

An **array** in JavaScript is a special variable that can hold **multiple values in a single variable**. Arrays can store different types of data like numbers, strings, objects, and even other arrays.

1 Creating an Array

We can create arrays in multiple ways:

- ◆ **Using Square Brackets ([] – Most Common Method)**

```
let names = ["Amit", "Priya", "Raj", "Sneha"];
console.log(names); // Output: ["Amit", "Priya", "Raj", "Sneha"]
```

- ◆ **Using new Array() (Less Common)**

```
let cities = new Array("Mumbai", "Delhi", "Bangalore");
console.log(cities); // Output: ["Mumbai", "Delhi", "Bangalore"]
```

2 Accessing Array Elements

Each array element has an **index**, starting from 0.

```
let fruits = ["Mango", "Banana", "Guava", "Apple"];
console.log(fruits[0]); // Output: Mango
console.log(fruits[2]); // Output: Guava
◆ Accessing the last element
console.log(fruits[fruits.length - 1]); // Output: Apple
```

3 Modifying an Array

We can change an existing array element:

```
let festivals = ["Diwali", "Holi", "Navratri"];
festivals[1] = "Raksha Bandhan"; // Replaces "Holi" with "Raksha Bandhan"
console.log(festivals); // Output: ["Diwali", "Raksha Bandhan", "Navratri"]
```

4 Array Methods

JavaScript provides powerful built-in methods for arrays.

- ◆ **Adding & Removing Elements**

Method	Action	Example
push()	Add at the end	arr.push("Value")
pop()	Remove from the end	arr.pop()
unshift()	Add at the start	arr.unshift("Value")
shift()	Remove from the start	arr.shift()

```
let foods = ["Dosa", "Biryani", "Pani Puri"];
```

```
// Add items
```

```
foods.push("Samosa");
```

```
foods.unshift("Idli");
```

```
console.log(foods); // ["Idli", "Dosa", "Biryani", "Pani Puri", "Samosa"]
```

```
// Remove items
```

```
foods.pop();
```

```
foods.shift();
```

```
console.log(foods); // ["Dosa", "Biryani", "Pani Puri"]
```

◆ Finding & Checking Elements

Method	Action	Example
indexOf(value)	Finds index	arr.indexOf("Value")
includes(value)	Checks if exists	arr.includes("Value")

```
let cricketers = ["Virat", "Rohit", "Dhoni", "Sachin"];
```

```
console.log(cricketers.indexOf("Dhoni")); // Output: 2
```

```
console.log(cricketers.includes("Sachin")); // Output: true
```

```
console.log(cricketers.includes("Kapil Dev")); // Output: false
```

◆ Slicing & Splicing

Method	Action	Example
slice(start, end)	Extracts part of array (does NOT modify original)	arr.slice(1, 3)
splice(start, count, newValue...)	Removes/Replaces/Inserts items (MODIFIES original)	arr.splice(2, 1, "New")

```
let languages = ["Hindi", "Bengali", "Telugu", "Marathi", "Tamil"];
```

```
// Slice - Extract 2nd & 3rd element
```

```
console.log(languages.slice(1, 3)); // ["Bengali", "Telugu"]
```

```
// Splice - Remove "Telugu" and add "Kannada"
```

```
languages.splice(2, 1, "Kannada");
```

```
console.log(languages); // ["Hindi", "Bengali", "Kannada", "Marathi", "Tamil"]
```

◆ Merging & Converting

Method	Action	Example
concat()	Merge arrays	arr1.concat(arr2)

```
join(separator) Convert to string arr.join(", ")
```

```
let southIndianFood = ["Dosa", "Idli"];
```

```
let northIndianFood = ["Chole Bhature", "Rajma Chawal"];
```

```
let allFood = southIndianFood.concat(northIndianFood);
```

```
console.log(allFood); // ["Dosa", "Idli", "Chole Bhature", "Rajma Chawal"]
```

```
console.log(allFood.join(" | ")); // Output: "Dosa | Idli | Chole Bhature | Rajma Chawal"
```

5 Looping Through Arrays

◆ Using forEach()

```
let names = ["Amit", "Ravi", "Pooja"];
```

```
names.forEach((name) => {
```

```
    console.log("Hello, " + name);
}

// Output:
// Hello, Amit
// Hello, Ravi
// Hello, Pooja
```

◆ **Using map() (Returns a new array)**

```
let numbers = [10, 20, 30];
let doubled = numbers.map(num => num * 2);
console.log(doubled); // Output: [20, 40, 60]
```

6 Advanced Concepts

◆ **Nested Arrays (2D Arrays)**

```
let matrix = [
  [1, 2, 3],
  [4, 5, 6],
  [7, 8, 9]
];
```

```
console.log(matrix[1][2]); // Output: 6
```

◆ **Filtering Elements (filter())**

```
let numbers = [5, 10, 15, 20, 25];
let greaterThan10 = numbers.filter(num => num > 10);
console.log(greaterThan10); // Output: [15, 20, 25]
```

7 Practical Example: Sorting Names Alphabetically

```
let names = ["Zoya", "Amit", "Rahul", "Priya"];
names.sort();
console.log(names); // Output: ["Amit", "Priya", "Rahul", "Zoya"]
```