MAZE GAME

PREPARED FOR OZOBOT
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Essential question

Using code, how can we efficiently achieve a desired outcome?

Overview

Using the OzoBlockly programming language, students program Ozobot Bit to find the treasure on one of the maze handouts. Students compete to see who can get to the treasure.They can be challenged to get there first, using the fewest number of blocks, etc.

Suggested prerequisites

Knowledge of how to program Ozobot Bit with OzoBlockly using blocks from the Line Following category.
To practice, please complete the OzoTown games on games.OzoBlockly.com.

Grouping

Groups of two or three students compete against another group of two or three students.

Materials

- Ozobot Bit, one per group
- Copies of maze handouts, one per group for each handout
- ozoblockly.com on a computer or tablet
- White board, chart paper or document camera for group instruction

Age/Grade Level

Grade 2 and up

OzoBlockly programming topics

Line following, Logic and Loops

OzoBlockly mode

Use mode 3 or higher

Duration

45 Minutes for the base challenge, can be extended to several class sessions

Vocabulary

- *Ozobot Bit* - Little robot that can follow drawn lines and can be programmed using visual codes or through the OzoBlocky programming language
- *OzoBlocky* - A visual editor which allows to create programs by plugging blocks together. The blocks can be used to control Ozobot Bit's behavior like movement, LED lights, etc.
- *Line Following* - Ozobot's capability of sensing and following lines on paper or tablets

Overview

Using the OzoBlockly programming language, students program Ozobot Bit to find the treasure on one of the maze handouts. Students compete to see who can get to the treasure. They can be challenged to get there first, using the fewest number of blocks, etc.

You can increase the level of difficulty by adding tasks for Ozobot Bit to complete along the way. *For example, "Your Ozobot Bit must make a full 360° spin somewhere along the way before it finishes the maze" or "Your Ozobot Bit must roll over one spot more than once (retrace its path) before it reaches the end of the maze"*

ACTIVITY

Programming notes

- To program Ozobot to follow lines and choose directions on a maze, please make sure to use blocks from the "Line Following" category in OzoBlockly mode 3 or higher.
- At the intersections, Ozobot Bit will choose a random way to go unless it has been programmed otherwise. The best way to get to the treasure is to program Ozobot Bit make the correct choices. Please see the example "Avoid Red" in mode 3 of the OzoBlockly editor for an illustration of how to choose a line-following direction.

Procedure

Whole Class Instruction

1. Divide students into groups of two or three. Provide each group with a copy of maze 1, an Ozobot Bit, and OzoBlockly on a computer or tablet.
2. Instruct students to use OzoBlockly mode 3 or higher.
3. Provide 5-10 minutes for groups to come up with and program a solution to the maze. The objective is to get Ozobot Bit to the treasure. Students can choose one of the three starting points of the maze. There are several ways to complete the maze so students will likely come up with different solutions or commands.
4. Bring the class together and share each group's solutions on chart paper, document camera or white board.
5. Vote and decide as a class, which was the best solution.
6. If some groups were unable to come up with a solution, have another group explain their process.

Notes

After calibrating and loading the program onto Ozobot Bit via a computer or tablet, Ozobot's sensors are calibrated for digital screens. Before using Ozobot Bit on the maze on paper, it may be necessary to calibrate Ozobot for play on paper. When loading a new program onto Ozobot the next time, please make sure to calibrate on a digital screen again. Please refer to the "Ozobot Tips" sheet which is downloadable from the Ozobot Stream website (ozobot.com/learnzone/) for more information on how to calibrate.

Challenges and Tasks

You can extend or repeat the activity by adding one of these **challenges**:
See if Ozobot Bit can find the treasure…

1. First/fastest
2. With the fewest number of blocks
3. Using blocks from all categories

You also may want to add one or more of these **tasks** they have to complete along the way:

1. Ozobot must "capture" as many coins as possible (this only applies to mazes 2 and 4). Small coins have a value of one point and the large coin on maze 4 is worth 2 points.
2. Ozobot must spin at different points or a particular number of times
3. Ozobot must change its LED color in particular places and/or a particular number of times
4. Ozobot must retrace its path to previous X number of intersections
5. Ozobot cannot go on any portion of the path more than once
6. Ozobot has to start at a specific starting point
7. Have students think of some tasks for the class to try

You may also challenge students to come up with their own mazes, challenges and tasks. Mazes can be drawn on paper with markers. Make sure the lines are thick enough for Ozobot to recognize (about 5mm is sufficient).

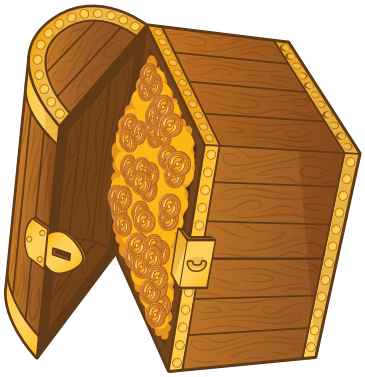
Group Activity

1. Give a new maze handout to the groups. The maze handouts have different levels of difficulty and different potential tasks, i.e. mazes 2 and 4 have coins to collect and mazes 3 and 4 are more difficult versions.
2. Allow time for the groups to work on a solution.
3. Have each group compete against another group to see who had the better solution.
4. After they have come up with a winner, throw them a twist by adding a tasks (see list of potential tasks above).

Closure

Ask the students to say or write on a sticky note which blocks they found themselves using the most and which ones they had difficulties with. Discuss.

Maze 1



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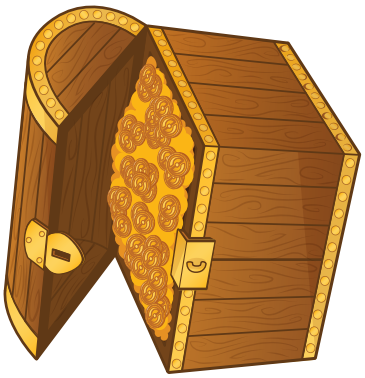
Maze 2



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Maze 3

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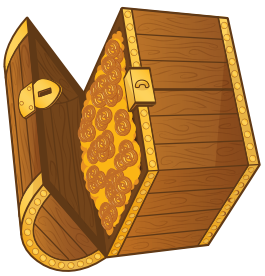

Maze 4

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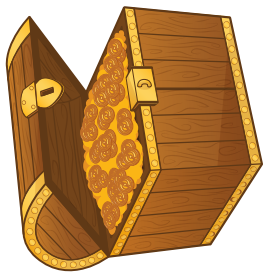

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