# var, let, and const in JavaScript – the Differences Between These Keywords Explained

In JavaScript, you can declare variables with the var, let and keywords. But what are the differences between them? That's what I'll explain in this tutorial.

I have a [video version of this topic](https://youtu.be/Gd_JG3e1g4A) you can check out as well. 😇

If you're just starting out using JavaScript, a few things you may hear about these keywords are:

* var and let create variables that can be reassigned another value.
* const creates "constant" variables that cannot be reassigned another value.
* developers shouldn't use var anymore. They should use let or const instead.
* if you're not going to change the value of a variable, it is good practice to use const.

The first two points are likely pretty self-explanatory. But what about why we shouldn't use var, or when to use let vs const? As we go through this tutorial, hopefully this will all make sense to you.

## **var** vs **let** vs **const** – What's the Difference?

To analyze the differences between these keywords, I'll be using three factors:

* Scope of variables
* Redeclaration and reassignment
* Hoisting

Let's start by looking at how these factors apply to variables declared with var.

## How to Declare Variables with **var** in JavaScript

### The scope of variables declared with **var**

Variables declared with var can have a **global** or **local** scope. Global scope is for variables declared outside functions, while local scope is for variables declared inside functions.

Let's see some examples, starting from global scope:

var number = 50

function print() {

var square = number \* number

console.log(square)

}

console.log(number) // 50

print() // 2500

The number variable has a global scope – it's declared outside functions in the global space – so you can access it everywhere (inside and outside functions).

Let's see an example of local scope:

function print() {

var number = 50

var square = number \* number

console.log(square)

}

print() // 2500

console.log(number)

// ReferenceError: number is not defined

Here, we declared the number variable in the function print, so it has a local scope. This means that the variable can only be accessed inside that function. Any attempt to access the variable outside the function where it was declared will result in a **variable is not defined** reference error.

### How to redeclare and reassign variables declared with **var**

Variables declared with var can be redeclared and reassigned. I'll explain what I mean with examples.

Here's how to declare a variable with var:

var number = 50

You have the var keyword, the name of the variable number, and an initial value **50**. If an initial value is not provided, the default value will be **undefined**:

var number

console.log(number) // undefined

The var keyword allows for redeclaration. Here's an example:

var number = 50

console.log(number) // 50

var number = 100

console.log(number) // 100

As you can see, we have redeclared the variable number using the var keyword and an initial value of **100**.

The var keyword also allows for reassignment. In the code var number = 50, we assigned the **50** value to number. We can reassign another value anywhere in the code since it was declared with var. Here's what I mean:

var number = 50

console.log(number) // 50

number = 100

console.log(number) // 100

number = 200

console.log(number) // 200

Here, we're not redeclaring – rather, we're reassigning. After declaring the first time with an initial value of **50**, we reassign a new value of **100** and later on with a new value of **200**.

### How to hoist variables declared with **var**

Variables declared with var are hoisted to the top of their global or local scope, which makes them accessible before the line they are declared. Here's an example:

console.log(number) // undefined

var number = 50

console.log(number) // 50

The number variable here has a global scope. Since it is declared with var, the variable is hoisted. This means that we can access the variable before the line where it was declared without errors.

But the variable is hoisted with a default value of **undefined**. So that's the value returned from the variable (until the line where the variable is declared with an initial value gets executed).

Let's see a local scope example:

function print() {

var square1 = number \* number

console.log(square1)

var number = 50

var square2 = number \* number

console.log(square2)

}

print()

// NaN

// 2500

In the print function, number has a local scope. Due to hoisting, we can access the number variable before the line of declaration.

As we see in square1, we assign **number \* number**. Since number is hoisted with a default value of **undefined**, square1 will be **undefined \* undefined** which results in **NaN**.

After the line of declaration with an initial value is executed, number will have a value of **50**. So in square2, **number \* number** will be **50 \* 50** which results in **2500**.

There are some problems with var, which we'll discuss at the end. Just know that it's generally not advisable to use it in your modern JavaScript projects.

## **How to Declare Variables with let in JavaScript**

### The scope of variables declared with **let**

Variables declared with let can have a **global**, **local**, or **block scope**. Block scope is for variables declared in a block. A block in JavaScript involves opening and closing curly braces:

{

// a block

}

You can find blocks in if, loop, switch, and a couple of other statements. Any variables declared in such blocks with the let keyword will have a block scope. Also, you can't access these variables outside the block. Here's an example showing a global, local, and block scope:

let number = 50

function print() {

let square = number \* number

if (number < 60) {

var largerNumber = 80

let anotherLargerNumber = 100

console.log(square)

}

console.log(largerNumber)

console.log(anotherLargerNumber)

}

print()

// 2500

// 80

// ReferenceError: anotherLargerNumber is not defined

In this example, we have a global scope variable number and a local scope variable square. There's also block scope variable anotherLargerNumber because it is declared with let in a block.

largerNumber, on the other hand – though declared in a block – does not have a block scope because it is declared with var. So largerNumber has a local scope as it is declared in the function print.

We can access number everywhere. We can only access square and largerNumber in the function because they have local scope. But accessing anotherLargerNumber outside the block throws an **anotherLargerNumber is not defined** error.

### How to redeclare and reassign variables declared with **let**

Just like var, variables declared with let can be reassigned to other values, but they cannot be redeclared. Let's see a reassignment example:

let number = 50

console.log(number) // 50

number = 100

console.log(number) // 100

Here, we reassigned another value **100** after the initial declaration of **50**.

But redeclaring a variable with let will throw an error:

let number = 50

let number = 100

// SyntaxError: Identifier 'number' has already been declared

You see we get a syntax error: **Identifier 'number' has already been declared**.

### How to hoist variables declared with **let**

Variables declared with let are hoisted to the top of their global, local, or block scope, but their hoisting is a little different from the one with var.

var variables are hoisted with a default value of **undefined**, which makes them accessible before their line of declaration (as we've seen above).

But, let variables are hoisted without a default initialization. So when you try to access such variables, instead of getting **undefined**, or **variable is not defined** error, you get **cannot access variable before initialization**. Let's see an example:

console.log(number)

// ReferenceError: Cannot access 'number' before initialization

let number = 50

Here, we have a global variable, number declared with let. By trying to access this variable before the line of declaration, we get **ReferenceError: Cannot access 'number' before initialization**.

Here's another example with a local scope variable:

function print() {

let square = number \* number

let number = 50

}

print()

// ReferenceError: Cannot access 'number' before initialization

Here we have a local scope variable, number, declared with let. By accessing it before the line of declaration again, we get the **cannot access 'number' before initialization** reference error

## How to Declare Variables with **const** in JavaScript

### The scope of variables declared with **const**

Variables declared with const are similar to let in regards to **scope**. Such variables can have a **global**, **local**, or **block** scope.

Here is an example:

const number = 50

function print() {

const square = number \* number

if (number < 60) {

var largerNumber = 80

const anotherLargerNumber = 100

console.log(square)

}

console.log(largerNumber)

console.log(anotherLargerNumber)

}

print()

// 2500

// 80

// ReferenceError: anotherLargerNumber is not defined

This is from our previous example, but I've replaced let with const. As you can see here, the number variable has a global scope, square has a local scope (declared in the print function), and anotherLargeNumber has a block scope (declared with const).

There's also largeNumber, declared in a block. But because it is with var, the variable only has a local scope. Therefore, it can be accessed outside the block.

Because anotherLargeNumber has a block scope, accessing it outside the block throws an **anotherLargerNumber is not defined**.

### How to redeclare and reassign variables declared with **const**

In this regard, const is different from var and let. const is used for declaring **constant** variables – which are variables with values that cannot be changed. So such variables cannot be redeclared, and neither can they be reassigned to other values. Attempting such would throw an error.

Let's see an example with redeclaration:

const number = 50

const number = 100

// SyntaxError: Identifier 'number' has already been declared

Here, you can see the **Identifier has already been declared** syntax error.

Now, let's see an example with reassignment:

const number = 50

number = 100

// TypeError: Assignment to constant variable

Here, you can see the **Assignment to constant variable** type error.

### How to hoist variables declared with **const**

Variables declared with const, just like let, are hoisted to the top of their global, local, or block scope – but without a default initialization.

var variables, as you've seen earlier, are hoisted with a default value of **undefined** so they can be accessed before declaration without errors. Accessing a variable declared with const before the line of declaration will throw a **cannot access variable before initialization** error.

Let's see an example:

console.log(number)

// ReferenceError: Cannot access 'number' before initialization

const number = 50

Here, number is a globally scoped variable declared with const. By trying to access this variable before the line of declaration, we get **ReferenceError: Cannot access 'number' before initialization**. The same will occur if it was a locally scoped variable.

Here's an article to learn more about [Hoisting in JavaScript with let and const – and How it Differs from var](https://www.freecodecamp.org/news/javascript-let-and-const-hoisting/).

## Wrap up

Here's a table summary showing the differences between these keywords:

| **KEYWORD** | **SCOPE** | **REDECLARATION & REASSIGNMENT** | **HOISTING** |
| --- | --- | --- | --- |
| var | Global, Local | yes & yes | yes, with default value |
| let | Global, Local, Block | no & yes | yes, without default value |
| const | Global, Local, Block | no & no | yes, without default value |

These factors I've explained, play a role in determining how you declare variables in JavaScript.

If you never want a variable to change, const is the keyword to use.

If you want to reassign values:

* and you want the hoisting behavior, var is the keyword to use
* if you don't want it, let is the keyword for you

The hoisting behavior can cause unexpected bugs in your application. That's why developers are generally advised to avoid var and stick to let and cost.

I hope you learned something from this article.