

Ozobot's Mad Dash!

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Grades: 6–12

Coding Methods: **OzoBlockly**

Subjects: **Math, Science, Computer Science**

Robots: **Evo, Bit**

Brief Summary

During the sudden onslaught of grocery hoarding during a pandemic, Ozobot must travel to several stores to find some toilet paper!

Pre-Reader/ESL: **No**

Required Materials

- 1 Evo or Bit per group
- 1 Computer or Tablet per group
- 1 Protractor per group
- 1 Ruler per group
- 1 Pencil per group
- 2 Ozobot's Mad Dash Map per group
- 1 Ozobot's Mad Dash WS per group

Lesson Objectives

- measure distance in centimeters and convert to millimeters
- code Ozobot using OzoBlockly to travel a path using the measurements made by the students
- measure angles using a protractor
- calculate the angles needed to rotate Ozobot using knowledge of the degrees in a circle and straight line

Preparation

Background Knowledge

- Prior Lesson <https://portal.ozobot.com/lessons/detail/basic-training-1>
- Completed Lesson <https://portal.ozobot.com/lessons/detail/ozoblockly-training-k-1>
- Completed Lesson <https://portal.ozobot.com/lessons/detail/ozoblockly-training-2-5>
- Completed Lesson <https://portal.ozobot.com/lessons/detail/ozoblockly-training-6-up>

- Ability to measure angles with a protractor
- Ability to measure centimeters with a ruler
- Knowledge of degrees in a circle
- Knowledge of degrees in a straight line (straight angle)
- Ability to perform addition and subtraction up to 3 digits
- Ability to convert centimeters to millimeters
- Ability to perform multi-step addition and subtraction problems

Lesson Tips

- Ozobot only record numbers up to 127. Students will need to break down distances and angles with this limitation in mind. They may discover as working in Ozoblockly or you may tell them
- degrees might need altering as they run the programs due to friction with the paper and individual bots
- OZOBOT ONLY ROTATES COUNTER-CLOCKWISE

Direct Instruction (Teacher Facing Instructions):

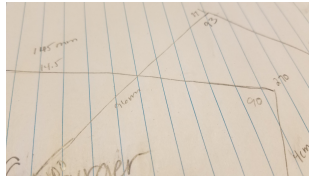
- 1 Draw lines connecting locations in order and measure distance between them in centimeters.
- 2 Convert centimeters to millimeters.
- 3 Measure the angles needed to rotate with a protractor (decide if you want to tell them about Ozobots rotation limitation- changes the math significantly but also a great discovery activity and learning extension).
- 4 After first 3 steps, give Ozoblockly get started standard instructions.

Lesson Closure (Optional)

-Discuss why the degrees had to sometimes be modified in Ozoblockly (friction with paper or technological differences).

Student Practice (Student Facing Instructions):

- 1 Make a path between locations (AVOIDING VIRUS MOLECULES) for Ozobot to travel and measure all the distances needed to travel in centimeters and convert to millimeters.
Goals: Measure the distances between objects and record data in mm.
Attachments: [Mad Dash TP Map.pdf](#), [Mad Dash TP Student WS.pdf](#), [Mad Dash for TP Directions.pdf](#)
- 2 Measure the angles between lines created to see how Ozobot needs to turn (will differ based on how they decide to pick up the items and the fact that Ozobot only rotates counter-clockwise).
Goals: Measure the angles created between 2 intersecting lines.
- 3 Create a program in Ozoblockly that has Ozobot travel to each object based on your measurements.
This step will likely take different times for each groups based on factors previously mentioned.
Different limitations will create a personalized learning experience for each student/group as previously mentioned in different parts of this lesson.
Limitations include: Ozobot number processing, rotation direction.
Measurements will likely alter between groups based on order traveled, lines drawn, etc. Do they need to account for a whole rotation, etc based on your expectations set forth at the beginning of the lesson.
Goals: Create a program in Ozoblockly that has Ozobot travel to each object based on your measurements.
Attachments: <https://youtu.be/Gp44-doputY>



Lesson Extension (Optional)

- 1 Have templates of locations and have students glue them down in different places then traveling to gather them all. Time may vary.
Goals: Gather all the items based on different location.
- 2 Create a larger scale poster to travel. Time may vary.
Goals: Gather items based on different data measurements.
- 3 Create a path traveling to each location in a different order. Time may vary.
Goals: Gather each item in a different order than the original.
- 4 Have them create a color code path including codes at each item. Time may vary.
Goals: Create a color code path for Ozobot to gather all items.

Supplements

Additional Attachments

- [Mad Dash TP Student WS.pdf](#)

Academic Standards

- ISTE.1.a
- ISTE.1.c
- ISTE.4.a
- ISTE.4.b
- CCSS.MATH.PRACTICE.MP1
- CCSS.MATH.PRACTICE.MP4
- CCSS.MATH.PRACTICE.MP5
- CCSS.MATH.PRACTICE.MP6
- CCSS.MATH.CONTENT.2.MD.A.1
- CCSS.MATH.CONTENT.2.MD.A.3
- CCSS.MATH.CONTENT.4.MD.A.1
- CCSS.MATH.CONTENT.4.MD.C.5.a
- CCSS.MATH.CONTENT.4.MD.C.5
- CCSS.MATH.CONTENT.4.MD.C.5.b
- CCSS.MATH.CONTENT.4.MD.C.7
- CCSS.MATH.CONTENT.4.MD.C.6
- CCSS.MATH.CONTENT.3.NBT.A.2
- CCSS.MATH.CONTENT.5.MD.A.1
- CCSS.MATH.CONTENT.7.G.B.5
- CCSS.MATH.CONTENT.8.G.A.5
- CSTA.1A-AP-12
- CSTA.1A-AP-13

Name(s) _____ Date: _____ Period: _____

Ozobot's Mad Dash for TP!

Student WS

1. Draw a plan to leave home and visit each location in the following order AVOIDING ALL VIRUS MOLECULES:

1. Wal-Mart
2. Target
3. Dollar Tree (Find TP HERE!!!!)
4. Whataburger
5. Home

2. Measure the distance between each item in centimeters then convert to mm. _____ mm = 1 cm

3. Measure the degrees of each angle needed to turn to travel to the next object with a protractor.

4. Go to Ozoblockly.com and begin programming. You will find the distance and rotation blocks under Level 4.

5. Code a section at a time.

What did you discover as you entered your lengths?

What did you have to do to adapt the lengths?

What did you discover about how Ozobot rotates?

What did you have to do to adapt the angles?

Did you have to change the angles any? Why do you think this is?

6. Gather all the items and take them Home and celebrate with a code of your choice!