

Lesson

Ozobots: Rate, distance, time

This lesson was designed for five groups of four students (20 students total)

Materials Needed:

Ozobot bowling template (the one used for OzoBlockly)

5 copies on heavy cardstock (one for each grouping to be reused each period – Ask students to not write on these).

50 copies on regular paper (two for each grouping X five classes – for writing on)

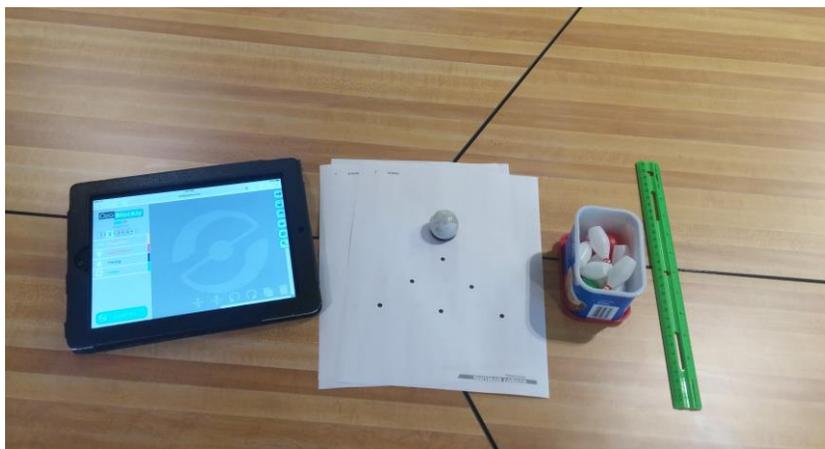
5 Rulers (with mm) – one for each table to be reused each period

5-10 ipads – one for each table to be reused each period but have some for backup

5 bowling Ozobot bowling kits – one for each table to be reused each period

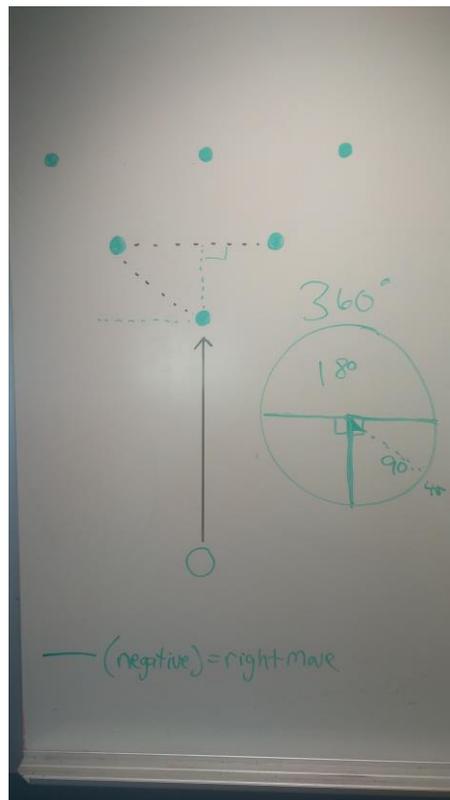
5-10 Ozobots – one for each table to be reused each period by extras for backup

“Bowling With Ozobot” four-page lesson (I scanned each page so I could project them on the whiteboard)



Procedure:

On the left side of the whiteboard, draw the Ozobot Bowling template to use to explain the code projected in the middle of the board.



Review 45 degree and 90 degree angles with the students. To make the Ozobot turn right, a negative sign will need to be placed in front of the number for the angle (see next step)

In the middle of the board, project the code located on page two of the four-page "Bowling With Ozobot" lesson.

try again - you may have to refine your program or just try to place Ozobot slightly differently on the starting position!

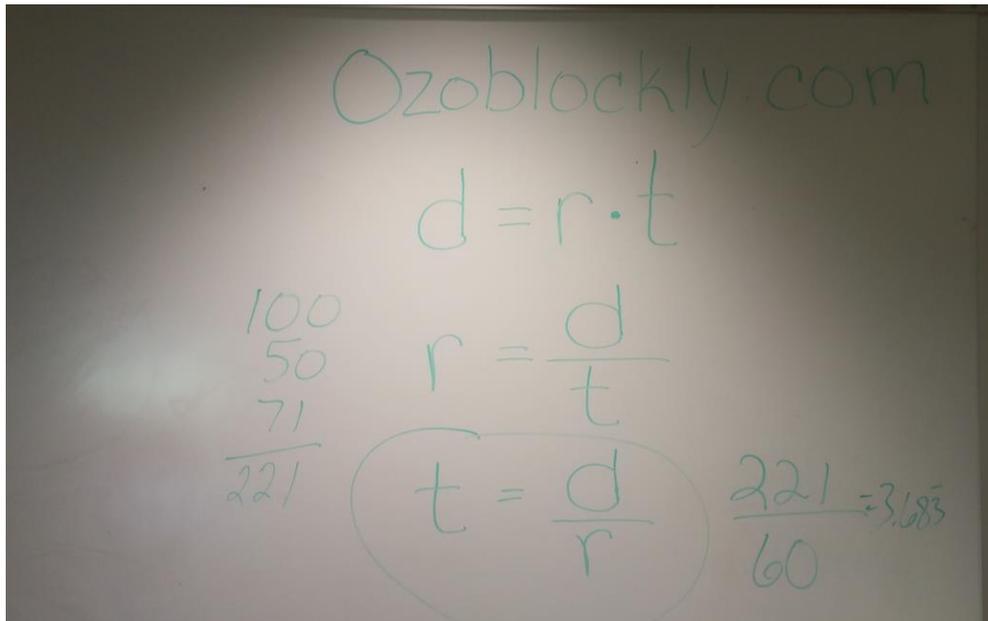
The following is an example of an OzoBlockly program. Three bowling pins were used and they were set on the lower three spots of the lane. You may notice the two second delay at the start of the program. This is really helpful to give the person some time to position Ozobot properly on the paper after double-clicking to start the program.

```
wait 2 . 0 second(s)
move distance: 100 mm speed: 60 mm/s
rotate angle: 45 deg speed: 30 mm/s
move distance: 50 mm speed: 60 mm/s
rotate angle: -90 deg speed: 30 mm/s
rotate angle: -45 deg speed: 30 mm/s
move distance: 71 mm speed: 60 mm/s
```

ozobot

On the right side of the projection, write down the three different formulas for rate, time and distance. Tell the class they'll be specifically focusing on the equation $t = d/r$. When they code the Ozobot, they will know the value of d and r . They will need to calculate the time and then test their calculations by timing the Ozobot as it travels the coded path.

With the class, add up the distance being traveled by the Ozobot in the "move" bars projected on the whiteboard ($100+50+71=221$). Divide that number by the rate of 60 mm/second. $221/60=3.683$ or approximately 4 seconds. So, it should take their Ozobot four seconds to travel from the starting point to the third pin.



Have the students duplicate the code on the screen in Ozoblockly.com using Level 4 codes. Show the students how to drag/drop the code in the workspace from the toolbar. Show the students how to load the code onto their Ozobot

Press the side of the Ozobot until he turns blue

Place the Ozobot on the white Ozobot spot on the iPad

Press Load

The code is being loaded if the Ozobot consistently blinks green.

When done loading, turn the Ozobot off by pressing the side button

Double press the side to turn the Ozobot on and place on the starting point. It will move according to the code.

Remind students to add a 2-second delay at the start of their code (as shown on whiteboard) so they have time to place their Ozobot on the starting point.

Once the students have tested the time for their first code load, challenge them to change the rate (or speed) of the Ozobot and recalculate their time and then test it.

Then challenge the students to change the distance (by adding more pins or by changing the Ozobot's path) and recalculate their time and then test it. (Using the non-cardstock sheets to plan).