

# for...in vs for...of loops

Absolutely! Let's break down the `for...in` and `for...of` loops in JavaScript — including **how they work, their differences, and when to use each.**

## `for...in` Loop

### ✓ Purpose:

Used to **iterate over the enumerable properties (keys)** of an **object**.

### ◆ Syntax:

```
for (let key in object) {  
  // use object[key]  
}
```

### ◆ Example with an object:

```
const person = {  
  name: "Abhi",  
  age: 22,  
  country: "India"  
};  
  
for (let key in person) {  
  console.log(key + ": " + person[key]);  
}
```

### 📌 Output:

```
name: Abhi  
age: 22
```

country: India

✓ **Also works on arrays (but not recommended for arrays):**

```
const arr = ["a", "b", "c"];

for (let index in arr) {
  console.log(index + ": " + arr[index]);
}
```

📌 Output:

```
0: a
1: b
2: c
```

🚫 **Avoid using `for...in` on arrays** — it may include inherited properties and is slower.

## **for...of Loop**

✓ **Purpose:**

Used to **iterate over the values** of **iterable objects** like:

- Arrays
- Strings
- Maps
- Sets
- etc.

◆ **Syntax:**

```
for (let value of iterable) {  
  // use value directly  
}
```

### ◆ Example with array:

```
const colors = ["red", "green", "blue"];  
  
for (let color of colors) {  
  console.log(color);  
}
```

 Output:

```
red  
green  
blue
```

### ◆ Example with string:

```
for (let char of "Hello") {  
  console.log(char);  
}
```

 Output:

```
H  
e  
l  
l  
o
```

## **for...in** vs **for...of** Comparison

Feature	<code>for...in</code>	<code>for...of</code>
Iterates over	Keys (property names)	Values (of an iterable)
Suitable for	Objects	Arrays, Strings, Sets, Maps, etc.
Output on array	Indexes	Actual values
Use with object	✅ Yes	❌ No (throws error)
Use with array	⚠️ Not recommended (keys)	✅ Yes (values)

## ! Pitfalls and Tips

- Don't use `for...in` on arrays unless you need the **index** or are iterating **custom properties**.
- `for...of` can't be used directly on plain objects — you'll get a **TypeError**.

## Example: Both Loops on Same Array

```
const fruits = ["apple", "banana", "cherry"];

console.log("Using for...in:");
for (let index in fruits) {
  console.log(index); // prints 0, 1, 2
}

console.log("Using for...of:");
for (let fruit of fruits) {
  console.log(fruit); // prints apple, banana, cherry
}
```

## Summary

- Use `for...in` to iterate **keys** of an object.
- Use `for...of` to iterate **values** of an iterable (array, string, etc.).

Would you like a **cheat sheet**, **interactive quiz**, or examples with `Map` and `Set` too?