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11

QUARTER

2

Computer Programming

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Quarter 2 – Module 15: JavaScript Arrays
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Computer Programming

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QUARTER 2

MODULE 15

JavaScript Arrays

Writer : Dan Reinnier C. Amigo
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Introductory Message

For the Facilitator:

Welcome to the Computer Programming for the ICT Module on JavaScript Arrays!

This module was collaboratively designed, developed and reviewed by educators from Schools Division Office of Pasig City headed by its Officer-In-Charge Schools Division Superintendent, Ma. Evalou Concepcion A. Agustin in partnership with the Local Government of Pasig through its mayor, Honorable Victor Ma. Regis N. Sotto. The writers utilized the standards set by the K to 12 Curriculum using the Most Essential Learning Competencies (MELC) while overcoming their personal, social, and economic constraints in schooling.

This learning material hopes to engage the learners into guided and independent learning activities at their own pace and time. Further, this also aims to help learners acquire the needed 21st century skills especially the 5 Cs namely: Communication, Collaboration, Creativity, Critical Thinking and Character while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Moreover, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the Learner:

Welcome to the Computer Programming for the ICT Module on JavaScript Arrays!

The hand is one of the most symbolized part of the human body. It is often used to depict skill, action and purpose. Through our hands we may learn, create and accomplish. Hence, the hand in this learning resource signifies that you as a learner is capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time. Your academic success lies in your own hands!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning material while being an active learner.

This module has the following parts and corresponding icons:

Expectation - These are what you will be able to know after completing the lessons in the module

Pre-test - This will measure your prior knowledge and the concepts to be mastered throughout the lesson.

Recap - This section will measure what learnings and skills that you understand from the previous lesson.

Lesson- This section will discuss the topic for this module.

Activities - This is a set of activities you will perform.

Wrap Up- This section summarizes the concepts and applications of the lessons.

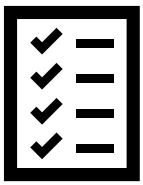
Valuing-this part will check the integration of values in the learning competency.

Post-test - This will measure how much you have learned from the entire module. Ito po ang parts ng module.

EXPECTATIONS

The students should be able to:

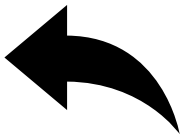
A. understand JavaScript Array;
B. describe the order of counting JavaScript Array; and,
C. execute a syntax using JavaScript Array.



PRETEST

Direction: In the parenthesis, underline the word/s that best corresponds to each statement.

1. In JavaScript, an array is an ordered list of values. **(Array, Sorting)**
2. Each value is called an _____. **(element, index)**
3. Using an array _____ is the easiest way to create a JavaScript Array. **(dynamic, literal)**
4. The first element of an array starts at _____. **(index 0, index 1)**
5. To get the full array, refer to the array _____. **(index, name)**



RECAP

JavaScript Numbers were discussed in the previous module. Give a brief description of the following terms relating to JavaScript Numbers:

1. JavaScript Numbers
2. The + Operator
3. Numeric String
4. Infinity and – Infinity
5. NaN (not-a-number)

LESSON

JavaScript Arrays

In JavaScript, an array is an ordered list of values. Arrays are container-like values that can hold other values. Each value is called an **element** specified by an **index**.

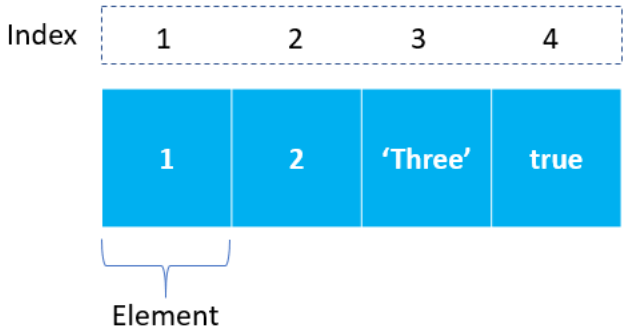


Image 1: https://www.javascripttutorial.net/javascript-array/

An array has the following characteristics:

1. An array can hold values of different types. For example, you can have an array that stores the number and string, and boolean values.
2. The length of an array is dynamically sized and auto-growing. In other words, you don't need to specify the array size upfront.

Understanding Array

An array is a special variable, which can hold more than one value at a time. If you have a list of items (a list of car names, for example), storing the cars in single variables could look like this:

```
var car1 = "Saab";
var car2 = "Volvo";
var car3 = "BMW";
```

However, what if you want to loop through the cars and find a specific one? And what if you had not 3 cars, but 300?

The solution is an **array.**

An array can hold many values under a single name, and you can access the values by referring to an index number.

Creating an Array

Using an array literal is the easiest way to create a JavaScript Array. JavaScript provides you with two ways to create an array.

1. Using the Array constructor as follows: `let scores = new Array();`

   The *scores* array is empty i.e. it holds no element.

If you know the number of elements that the array will hold, you can create an array with an initial size as shown in the following example:

```
let scores = Array(10);
```

It's important to notice that if you use the array constructor to create an array and pass in a number, you are creating an array with an initial size. However, if you pass in one argument of another type, you create an array that holds that element.

```
let athletes = new Array(3); // creates an array with initial size 3
let scores = new Array(1, 2, 3); // create an array with three numbers 1,2 3
let signs = new Array('Red'); // creates an array with one element 'Red'
```

JavaScript allows you to omit the *new* operator when you use the array constructor.

2. Creating an array by using the array literal notation. The array literal form uses the square brackets [] to wrap a comma-separated list of elements. For example, the following statement creates *colors* array of three colors

   ```
   let colors = ['red', 'green', 'blue'];
   ```

   It's possible to create an empty array by using empty square brackets.

   ```
   let emptyArray = [];
   ```

   The following example creates an array of two undefined elements.

   ```
   let nonEmptyArray = [,,];
   console.log(nonEmptyArray); // [undefined, undefined]
   ```

Array Elements

JavaScript arrays are zero-based indexed. In other words, the first element of an array starts at **index 0**, the second element starts at index 1, and so on. To access one of the elements inside an array, you'll need to use the brackets and a number like this: arrayName[index].

```
var colors= ["red", "green", "blue"];

      colors[0]; //red
      colors[1]; //green
      colors[2]; //blue
```

To change the value of an element, you assign that value to the element like this:

```
var colors = ["red", "green", "blue"];
colors[0] = "black"; //result is black
```

To get the full array, refer to the array name:

```
var colors = ["red", "green", "blue"];
document.getElementById("demo").innerHTML = colors;
```

Array Properties and Methods

Properties	Description
constructor	Returns a reference to the array function that created the object.
index	The property represents the zero-based index of the match in the string
input	This property is only present in arrays created by regular expression matches.
length	Reflects the number of elements in an array.
prototype	The prototype property allows you to add properties and methods to an object.
Methods	**Description**
concat()	Returns a new array comprised of this array joined with other array(s) and/or value(s)
every()	Returns true if every element in this array satisfies the provided testing function.
filter()	Creates a new array with all of the elements of this array for which the provided filtering function returns true.
forEach()	Calls a function for each element in the array.
indexOf()	Returns the first (least) index of an element within the array equal to the specified value, or -1 if none is found.
join()	Joins all elements of an array into a string.
lastIndexOf()	Returns the last (greatest) index of an element within the array equal to the specified value, or -1 if none is found.
map()	Creates a new array with the results of calling a provided function on every element in this array.
pop()	Removes the last element from an array and returns that element.
push()	Adds one or more elements to the end of an array and returns the new length of the array.
reduce()	Apply a function simultaneously against two values of the array (from left-to-right) as to reduce it to a single value.
reduceRight()	Apply a function simultaneously against two values of the array (from right-to-left) as to reduce it to a single value.
reverse()	Reverses the order of the elements of an array -- the first becomes the last, and the last becomes the first.
shift()	Removes the first element from an array and returns that element
slice()	Extracts a section of an array and returns a new array.
some()	Returns true if at least one element in this array satisfies the provided testing function.
toSource()	Represents the source code of an object
sort()	Sorts the elements of an array
splice()	Adds and/or removes elements from an array.
toString()	Returns a string representing the array and its elements.
unshift()	Adds one or more elements to the front of an array and returns the new length of the array.

ACTIVITIES

Creating Syntax: Provide what is asked in each problem. Use the rubrics that follows as basis for scoring for both problems.

Problem 1: Write a JavaScript program to find the most frequent item of an array.
Given array: var arr1=[7, 's', 'e', 'e', 2, 7, 'e', 'e', 'e', 2, 7, 9,];
Expected Output: a (5 times)

Problem 2: Write a JavaScript program to sort the items of an array.
Given array : var arr1 = [-1, -9, -12, 5, 9, 23, 15, 7, 1];
Expected Output : -12,-9,-1,1,5,7,9,15,23

This rubrics serves as basis for scoring.

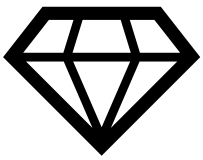
	Needs work	Developing	Meets Standard	Exceeds Expectation	Score
Visual Structure	Visual structure and readability was unorganized	Visual structure was unorganized but somehow readable	Visual structure and readability is well organized	Visual structure and readability is well organized with comments and labels	
	5 points	10 points	15 points	20 points	
Code	With syntax and logical errors.	Syntax is correct but with logical errors.	Syntax works well	Syntax works on different platforms	
	10 points	15 points	20 points	30 points	
				Total	**/50**

WRAP–UP

This module discussed JavaScript Arrays. In no more than 3 paragraphs, make brief summary of what you have learned in this module. You may include JavaScript Array syntax.

	Very Good	Good	Needs improvement	Score
Knowledge Does your response clearly show you have read and understand the lesson content by correctly defining key terms, key persons and summarizing concepts?	5	3	2	

Analysis Have you clearly stated analysis and give examples to back them up? Does your response provide analysis to the larger concepts of the lesson?	5	3	2	
Programming Skill Are there any syntaxes included in your work? Are the syntax given correct and precise?	5	3	2	
			Total	**/15**



VALUING

Directions: Read carefully and answer the following questions.

1. In making a program, what is the relevance of using arrays in your codes?
   _____
   _____
   _____
2. Why is there a need for programmers to learn arrays?
   _____
   _____
   _____

POST TEST

Direction: Identify the property or method described in each statement.

1. Reflects the number of elements in an array.
2. Removes the first element from an array and returns that element
3. Returns a new array comprised of this array joined with other array(s) and/or value(s)
4. The prototype property allows you to add properties and methods to an object.
5. Sorts the elements of an array

KEY TO CORRECTION

Pre-test:	Post-test:
1. Array	1. length
2. element	2. shift()
3. literal	3. concat()
4. index 0	4. prototype
5. name	5. sort()

References

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Photo Credit:

- Image 1: https://www.javascripttutorial.net/javascript-array/