

GLA 2: JavaScript Array Manipulation

OBJECTIVE

In this Graded Learning Activity, you will explore some of JavaScript's most useful built-in functionalities: map, filter, and reduce. You'll practice modifying arrays, extracting specific elements, and transforming arrays into single values, which are essential skills for JavaScript development. Learning how to explore the documentation and understanding how these methods work is an essential part of this activity. Learning how to declare the correct variables and proper variable naming is also a part of this activity. No HTML or CSS coding is required, just a simple HTML index page that imports your JavaScript file.

TASKS

Create a basic HTML document.

Create a JavaScript file and name it `GLA2_YourFirstName_YourStudentID.js`

E.g.: GLA2_John_123456.js

Link your JavaScript file to your HTML file declaring the script tag and its source attribute.

For each of the following steps, use `console.log` to display the answer. (-1 for each missing log).

Use the requested method (map, filter, or reduce)

Original array: [1, 3, 5, 2, 4, 8, 2, 3, 1, 11, 7, 4, 9, 9, 1]

- 1) **Use “.map”** to create a new array without modifying the original array's elements:
 - a) Multiply each element by 2. (/3 marks)
 - b) Add 1 to each element. (/3 marks)
 - c) Multiply each element by your Student ID number. (/3 marks)
- 2) **Use “.filter”** to create a new array containing elements that meet the following conditions:
 - a) For the array resulting from step 1a, all numbers smaller than 10. (/3 marks)
 - b) For the array resulting from step 1b, all odd numbers. (/3 marks)
 - c) For the array resulting from step 1c, all numbers greater than 1,000,000. (/3 marks)
- 3) **Use “.reduce”** to calculate a single value from the array:
 - a) Calculate the sum of all elements from the original array. (/3 marks)
 - b) Remove all duplicates from the original array. (/3 marks)
 - c) Flatten the following multidimensional array into a one-dimensional array:
[[1, 2], [3, 4], [5, [6, 7]]] (/3 marks)

Consider the following array:

```
[ { name: "Alice Johnson", program: "Rocket Science", GPA: "3.75" }, { name: "Brian Smith",  
program: "Rocket Science", GPA: "3.89" }, { name: "Chloe Brown", program: "Rocket Science",  
GPA: "3.63" }, { name: "David Lee", program: "Rocket Science", GPA: "3.94" }, { name: "Ella  
White", program: "Rocket Science", GPA: "3.47" }, { name: "Finn Walker", program: "Rocket  
Science", GPA: "3.71" }, { name: "Grace Hall", program: "Rocket Science", GPA: "3.99" }, { name:  
"Henry Adams", program: "Rocket Science", GPA: "3.54" }, { name: "Isla Carter", program:  
"Rocket Science", GPA: "3.68" }, { name: "Jack Moore", program: "Rocket Science", GPA: "3.85"  
} ]
```

It is a list of 10 students with the following properties: “name”, “program”, and “GPA”.

- 4) Without modifying the original array, sort the elements according to the students’ GPA in **descending order** (higher GPA first) and add a new property “status” to all of the students, with the value “active”. (/15 marks)

After the modifications, display both your original students array and the final updated array on console. (/3 marks)

Modified student example:

```
{  
name: "Will",  
program: "Rocket Science",  
GPA: "4.0",  
status: "active"  
}
```

Submission

Submit your HTML and JavaScript files inside of a .zip file to GLA 2’s Dropbox in D2L.

Grading

This GLA is graded out of 45 total marks. Check each item for the individual weight.