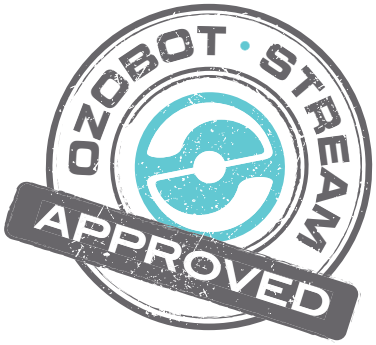

Ozobot Bit Classroom Application:

Slope Practice

Created by

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Topics

Mathematics

Ages

Grades 7 – 9

Duration

15-20 minutes

Ozobot Bit Classroom Application:

Slope Practice

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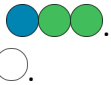
Are you a middle school teacher who teaches the mathematical concept of ***slope***? Would you like to give your students a fun way to practice calculating slope in your classroom? Then the ***Ozobot Bit Classroom Application: Slope Practice*** may be just what you need!

All you need to do is load *SlopePractice.ozocode* into your classroom Ozobot Bits using the "Load Ozobot" feature of the OzoBlockly Web site and print copies of the maze on the last page of this document for each group of students. Make sure that the Ozobot Bits are fully charged, calibrated on paper, and have clean wheels.

The maze contains a Cartesian coordinate grid system with ten line segments having varying slopes. The line segments are identified and differentiated by the letters A through J. The instructions are pretty straight forward:

1. Place Ozobot Bit on line segment A, near the letter A and facing toward the end of the line segment. Turn Ozobot Bit on by double-clicking the start button. He will start moving along the segment while displaying a yellow LED.
2. When he reaches the end of the segment, he will stop for 10 seconds while continuing to display a yellow LED, giving the student time to determine the slope.
3. After the 10 seconds has elapsed, Ozobot Bit will quickly flash the yellow LED several times as a warning that time is up and he is about to display the answer.
4. He will then display the answer by flashing his led as follows.
    a. White means the slope is zero.
    b. Red means that the slope is negative.
    c. Blue represents a decimal point in the answer.
    d. Green flashes signify digits.

    For example:

    If the slope is -1.4, Ozobot Bit would flash  .
    If the slope is 3, Ozobot Bit would flash  .
    If the slope is .2, Ozobot Bit would flash  .
    If the slope is 0, Ozobot Bit would flash .

5. After flashing the answer, Ozobot Bit will display a solid purple LED for 7 seconds, allowing 7 seconds for the student to move him to the next line segment. ***It is important that Ozobot be moved to segments in alphabetical order each time the purple LED is displayed.*** After displaying the answer on the final line segment (J) Ozobot Bit will shut off.

Class Discussion Questions

1. What is the slope of any line segment that is horizontal? *[0]*
2. Ask the students if they notice anything similar about line segments G and J. *[They should have found that both of these segments have the same slope, namely -2. Hopefully, they will also notice that the two segments are parallel. Segments with the same slope are always parallel (or may lie on the same infinite straight line).]*
3. Ask the students if they notice a *geometrical relationship* between segments B and F. *[Hopefully, they will observe that these two segments are at right angles to one another.]* Then ask them what the slopes of these two segments are. *[The slope of segment B is -.5 and the slope of segment F is 2.]* Then ask them to multiply these two slopes together. *[The product is -1.]* **If the product of two slopes is -1, then the two segments will be perpendicular to one another.**
4. Suppose that a line segment has a slope of -1.25. What would be the slope of any segment that is perpendicular to it? *[-1.25x = -1 implies that x = .8]*
5. Discuss the problem of computing the slope of a vertical line segment. *[With **slope** defined as **rise/run**, or **Δy/Δx**, the problem with a vertical segment is that Δx is 0. Division by zero is "not allowed". The slope is **undefined**.]*

Ozobot Bit

Slope Practice