

# JavaScript: Variables, Operators & Expressions

## 1. What is a Variable?

A variable is a container that holds data values. In JavaScript, variables are declared using var, let, or const.

## 2. Declaring Variables:

```
var x = 10;           // function-scoped
let y = 20;           // block-scoped
const z = 30;         // constant
```

## 3. Variable Naming Rules:

- Begin with letter, \_ or \$
- No numbers at the start
- No spaces or special characters
- Case sensitive

## 4. JavaScript Data Types:

JavaScript supports various data types including String, Number, Boolean, Object, Array, Null and Undefined.

```
let name = "Taruna";    // String
let age = 44;           // Number
let isActive = true;    // Boolean
let person = { name: "Shekhar", age: 45 }; // Object
let scores = [90, 80, 85]; // Array
let nothing = null;     // Null
let unknown;            // Undefined
```

## 5. Arithmetic Operators:

Operator	Description	Example	Result
+	Addition	5 + 3	8
-	Subtraction	5 - 2	3
*	Multiplication	4 * 2	8
/	Division	10 / 2	5
%	Modulus	7 % 2	1
**	Exponent	2 ** 3	8

## 6. Assignment Operators:

```
let a = 10;
a += 5;   // 15
a -= 2;   // 13
```

# JavaScript: Variables, Operators & Expressions

```
a *= 2;    // 26
a /= 2;    // 13
```

## 7. Comparison Operators:

Operator	Description	Example	Result
==	Equal value	5 == '5'	true
===	Equal value & type	5 === '5'	false
!=	Not equal value	5 != '5'	false
!==	Not equal type/value	5 !== '5'	true
>	Greater than	6 > 5	true
<	Less than	2 < 5	true

## 8. Logical Operators:

```
true && false    // false
true || false     // true
!true             // false
```

## 9. Type Checking with typeof:

```
typeof "Hello"    // "string"
typeof 42          // "number"
typeof true       // "boolean"
typeof []         // "object"
typeof {}         // "object"
typeof undefined  // "undefined"
```

## 10. Expressions:

Expressions evaluate to values and are used in assignments, conditions, and calculations.

```
let total = 5 + 3;           // arithmetic expression
let isLarge = total > 10;    // comparison expression
let greeting = "Hi " + "there"; // string expression
```