



Arrays and For Loops

Robotics Curriculum
IT Adventures



Lesson Overview

- Learn what arrays are and how they can interact with for loops
- Learn how to loop through an array in code with the micro:bit
- Use what you've learned to program the RVR in more efficient, complex ways!



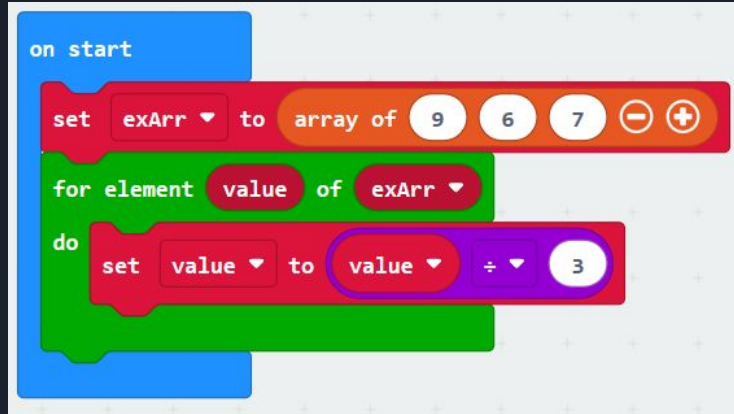
Arrays and For Loops

Arrays are sets of data. Previously, we've covered how variables can store a single value. However, a variable can also be an array, which can store multiple values, and are accessed like a list. Depending on the language, these can be the same or different types

In the last lesson, we discussed how for loops work for a specified number of iterations, or they work through an array. By using a for loop with an array, it can iterate through each cell of the array, manipulating the value as appropriate. This can create efficient, complex code.


Code Example

In this code, the *for* loop is iterating through the array, changing the values of each cell by dividing them by 3.



```
on start
  set exArr to array of 9 6 7
  for element value of exArr
    do
      set value to value ÷ 3
```

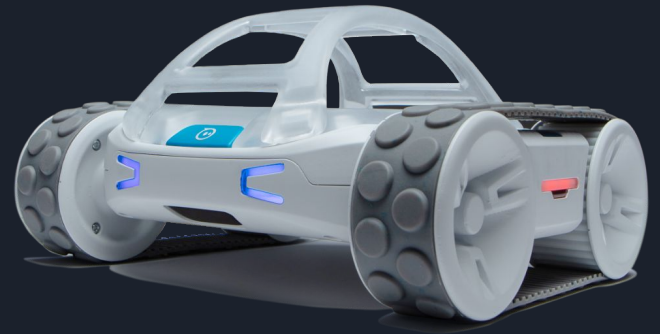
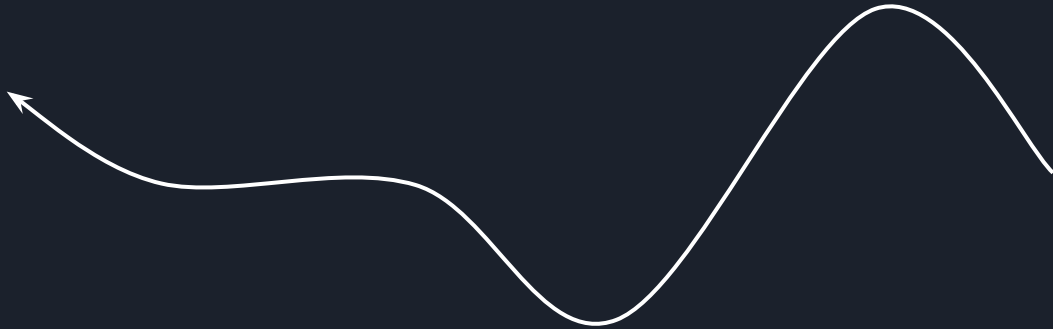
After running this code, `exArr` would be set to `[3, 2, 2]`. Note that this does integer math, so the 2.33 from dividing 7 by 3 gets turned into a 2 automatically, as would any number less than 3. While the array in this example is holding integers, they can hold any value, including strings, booleans, and more. Check out arrays under the “Advanced”->“Arrays” tab!



Primary Learning Challenge: Swerve All Over the Road

Now that you've covered loops and arrays, it's time to drive using that knowledge. Using only *one* loop and drive command, write a program that will cause the RVR to drive in at least 5 different directions, speeds, or both. Be creative! The RVR can drive in any direction or speed you wish it to, but they all must be different.

Effectively, it will look like your RVR is moving randomly. Be safe while testing, and have fun!





Secondary Learning Challenge

For the second challenge of the lesson, your goal is to program the RVR to drive in the form of a certain shape (the more complex, the better!). While you are still limited to one loop, you can otherwise be creative with the shape.

Place down some tape on the starting location, to make sure you end up back there, and get to coding!

