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3D Game Programming for Kids, Second Edition

Create Interactive Worlds with JavaScript

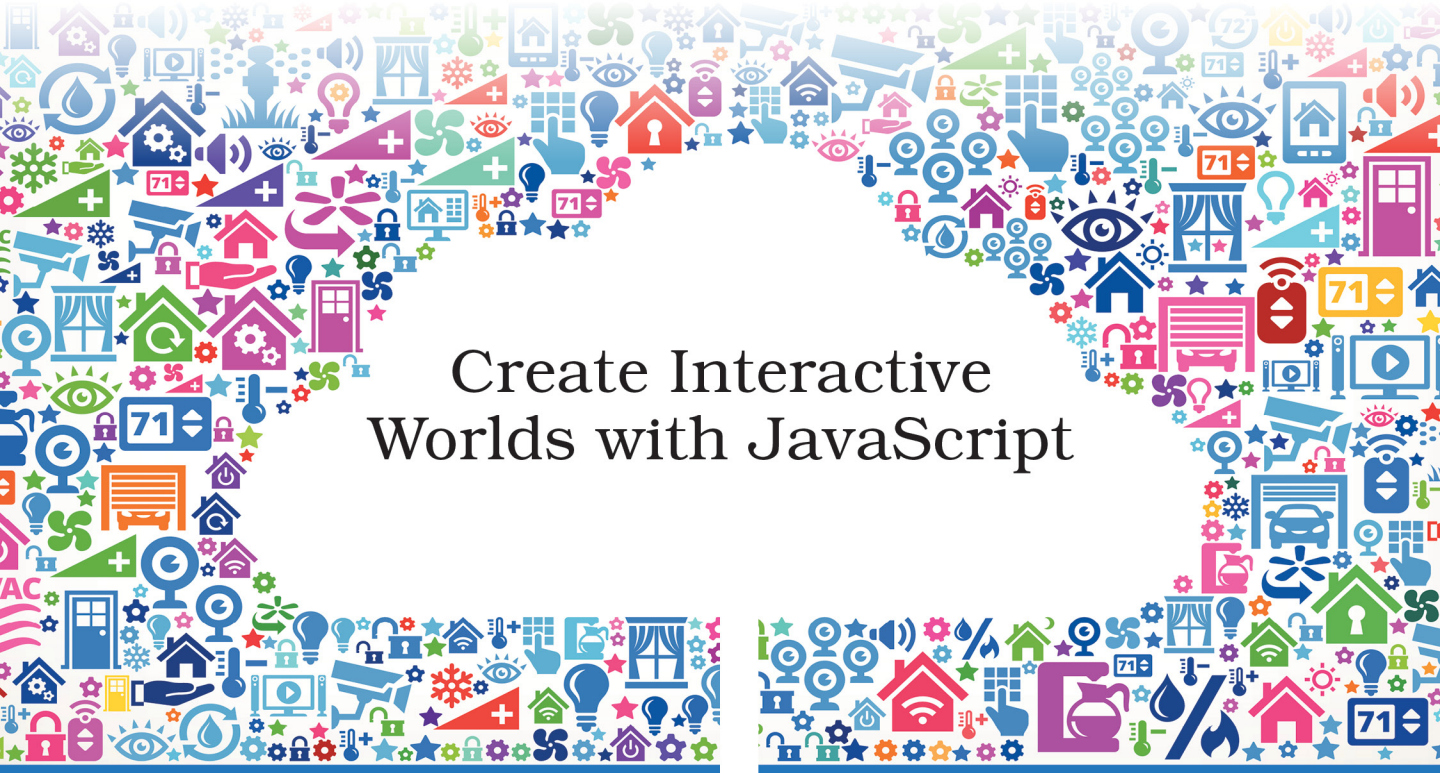
The Pragmatic Bookshelf

Raleigh, North Carolina

The Pragmatic Programmers

3D Game Programming for Kids

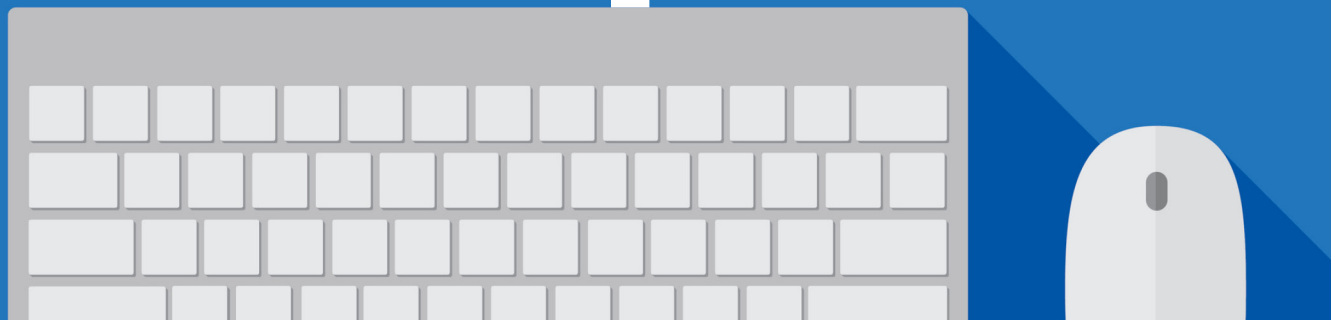
Second Edition



Create Interactive Worlds with JavaScript

Chris Strom

edited by Adaobi Obi Tulton



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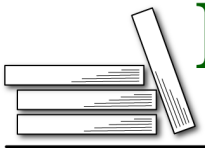

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Getting Started

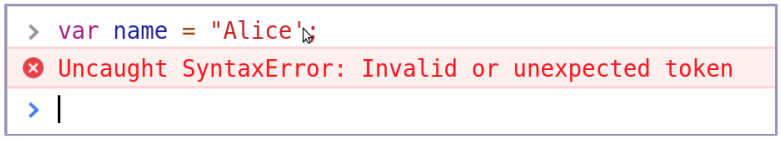
Instead of drawing and moving shapes in this chapter, we're going to explore the JavaScript programming language. We can do this in the JavaScript console, so let's start by opening that. Refer to *Opening and Closing the JavaScript Console*, on page ?, if you don't remember how.

The JavaScript console is a web programmer's best friend. Modern browsers pack the JavaScript console with all kinds of features that help programmers improve network performance, security, memory usage, and lots more. In this book, we use it to debug our code and to experiment with JavaScript. We talked about debugging in Chapter 2, *Debugging: Fixing Code When Things Go Wrong*, on page ?. In this chapter, we experiment. And when programmers experiment, we play!

First, a quick tip...

You Can Change Code in the Console (sort of)

If you make a mistake in your code and then press `Enter`, you can't just click on the mistake to change it.



But, you can press the `Up` arrow key on your keyboard to bring up the last thing that you typed.

Then you can fix the problems and press `Enter` to try again.

Don't Type the Same Thing Over and Over in the JavaScript Console.

We programmers have to type code. But we programmers like tools that make typing easier. Use the up and down arrow keys to access and navigate the *history* of the code you type in the JavaScript console. Making small changes to code you already typed saves lots of time.

All right, let's have some fun with JavaScript in the console!

Describing Things in JavaScript

Have you noticed how we introduce new things in JavaScript?

```
var speed = 10;
var title = '3D Game Programming for Kids';
var isCool = true;
```

The var keyword declares new things in JavaScript. It tells both the computer and the humans reading the code, "Get ready—something new is coming!"

The var Keyword

The var keyword is short for *variable*. A variable is a thing that can change.

```
> var i
< undefined
> i = 0;
< 0
> i = 1;
< 1
> i = 2;
< 2
```

First, the variable i is set to the value of 0. Then, it is set to 1. Last, the variable is set to the value of two. The value that the variable points to changes—it *varies*—as the code does stuff (or as we type changes in the console).

We always use var when we first introduce a variable in our code. Without it, JavaScript can get confused about which value gets set to a variable and when. In other words, not using var can make buggy code that is hard to fix. So *always* use var when you introduce a variable…

…Except in the JavaScript console. Code in the JavaScript console is for quick experiments, so there's little chance to create bugs. When writing these quick experiments, programmers save time by not typing var *or* ending lines with semicolons.

The other reason to skip var in the JavaScript console is that the value being set is not reported. When you set a variable in the JavaScript console without var, the value is reported after pressing Enter.

```
> title = "3D Game Programming for Kids"
< "3D Game Programming for Kids"
```

Weirdly, if you set a variable with var in the JavaScript console, the console reports the result as undefined.

```
> var title = "3D Game Programming for Kids"
<- undefined
```

It's *not* undefined though. Typing the variable name alone and pressing Enter will report its value.

```
> title
<- "3D Game Programming for Kids"
```

JavaScript is a great language. It can still behave oddly at times.

Always Introduce Variables with var (but Not in the JavaScript Console).

Code is better if you always use var when first introducing a variable in a project or inside a function. It's easier to read and less likely to lead to weird bugs.

But don't use var in the JavaScript console, because JavaScript is weird.

Different Kinds of Things in JavaScript

JavaScript can set variables to lots of different things. It can set numbers, words, dates, and true-and-false values. JavaScript has two different ways to set "nothing" (JavaScript is weird). There are a couple of ways to list things. There are even ways to set a variable to 3D shapes!

We'll take a close look each of these—and ways to code with them.

Code Is for Computers and Humans, Comments Are Only for Humans

We write code for both computers *and* people. Code is written for computers so computers can do stuff. Code is written for people so we can understand code and add features to it. Sometimes code can be a little hard for people to understand. When that happens, programmers add *comments* to their code.

Computers know that they're supposed to ignore comments. Programmers know that we should read them to better understand the following code.

In JavaScript, double slashes indicate comments. Type the following in the JavaScript console.

```
// Set today's date
date = new Date()

// Set January 1, 2050
date = new Date(2050, 0, 1)
```

Unless you've seen JavaScript dates before, you probably wouldn't know what that code does (especially that 0 is the first month in JavaScript). But, thanks to comments, it's pretty easy to figure it out.

You Don't Need to Type the Comments (but You Should).

The comments you see in this book are meant to give you helpful hints. You don't *have* to type them in. But you should. When you open your code later to make a change, comments will help you remember why you did things.

Really, instead of copying comments, you should add your own. If you have a hard time understanding something when you code it, chances are you will have a hard time understanding it when you come back to add new stuff. Comments are little hints for your future self!

Next, let's take a close look at the different kinds of JavaScript things, starting with numbers.