Ozobot Obstacle Course

Created by

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Teacher

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Topics

Robotics

Technology

Mathematics

Ages

Grades 3 and higher

Duration

At least one hour

Title: Ozobot Obstacle Course

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Purpose: Students will use creative thinking to solve several engineering challenges and construct an obstacle course for the Ozobot.

Description:
Students will choose from a menu of challenges, and then work in small groups to construct an obstacle course for their Ozobot Bits, incorporating at least three of the challenges and meeting any other requirements. After completing this activity, each group's Ozobot Bit should be able to successfully run the obstacle course and students should be able to explain how they constructed and solved each obstacle. Extensions for this activity are also provided.

Lesson type: Activity
Subjects/Topics: engineering, creative thinking
Grade Level: 3rd-6th
Duration: 60 minutes or more, depending on complexity.

Materials:
    Ozobot Bit , one for each group of 2-4 students
    Choice Menu for obstacle course
    Useful materials for building obstacles may include construction paper, tagboard, markers, tape, rulers, scissors, cereal and tissue boxes, paper towel cores, sticky notes, file cards, colored masking tape, pingpong balls, 3 oz. paper cups, string or yarn, jingle bells, pipe cleaners, rulers, and pencils. Not recommended: glue, as it dries slowly and can gum up little Ozo-wheels.

Procedure:
    Once students have learned to control Ozobot by drawing lines and color codes, they will be ready to test their skills by creating an obstacle course for the Ozobot. Divide the students into small groups. Each group will start with a blank drawing surface (such as a large, desk-sized sheet of white or yellow bulletin board paper), a set of markers, and a Ozobot. The craft materials may be stacked in an area where students may easily take what they need. Depending on the students' experience with working cooperatively, the teacher may wish to assign particular jobs to one or two students per group. The Materials Manager, for example would be the only one allowed to collect and bring craft items to the group; there could be a TimeKeeper/ScoreKeeper, a Information Specialist could be the one to ask questions or get information for the group, and so on. Further examples may be found at http://www.nsta.org/publications/news/story.aspx?id=52116 .
    Begin with a fairly simple maze plan with three obstacles. Each group should use pencils to mark four points on their paper, with each point each a few inches

away from the edges of the paper, forming a roughly four-sized figure. Three points will be locations for obstacles, and the fourth will be the Start/Finish point.

Post the Challenges Menu (an example is at the end of this document). Explain that each group may choose three different challenges from the menu and build one at each obstacle location on their course map. The goal will be for their Ozobot to successfully complete the course from Start to Finish, passing through each obstacle. Suggest that groups might want to construct and test each obstacle with the Ozobot before fastening the obstacle permanently to the course (avoid glue!) and before drawing the final course with markers. A countdown timer might be set up so students are better able to budget their work time.

When the allotted time is up, each group should present their obstacle course explaining how they built their obstacles and demonstrating how their Ozobot travels through each obstacle and returns to home (Start/Finish).

Extensions:
Groups may rotate and try out other obstacle courses.
A rubric may be used to rate accomplishments and creativity of design.
Additional challenges may be added to the course.
Side paths, color code actions, and dead ends may be added.
The Start and Finish points may be separated and put in different locations.
Set a time limit (ex: how many obstacles can be done in three minutes?)
Ozobots may be customized with "skins" or wear "hats" (3 oz. paper cups make great "shells" that can be decorated yet keep the Ozobot clean).
Add a color code action after each obstacle is completed.
Ozoblockly coding may be used instead of paths drawn with marker.

Add in probability and math skills by using a tree diagram instead of an obstacle course circuit. (See an example of a tree diagram and probability at https://www.mathsisfun.com/data/probability-tree-diagrams.html .) If an obstacle is placed near the end of every branching path, students can record and graph the outcomes. A different point value might be assigned to each obstacle, resulting in different paths having different total point values, depending on which path the Ozobot randomly chooses.

Comments/questions: rhairston@dallasisd.org

See below for some example of Ozobot Obstacles.

OZOBOT OBSTACLE COURSE CHALLENGES

The Ozobot must travel through a TUNNEL that it at least three inches long.

The Ozobot must push open a GATE and go through.

The Ozobot must push a PINGPONG BALL around a corner.

The Ozobot must knock down a PAPER TUBE.

The Ozobot must ring a BELL.

The Ozobot must travel through an S-shaped CHUTE.