobot drives along the line, Ozobot sees the color sequence red black red. Ozobot has been programmed at the factory to know that this means: "drive slowly". As you have probably seen by now, the other codes mean "fast" and "turbo speed".
There are many different other codes that Ozobot knows.
Take a look at the Color Code reference chart (on the class website) to see some of them.

...ORDER MATTERS...

Use printout #2: Lesson 1. No. 2
Place Ozobot onto the track at any point and observe which movements Ozobot reads.
These 4 codes are the different "cool moves" from the OzoCode reference chart. Notice that the code for "Tornado" is the reverse of "Spin" and "Zigzag" the reverse of "Backwalk". And you can see on the track how it works: if Ozobot reads the code (red, green, red, green), then Ozobot does the tornado move. Now, if Ozobot sees the code with the colors reversed (green, red, green, red), then Ozobot spins.

Some codes are symmetric, for example "Slow" or "Fast", so it doesn't matter if Ozobot reads them from left to right or right to left. But many codes are not symmetric, like the ones you have just tried out. Make sure that you rotate them according to how Ozobot reads them. All codes on the reference chart are oriented to be read from left to right.

...A-MAZE-ING...

To review everything we learned today, take a look at the handout #3.

Can you help Ozobot find the way to the shop across the river? On the right is your house and Ozobot needs to take you from the house to the shop. But Ozobot might end up at the river with no place to go. So it is up to you to guide Ozobot with the help of codes. Make sure that when Ozobot starts at home, Ozobot always arrives at shop.

Use printout Lesson 1. No. 3
To accomplish this, fill in the codes on the bottom left of printout into the empty spaces on the road. You have to use all codes, but you can use each of them only once. Once you have filled in all spaces, turn Ozobot on and place Ozobot on the line at the "Place here" marker.
Does Ozobot arrive at the shop? Repeat this a couple of times. If you found you have made a mistake, take another copy and fill in the codes differently.