### 🔢 JavaScript: Converting Strings to Numbers

JavaScript is smart when dealing with numbers inside **strings**, but sometimes it can cause unexpected results. Let's break it down!

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# 1️⃣ JavaScript Auto-Converts in Math Operations

JavaScript **automatically** converts **numeric strings** when using `-`, `*`, and `/`.

```
console.log("200" - "150"); // ✅ Output: 50
console.log("10" * "5");    // ✅ Output: 50
console.log("100" / "2");   // ✅ Output: 50
console.log("50" - "duck"); // ❌ Output: NaN (Not a Number)
```

🔹 **Exception: `+` (Addition) does NOT convert!** Instead, it **concatenates** strings.

```
console.log("200" + 150);   // ❌ Output: "200150" (Not 350!)
```

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# 2️⃣ Fixing Addition Issues: `parseInt()` and `parseFloat()`

If you **want to do math**, you must **explicitly** convert the string to a number.

```
var currentAge = prompt("Enter your age."); // User enters "25"
var qualifyingAge = parseInt(currentAge) + 1;
console.log(qualifyingAge); // ✅ Output: 26
```

🚨 **Warning:** `parseInt()` removes decimals instead of rounding!

```
console.log(parseInt("1.9999")); // ❌ Output: 1 (NOT 2)
console.log(parseFloat("1.9999")); // ✅ Output: 1.9999
```

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# 3️⃣ Another Conversion Method: `Number()`

`Number()` works like `parseFloat()` but better—it converts `null`, `""`, and `" 42 "` correctly.

```
console.log(Number("42"));       // ✅ Output: 42
console.log(Number("42.99"));    // ✅ Output: 42.99
console.log(Number("42px"));     // ❌ Output: NaN
console.log(Number(""));         // ✅ Output: 0
console.log(Number(null));       // ✅ Output: 0
console.log(Number("   42   ")); // ✅ Output: 42
```

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## 4⃣ Safer Conversion Using + Unary Operator

Another shortcut: Using + before the string converts it to a number!

```
var age = prompt("Enter your age");  // User enters "30"
var newAge = +age + 1;  // ✅ Converts "30" to 30, then adds 1
console.log(newAge);    // ✅ Output: 31
```

🔹 **Same as:**

```
var newAge = Number(age) + 1;
```

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## 🔥 Best Practices for Number Conversion

| Method | Converts Strings? | Handles Decimals? | Handles Empty String / null? | Safe for all cases? |
|---|---|---|---|---|
| parseInt() | ✅ Yes | ❌ No (Truncates) | ❌ No (NaN) | ⚠️ No (Loses decimals) |
| parseFloat() | ✅ Yes | ✅ Yes | ❌ No (NaN) | ⚠️ No (Fails on non-numbers) |
| Number() | ✅ Yes | ✅ Yes | ✅ Yes (0) | ✅ Best choice! |
| + (Unary) | ✅ Yes | ✅ Yes | ✅ Yes (0) | ✅ Quick and safe |