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HTML5 and CSS3, Second Edition

Level Up with Today's Web Technologies

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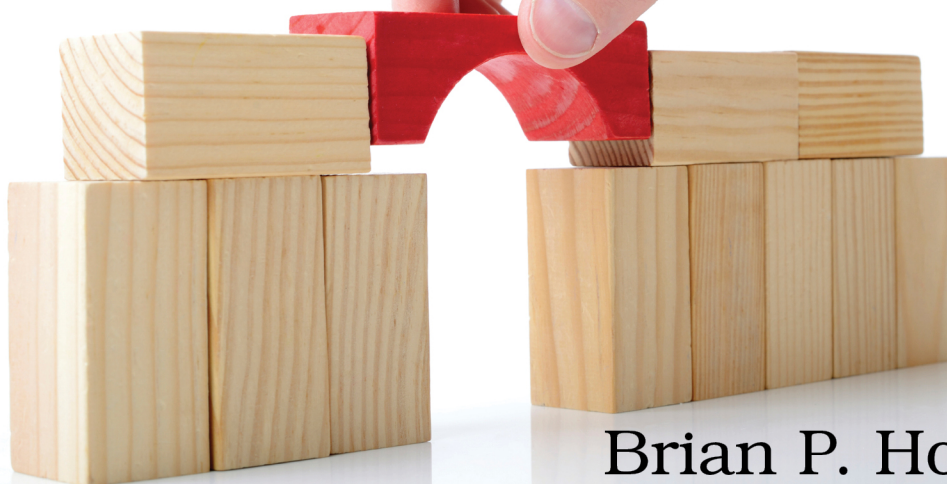
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The
Pragmatic
Programmers

HTML5 and CSS3

Second Edition

Level Up with Today's
Web Technologies



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Preface

To a web developer, three months on the Web is like a year in real time. And that means it's been twelve web years since the last edition of this book.

We web developers are always hearing about something new. A few years ago HTML5 and CSS3 seemed so far off, but companies are using these technologies in their work today because browsers like Chrome, Safari, Firefox, Opera, and Internet Explorer are implementing pieces of the specifications.

HTML5 and CSS3 help lay the groundwork for solid, interactive web applications. They let us build sites that are simpler to develop, easier to maintain, and more user-friendly. HTML5 has elements for defining site structure and embedding content, which means we don't have to resort to extra attributes, markup, or plug-ins. CSS3 provides advanced selectors, graphical enhancements, and better font support that makes our sites more visually appealing without using font image-replacement techniques, complex JavaScript, or graphics tools. Better accessibility support will improve dynamic JavaScript client-side applications for people with disabilities, and offline support lets us start building working applications that don't need an Internet connection.

In this book, we'll get hands-on with HTML5 and CSS3 so you can see how to use them in your projects, even if your users don't have browsers that can support all of these features yet. Before we get started, let's take a second to talk about HTML5 and buzzwords.

HTML5: The Platform vs. The Specification

HTML5 is a specification that describes some new tags and markup, as well as some wonderful JavaScript application programming interfaces (APIs), but it's getting caught up in a whirlwind of hype and promises. Unfortunately, HTML5 *the standard* has evolved into HTML5 *the platform*, creating an awful lot of confusion among developers and customers. In some cases, pieces from the CSS3 specification, such as shadows, gradients, and transformations,

are being called HTML. Browser-makers are trying to one-up each other with how much “HTML5” they support. People are starting to make strange requests like “Create the site in HTML5.”

For the majority of the book, we’ll focus on the HTML5 and CSS3 specifications themselves and how you can use the techniques they describe on all the common web browsers. In the last part of the book, we’ll look into a suite of closely related specifications associated with HTML5 that are in use right now on multiple platforms, such as Geolocation and Web Sockets. Although these technologies aren’t *technically* HTML5, they can help you build incredible things when combined with HTML5 and CSS3.

What’s in This Book

Each chapter in this book focuses on a specific group of problems that we can solve with HTML5 and CSS3. Each chapter has an overview and a list summarizing the tags, features, or concepts covered in the chapter. The main content of each chapter is broken into *tips*, which introduce you to a specific concept and walk you through building a simple example using the concept. The chapters in this book are grouped topically. Rather than group things into an HTML5 part and a CSS3 part, it made more sense to group them based on the problems they solve. You’ll find some chapters that specifically focus on CSS3, and you’ll find CSS3 goodness sprinkled throughout other chapters.

Many tips contain a section called “Falling Back,” which shows you methods for addressing users whose browsers don’t directly support the feature we’re implementing. We’ll be using a variety of techniques to make these fallbacks work, from third-party libraries to our own JavaScript and jQuery solutions.

Each chapter wraps up with a section called “The Future,” where we discuss how the concept can be applied as it becomes more widely adopted.

We’ll start off with a brief overview of HTML5 and CSS3 and take a look at some of the new structural tags you can use to describe your page content. Then we’ll work with forms, and you’ll get a chance to use some form fields and features, such as autofocus and placeholders. From there, you’ll get to play with CSS3’s new selectors so you can learn how to apply styles to elements without adding extra markup to your content.

Then we’ll explore HTML5’s audio and video support, and you’ll learn how to use the canvas to draw shapes. You’ll also see how to use CSS3’s shadows, gradients, and transformations, as well as how to work with fonts, transitions, and animations.

Next we'll use HTML5's client-side features, such as web storage, IndexedDB, and offline support to build client-side applications. We'll use web sockets to talk to a simple chat service, and discuss how HTML5 makes it possible to send messages and data across domains. You'll also get a chance to play with the Geolocation API and learn how to manipulate the browser's history.

This book focuses on what you can use today in modern browsers. Additional HTML5 and CSS3 features might not be ready for widespread use yet but are valuable nonetheless. You'll learn more about them in the final chapter, [Chapter 11, *Where to Go Next*, on page ?](#).

In [Appendix 1, *Features Quick Reference*, on page ?](#), you'll find a listing of all the features covered in this book, with a quick reference to the chapters that reference each feature. We'll be using a lot of jQuery in this book, so [Appendix 2, *jQuery Primer*, on page ?](#), gives you a short primer. [Appendix 3, *Encoding Audio and Video for the Web*, on page ?](#), is a small appendix explaining how to encode audio and video files for use with HTML5.

Browser Compatibility Lists

At the start of each chapter, you'll find a list of the HTML5 features we'll discuss. In these lists, browser support is shown in square brackets using a shorthand code and the minimum supported version number. The codes used are *C*: Chrome, *F*: Firefox, *S*: Safari, *IE*: Internet Explorer, *O*: Opera, *iOS*: iOS devices with Safari, and *A*: Android browser.

What's Not in This book

We won't talk about Internet Explorer versions before Internet Explorer 8. Microsoft has actively pushed people off of those old browsers.

We also won't cover every aspect of HTML5 and CSS3. Some things don't make sense to talk about because the implementations have changed or they're not practical yet. For example, the CSS grid layout is really exciting,¹ but it's not worth spending time on until browsers all get "on the same page." In this book I focus on showing how you can use HTML5 and CSS3 techniques right now to improve things for the widest possible audience.

Since this book doesn't have any basic HTML or CSS content, it's not a book for absolute beginners. It is aimed primarily at web developers who have a good understanding of HTML and CSS. If you're just getting started, go get a copy of [HTML and CSS: Design and Build Websites \[Duc11\]](#), by Jon Duckett.

1. <http://www.w3.org/TR/css3-grid-layout/>

It covers the basics nicely. You should also look at [Designing with Web Standards \[Zel09\]](#), by Jeffrey Zeldman.

I assume that you have a basic understanding of JavaScript and jQuery,² which we'll be using to implement many of our fallback solutions. [Appendix 2, jQuery Primer, on page ?](#), is a brief introduction to jQuery that covers the basic methods we'll be using, but you should consider picking up the book [Pragmatic Guide to JavaScript \[Por10\]](#), by Christophe Porteneuve, as a more in-depth reference for JavaScript. The last part of the book gets pretty JavaScript-heavy, but I'm confident you'll do just fine.

Changes in the Second Edition

The second edition of this book brings everything up-to-date and removes material that specifically targets Internet Explorer 7 and lower. You'll find more detail on HTML5 accessibility, more stable and proven fallback approaches, and nine new tips:

- [Tip 2, Showing Progress toward a Goal with the meter Element, on page ?](#)
- [Tip 4, Defining an FAQ with a Description List, on page ?](#)
- [Tip 8, Validating User Input without JavaScript, on page ?](#)
- [Tip 19, Creating Vector Graphics with SVG, on page ?](#)
- [Tip 22, Making Videos Accessible, on page ?](#)
- [Tip 16, Improving Table Accessibility, on page ?](#)
- [Tip 26, Making Things Move with Transitions and Animations, on page ?](#)
- [Tip 28, Storing Data in a Client-Side Database Using IndexedDB, on page ?](#)
- [Tip 34, Getting It All Sorted Out with Drag and Drop, on page ?](#)

Plus, you'll explore CSS's Flexible Box model, cross-origin resource sharing, web workers, server-sent events, and CSS filter effects in [Chapter 11, Where to Go Next, on page ?](#).

In addition to the new content, the other tips have been updated with new fallback solutions as necessary, and you'll find a handy Node.js-based web server in this book's example-code download, which will make it easy for you to test all the projects across multiple browsers.

2. <http://www.jquery.com>

How to Read This Book

Don't feel that you have to read this book from cover to cover. It's broken up into easily digestible tips that focus on one or two core concepts. In each chapter, you'll find several projects. If you download the example code from this book's website,³ you'll find a `template/` folder, which is a great place to start.

When you see code examples like this

```
html5_new_tags/index.html
<link rel="stylesheet" href="stylesheets/style.css">
```

the label above the code shows where you'll find the file in the example code. If you're reading this in electronic format, you can click that label to bring up the entire file so you can see the code in context. The label shows the location of the file in the example code; it may not always match the file you're working with.

Finally, follow along with the code in the book and don't be afraid to examine and tweak the finished examples. Let's get more specific about what you need to work with the examples in this book.

What You Need

You'll need Firefox 20 or later, Chrome 20 or higher, Opera 10.6, or Safari 6 to test the code in this book. You'll probably want all of these browsers to test everything we'll be building, since each browser does things a little differently. Having an Android or iOS device around is helpful, too, but it's not required.

Testing on Internet Explorer

You'll also need a way to test your sites with Internet Explorer 8 and later so you can ensure that the fallback solutions we create actually work. The easiest way to do this is to install Microsoft Windows on VirtualBox for testing.⁴ Microsoft provides free virtual machines for testing web applications at Modern.IE, where you can download ready-to-go images for VirtualBox, Parallels, or VMware.⁵ These machines work for thirty days and then need to be redownloaded.

Node.js and the Example Server

Testing some of the features in this book requires that you serve the HTML and CSS files from a web server, and testing others requires a more complex

3. <http://pragprog.com/titles/bhh52e/>
4. <http://virtualbox.org>
5. <http://modern.ie>

back end. In the downloadable example code for the book, you'll find a server you can use to make the examples easier to work with. To run this server you'll need to install Node.js by following the instructions on the Node.js website.⁶ You'll want at least version 0.10.0 to avoid intermittent server crashes.

You'll also need `npm`, a command-line utility to install Node Packaged Modules, so you can install dependencies. This utility is included as part of a Node.js installation.

Once you've installed Node.js, visit the book's website and download the example code. Extract the archive, navigate to the location of the extracted files in the Terminal (or the Command Prompt if you're on Windows), and run this command, *without the \$*, to download all of the dependencies:

```
$ npm install
```

Then type the following, again leaving off the \$:

```
$ node server
```

to launch the server on port 8000. Load up `http://localhost:8000` in your browser and browse the demos. If you're testing on virtual machines, your machines should be able to connect using the actual IP address of the computer that's running the example server. Best of all, any files or folders you place in the same folder as the server file will get served, so you could follow along with this book by working out of the example-code folders.

A Note about JavaScript and jQuery Usage

In this book we'll use a lot of JavaScript. In the past, it's been common practice to load JavaScript files in the `<head>` section of the page and then use techniques like jQuery's `document.ready()` to wait until the Document Object Model (DOM) is ready for modification. However, it's recommended practice to load all scripts at the *bottom of the page*, as this can result in better performance. So that's what we'll do. All scripts, including jQuery, will go at the bottom of the page, except for a few cases where we must alter the DOM before any elements load.

In addition, we'll use jQuery where it makes sense. If we're simply looking for an element by its ID, we'll use `document.getElementById()`. But if we're doing event handling or more complex DOM manipulation that needs to work in Internet Explorer 8, we'll use jQuery.

6. <http://nodejs.org>

To put it another way, we're going to "use the right tool for the job." It might lead to a little inconsistency at times, but that's the tradeoff when we start introducing fallback solutions to make old browsers fall in line. I'll be sure to explain why we're doing things as we go forward.

Online Resources

The book's website has links to an interactive discussion forum as well as errata for the book. The source code for all the examples in this book is linked on that page, as well.⁷

If you find a mistake, please create an entry on the Errata page so we can get it addressed. In the electronic version of this book, there are links in the footer of each page that you can use to easily submit errata.

Finally, be sure to visit this book's blog, Beyond HTML5 and CSS3.⁸ I'll be posting related material, updates, and working examples from this book.

Ready to go? Great! Let's get started with HTML5 and CSS3.

7. <http://www.pragprog.com/titles/bhh52e/>

8. <http://www.beyondhtml5andcss3.com/>