

3D Ozobot Maps

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Grades: **3–6**

Subjects: **Computer Science**

Coding Methods: **OzoBlockly**

Robots: **Evo, Bit**

Brief Summary

This lesson is an exploratory lesson for students to have an opportunity to show their coding knowledge and skills in a new and creative way.

Pre-Reader/ESL: **No**

Required Materials

- 1 Evo or Bit per group
- 1 Access to Ozoblockly.com per group
- 4 A variety of 3D Maps per class
- 1 Ozobot 3D Map: My Planning Document per student
- 1 Pencil per student

Lesson Objectives

- use Ozoblockly to effectively code an Ozobot to travel through a 3D map successfully.

Preparation

Background Knowledge

- Ability to effectively code an Ozobot using ozoblockly.com
- Knowledge of an Ozobot and its functions using ozoblockly.com

Lesson Tips

- Ideally, I like to have four to six 3D maps for students to use. I have a combination of maps that students have created along with maps that I created. I typically hot glue the items on the back of a large piece of white board so that the base

is sturdy and easy to move about the classroom. My maps are creative and designed with items that the students have interest in such as LEGOs, 3D printed items, small plastic animals, toy cars, etc.

- Typically, this lesson is the culmination project as we wrap up using Ozobots for the school year. In other words, students will need lots of practice with the Ozobots before attempting this lesson. It is more difficult than it may appear at first glance.

Direct Instruction (Teacher Facing Instructions):

- 1 Tell the students that today they will be designing a plan that uses their knowledge and skills of coding an Ozobot to maneuver through a 3D map.
- 2 First, show the students the 3D maps that you have placed around the classroom. Tell the students that they will choose a 3D map that they'd like to explore, partner up with a peer, and begin planning their journey. Once students have a partner, pass out the student planning document to each student and ask them to determine which destination they'd like to attempt to reach first. Ask students to complete the planning required in the first two boxes on their student planning document. It's important to communicate with students that if the Ozobot touches any part of the 3D materials on the map at any time, then their code fails and they will have to redesign. Talk openly about how we can 'fail forward' and use our knowledge that we gain along the way to redesign and retest until we've mastered the codes needed to reach a destination. Then the challenge starts over when they attempt to reach a new destination.
- 3 As students finish their planning, give each group access to ozoblockly.com and have them begin coding the steps needed to reach their chosen destination. Ask students to document on their processes on their student planning document. The "Document" section of their paper should be messy. Students will design, test, redesign, retest, ect. Assure them that exploration is not a oneway direction, but rather a journey of trying something you think will work, identifying the challenges, and redesigning over and over.

****Teacher note:** Please know that not all students will be successful depending on the level of difficulty that they have chosen to reach a destination. I have found students that begin with high hopes, struggle greatly to achieve their goal, readjust their ideas, and then eventually accomplish the shortest and easiest path to the closest destination. All successes should be celebrated, no matter how big or little.

- 4 Toward the end of your time together, or during the last session where you are wrapping up their time of exploration, ask students to reflect on their learning. The "Reflection" portion of the student planning document will help to guide your conversation with students. Ask them questions to describe their chosen paths, the uniqueness of the codes chosen, challenges they faces along the way, and how they troubleshooted those challenges. Allow them to share as a class and with small groups before they put pencil to paper. It will help them to see that everyone encountered challenges, had to troubleshoot along the way, and the value found in the process.

Lesson Closure (Optional)

To close the lesson, take the time to really understand the students learning and look for the details. It's not about whether or not they actually reached a destination, but rather what did they learn about coding, how the Ozobot moves, and how they troubleshooted the challenges. This should be an in-depth and rich conversation about how they 'failed forward' and what new learning they found along the way.

Student Practice (Student Facing Instructions):

- 1 Welcome to your next Ozobot challenge! Today you will explore the 3D maps located around the classroom as you try to code an Ozobot to maneuver through the map and reach your chosen destination. You will use your knowledge and skills that you've learned about the Ozobot and the codes with ozoblockly.com to attempt the challenge. Today we will all be required to have an open mind, be willing to take risks, and accept that this challenge will take time to master. We will focus on 'failing forward' today, which means that we recognize that our first attempts will most likely fail, so we will redesign and readjust. Each time you redesign and readjust, you will have the opportunity to test your Ozobot's code again. This design process includes an initial design, testing your design, making observations and readjusting your ideas, and testing again. This cycle will repeat over and over again, so please know that this is a part of the challenge today. Are you ready for the challenge?

Goals: The goal is for students to understand that today's task is a challenge. It will take time to master, so we're going to focus on the process more than the final outcome.

Attachments: [Ozo 3D Map - Student Plan.pdf](#)

- 2 First, let's make a plan. You are going to choose one 3D map to focus on today and a partner to tackle the challenge with. Once you have a partner, begin your planning your next steps. Complete the first two boxes on the "Ozobot 3D Map: My Planning Document" by choosing a destination that you'd like to attempt to reach first and think through the coding that will be required to move the Ozobot to that chosen destination. Record your thoughts on the student planning document.

Goals: The goal is to choose a 3D map and a partner along with beginning the planning process. Record all planning on the student planning document.

- 3 Now that you have an initial plan, use ozoblockly.com to create the code that will take your Ozobot from the start line to your chosen destination. Keep in mind that it is more difficult than it looks, so really pay attention to the small details. Think about what is an Ozobot step, how far it goes, and what minor adjustments might be needed in your code to maneuver successfully through the Ozobot 3D map. As you design your code, use the "Document" portion of the student planning document to record your processes. This part will be messy. It will have your ideas, new ideas, ideas that didn't work, and ideas that you gave up on. There is not one right answer here, so be confident in your ideas and make the most of it. Just be sure to talk things out with your partner and record your thinking as you go.

Goals: The goal is to design a code sequence using ozoblockly.com that will be used to maneuver an Ozobot from the starting line to a chosen destination.

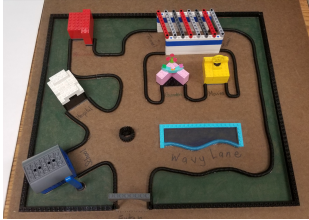
- 4 Wow, I bet that was fun! Now that you have experienced this challenge, let's reflect on what happened along the way. Using the "Reflection" portion of the student planning document, record your thoughts as you reflect on the challenges you encountered and how you troubleshooted during those challenges. Whether there were big adjustments or very minor, we want to know what you and your partner did during the process. How did you have to adjust to reach a destination? How many destinations were you able to reach? Remember that some of you may not have reached any destination, so focus to what you learned along the way about your robot, the codes it required, and the challenges you ran into along the way.

Goals: The goal is to reflect on the process and the challenges that were presented during this activity.

Supplements

Additional Attachments

- [Ozo 3D Map - Student Plan.pdf](#)



Academic Standards

- ISTE.4.a
- ISTE.4.d

Name: _____

Date: _____

Ozobot 3D Map: My Planning Document

Planning:

What is your first destination?

What codes do you think are needed for the Ozobot to reach the destination?

Document:

Write down or draw a picture of the codes you are using to maneuver through the 3D map to arrive successfully at your destination.

Reflection:

Describe in detail what you did to troubleshoot as you designed your code. How many times did you have to adjust your code before you had a successful attempt to reach the destination?

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Describe in detail what you did to troubleshoot as you designed your code. How many times did you have to adjust your code before you had a successful attempt to reach the destination?