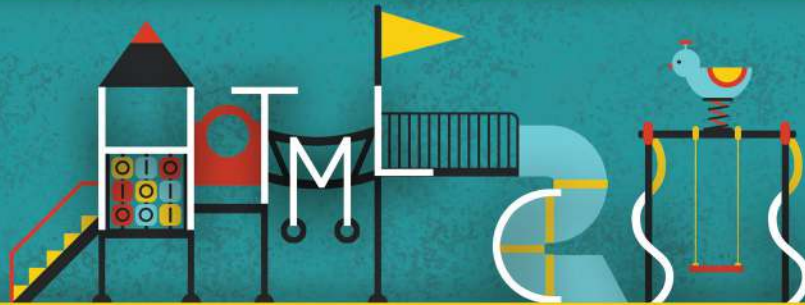


SECOND EDITION

WEB DESIGN



PLAYGROUND

HTML + CSS

THE INTERACTIVE WAY

PAUL MCFEDRIES

 MANNING

Creating the main section of a photo gallery on the Web Design Playground

Creating a Photo Gallery: The Main Section

Project

Creating a Photo Gallery

The Main Section


This example sets up the main element as a Flexbox container. The flex items are the photo thumbnails, each of which links to its original photo.

HTML

```
1 <headers>
2   
3   <h1>Ampersand Photography</h1>
4 </headers>
5 <nav>
6   <ul>
7     <li><span class="current-
  page">Gallery 1</span></li>
8     <li><a href="#">Gallery 2</a></li>
9     <li><a href="#">Gallery 3</a></li>
10    <li><a href="#">Gallery 4</a></li>
11  </ul>
```

CSS

```
1 {
2   margin: 0;
3   padding: 0;
4   box-sizing: border-box;
5   line-height: 1.3;
6 }
7 / body {
8   display: flex;
9   flex-direction: column;
10  justify-content: flex-start;
11  align-items: center;
12  min-height: 100vh;
13  font-family: Optima, Calibri, sans-serif;
14  background-color: #333333;
```





Ampersand Photography

GALLERY 1

GALLERY 2

GALLERY 3

GALLERY 4



Hide Editors

New Sandbox

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Outstanding resource, not only for learning HTML and CSS, but also for setting you on the path to being a true web designer.

—*Shawn Eion Smith*, director of software engineering,
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InComm Product Control

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—*Prabhuti Prakash*, solution architect, Atos India Pvt Ltd

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—*Sachin Kumar*, programmer/developer lead, Capgemini America

WEB DESIGN PLAYGROUND

SECOND EDITION

PAUL MCFEDRIES



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To Karen and Chase

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Preface



In today's world, lots of people crave the experience of expressing themselves online. They can do that through fixed-format media such as Facebook, X (formerly Twitter), and Instagram, but for many people, these sites are too restrictive. Instead, they prefer to build their own presence on the web, and the way to do that with the maximum amount of freedom and creativity is to learn HTML and CSS.

In programming circles, many people believe that the best way to learn how to code is by coding. Reading about the language is fine and necessary, but if you really want to learn the language, you must use it. My own belief is that the best way to learn to code is to play with code. For HTML and CSS, this means two things:

- In standard HTML/CSS teaching, you're given some code—a tag, say, or a template—and are told how it works. In *playful* HTML/CSS teaching, you're given some code and encouraged to play with it: change the font size, expand the padding, apply colors, and so on.
- In standard HTML/CSS teaching, you're given simple or trivial examples, such as the classic Hello World! demonstration. In *playful* HTML/CSS teaching, you're given substantive, useful projects to build from scratch and customize to suit your needs.

This spirit of playfulness and experimentation pervades *Web Design Playground*, and I encourage you to view HTML and CSS as tools for creativity and expression.

Acknowledgments



The English essayist Joseph Addison once described an editor as someone who “rides in the whirlwind and directs the storm.” I don’t know if that’s true for editors in some of the more sedate publishing nooks (novels, cookbooks, and such), but I think it applies perfectly to the rigors of computer-book editing. Why? Well, the computer industry (and the web in particular) is so exacting that even the teensiest authorial (or editorial) lapse could result in a book that sows confusion and consternation rather than certainty and delight.

The good folks at Manning Publications minimize book blunders by subjecting each manuscript to a barrage of reviews, not only by editorial specialists but also by a team of dedicated outsiders (in a process I call “gang reviewing”). Instead of a process in which single-digit numbers of eyeballs look at the manuscript, a Manning book is scrutinized by dozens, so you get a book that contains accurate and relevant information and a book that has passed muster with some of the sharpest eyes and ears in the business. My name may be the only one on the cover, but tons of people had a big role in creating what appears between the covers (be they physical or virtual). Those reviewers are Adam Wan, Andres Sacco, Boris Egorov, Eder Andres Avila Niño, Jean-Baptiste Bang Nteme, Matteo Battista, Mitchell Fox, Srikar Vedantam, Steve Prior, and Tony Holdroyd. In addition, I’d like to extend warm thanks to publisher Marjan Bace, development editor Karen Miller, technical editor Brian Daley, and all the rest of the production staff at Manning who helped bring this book to fruition.

The members of the editorial team aren’t the only people who had their fingers in this publishing pie. There’s a surprisingly long list of other professionals who worked hard to produce this book. I tip my authorial hat to all of them. I’d also like to thank all the people who took the time to review the early manuscripts of the book and to offer comments and suggestions. Your couple of cents’ worth was very much appreciated.

I’d be remiss if I didn’t extend a hearty and heartfelt thanks to my agent, Carole Jelen, whose hard work made this project possible and whose breathtaking knowledge of the technical-publishing industry fills me with awe and makes me grateful every day to have Carole working on my behalf.

About This Book



In this book, I teach you how to create beautiful web pages in no time flat. I understand that the very idea of trying to create something that looks as good as what you see on the web seems like an intimidating challenge. However, it's my goal in this book to show you that it's quite straightforward and that *anyone* can build an attractive and sophisticated web page with their bare hands. I even try to have—gasp!—a little irreverent fun as I go along.

You'll also be happy to know that this book doesn't assume that you have any experience in web design, HTML, or CSS. You start from scratch and slowly build your knowledge until, before you know it, you have your very own tract of web real estate. All the information is presented in short, easy-to-digest chunks that you can skim to find the information you want. The online Web Design Playground (<https://webdesignplayground.io/2>) also offers instruction and exercises that you can work through to hone your knowledge.

I'm assuming that you have a life away from your computer screen, so *Web Design Playground* is set up so that you don't have to read it from cover to cover. If you want to know how to add an image to your web page, for example, turn to the chapter that covers working with images (chapter 6). Beginners, however, will want to read at least chapters 1 through 4 before moving on to more esoteric topics. To make things easier to find, the following section gives you a summary of the book's 20 chapters (and one appendix).

How this book is organized: A road map

Chapter 1 introduces you to HTML and CSS. You learn about the benefits and limitations of these essential web design technologies, and you learn how HTML tags and CSS properties work. You also get a brief introduction to the book's companion website, the Web Design Playground.

Chapter 2 takes you on a journey to build your first web page. You learn how to set up the basic structure of a page and then add a title and some text. From there, you learn how to mark up important and emphasized text, quote text, add headings, and create links.

Chapter 3 shows you how to add some structure to a web page by giving you the HTML tags that divide page text into paragraphs, add line breaks, organize page text into separate chunks, and create inline containers for styling words and phrases. You also get the lowdown on building numbered and bulleted lists.

Chapter 4 shifts back to CSS and shows you how to format text by applying a typeface, a type size, and bold and italic styling. You also learn how to align and indent paragraphs and how to apply colors to the page text and background.

Chapter 5 covers the first project of the book. In this case, you gather the HTML and CSS knowledge from chapters 1 through 4 and use it to build a personal home page for yourself.

Chapter 6 shows you how to augment your web pages with nontext elements. Most of the chapter covers images, such as photos and illustrations, but you also learn how to add video and audio files.

Chapter 7 furthers your CSS education by showing you the three ways you can add styles to a page. You also learn how to wield class selectors, which are among the most useful and powerful CSS techniques. I also introduce you to the various measurement units you can use in your CSS rules.

Chapter 8 gives you the tools you need to take charge of your page elements by taking them out of the default page flow used by the web browser. You learn how to float elements on the page and how to position elements relative to other elements or to the browser window itself.

Chapter 9 introduces you to one of the most powerful concepts in all of CSS: the box model. You learn what the box model is all about, and you use it to set an element's width and height, add padding around an element's content, and augment an element with a border and a margin.

Chapter 10 takes you through the book's second project, which is a landing page for a product or service. You run through the full page-building process, from sketching the design to choosing the typefaces and colors to building the page structure and content.

Chapter 11 gets you started on the all-important topic of web page layout. I introduce you to HTML5's semantic page layout tags—including `<header>`, `<article>`, and `<footer>`—and show you how to use them to create modern page layouts.

Chapter 12 gives you a complete tutorial on using the powerful, popular Flexbox layout technology. You discover what Flexbox is and what it can do; you learn the fundamentals of the technology; and then you put Flexbox to work creating a standard web page layout.

Chapter 13 takes your page layout prowess to the next level by showing you how to use CSS Grid, which is state of the art when it comes to page layout. You learn what CSS Grid can do, and then I take you slowly and carefully through the basics of setting up a grid and using it to perform page layout magic.

Chapter 14 introduces responsive web pages, one of the hottest topics in modern web design. You learn techniques that enable you to structure your web pages so that they adapt to changing device screens, from giant desktop monitors to tiny smartphone screens.

Chapter 15 covers the book's third project, which is an attractive, sophisticated photo gallery. You sketch the layout, choose fonts and colors, and then build the page step by step.

Chapter 16 takes you on a tour of many more HTML tags that will come in handy during your web design career. You also learn how to use more sophisticated linking techniques, add special characters (ones that aren't

readily accessible via the keyboard), and make your page source code easier to understand with comments.

Chapter 17 is all about color, and you learn some color theory, along with how colors work in CSS and the various techniques for applying a color. This chapter gives you some pointers on choosing a harmonious color scheme for your pages. Finally, you learn how to apply a color gradient to a page element.

Chapter 18 focuses on web page typography. You learn more about how to apply a typeface, including using third-party fonts (such as those from the Google Fonts collection) and how to host your own fonts. You also learn how to apply small caps and set the line height for easier reading.

Chapter 19 presents several advanced but vitally important CSS concepts. You learn lots more about CSS selectors, and you get some background on three crucial CSS ideas: inheritance, cascading, and specificity.

Chapter 20 presents the book's fourth and final project: a website for showing off your personal portfolio. After building the basic structure, you learn how to add site navigation, portfolio images, contact info, and more.

The **appendix** is devoted to getting your web code online. You learn the various ways you can get your code from the Web Design Playground to your computer. From there, I talk about how to choose a web hosting provider and how to obtain a domain name. I close by showing you how to upload and validate your files.

About the code

To encourage play and experimentation, the book has a companion website called the Web Design Playground (located at <https://webdesignplayground.io/2>). The site lets you type your HTML and CSS code in the editors provided, and the browser's rendering of that code appears with the click of a button in the Results window.

The Web Design Playground also gives you access to all the book's example files, which you can customize and play with as your creativity moves you. To facilitate experimentation and to reinforce the overall sense of play, the book's tutorial chapters also offer numerous hands-on exercises that direct you to use the Playground to modify the provided code in various ways. This helps you not only learn the material but also see the range of what's possible. If you want to download all the book's example files, go to the book's GitHub repository at <https://github.com/paulmcf/wdpg2-example-files>, click the green Code button, and then click Download ZIP.

The Playground has an extensive help system to show you how everything works, but you can find the basics in chapter 1. Instructions for getting the code from the Playground to your computer are provided for you in the appendix.

You can get executable snippets of code from the liveBook (online) version of this book at <https://livebook.manning.com/book/web-design-playground-second-edition>. The complete code for the examples in the book is available for download from the Manning website at <https://www.manning.com/books/web-design-playground-second-edition>, and from GitHub at <https://github.com/paulmcf/wdpg2-example-files>.

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About the Author



PAUL McFEDRIES has been a professional technical writer for more than 30 years. He has more than 100 books to his credit, which collectively have sold more than 4 million copies worldwide. When he's not writing books, Paul is building web pages, which he's been doing since 1996. Paul has hand-coded many sites, including his web home (<https://paulmcfedries.com>); Word Spy (<https://wordspy.com>); WebDev Workshop (<https://webdevworkshop.io>); and this book's companion site, Web Design Playground (<https://webdesignplayground.io/2>).

Part 1

.....

Getting Started with HTML and CSS

This book begins at the beginning by defining HTML and CSS, introducing you to tags and properties, and showing you what you can (and can't) do with these web-design technologies. With Chapter 1's brief but necessary introduction out of the way, in Chapter 2, you dive in and create your first web page, complete with formatted text, headings, and links. The rest of Part 1 builds on this foundation by showing you how to add structure to your page (Chapter 3) and how to style typefaces, paragraphs, and colors (Chapter 4). Chapter 5 brings everything together with a project that shows you how to build a personal home page to show off to the world.



Getting to Know HTML and CSS



This chapter covers

- Exploring the fundamentals of HTML
- Learning the basics of CSS
- Understanding how HTML and CSS combine to make web pages
- Introducing the Web Design Playground

When a jazz musician creates an improvisation, no matter how intricate, she plays by using combinations of 12 musical notes (A through G plus the five flats/sharps in between). When an artist creates a picture, no matter how detailed, he paints by using combinations of three primary colors (red, yellow, and blue). When poets create verse, no matter how inventive, they write by using words that are combinations of the 26 letters of the alphabet. These examples show that creativity and play don't require elaborate resources or complex raw materials. Imagination and curiosity combined with a few building blocks are all you need to express yourself in almost any art, including the art of web page design. As you learn in this chapter and throughout this book, HTML and CSS provide those building blocks. And although there are more of those blocks than there are musical notes, primary colors, or even letters of the alphabet, there aren't too many, but more than enough to let you express yourself on an exciting modern canvas: the web.



What is HTML?

The hardest thing about HTML by far is its name. *HTML* stands for *Hypertext Markup Language*, which sounds about as inviting as a tax audit. But it becomes a lot less intimidating when you break down its terms.

I'll begin with *hypertext*. A *link*, as I'm sure you know, is a special word or phrase (or even an image) in a web page that "points" to another web page. When you click one of these links, your browser transports you to the other page immediately. The folks who invented the web used the geeky term *hypertext link* for this special text. (The prefix *hyper* means *beyond*.) Because these hypertext links are the distinguishing features of the web, pages are often known as hypertext documents. So, *HTML* has *hypertext* in it because you use it to create these hypertext documents. (It would be just as accurate to call this language WPML, or Web Page Markup Language.)

My dictionary defines *markup* as "detailed stylistic instructions written on a manuscript that is to be typeset" (among other things). For the purposes of this chapter, I can rephrase this definition as follows: "detailed stylistic instructions typed in a text document that is to be published on the World Wide Web." That's HTML in a nutshell. It has a few simple alphabetic codes—called *tags*—for detailing things such as herding text into paragraphs, creating bulleted lists, inserting images, and (of course) defining links. You type these tags in the appropriate places in an ordinary text document, and the web browser handles the dirty work of translating—or *rendering*—the tags into paragraphs, lists, links, and so on. What happens when you use a web browser to load your text document? Instead of showing the tags, the browser automatically renders the tags so that your page is laid out according to what the tags suggest.

The word *language* may be the most intimidating because it seems to imply that HTML is a programming language. Fortunately, HTML has nothing to do with computer programming. Rather, HTML is a "language" in the sense that it has a small collection of "words" that you use to specify how you want your text to appear—as a heading or as a numbered list, for example.

In short, playing with HTML means inserting a few codes strategically between stretches of regular text in such a way that you end up with an honest-to-goodness web page. As far-fetched as this may sound to you now, by the end of this book, you'll have created several impressive HTML projects.

What Can You Do with HTML?

When you add HTML to a document, you're essentially giving the web browser a series of instructions that specify how you want the page to be structured within the browser window. You use HTML to specify, in its succinct way, the overall structure of the page and to let the browser know what you want each part of the page to be. You use HTML to supply instructions like the following:

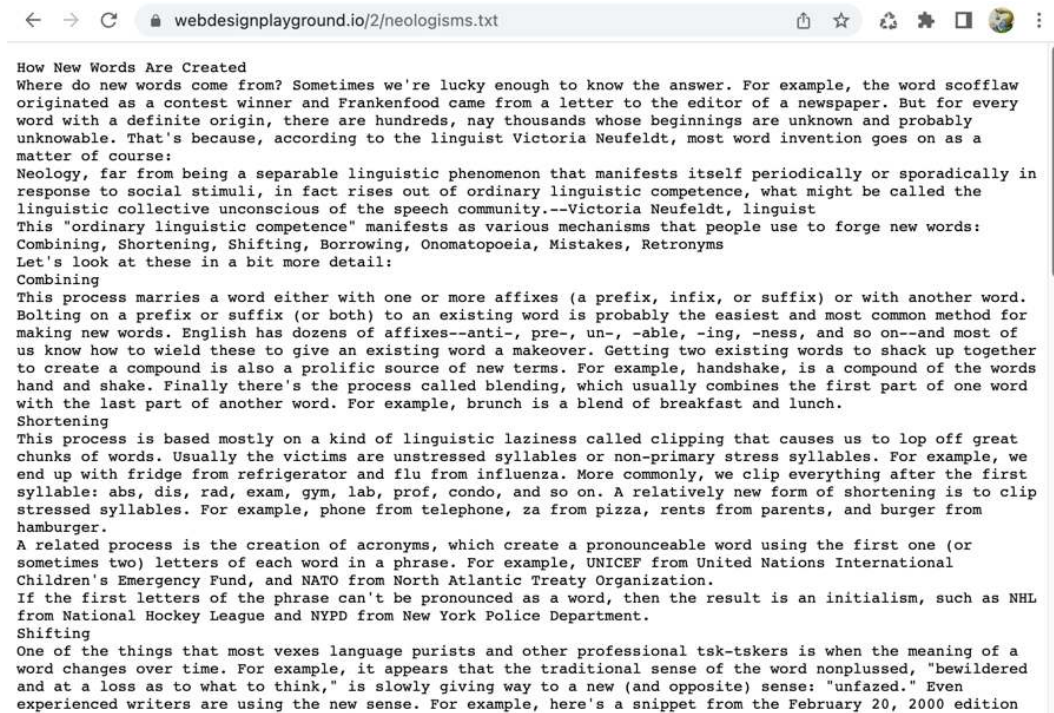


- Use this line of text as the main heading of the page.
- Treat these lines of text as subheadings.
- Make this chunk of text a separate paragraph.
- Turn these five consecutive items into a bulleted list.
- Convert these six consecutive steps to a numbered list.
- Make this phrase a link.

These instructions likely seem a bit abstract to you now, so I'll show you a concrete example of HTML in action.

From Plain Text to HTML: An Example

Figure 1.1 shows a plain-text document displayed in a web browser. As you can see, except for the occasional line break, the browser displays a wall of unformatted, unwrapped text. This text is extremely difficult to read, and it's exceptionally hard to extract meaning from the text because it's almost entirely undifferentiated.

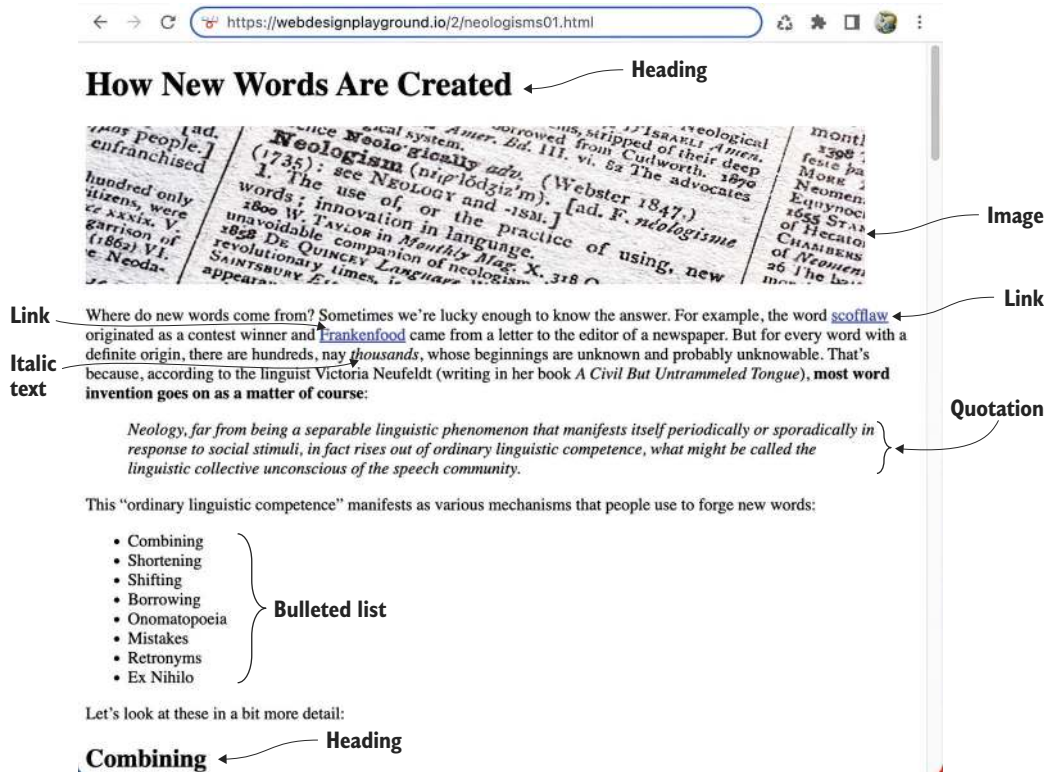


► **Figure 1.1** The browser can display plain-text files, but they're awfully hard to read.



Getting to Know HTML and CSS

HTML rides to the rescue, providing the means to make plain text more readable and allowing you to display the text in a way that your readers will find meaningful. Figure 1.2 shows the text from Figure 1.1 with some HTML applied.



► **Figure 1.2** With some HTML applied, the text from Figure 1.1 becomes easier to read, navigate, and understand.

Here, I've used headings to display both the article title at the top and a section title near the bottom. Notice that the section title is rendered in a type size that's slightly smaller than the main title, making the article hierarchy immediately clear. I also used HTML to add an image for visual interest. To help put the *H* in this page's HTML, I set up two of the words as links to (in this case) other sites. Although you see a bit later in this chapter that text formatting usually is the domain of CSS, you can also use HTML to add a bit of formatting flourish to your pages, such as the italics I added here. I also set up a quotation, which the browser renders indented from the regular text, and I added italics to that quotation for added differentiation. Finally, I used HTML to set up a bulleted list. Now that you know what HTML can do, it's time to take a closer look at how you tell the browser what you want your page to look like.



What is CSS?

When you build a house, one of the early jobs is framing, which involves putting up the basic structure for the floors, walls, and roof. That foundational framing is what you're doing when you add HTML to your page: you specify what you want to appear on the page, what you want the page's various items to be (such as a heading, paragraph, or list), and the order in which you want these items to appear.

But as a house isn't a home without finishing touches such as molding, paint, and flooring, your document isn't a modern example of a web page until you've used CSS to add some finishing work. CSS stands for *Cascading Style Sheets*, and, as is the case with HTML, its name is more complicated than what it does. I'll break down the words, although in this case, I'll address them slightly out of order for simplicity's sake.

First, a *style* is an instruction to the browser to modify how it displays something on the page, such as a word, a paragraph, or every instance of a particular HTML element. These are usually formatting-related modifications, such as changing the typeface or the text color, but you can also use styles to control page layout and even to create animated effects. If you've ever used styles in a word processing program, you already have a good idea of what web page styles can do.

Okay, so what's a *sheet*? In the early days of publishing, firms maintained manuals that defined their preferred formatting for typefaces, headings, pulled quotes, and so on. This formatting was known as the *house style*, and the manual was called a *style sheet*. In web design, a style sheet performs essentially the same duties—it's a collection of styles that get applied to a particular web page.

To understand the *cascading* part of CSS, you need to know that in the same way that water running down a hill can take different routes to the bottom, styles can take different routes before they get applied to an element. Some styles come from the web browser; some styles come from the user (if the user configures her browser to use a different default type size, for example); and some styles come from your style sheets. When these styles overlap, the web browser uses a complex algorithm to decide which style gets applied, and that algorithm is called the *cascade*.

You use CSS, in other words, to define how your page looks. It may seem that you use CSS only to add "eye candy" to a page, and it's certainly true that CSS offers you the tools to make only trivial or frivolous modifications. *How* your page looks, however, is every bit as important as *what* your page contains because few people will bother to read text that's formatted poorly or incoherently.

BEWARE

The idea of the cascade is by far the most complex and convoluted aspect of CSS. I get into it later in the book (see Chapter 19), but for now, I highly recommend that you transfer it to a mental back burner until you get that far.



The Separation of Structure and Presentation

While you're trying to wrap your head around the differences between HTML and CSS, let me offer a key distinction. Although I'm generalizing somewhat, here's the basic difference between the two:

- HTML defines the overall structure of the web page.
- CSS defines the visual presentation of the web page.

Some overlap exists here (HTML can affect the presentation of the page, for example, and CSS can affect the layout), but for the most part, HTML and CSS enable you to separate structure and presentation, respectively. This distinction is important because when you keep these two aspects of a web page separate, your page will be easier to build, easier to maintain, and easier to customize.

What Can You Do with CSS?

When you add CSS to a document, you're telling the web browser how you want specific elements to look. Each style is a kind of formatting instruction to the browser. You can use these instructions in a wide variety of ways that are similar to the following examples:

- Display all the links in red text.
- Use a specific font for all the headings.
- Create a bit of extra space around this paragraph.
- Add a shadow to this photo.
- Use lowercase Roman numerals for all numbered lists.
- Always display this section of text on the far-right side of the window.
- Rotate this drawing by 45 degrees.

I'll make this list more concrete by showing you an example.

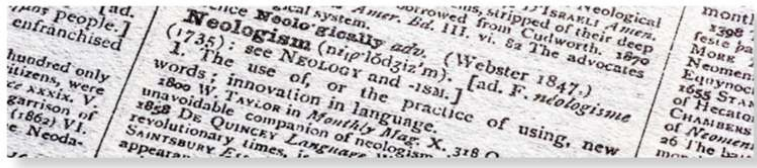
From Structure to Presentation: A CSS Example

Earlier in this chapter, I took a plain-text document (Figure 1.1) and applied a bit of HTML to give it some structure and improve its readability (Figure 1.2). In Figure 1.3, I've applied a few styles to make the page look a bit nicer.



← → ↻ https://webdesignplayground.io/2/neologisms02.html

HOW NEW WORDS ARE CREATED



Where do new words come from? Sometimes we're lucky enough to know the answer. For example, the word *scofflaw* originated as a contest winner and *Frankenfood* came from a letter to the editor of a newspaper. But for every word with a definite origin, there are hundreds, nay *thousands*, whose beginnings are unknown and probably unknowable. That's because, according to the linguist Victoria Neufeldt, most word invention goes on as a matter of course:

Neology, far from being a separable linguistic phenomenon that manifests itself periodically or sporadically in response to social stimuli, in fact rises out of ordinary linguistic competence, what might be called the linguistic collective unconscious of the speech community.

This "ordinary linguistic competence" manifests as various mechanisms that people use to forge new words:

- Combining
- Shortening
- Shifting
- Borrowing
- Onomatopoeia
- Mistakes
- Retronyms
- Ex Nihilo

Let's look at these in a bit more detail:

Combining

This process marries a word either with one or more affixes (a prefix, infix, or suffix) or with another word. Bolting on a prefix or suffix (or both) to an existing word is probably the easiest and most common method for making new words. English has dozens of affixes — *anti-*, *pre-*, *un-*, *-able*, *-ing*, *-ness*, and so on — and most of us know how to wield these to give an existing word a makeover. Getting two existing words to shack up

► **Figure 1.3**

The example web page with a few styles applied

Here's a summary of the major styles changes I made:

- Displayed the title in a larger text size, in small caps, and centered
- Added a shadow to the photo
- Made all the text slightly smaller
- Removed the underline from the links
- Displayed the quotation in lighter-color text
- Converted the bullets to a two-column list
- Increased the side margins



What Can't You Do with HTML and CSS?

Earlier, I mentioned that HTML isn't a programming language, so it's fairly straightforward to learn and deploy it in your web pages, which is good news. The bad news is that HTML can't handle many higher-level operations *because* it's not a programming language. The list of what you can't do with HTML alone is quite long, but I'll mention the following because one or more of them may be on your to-do list:

- Get data from a server database or other remote address
- Process data submitted through a form
- Handle user accounts, logins, and passwords
- Add, hide, or remove web page elements on the fly

Performing tasks like these requires a programming language such as JavaScript or PHP, which are well beyond the scope of this book.

How HTML and CSS Create the Web

One of the most extraordinary facts about the web is that, except for extra features such as images, videos, and sounds, its pages are composed of nothing but text. That's right—almost everything you see as you surf the web was created by stringing together the letters, numbers, and symbols that you can tap on your keyboard.

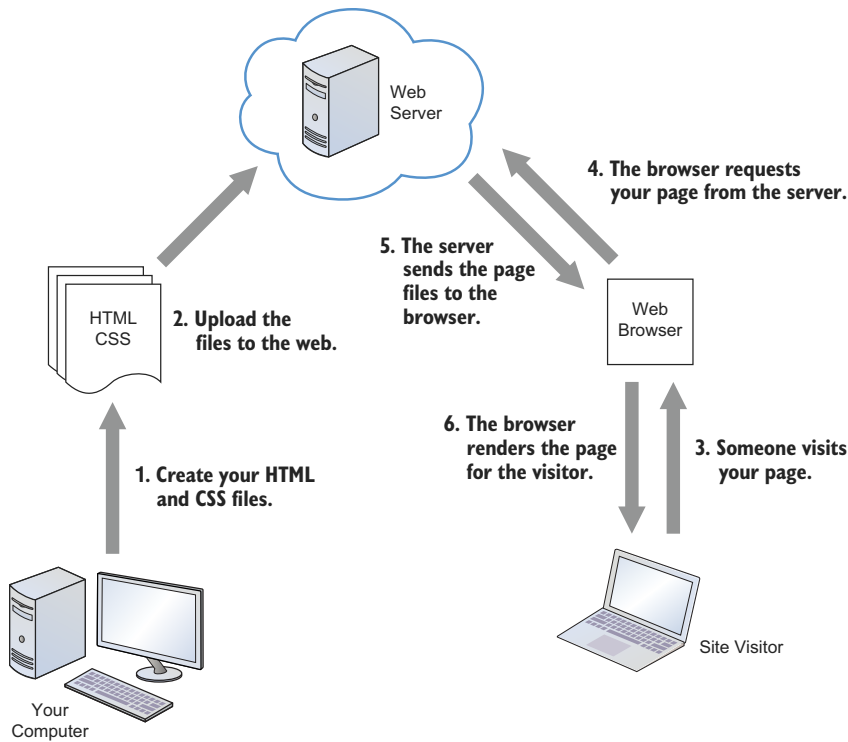
That idea is a mysterious one, to say the least, so I'll give you a quick look at how it works. Figure 1.4 shows the process.

The following steps explain the process in detail:

- 1 You use a text editor or similar software to create your HTML and CSS files.
- 2 You upload your HTML and CSS files to an online service called a *web hosting provider*, which runs a web server.

When you sign up for an account, the hosting provider issues you a unique address, such as `www.yourdomain.com`. So, if you upload a file named `index.html`, the address of that page is `www.yourdomain.com/index.html`.

- 3 A site visitor uses her web browser to type the address of your page.
- 4 The web browser uses that address to request your page from the web server.
- 5 After making sure that the address is correct, the web server sends the page to the user's web browser.
- 6 The web browser interprets the page's HTML tags and CSS properties through a process called *rendering*, and the rendered code appears on the user's device.



► **Figure 1.4**

To go from HTML and CSS to a web page, you send your code to a web server, and visitors use their web browsers to retrieve and render your code into a page.

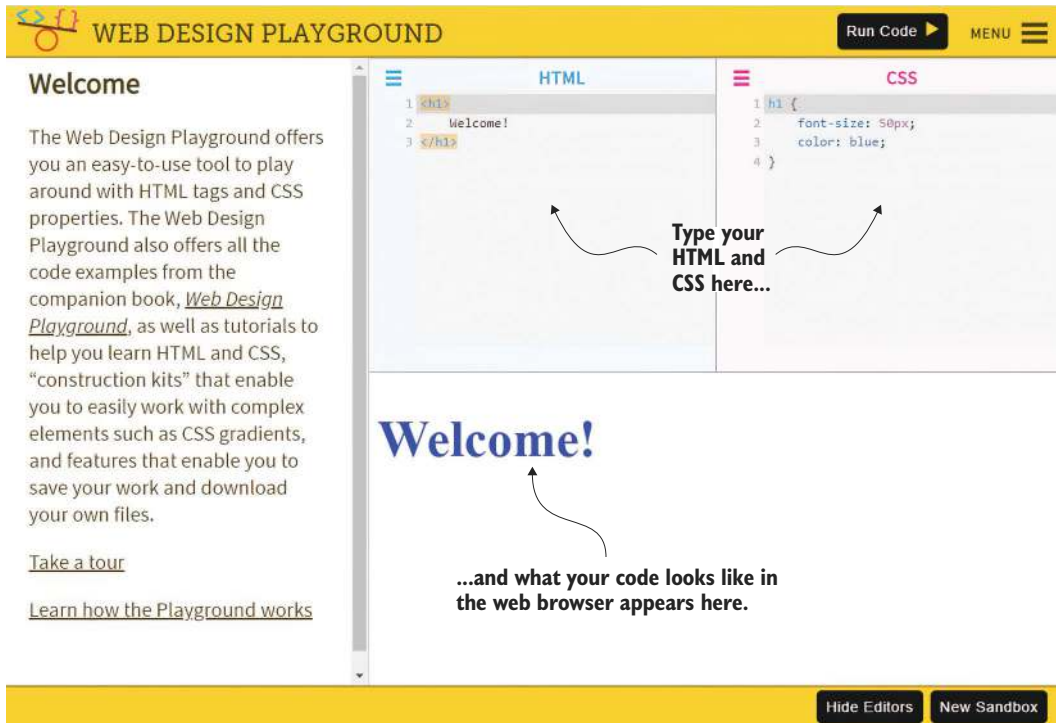
As you can see, just because the web is made of simple stuff doesn't mean that getting that stuff on the web is a simple matter. In fact, the procedure is a bit convoluted, especially when you're starting. That's why I devote the entire appendix to the process.

Introducing the Web Design Playground

Right now, though, you're probably itching to start playing around with HTML and CSS to see what these fascinating technologies can do. I don't blame you. One of this book's core ideas is that the best way to learn HTML and CSS is to have fun playing with your new knowledge, trying out different tags and properties, and experimenting with different values. To help you do all that with the least amount of fuss, I've built an online tool called the Web Design Playground, shown in Figure 1.5, which you can access at <https://webdesignplayground.io/2>.



Getting to Know HTML and CSS



► **Figure 1.5** The Web Design Playground lets you play with HTML and CSS online.

You can use this site to try out HTML tags and CSS properties, load the book's example files, run through lessons that help you learn a topic, access various “construction kits” for experimenting with features, save your work, and even download the resulting HTML and CSS files to your computer. The next few sections provide the details.

Playing with HTML and CSS

The main purpose of the Web Design Playground is to provide an easy-to-use tool for playing around with HTML tags and CSS properties. Here's how it works:

- 1 In the Web Design Playground, use the HTML editor to type the HTML tags you want to try.
If a tag requires one or more attributes, be sure to add them as well.
- 2 Use the CSS editor to type the CSS property definitions you want to use.
- 3 Examine the Results box, which displays what your HTML and CSS will look like in a web browser.
- 4 Repeat steps 1–3 to fix any problems or perform further experiments.



Loading the Lesson Files

This book contains a ton of HTML and CSS code. As a rule, you'll learn these subjects in a deeper way if you type the examples by hand (which gives you what I call a "fingertip feel" for the code). I understand, however, that you're a busy person who may not have the time to type each example. To help you, the Web Design Playground includes a menu that links to every lesson from the book. When you select a lesson, you see an introduction followed by one or more examples and then by one or more activities that help you learn the lesson material. In each case, the code appears automatically, and you can play around with it as you see fit.

Here are the steps to follow to load a lesson:

- 1 In the Web Design Playground, click Menu at the right end of the toolbar. A menu of the site's links appears.
The Book Lessons section contains an item for each chapter in the book.
- 2 Click the chapter that contains the lesson you're looking for.
- 3 In the submenu that appears, click the lesson you want to play with.
The lesson introduction appears.
- 4 Click the Next Page button.
The lesson example's HTML tags and text appear in the HTML editor, and the example's CSS code appears in the CSS editor.
- 5 Click Next Page to work through the activities for the lesson.
- 6 To jump to another lesson in the same chapter, click the drop-down menu above the Previous Page and Next Page buttons, and then click the lesson you want to see.

REMEMBER

You can also download the book's lesson files individually or all at once by using the book's GitHub repository: <https://github.com/paulmcf/wdpg2-example-files>.

Preserving Your Work

You'll spend most of your time in the Web Design Playground performing experiments and trying out this book's exercises. Occasionally, however, you'll create some code that you want to save. The Web Design Playground gives you two ways to do that:

- *Copy some code.* To copy code for use elsewhere, use the HTML editor or the CSS editor to select the code you want to copy, click the editor's Menu icon (the three horizontal lines in the top-left corner of the editor), and then click Copy to Clipboard.
- *Download your work.* In the Web Design Playground toolbar, click Menu, and below the Playground heading, click Download Code. This command saves the HTML and CSS as separate files, which are stored in a zip archive and downloaded to your web browser's default downloads folder.



Getting to Know HTML and CSS

Now that you know what you can do with HTML and CSS and how to use the Web Design Playground, you're ready to use the Playground to understand how to work with HTML tags and CSS properties.

Some Helpful Features of the Playground

Now that you know what HTML tags and CSS properties look like, you can return to the Web Design Playground and run through a few features that are designed to help you enter your tags and properties correctly:

- The HTML tags and CSS property names and values appear in colors that are different from the regular text. These colors help you differentiate between code and noncode.
- In the HTML editor, when the text cursor is inside a tag, the editor automatically highlights both that tag and its companion tag. In Figure 1.6, you see that when I have the cursor in the opening `<p>` tag, which is the tag for creating a paragraph (see Chapter 2), the editor highlights that tag as well as its closing `</p>` tag. This highlighting gives you a visual indicator that you've closed your tags.

► **Figure 1.6**

The Web Design Playground's HTML editor highlights both the opening and closing tags when the cursor is inside one of them.



- The CSS editor has a similar feature: When the cursor is to the immediate left or right of a brace, the editor highlights the companion brace. This highlighting helps you make sure to enter both the opening and closing braces when you define a style.
- You can adjust the relative sizes of the editors by dragging the vertical border that separates them.
- The Web Design Playground can do a limited amount of error checking if you click an editor's Menu icon (pointed out earlier in Figure 1.6) and then click Display Errors. If the editor detects something wrong, you see a red error indicator in the margin to the left of the line that has the problem. Hovering the mouse pointer over that icon displays the error message. If you forget the forward slash in a closing tag, for example, you see the error `Tag must be paired`, as shown in Figure 1.7.



The closing tag's forward slash is missing.

► **Figure 1.7**

If the Web Design Playground detects a problem, an error icon appears in the margin to the left of the code, and hovering the mouse over the icon displays the error message.

Summary

- HTML stands for Hypertext Markup Language.
- HTML defines the structure of your web page.
- CSS stands for Cascading Style Sheets.
- CSS defines the presentation of your web page.
- To see this book's lessons and to play around with HTML and CSS code, use this book's companion website, the Web Design Playground: <https://webdesignplayground.io/2>.



Building Your First Web Page



This chapter covers

- Learning the basic page structure and elements
- Learning the most common text elements and styles
- Making a page easier to read with headings
- Creating links to other web pages

Many of the modern technologies that we have to learn—whether it’s building spreadsheets with Microsoft Excel, enhancing images with Adobe Photoshop, or maintaining a music collection with Apple Music—require us to master complex features bristling with settings and plagued by unintuitive interfaces. So, it’s with great pleasure that we come across technologies such as HTML and CSS that have no complicated tools, settings, or interfaces to figure out. In fact, they have no interfaces at all. They’re mere text—a blissfully simple symphony of letters and numbers and symbols. They’re simple, yes, but not unsophisticated. With HTML tags and CSS properties, you can build a web page that reflects who you are, shows off your creativity, and announces to the world, “Yes, I built this!”



That's why, after the brief introduction in Chapter 1, you get your HTML and CSS education off to a proper start here in Chapter 2 by building your first web page. You learn the underlying structure that's common to all pages, as well as all the standard text elements, and you learn how to add headings and links. If you've got something to say, you learn how to say it with HTML and CSS.

Lesson 2.1: Introducing HTML Tags

Covers: HTML tags

➡ Online: wdpg.io/2/2-1-0

PLAY

The addresses that appear here and elsewhere in this chapter refer to locations in the Web Design Playground, this book's companion online site. See "Introducing the Web Design Playground" in Chapter 1.

HTML works its magic through short codes called *tags*. Each tag consists of three parts:

- An opening left angle bracket (<), also known as the less-than sign.
- The name of the element you want to use. Element names are short alphanumeric codes such as `p` for a paragraph, `em` for emphasis, and `h1` for a first-level heading.
- A closing right angle bracket (>), also known as the greater-than sign.

Figure 2.1 shows the tag for an `h1` element.

Angle brackets

<h1>

Element name

► Figure 2.1

The structure of a typical HTML tag

In most cases, the tag tells the browser to start laying out the page according to the element you specified. If you add the `` tag (*em* = *emphasis*) as the *opening tag*, for example, you're telling the browser to display the text that follows in italics. You also must tell the browser when you want it to stop displaying the text with that element, so you need to add a companion to the opening tag called the *closing tag*. The closing tag is the same as the opening tag except that it requires a forward slash before the element name. A closing tag consists of the following four parts:

- An opening left angle bracket (<)
- A forward slash (/)
- The name of the element
- A closing right angle bracket (>)

Angle brackets

</h1>

Forward slash

► Figure 2.2

The structure of the closing tag for the `h1` element

Figure 2.2 shows the closing tag for an `h1` element. Together, the opening and closing tags create a kind of container to which you add some text (or even other elements); the browser displays the text according to the element that you specify in the tags. In Figure 1.1 of Chapter 1, the text *How New Words Are Created* appears at the top of the file. To turn that text into the article's main heading (as shown in Figure 1.2 of Chapter 1), I applied the `<h1>` tag, which displays the text as a first-level heading. The following example shows how I did it.

MASTER

Throughout this book, I use the word *element* to refer to a specific item of HTML, such as `p` or `em`, and the word *tag* to refer to the element and its surrounding angle brackets, such as `<p>` or ``.



► Example

➡ Online: wdpg.io/2/2-1-1

This example uses the `h1` element to turn the text *How New Words Are Created* into a first-level heading.

WEB PAGE	<h1>How New Words Are Created</h1>	Text rendered as an h1 heading
HTML	<code><h1>How New Words Are Created</h1></code>	<p>The opening tag</p> <p>The affected text</p> <p>The closing tag</p>

By adding a few characters, you're telling the browser to do a whole bunch of things to the text:

- Display the text visibly separated from the rest of the content.
- Add a bit of vertical space above and below the text.
- Format the text as bold.
- Format the text larger than the regular-page text to make it clear that the text is a heading.

You learn more about headings later in this chapter, but you can see that this deceptively simple code lets you do many things without much work. That's the magic of HTML.

Adding HTML Tag Attributes

Many HTML elements require no embellishment: you add the tag to the page, and the browser does the rest. A few tags, however, do require extra information before the web browser can process them correctly. You use the `` tag, for example, to insert a picture into a web page, but you need to tell the web browser where your image is located. Similarly, to create a link, you use the `<a>` tag, but again, the web browser needs more info. In this case, it needs to know *what* you want to link to (such as the address of another website).

You supply these and similar extra bits of data to the browser by adding one or more attributes to the tag. An *attribute* is a name-value pair in which the name tells the browser the specific attribute, and the value assigns the setting you want to use.

MASTER

Although most HTML elements have both an opening and a closing tag, not all of them do. The element that you use to insert an image, for example (see Chapter 6), doesn't require a closing tag. These tags are known as self-closing tags, and these elements are known as void elements because, in a sense, they don't "contain" anything.

PLAY

The text in Figure 1.1 of Chapter 1 has several single-word paragraphs that are intended to be headings. Line 7, for example, consists of the text *Combining*. Given what you've learned about applying a first-level heading to the article title, apply a second-level heading to the *Combining* text.

➡ Online: wdpg.io/2/2-1-4



REMEMBER

Although technically you're allowed to mix lowercase and uppercase letters in HTML element names and attribute names, I highly recommend using only lowercase letters. All lowercase is the norm in web design because it's easier to type and read. You should also use lowercase for attribute values except when a specific value requires some uppercase, such as in a filename or an address.

When you're writing a link, for example, you specify the link address by adding the href attribute and setting its value to the address you want to use. Figure 2.3 shows an example.

```
<a href="https://webdesignplayground.io">
```

Diagram labels: An arrow points from the text "Attribute name" to the `href` attribute. A bracket points from the text "Attribute value" to the value `"https://webdesignplayground.io"`.

► **Figure 2.3**

You can use attributes to specify extra data for some HTML elements, such as the link address for an `<a>` tag.

Here, the href (short for *hypertext reference*) attribute is assigned the value `https://webdesignplayground.io/`, which is the address the user will be taken to if she clicks this link. Notice that the attribute value is surrounded by double quotation marks. These quotation marks are optional, but using them makes your code easier to read and maintain.

When combined with attributes, HTML can do some useful, powerful things. But HTML isn't the only web page tool you get to play with. In many ways, CSS is far more powerful and fun than HTML, and you begin learning how it works in the next section.

Lesson 2.2: Introducing CSS Properties

Covers: CSS properties

➡ Online: wdpg.io.com/2/2-2-0/

CSS consists of a large collection of items called *properties* that control aspects of your page such as the text color, the font size, and the margins that surround an object. For each property you want to use, you assign a value, and that property-value pair (also known as a *declaration*) is the instruction that the browser carries out.

You have multiple ways to define a style, as you'll see in Chapter 7. For now, I'll go through the two most common methods. Figure 2.4 shows the general form of the first method.

► **Figure 2.4**

The syntax to use for defining CSS properties

Diagram illustrating the syntax for defining CSS properties:

```
selector {  
  property1: value1;  
  property2: value2;  
  ...  
}
```

Labels and annotations:

- "The web page element to be styled" points to the `selector`.
- "The property-value pairs are surrounded by opening and closing braces." points to the curly braces `{}`.
- "One or more property-value pairs" points to the list of properties and values inside the braces.

From Figure 2.4, you see that defining a style consists of the following five parts:



- A reference to the web page element or elements to which you want the style applied. This reference is known as a *selector* because you use it to choose which page elements you want the browser to style.
- An opening left brace (`{`).
- The name of the property you want to apply. Property names are short alphabetic codes such as `color` for the text color, `font-size` for the text size, and `margin` for the margin size. The property name is always followed by a colon (`:`) and then a space for readability.
- The value you want to assign to the property, as well as the unit you want to use, if necessary. To specify a text size in pixels, for example, you add `px` to the value. The value is always followed by a semicolon (`;`), except for the last value, where you can skip the semicolon.
- A closing right brace (`}`).

Taken together, these five parts comprise a style *rule*. If you ever need to refer to just the set of declarations inside the curly braces, you can call them the *declaration block*. The following example shows the style rule I used to tell the browser to set the font size for the main (`h1`) heading in Figure 1.2 (Chapter 1).

► Example

➡ Online: wdpg.io/2/2-2-1

This example uses CSS to apply the `font-size` property to the `h1` element.

WEB PAGE	<h1>How New Words Are Created</h1> <p>Text rendered with a 36-pixel type size</p>
CSS	<pre>h1 { font-size: 36px; }</pre> <p>The item you want to style and the opening brace</p> <p>The closing brace</p> <p>The style property and its value</p>
HTML	<pre><h1>How New Words Are Created</h1></pre>



Building Your First Web Page

PLAY

How would you format a web page's second-level headings with a font size of 30 pixels? ➡ Online: wdpg.io/2/2-2-2

The style rule begins by referencing the `h1` HTML element, which tells the browser to apply what follows to every `<h1>` tag in the current web page. After the opening brace (`{`), the next line specifies the declaration: `font-size: 36px;`. This line instructs the web browser to display every instance of `h1` text at a font size of 36 pixels. Finally, the closing brace (`}`) completes the style rule.

Here, you see one of the great advantages of using styles. If your page has a dozen `h1` headings, this rule applies to them all, which gives the page a consistent look. Even better, if you decided that a size of 48px would look nicer for your headings, you'd have to change the value only once in the style rule, and that change would get reflected automatically in all your `h1` headings.

Note that you're not restricted to a single declaration in your style rules. As you can see in the following example, you can add multiple declarations as needed.

► Example

➡ Online: wdpg.io/2/2-2-3

This example uses multiple declarations in a single CSS rule..

WEB PAGE	<p>Text rendered at 36 pixels, centered, and small caps</p> <h1>INTRODUCING CSS PROPERTIES</h1>
CSS	<pre>h1 { font-size: 36px; text-align: center; font-variant: small-caps; }</pre> <p>This property centers the heading.</p> <p>This property displays the heading in small capital letters.</p> <p>The closing brace</p>
HTML	<pre><h1>How New Words Are Created</h1></pre>

Here, I've added the declarations `text-align: center;` to center the heading and `font-variant: small-caps;` to display the heading in small capital letters.



I mentioned earlier that you have another way to specify a style. You can insert the declaration directly into an HTML element by using the `style` attribute:

```
<element style="property1: value1; property2: value2; etc.">
```

Here's an example:

```
<h1 style="font-size: 36px; text-align: center">
```

When you use this method, your styles apply only to the HTML element in which they're declared. I talk more about this method in Chapter 7.

CSS is slightly more complicated than HTML, but with that complication comes immense power and expressiveness. As you see throughout the rest of this book, CSS is your royal road to creating fantastic, fun web pages. When your HTML structure is festooned with CSS formatting, you can create beautiful web pages that are a pleasure to read and navigate.

Getting Your Web Page Off the Ground

This book's goal is to help you create your own web pages and thus lay claim to a little chunk of personal cyberspace real estate—a home page away from home, if you will. Before you can live in this humble abode, however, you must pour the concrete that serves as the foundation for the rest of your digital domicile. In this section, I show you a few HTML basics that constitute the underlying structure of all web pages.

MASTER

In this section's examples, I use four spaces to indent the declarations. This indentation isn't required, but it makes CSS much easier to read, so it's a good idea to get into the habit of indenting your declarations.

PLAY

How would you format a web page's second-level headings with a font size of 30 pixels and right alignment?

➞ Online: wdpg.io/2/2-2-4

Lesson 2.3: Laying Down the Basic Page Structure

Covers: Page-structure elements

➞ Online: wdpg.io/2/2-3-0

All your web page projects, from the simplest page to the most sophisticated business site, begin with the same basic structure, as follows:

```
<!DOCTYPE html>           #1
<html lang="en">           #2
  <head>                   #3
    <meta charset="utf-8">  #4
    <title></title>         #5
    <style></style>         #6
  </head>                  #3
  <body>                   #7
  </body>                  #7
</html>                   #2
```

No doubt this code looks a little intimidating to you. I apologize for that complication, but it's a necessary one that's baked into the way web pages are built. Fortunately, I can soften the blow somewhat by offering you two bits of good news:

MASTER

Here, I use four spaces to indent the tags when they fall inside other tags. This indentation isn't strictly necessary, but it's a good idea; indentation makes your code easier to read and troubleshoot because you can more readily see each pair of opening and closing tags.



Building Your First Web Page

PLAY

You can copy and paste the basic web page structure from the Web Design Playground.

➡ Online: wdpg.io/2/2-3-0

REMEMBER

In the Web Design Playground, I've deliberately hidden elements such as `<!DOCTYPE>`, `<html>`, `<head>`, `<style>`, and `<body>` because (at least in the Playground) you don't work with these elements directly. When you type tags in the HTML editor, the Playground adds them between the `<body>` and `</body>` tags behind the scenes. Similarly, when you type styles in the CSS editor, the Playground adds them between the `<style>` and `</style>` tags in the background.

- This code is by far the most complex you'll see in this chapter, so if you can muddle through the next few paragraphs, sailing the rest of the way will be much easier.
- When you work in the Web Design Playground, you don't see the basic structure code shown previously because the Playground hides it behind the scenes. (You're welcome.)

The structure begins with `<!DOCTYPE html>` right at the top (#1), and this line has a technical meaning that you can ignore. Suffice it to say that you must include this line to ensure that your web page renders correctly. The next part of the structure consists of the `<html>` tag and its closing `</html>` tag (#2), which together define the overall container for the rest of the page's HTML and CSS. The `<html>` tag includes the `lang="en"` attribute, which tells the web browser that the primary language of the page is English.

The rest of the structure is divided into two sections: the *header* and the *body*.

The header section is defined by the `<head>` tag and its closing `</head>` tag (#3). The header section acts as an introduction to the page because web browsers use the header to glean various types of information about the page. One important bit of data is the character set used by the page, which is what the `<meta>` tag is doing (#4). You also use the header section to define the page title (#5), which I talk about in the next section. Most important for this book, the `<style>` tag and its closing `</style>` tag (#6) are where you enter your style definitions.

The body section is defined by the `<body>` tag and its closing `</body>` tag (#7), and this section is where you'll enter most of your HTML tags. The text and tags that you type in the body section are what appear in the web browser.

Lesson 2.4: Adding a Title

Covers: The `<title>` tag

➡ Online: wdpg.io/2/2-4-0

You may be tempted to think of the page title as the text that appears at the top of the page. In HTML, however, the page title is what appears on the web browser's tab for that page, as shown in the following example.

⇒ Online: wdpg.io/2/2-4-0

The text that you add between the header section's <title> and </title> tags

HTML

How New Words Are Created

Place the page title between the <title> and </title> tags.

- Your HTML code must include a title to be considered a valid web page (see the appendix to learn how to validate your HTML code).
- Make sure that your title reflects what the page is about.
- Make the title unique with respect to your other pages.
- Because a longish title often gets truncated when it's displayed in the narrow confines of a browser tab, put a truly descriptive word or two at the beginning of the title.
- Use a title that makes sense when someone views it out of context. A person who really likes your page may bookmark it, and the browser displays the page title in the bookmarks list, so it's important that the title makes sense when that person looks at the bookmarks later.



Lesson 2.5: Adding Some Text

Covers: Adding web page text

➡ Online: wdpg.io/2/2-5-0

If you tried to load a page containing only the basic structure code shown earlier in Lesson 2.3, you wouldn't see anything in the browser. Although the browser uses the tags in the header section internally, including displaying the title in the browser's current tab, the browser's content area displays only the tags and text that you place between the `<body>` and `</body>` tags.

“*Ultimately, users visit your website for its content. Everything else is just the backdrop.* —Jakob Nielsen

In the following example, I added the text `Hello HTML World!` to the body section.

► Example

➡ Online: wdpg.io/2/2-5-1

The text that you add between the `<body>` and `</body>` tags appears in the browser window.

WEB PAGE	 <p>Hello HTML World!</p> <p>The text between the <code><body></code> and <code></body></code> tags appears in the browser's content area.</p>
HTML	<pre><!DOCTYPE html> <html lang="en"> <head> <meta charset="utf-8"> <title>The Web Design Playground</title> <style></style> </head> <body> Hello HTML World! </body> </html></pre> <p>Place the page text between the <code><body></code> and <code></body></code> tags.</p>



Here are a few things you should know about adding text to a web page:

- If you're working in the Web Design Playground, remember that the HTML editor assumes that what you type in that box will be inserted between the `<body>` and `</body>` tags, so you don't need to enter them.
- You may think that you can line things up and create some interesting effects by stringing together two or more spaces. Alas, no, that effect won't work. Web browsers chew up all those extra spaces and spit them out into the nether regions of cyberspace. Why? Well, the philosophy of the web is that you can use only HTML tags to structure a document and CSS to style it. So, a run of multiple spaces—*whitespace*, as it's called—is ignored (with some exceptions; for example, see the `pre` element in Chapter 16).
- Tabs also fall under the rubric of whitespace. You can enter tabs all day long, but the browser ignores them.
- Other things that browsers like to ignore are carriage returns. It may sound reasonable that pressing Enter or Return starts a new paragraph, but that's not so in the HTML world. I talk more about this topic in the next section.
- Earlier, I mentioned that web pages consist only of the characters that you can peck out on your keyboard. Does that mean you're out of luck if you need to use characters that *don't* appear on the keyboard, such as the copyright symbol or an em dash? Luckily, you're not. HTML has special codes for these kinds of characters, and I talk about them in Chapter 16.

Learning the Most Common Text Elements

Having great content is essential for any web page, and as you've seen so far in this chapter, you can get started on a web page by typing some text. But content is only the beginning. Figure 2.5 shows an example of a text-only web page.

How New Words Are Created Where do new words come from? Sometimes we're lucky enough to know the answer. For example, the word *scofflaw* originated as a contest winner and *Frankenfood* came from a letter to the editor of a newspaper. But for every word with a definite origin, there are hundreds, nay thousands whose beginnings are unknown and probably unknowable. That's because, according to the linguist Victoria Neufeldt (writing in her book *A Civil But Untrammelled Tongue*), most word invention goes on as a matter of course: Neology, far from being a separable linguistic phenomenon that manifests itself periodically or sporadically in response to social stimuli, in fact rises out of ordinary linguistic competence, what might be called the linguistic collective unconscious of the speech community. This "ordinary linguistic competence" manifests as various mechanisms that people use to forge new words.

► **Figure 2.5** A web page with nothing but text



“Content precedes design. Design in the absence of content is not design, it’s decoration. —Jeffrey Zeldman

What you’re seeing in Figure 2.5 is a page in which the text isn’t adorned with any HTML elements. Yes, you can read the page, but would you really want to? I didn’t think so. The page as it stands is fundamentally unappealing because it’s a bunch of undifferentiated text, which makes it both difficult to read and dull to look at. By contrast, check out the revised version of the page shown in Figure 2.6.

How New Words Are Created

Where do new words come from? Sometimes we’re lucky enough to know the answer. For example, the word [scofflaw](#) originated as a contest winner and [Frankenfood](#) came from a letter to the editor of a newspaper. But for every word with a definite origin, there are hundreds, nay *thousands*, whose beginnings are unknown and probably unknowable. That’s because, according to the linguist Victoria Neufeldt (writing in her book *A Civil But Untrammelled Tongue*), **most word invention goes on as a matter of course**:

Neology, far from being a separable linguistic phenomenon that manifests itself periodically or sporadically in response to social stimuli, in fact rises out of ordinary linguistic competence, what might be called the linguistic collective unconscious of the speech community.

This “ordinary linguistic competence” manifests as various mechanisms that people use to forge new words.

► **Figure 2.6** The web page from Figure 2.5 with some basic HTML text elements added

Ah, that’s better! Now the page is easy to read and reasonably nice to look at. The difference is that in this version, I used some basic HTML text elements to redisplay the text in a form that’s readable and understandable. You’ll learn how I did that as you read this chapter. In the next section, you learn how to use the HTML required to mark text as important.

Lesson 2.6: Marking Important Text

Covers: The strong element

MASTER

All web browsers define a default style for every text element, such as bold for text marked up with the strong element. You don’t have to stick with the browser styling, however, because, in all cases, you can augment or override the defaults by using your own styles. You get into this topic big-time in Chapter 4.

⇒ Online: wdpg.io/2/2-6-0

On your web page, you may have a word, phrase, or sentence that you want to be sure the reader sees because it’s important. This text may be a vital instruction, a crucial condition, or a similarly significant passage that needs to stand out from the regular text because you don’t want the reader to miss it. In HTML, you mark text as important by using the strong element:

```
<strong>important text goes here</strong>
```

All browsers render the text between the `` and `` tags in a bold font. The following example shows some web page text with an important passage displayed in bold and the HTML markup used with the text.



► Example

⇒ Online: wdpg.io/2/2-6-1

This example uses the `` tag to mark an important passage of the text as bold.

WEB PAGE	<p>That's because, according to the linguist Victoria Neufeldt (writing in her book <i>A Civil But Untrammelled Tongue</i>), most word invention goes on as a matter of course</p> <p>Text marked with the <code></code> tag</p>
HTML	<p>That's because, according to the linguist Victoria Neufeldt (writing in her book <i>A Civil But Untrammelled Tongue</i>), <code>most word invention goes on as a matter of course</code></p> <p>Text marked as important with the <code></code> tag</p>

Lesson 2.7: Formatting Keywords

Covers: The `b` element

⇒ Online: wdpg.io/2/2-7-0

In some cases, you want to draw attention to a word or phrase not because it's important per se, but because the text in question plays a role that makes it different from regular text. That text could be a product name, a company name, or an interface element such as the text associated with a check box or command button. Again, the text you're working with isn't crucial—it's different in some way—so you want it to look different from the regular page text.

Each of these items indicates a keyword (or key phrase) that has meaning beyond the regular page text. In HTML5, this type of semantic item is marked up with the `b` element:

```
<b>keyword</b>
```

Web browsers render the text between the `` and `` tags in a bold font. At this point, I imagine you scratching your head and wondering what the difference is between the `strong` element and the `b` element because both render as bold text. That's a fair point, and I'll admit that the difference is a subtle one. I should say that it's a *semantic* one because HTML5 uses these two separate elements to differentiate between important text and keywords. In the future, I hope, screen readers and similar assistive technologies for disabled readers will use this semantic difference to alert the visitor in some way that this text is important and that text is a keyword.

PLAY

To learn more about the `strong` element, try the exercises on the *Web Design Playground*.
⇒ Online: wdpg.io/2/2-6-2

USE IT

Other candidates for web page keywords include the name of a person (such as the infamous "boldface names" that appear in celebrity gossip columns) and the first few words or the opening sentence of an article.

PLAY

How would you mark up an article so that its lede sentence appears in bold? ⇒ Online: wdpg.io/2/2-7-2



Building Your First Web Page

The following example shows some web page text with a keyword displayed in bold and the HTML markup used with the text.

► Example

⇒ Online: wdpg.io/2/2-7-1

This example shows some web page text with several keywords displayed in bold thanks to the `b` element

WEB PAGE	<p>Text marked with the <code></code> tag</p> <p>The combining process marries a word either with one or more affixes (a prefix, infix, or suffix) or with another word.</p>
HTML	<p>The <code>combining</code> process marries a word either with one or more affixes (a prefix, infix, or suffix) or with another word.</p> <p>Text marked as keywords with the <code></code> tag</p>

Lesson 2.8: Emphasizing Text

Covers: The `em` element

⇒ Online: wdpg.io/2/2-8-0

FAQ

What's the difference between the `strong` element and the `em` element? You use `strong` when the text in question is inherently crucial for the reader; you use `em` when the text in question requires an enhanced stress to get a point across.

It's often important to add emphasis to certain words or phrases on a page. This emphasis tells the reader to read or say this text with added stress. Consider the following sentence:

Verdana is a sans-serif typeface.

Now read the same sentence with emphasis (expressed in italics) added to the word *sans*:

Verdana is a *sans*-serif typeface.

The meaning of the sentence and how you read the sentence change with the addition of the emphasis (in this case, to stress the fact that Verdana isn't a serif typeface).

In HTML5, this type of semantic item is marked up with the `em` (for emphasis) element:

```
<em>text</em>
```

Web browsers render the text between the `` and `` tags in italics. The following example shows a web page with emphasized text displayed in italics, as well as the HTML markup that creates the effect.



► Example

⇒ Online: wdpg.io/2/2-8-1

This example shows some web page text with several words emphasized via the `em` element.

WEB PAGE	<p>But for every word with a definite origin, there are hundreds, nay <i>thousands</i>, whose beginnings are unknown and probably unknowable.</p> <p>Text marked with the <code></code> tag</p>
HTML	<p>But for every word with a definite origin, there are hundreds, nay <code>thousands</code>, whose beginnings are unknown and probably unknowable.</p> <p>Text marked as emphasized with the <code></code> tag</p>

Lesson 2.9: Formatting Alternative Text

Covers: The `i` element

⇒ Online: wdpg.io/2/2-9-0

It's common in prose to need markup for a word or phrase to indicate that it has a voice, mood, or role that's different from that of the regular text. Common examples of alternative text are book and movie titles. In HTML5, this type of semantic text is marked up with the `i` (for italics) element:

```
<i>text</i>
```

Web browsers render such text in italics. The `i` element may seem to be precisely the same as the `em` element, but there's a significant semantic difference: `em` adds stress to enhance the emphatic nature of the affected text, whereas `i` tells the reader that the text is to be interpreted in an alternative way to the regular text. Again, this subtle difference is potentially useful in terms of accessibility; a screen reader would (at least in theory) emphasize `em` text and let the user know about alternative text marked up with the `i` element. The following example shows a web page with alternative text displayed in italics, as well as the HTML markup that does the job.

PLAY

You can nest text-level elements within other text-level elements for extra effect. You can mark up a sentence as important by using the strong element, and within that sentence, you can mark up a word with emphasis by using the `em` element.

⇒ Online: wdpg.io/2/2-8-3

USE IT

Other examples of alternative text include publication names, technical terms, foreign words and phrases, and a person's thoughts.



► Example

⇒ Online: wdpg.io/2/2-9-1

This example shows some web page text with several words emphasized via the `i` element.

WEB PAGE	<p>That's because, according to the linguist Victoria Neufeldt (writing in her book <i>A Civil But Untrammeled Tongue</i>), most word invention goes on as a matter of course:</p> <p>Text marked with the <code><i></code> tag</p>
HTML	<p>That's because, according to the linguist Victoria Neufeldt (writing in her book <code><i>A Civil But Untrammeled Tongue</i></code>), most word invention goes on as a matter of course:</p> <p>Text marked as alternative with the <code><i></code> tag</p>

Lesson 2.10: Quoting Text

Covers: The `q` and `blockquote` elements

PLAY

To get familiar with the `i` element, try the exercises on the Web Design Playground. ⇒ Online: wdpg.io/2/2-9-2

⇒ Online: wdpg.io/2/2-10-0

Many web pages include quotes from other works, which could be web pages, people, books, magazines, or any written source. To help your readers know that some text is quoted material and not your own words, you could just place the text between double quotation marks. An alternative is to mark up the text as a quotation. How you add this markup depends on the length of the quotation.

A short quotation should appear inline with your regular page text. You mark up this text as a quotation by using the `q` element:

```
<q cite="url">quotation</q>
```

Most web browsers display text marked up with the `q` element the same way as the regular page text but surrounded by double quotation marks. If your quotation comes from another web page, you can include the optional `cite` attribute and set its value to the URL of the web page.

A longer quotation should appear on its own for readability. You mark up a longer quotation by using the `blockquote` element:

```
<blockquote>
Long quotation
</blockquote>
```



The web browser displays text marked up with the `blockquote` element in a separate paragraph that's indented slightly from the left and right margins of the containing element. The following example shows some web page text that includes a short quotation inline with the regular text and a longer quotation separated from the regular text, as well as the HTML markup.

PLAY

To get familiar with the `q` and `blockquote` elements, try the exercises on the Web Design Playground.

➞ Online: wdpg.io/2/2-10-2

► Example

➞ Online: wdpg.io/2/2-10-1

This example shows some web page text with both a short quotation inline with the regular text and a longer quotation separated from the regular text.

WEB PAGE	<p>That's because, according to the linguist Victoria Neufeldt (writing in her book <i>A Civil But Untrammelled Tongue</i>), most word invention goes on as a matter of course:</p> <p>Neology, far from being a separable linguistic phenomenon that manifests itself periodically or sporadically in response to social stimuli, in fact rises out of ordinary linguistic competence, what might be called the linguistic collective unconscious of the speech community.</p> <p>This “ordinary linguistic competence” manifests as various mechanisms that people use to forge new words:</p> <p>Shorter, inline quotation marked with the <code><q></code> tag</p>
HTML	<pre> That's because, according to the linguist Victoria Neufeldt (writing in her book <i>A Civil But Untrammelled Tongue</i>), most word invention goes on as a matter of course</ strong>: <blockquote> Neology, far from being a separable linguistic phenomenon that manifests itself periodically or sporadically in response to social stimuli, in fact rises out of ordinary linguistic competence, what might be called the linguistic collective unconscious of the speech community. </blockquote> This <q>ordinary linguistic competence</q> manifests as various mechanisms that people use to forge new words: </pre> <p>Text marked as a longer quotation with the <code><blockquote></code> tag</p> <p>Text marked as a short quotation with the <code><q></code> tag</p>



Lesson 2.11: Working with Headings

Covers: The h1 through h6 elements

➡ Online: wdpg.io/2/2-11-0

A *heading* is a word or phrase that appears immediately before a section of text and is used to name or briefly describe the contents of that text. Almost all web pages have a main heading at or near the top of the page that serves as the title of the content. (Don't confuse this heading with the text between the `<title>` and `</title>` tags in the page's `<head>` section. The main heading appears on the page itself, whereas the text within the `title` element appears only on the browser tab.)

Besides the main heading, many web page contents are divided into several sections, each of which has its own heading. These sections may be further divided into subsections with, again, each subsection having a heading, and so on. Taken together, the main heading, section headings, and subsection headings form an outline that neatly summarizes the structure and hierarchy of the web page.



Well-written, thoughtful headings interspersed in the text act as an informal outline or table of contents for a page. —Steve Krug

In HTML, you mark up your page's heading text by using the various heading elements, which run from `h1` for the highest level of your page hierarchy (usually, the page's main heading) to `h2` for the section headings, `h3` for the subsection headings, and all the way down to `h6` for the lowest-level headings. The web browser displays each heading in its own block, formats the text as bold, and (as you see in the example that follows) adjusts the text size depending on the element used: `h1` is the largest, and `h6` is the smallest.



► **Example**

⇒ Online: wdpg.io/2/2-11-1

This example shows how the web browser renders the six HTML heading elements.

WEB PAGE	Level 1 Heading
	Level 2 Heading
	Level 3 Heading
	Level 4 Heading
	Level 5 Heading
	Level 6 Heading
HTML	<pre> <h1>Level 1 Heading</h1> <h2>Level 2 Heading</h2> <h3>Level 3 Heading</h3> <h4>Level 4 Heading</h4> <h5>Level 5 Heading</h5> <h6>Level 6 Heading</h6> </pre>

Although HTML5 offers other ways to create semantic page divisions (see Chapter 11), using heading elements is an easy, common way to tell the browser and the reader how your web page text is organized, as shown in the following example, which includes the heading from the web page you saw earlier.

► **Example**

⇒ Online: wdpg.io/2/2-11-2

This example shows how the web browser renders the h1 heading element.

WEB PAGE	How New Words Are Created
HTML	<pre> <h1>How New Words Are Created</h1> </pre>

<h1> heading

<h1> heading



Lesson 2.12: Crafting Links

Covers: The `a` element

PLAY

You're given a document with a title, main sections (Section 1, Section 2, and so on), subsections (Section 1.1, Section 1.2, and so on), and sub-subsections (Section 1.1a, Section 1.1b, and so on). Work up a heading scheme for this structure. ➡ Online: wdpg.io/2/2-11-3

BEWARE

Using uppercase versus lowercase letters can be crucial in entering a URL. On most (but not all) websites, if you enter even a single letter of a directory or filename in the wrong case, you likely won't get where you want to go (that is, you'll get a 404 Not Found error).

FAQ

Does the `a` in the `<a>` tag stand for anything? The `a` is short for anchor, which comes from the fact that you can create special links called anchors that send your readers to other parts of the same page instead of sending them to a different page. You learn how this feature works in Chapter 16.

➡ Online: wdpg.io/2/2-12-0

I mentioned in Chapter 1 that one of the defining characteristics of HTML (in fact, the *H* in *HTML*) is *hypertext*: links to pages on your own site or to sites anywhere on the web. In fact, it's a rare page that doesn't include at least a few links, so you need to know how to craft hypertext by using HTML.

The HTML tags that you use to create a link are `<a>` and its corresponding `` closing tag. The `a` element is a little different from most of the other elements you've seen in this chapter because you don't use it by itself. Instead, you insert the address—often called the *URL* (short for *Uniform Resource Locator*)—of your link into it. Figure 2.7 shows how this element works.

The `<a>` tag takes the `href` attribute, which stands for *hypertext reference*. Set this attribute equal to the URL of the web page you want to use for the link, enclosed in double (or single) quotation marks. Most link addresses are one of the following:

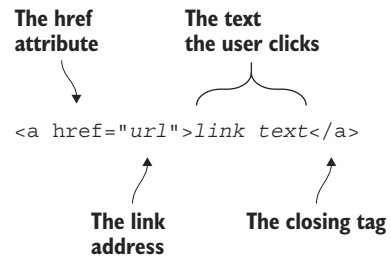
- **Local**—A link to another page on your website. To keep things simple, I'm going to assume that all of your website's page files reside in the same directory. (For the slightly more complex case of having page files in multiple directories, see Chapter 16.) In that case, the `<a>` tag's `href` attribute value is the name of the page file you're linking to. Here's an example:

```
<a href="wordplay.html">
```

- **Remote**—A link to a page on another website. In that case, the `<a>` tag's `href` attribute value is the full URL of the page on the other site. Here's an example:

```
<a href="https://webdesignplayground.io/2/index.php">
```

Next, you replace `link text` with the descriptive link text that you want the user to click and then finish everything with the `` closing tag. By default, most web browsers display the link in blue underlined text, as shown in the following example.



► **Figure 2.7** The syntax to use for the `<a>` tag



► Example

⇒ Online: wdpg.io/2/2-12-1

This example shows some web page text with two links created using the `a` element.

WEB PAGE	<p>Where do new words come from? Sometimes we're lucky enough to know the answer. For example, the word scofflaw originated as a contest winner and Frankenfood came from a letter to the editor of a newspaper.</p> <p>Links appear as blue, underlined text.</p>
HTML	<pre> Where do new words come from? Sometimes we're lucky enough to know the answer. For example, the word scofflaw originated as a contest winner and Frankenfood came from a letter to the editor of a newspaper. </pre> <p>The <code><a></code> tag includes the link address</p> <p>The text that the browser displays as a link</p> <p>The closing tag</p>

Summary

- An *HTML tag* is a short code surrounded by angle brackets—such as `<h1>` or `<p>`—that applies an effect or inserts an object. Most tags also require a closing tag, such as `</h1>` or `</p>`.
- In CSS, a *declaration* is a property-value pair; a *declaration block* is a collection of declarations surrounded by curly braces; and a *style rule* is a declaration block applied to one or more web page elements (such as a tag name).
- In the basic HTML page structure, the header is defined by the `<head>` and `</head>` tags, and it includes the page title (between the `<title>` and `</title>` tags) and the page CSS (between the `<style>` and `</style>` tags).
- In the basic page structure, you type your HTML tags and text between the `<body>` and `</body>` tags.



Building Your First Web Page

- Use `` for important text and `` for keywords.
- Use `` to emphasize text and `<i>` to format alternative text.
- You can create a strong visual hierarchy on your page by taking advantage of the heading tags: `<h1>` through `<h6>`.
- You set up a link by surrounding text with the `<a>` and `` tags. In the `<a>` tag, use the `href` attribute to specify the name of a local file or the URL of a remote file.



Adding Structure to Your Page



This chapter covers

- Dividing page text into paragraphs and sections
 - Adding numbered lists
 - Building bulleted lists
-

You learned in Chapter 2 that you can create an effective web page by typing some text and then using headings and elements such as `strong` and `em` to make the text more readable and easier to understand. Headings are crucial page devices, not only because they help the reader see where one part of the page ends and another begins, but also because they give the reader a general sense of the page hierarchy. All this falls under the general rubric of page structure, and that's the focus of this chapter.



Thinking about the structure of your web page is important because a wall of unstructured text is difficult to scan and read, as well as difficult to style. When you add structure (such as the headings from Chapter 2 and the paragraphs, sections, containers, and lists that you learn about in this chapter), each of those substructures is seen by the browser as a separate entity to which you can apply many style properties. As a rule, the more structured your page, the greater the control you have over how it looks. Fortunately, as you'll see in this chapter, HTML comes with several useful and straightforward tools for adding structure to a page.

HTML Elements for Structuring Page Text

If you work with a word processor, you know that *almost* all documents have a structure: a title, possibly a subtitle, one or more topic headings, and one or more paragraphs within each topic. This makes the document easy to browse and comfortable to read because the structure guides readers and enables them to focus on the text. You can get those same advantages in your web pages by taking advantage of the various structural elements offered by HTML. I'll begin with one of the most common structures: the paragraph.

Lesson 3.1: Working with Paragraphs

Covers: The `p` element

PLAY

Using the Web Design Playground, modify the first five lines in this example so that the text snippets Line 1, Line 2, Line 3, and Line 4 each appear in a separate paragraph.
⇒ Online: wdpg.io/2/3-1-2

⇒ Online: wdpg.io/2/3-1-0

I mentioned in Chapter 2 that web browsers generally ignore whitespace, including carriage returns created by pressing Enter or Return, which is normally how you'd separate text into paragraphs in a text editor or word processor. The most common way to create a paragraph in HTML is to place a `<p>` (for paragraph) tag at the beginning of the text and a closing `</p>` tag at the end of the text. (Technically, the closing `</p>` tag is optional, but it's always good practice to include it.) The following example shows you both the wrong and right ways to create paragraphs.



► **Example** ⇨ **Online:** wdpg.io/2/3-1-1

In this example, you can see that the web browser ignores the whitespace created by the carriage returns but happily renders text into paragraphs when you use the `p` element.

WEB PAGE	<p>Line 1 Line 2 Line 3 Line 4</p> <p>Paragraph 1</p> <p>Paragraph 2</p> <p>Paragraph 3</p> <p>Paragraph 4</p> <p>The web browser ignores the carriage returns.</p> <p>The browser uses the <code><p></code> tags to render the text into separate paragraphs.</p>
HTML	<p>Line 1</p> <p>Line 2</p> <p>Line 3</p> <p>Line 4</p> <p>Wrong: Separate lines created by pressing only Enter/Return</p> <p><code><p>Paragraph 1</p></code></p> <p><code><p>Paragraph 2</p></code></p> <p><code><p>Paragraph 3</p></code></p> <p><code><p>Paragraph 4</p></code></p> <p>Right: Paragraphs created by using the <code>p</code> element</p>



Adding Structure to Your Page

Lesson 3.2: Inserting Line Breaks

Covers: The `br` element

USE IT

Use a line break for poems, lyrics, addresses, contact information, or programming statements, or to show a sample of HTML or CSS code.

PLAY

Render the poem “Break, Break, Break,” by Alfred Lord Tennyson, correctly by adding line breaks to each line that isn’t the end of a stanza. [Online: wdpg.io/2/3-2-2](https://wdpg.io/2/3-2-2)

[Online: wdpg.io/2/3-2-0](https://wdpg.io/2/3-2-0)

When you separate page text into paragraphs, the web browser renders this text by (among other things) creating a bit of space between paragraphs. This space is normally what you want because that vertical gap gives the reader a visual clue as to where one paragraph ends and the next one begins, as well as a chance to take a quick breather between sections of text. This space isn’t *always* what you want, however. If your page text is a poem, for example, you almost certainly don’t want paragraphs between lines. The same is true if your text is programming code or song lyrics.

When you want to start a new line but don’t want to have any space between the two lines, you need the `br` (short for *line break*) element. (If you do want some vertical space between one line and the next, use the `p` element to create a new paragraph; see Lesson 3.1.) As you can see in the following example, the web browser renders the `br` element by inserting a carriage return and beginning the next line immediately below the previous one.

Example

[Online: wdpg.io/2/3-2-1](https://wdpg.io/2/3-2-1)

In this example, you can see that the web browser renders the `br` element by inserting a carriage return and beginning the next line immediately below the previous one..

WEB PAGE	<h2>Contact Info</h2> <p>Manning Publications Co. PO Box 761 Shelter Island, NY 11964 support@manning.com 203-626-1510</p>
HTML	<pre><h3>Contact Info</h3> Manning Publications Co.
 1233 Heartwood Drive
 Cherry Hill, NJ 08003
 support@manning.com
 203-626-1510</pre> <p>The <code>
</code> tag tells the browser to start the following text on a new line.</p>



Lesson 3.3: Dividing Web Page Text

Covers: The `div` element

➡ Online: wdpg.io/2/3-3-0

In Chapter 11, I show you the HTML5 sectioning elements, including `<section>` and `<article>`. These elements enable you to structure your page semantically by designating containers as sections and articles within those sections, as well as headers, footers, navigation, and more. Not all text falls neatly into any of the HTML5 semantic categories, however. For text that requires a container but for which none of the semantic elements (including the `p` element) is appropriate, HTML offers the `div` (short for *division*) element. The `<div>` tag and its corresponding `</div>` end tag create a simple container for text. The web browser applies no inherent formatting to the text, including not rendering any space between consecutive `div` elements, as you see in the following example.

PLAY

The `br` element is often a poor choice for structuring page text because it doesn't provide a container for the text, so you can't style the text. On the Web Design Playground, replace the `br` elements with `div` elements. ➡ Online: wdpg.io/2/3-3-2

► Example

➡ Online: wdpg.io/2/3-3-1

This example uses the `div` element to divide a web page into two text blocks.

WEB PAGE	<h3>Shortening</h3> <p>The <code><div></code> blocks</p> <ul style="list-style-type: none"> The shortening process is based mostly on a kind of linguistic laziness called clipping that causes us to lop off great chunks of words. For example, we end up with <i>fridge</i> from <i>refrigerator</i> and <i>flu</i> from <i>influenza</i>. Often we clip everything after the first syllable: <i>dis</i> (from <i>disrespect</i>) and <i>gym</i> (from <i>gymnasium</i>). A related process is the creation of acronyms, which form a pronounceable word using the first letters of each word in a phrase. For example, <i>UNICEF</i> from United Nations International Children's Emergency Fund, and <i>NATO</i> from North Atlantic Treaty Organization.
HTML	<pre> <h2>Shortening</h2> <div> The shortening process is based mostly on a kind of linguistic laziness called clipping that causes us to lop off great chunks of words. For example, we end up with <i>fridge</i> from <i>refrigerator</i> and flu from <i>influenza</i>. Often we clip everything after the first syllable: <i>dis</i> (from <i>disrespect</i>) and <i>gym</i> (from <i>gymnasium</i>). </div> <div> A related process is the creation of acronyms, which form a pronounceable word using the first letters of each word in a phrase. For example, <i>UNICEF</i> from United Nations International Children's Emergency Fund, and <i>NATO</i> from North Atlantic Treaty Organization. </div> </pre> <p>The <code><div></code> and <code></div></code> tags divide your web page text into blocks.</p>



Adding Structure to Your Page

REMEMBER

Elements such as `div` and `p` are block-level elements because they create a boxlike container that begins on a new line and within which the content flows. Elements such as `span` are inline elements because each creates a container that exists within a larger element and flows with the rest of that element's content..

Lesson 3.4: Creating Inline Containers

Covers: The `span` element

⇒ Online: wdpg.io/2/3-4-0

Elements such as `div` and `p` are important because they provide containers in which you add and style text. Sometimes, however, you want to style just a subset of the text within such a container. You may want to apply a font effect or color to a few words or to a sentence, for example. In that case, you can create an *inline container* by surrounding the text with the `` tag and its `` end tag. The following example creates several inline containers, and a CSS property is defined for the `span` element to apply a yellow background to each container.

► Example

⇒ Online: wdpg.io/2/3-4-1

This example creates several inline containers, and a CSS property is defined for the `span` element to apply a yellow background to each container.

WEB PAGE

Throughout this document, screen items that you click and text that you type appear with a yellow background. Here are some examples:

- Click the **File** menu and then click **Save**.
- Set the number of copies and then click **Print**.
- Click **Search**, type **blockquote**, and then press **Enter**.

CSS

```
span {  
    background-color: yellow;  
}
```

Tells the browser to apply yellow as the background color to all `span` elements.



HTML

```

<p>
Throughout this document, screen items that you click and text
that you type appear with a <span>yellow background</span>. Here
are some examples:
</p>

<ul>
<li>Click the <span>File</span> menu and then click
<span>Save</span>.</li>
<li>Set the number of copies and then click <span>Print</span>.</
li>
<li>Click <span>Search</span>, type <span>blockquote</span>,
and then press <span>Enter</span>.</li>
</ul>

```

The `` and `` tags
create inline containers.

Lesson 3.5: Adding a Visual Break Between Blocks

Covers: The `hr` element

➡ Online: wdpg.io/2/3-5-0

As I mentioned earlier, the `p` element automatically adds whitespace between paragraphs, and for other block-level elements such as `div`, you can use CSS to create your own vertical spacing between blocks. Sometimes, however, you want a more direct or more emphatic visual indicator of a break between blocks. In such a case, you can insert the `hr` (short for *horizontal rule*) element. As you can see in the following example, the web browser displays a horizontal line across the page. If you don't want the line to extend to the width of its container, you can use the `width` CSS property and set it to the width (measured in, say, pixels or a percentage) you prefer.

PLAY

To get some practice with the `span` element, try the exercises on the Web Design Playground.

➡ Online: wdpg.io/2/3-4-2



Adding Structure to Your Page

► Example

➡ Online: wdpg.io/2/3-5-1

This example shows that when you add the `hr` element, the web browser displays a horizontal line across the page.

WEB PAGE	<p>Word Origins: Introduction</p> <p>In a cynical world where attention spans are 140-characters long and where much of the populace is obsessed with the low-brow goings-on of Kim or Miley or Kylie, one amazing fact rises above the muck: it's rare to meet someone who isn't in some way interested in words and language. From slang-slinging youngsters to crossword-solving oldsters, from inveterate punsters to intrepid neologists, some aspect of language appeals to everyone.</p> <hr/> <p>Is there one slice of the language pie that everyone likes? Probably not. People are just too complex to like any one thing universally. However, in my own admittedly limited experience (I haven't met every person in the world), I have yet to come across a person who doesn't appreciate a good story about the origins of a word or phrase.</p>
HTML	<pre><h2>Word Origins: Introduction</h2> <div>In a cynical world where attention spans are 140-characters long and where much of the populace is obsessed with the low- brow goings-on of Kim or Miley or Kylie, one amazing fact rises above the muck: it's rare to meet someone who isn't in some way interested in words and language. From slang-slinging youngsters to crossword-solving oldsters, from inveterate punsters to intrepid neologists, some aspect of language appeals to everyone.</div> <hr> <div>Is there one slice of the language pie that everyone likes? Probably not. People are just too complex to like any one thing universally. However, in my own admittedly limited experience (I haven't met every person in the world), I have yet to come across a person who doesn't appreciate a good story about the origins of a word or phrase.</div></pre> <p>The <code><hr></code> tag inserts a horizontal line between two text blocks.</p>

Many web design gurus recommend that instead of using the `hr` element to get a horizontal line between two blocks, you should add a bottom border to the top block or a top border to the bottom block. See Chapter 9 for more info on styling borders.

Organizing Text into Lists

It's tough to surf the web these days and not come across a list or three in your travels—a top-10 list, a best-of list, a point-form summary of an event, or any of a thousand other variations on the list theme. A list is often the perfect way to display certain types of information, such as a series of steps or an unordered collection of items.



HTML offers these two list types:

- A *numbered list* (sometimes called an *ordered list*) presents its items in numeric order, with each item's number on the left and the item text indented to the right.
- A *bulleted list* (sometimes called an *unordered list*) presents its items in the order you specify, with each item having a bullet (usually, a small dot) on the left and the item text indented to the right.

Lesson 3.6: Adding a Numbered List

Covers: The `ol` element

➡ Online: wdpg.io/2/3-6-0

If the things you want to display have an inherent numeric order, such as you might find in the steps of a procedure or the elements in a series, a numbered list is the way to go. The good news is that you don't have to enter the numbers yourself because the browser takes care of them for you automatically. The first item in the list is given the number 1, the second is given 2, and so on. If you insert or delete items, the browser adjusts all the list numbers as needed to keep everything in numeric order.

You start to construct a numbered list by creating a container that consists of the `` tag (short for *ordered list*) and its closing `` tag. Between those tags, you add one or more `` (short for *list item*) tags followed by the item text and the (optional, but recommended) closing `` tag:

```
<li>Item text</li>
```

The browser displays the item with a number on the left (the value of which is determined by the item's position in the list), followed by item text, which is indented from the number, and the entire item is indented from the left margin of whatever element contains it. The following example shows a basic numbered list and the HTML tags and text used to create it.

REMEMBER

Although this type of list is used far less than numbered and bulleted lists, you should also be aware of the description list, which is a list of terms and descriptions. The entire list uses the `<dl>` and `</dl>` tags as a container; you specify each term within the `<dt>` and `</dt>` tags and each description within the `<dd>` and `</dd>` tags.

USE IT

Use a numbered list for any collection that must appear in sequential, numeric order. Examples are the steps the reader must follow in a how-to procedure, the tasks involved in a recipe, the sections in a document (particularly a contract or other legal document), or the items in a ranking such as a top-10 list.



Adding Structure to Your Page

► Example

➡ Online: wdpg.io/2/3-6-1

This example shows how to use a numbered list to set up a top-10 list.

WEB PAGE

Top 10 Modern Words of Unknown Origin

1. *jazz* (1909)
2. *jive* (1928)
3. *bozo* (1920)
4. *dork* (1964)
5. *pizzazz* (1937)
6. *humongous* (1970)
7. *gismo* (1943)
8. *zit* (1966)
9. *reggae* (1968)
10. *mosh* (1987)

HTML

```
<h3>Top 10 Modern Words of Unknown Origin</h3>
<ol>
  <li><em>jazz</em> (1909)</li>
  <li><em>jive</em> (1928)</li>
  <li><em>bozo</em> (1920)</li>
  <li><em>dork</em> (1964)</li>
  <li><em>pizzazz</em> (1937)</li>
  <li><em>humongous</em> (1970)</li>
  <li><em>gismo</em> (1943)</li>
  <li><em>zit</em> (1966)</li>
  <li><em>reggae</em> (1968)</li>
  <li><em>mosh</em> (1987)</li>
</ol>
```

Within the container, enter each item's text between the `` and `` tags.

Use the `` and `` tags as the container for the numbered list.

PLAY

To get some practice with the `ol` and `li` elements, try the exercises on the Web Design Playground.

➡ Online: wdpg.io/2/3-6-2

By default, the numbers used in the list are standard decimal values (1, 2, 3, and so on). You can change the number type by specifying the `list-style-type` CSS property. Table 3.1 lists the most common numbered-list values for this property.



► **Table 3.1** Common numbered-list values for the `list-style-type` CSS property

Value	Description	Example Numbers
decimal	Decimal numbers	1, 2, 3, 4, ...
decimal-leading-zero	Decimals numbers with a leading 0	01, 02, 03, 04, ...
lower-alpha	Lowercase letters	a, b, c, d, ...
upper-alpha	Uppercase letters	A, B, C, D, ...
lower-roman	Lowercase Roman numerals	i, ii, iii, iv, ...
upper-roman	Uppercase Roman numbers	I, II, III, IV, ...
lower-greek	Lowercase Greek letters	α, β, γ, δ, ...
upper-greek	Uppercase Greek letters	A, B, Γ, Δ, ...

LEARN

Quite a few values for `list-style-type` are associated with various other languages, such as Chinese, Hebrew, and Japanese. See the following page for the complete list: <https://developer.mozilla.org/en-US/docs/Web/CSS/list-style-type>.

Lesson 3.7: Adding a Bulleted List

Covers: The `ul` element

⇒ Online: wdpg.io/2/3-7-0

If the items you want to display have no inherent numeric order, such as you might find in a to-do list or a set of characteristics, a bulleted list is the way to go. Each item appears in its own paragraph, preceded by a bullet (usually, a black dot). You don't have to enter the bullets manually because the browser adds them automatically.

You start building a bulleted list by creating a container that consists of the `` (short for *unordered list*) tag and its closing `` tag. Between these tags, as with a numbered list, you add one or more `` tags, followed by the item text and the (optional, but recommended) closing `` tag:

```
<li>Item text</li>
```

The browser displays the item with a bullet on the left, followed by item text, which is indented from the bullet, and the entire item is indented from the left margin of the element that contains it. The following example shows a basic bulleted list and its underlying HTML tags and text.

USE IT

Use a bulleted list for any collection of items that are related in some way but don't have to appear in numeric order. Examples include a to-do list or grocery list, a set of traits or properties associated with an object, or a collection of prerequisites for a course.



Adding Structure to Your Page

► Example

➡ Online: wdpg.io/2/3-7-1

This example shows you how to build a bulleted list.

WEB PAGE

This “ordinary linguistic competence” manifests as various mechanisms that people use to forge new words:

- Combining
- Shortening
- Shifting
- Borrowing
- Onomatopoeia
- Mistakes
- Retronyms
- Ex Nihilo

HTML

```
<p>This <q>ordinary linguistic competence</q> manifests as various mechanisms that people use to forge new words:</p>
```

```
<ul>
```

```
<li>Combining</li>
<li>Shortening</li>
<li>Shifting</li>
<li>Borrowing</li>
<li>Onomatopoeia</li>
<li>Mistakes</li>
<li>Retronyms</li>
<li>Ex Nihilo</li>
```

```
</ul>
```

Within the container, enter each item's text between the `` and `` tags.

Use the `` and `` tags as the container for the bulleted list.

PLAY

To get some practice with the `ul` and `li` elements, try the exercises on the Web Design Playground.

➡ Online: wdpg.io/2/3-7-2

By default, the bullets used in the list are filled circles (•). You can change the number type by specifying the `list-style-type` CSS property. Table 3.2 lists the available bulleted-list values for this property.

► **Table 3.2** The bulleted-list values for the `list-style-type` CSS property

Value	Description	Example Bullet
disc	Filled circle	●
circle	Unfilled circle	○
square	Filled square	■



Summary

- To structure your page text into paragraphs, use the `p` element.
- To separate one line from the next, insert the `br` element to add a line break.
- Use the `div` element to divide the page into text blocks.
- To create an inline container for text, surround the text with the `` and `` tags.
- Use the `hr` element to separate text blocks with a horizontal rule.
- Use the `` tag to create a numbered list and the `` tag to create a bulleted list. In both cases, you use the `` tag to designate each item in the list.



Formatting Your Web Page



This chapter covers

- Styling the text font, size, and style
 - Aligning and indenting paragraphs
 - Adding text and background colors
-

You now know how to display important and emphasized text, create links and headings, and show items in bulleted or numbered lists, but although these important techniques give your web page a bit of visual interest, they won't win you any design awards. To get people to sit up and take notice of your page, you need to concentrate on the CSS side of things for a bit, and that's what you'll do in this chapter.



First, you'll learn a few ways to style your web page text, including specifying the typeface you want to use and setting the size of the text. You'll also learn how to apply bold to any text (not only important terms or keywords) and how to add italic to any text (not only emphasized words or alternative terms). From words and phrases, you jump to paragraphs, learning how to align text horizontally and indent paragraph text. The chapter closes on a colorful note as you learn how to apply CSS colors to text and to the page background.

As you'll see, these basic CSS techniques are straightforward to learn and implement, but don't let their inherent simplicity fool you. These are powerful tools that you'll use over and over to make your pages look great and to give them your personal touch. Those design awards are right around the corner.

Styling Text

Each browser uses default styles to render text such as headings and paragraphs. Although some differences exist among browsers, for the most part, these styles are rendered similarly in Google Chrome, Mozilla Firefox, Apple Safari, and so on. These styles are perfectly good design choices, but if you use these default styles, you run the risk of having your web page end up with a default look. That's the last thing you want as a web page designer, so one of your most important tasks is to override those defaults and specify your own text formatting.

Web typography is a huge, fascinating topic that I cover in depth in Chapter 18. For now, I'll keep things simple by focusing on four of the most important text-formatting features: typeface, type size, bolding, and italics.

Styling the Typeface

A *typeface* is a distinctive design that's common to any related set of letters, numbers, and symbols. What's the difference between a typeface and a font? For all practical purposes, the two terms are interchangeable. For all impractical purposes, however, a *font* is a particular implementation of a typeface, meaning the typeface as rendered with a specific size, weight, and style. Helvetica is a typeface; Helvetica 16-point bold is a font.

The typeface design gives each character a shape and thickness that's unique to the typeface and difficult to classify. Five main categories serve to distinguish most typefaces that you'll come across in your web design career:



Serif—A *serif* (rhymes with *sheriff*) typeface contains fine cross strokes (called *feet*) at the extremities of each character. These subtle appendages give the typeface a traditional, classy look, but they can get lost when displayed on a screen at small sizes.

Playground

Sans serif—A *sans-serif* typeface doesn't contain cross strokes on the extremities of characters. These typefaces usually have a clean, modern look that's well suited to screen text, particularly at small sizes.

Playground

Monospace—A *monospace* typeface (also called a *fixed-width* typeface) uses the same amount of space for each character, so skinny letters such as *i* and *l* take up as much space as wider letters such as *m* and *w*.

Playground

Cursive—The *cursive* typefaces are designed to resemble handwritten pen or brush writing.

Playground

Fantasy—*Fantasy* typefaces usually are fanciful designs that have some extreme elements (such as being extra thick).

Playground

In CSS, you tell the web browser which typeface you want to apply to an element by using the `font-family` property. You have several ways to set the `font-family` value, but let's begin by looking at the method that requires the least amount of work.

USE IT

On a screen, serif usually works best for headings and other text set at large sizes; sans serif makes good body text; monospace works well for code listings; cursive is best for short bits of text that require elegance or playfulness; and fantasy should be used only when a special effect is required.

Lesson 4.1: Specifying a Generic Font

Covers: The `font-family` property and generic fonts

➡ Online: wdpg.io/2/4-1-0

The simplest way to use `font-family` is to specify a *generic font*, which is a standard font implemented by all modern web browsers. There are five generic font families, and their names correspond to the five typeface categories discussed in the preceding section: *serif*, *sans-serif*, *monospace*, *cursive*, and *fantasy*. The following example puts the `font-family` property through its paces.



Formatting Your Web Page

► Example

⇒ Online: wdpg.io/2/4-1-1

This example shows you how to use the `font-family` property to apply the sans-serif generic font to the `h3` element and the serif generic font to the `p` element.

WEB PAGE	<p>The Web Design Playground</p> <p>Why work towards web design proficiency when you can play your way there?</p>
CSS	<pre>h3 { font-family: sans-serif; } p { font-family: serif; }</pre> <p>The <code>h3</code> element gets the sans-serif generic font.</p> <p>The <code>p</code> element gets the serif generic font.</p>
HTML	<pre><h3>The Web Design Playground</h3> <p>Why work towards web design proficiency when you can play your way there?</p></pre>

Generic fonts are useful because they're supported by all web browsers; however, with only five font families, they lack variety. If you'd like a bit more choice for your web page text, you need to access a broader collection of fonts.

Lesson 4.2: Specifying a System Font

Covers: The `font-family` property and system fonts

REMEMBER

Using quotation marks and capitalizing the first letter of each word in a system font name are optional, but they're good habits to get into because they make your code more readable.

⇒ Online: wdpg.io/2/4-2-0

Besides the built-in generic fonts, each web browser can access the fonts that site visitors have installed on their computers. Most computers have the serif typeface Times New Roman installed, for example, so your web page could use that typeface instead of the generic serif font. These installed typefaces are known as *system fonts*.

When you specify a system font, here are two things to keep in mind:

- If the font name includes one or more spaces, numbers, or punctuation characters other than a hyphen (-), surround the name with quotation marks:

```
font-family: "Times New Roman";
```



- To increase readability of your code, capitalize the first letter (or, for multiword names, capitalize the first letter of each word):

```
font-family: Georgia;
```

Note that it's perfectly acceptable—and always recommended—to specify more than one font name as long as you separate the names with commas. In that case, the browser checks the fonts in the order in which they appear and uses the first one that's installed on the user's computer. This arrangement is useful because you can't be sure which system fonts each user has installed. In particular, it's good practice to include a similar generic font family after the system font. If you specify a serif system font such as Times New Roman or Georgia (or both), for example, include the serif generic font as the last item in the `font-family` value:

```
font-family: "Times New Roman", Georgia, serif;
```

The following example applies the Verdana system font to the `div` element, which (as you might recall from Chapter 2) is the element you use to divide the web page content into separate sections.

LEARN

To get the installation percentages for many popular system fonts, see www.cssfontstack.com.

REMEMBER

Some system fonts are installed on at least 90% of both Macs and Windows PCs. For sans-serif, these fonts are Arial, Arial Black, Tahoma, Trebuchet MS, and Verdana. For serif, these fonts are Georgia and Times New Roman. For monospace, this font is Courier New.

► Example

➡ Online: wdpg.io/2/4-2-1

This example applies the Verdana system font to the `div` element and adds the `sans-serif` generic font as a backup.

WEB PAGE	<p><u>The clean, modern look of a sans serif typeface makes it ideal for web page text.</u></p> <p>↖ The div element</p>
CSS	<pre>div { font-family: Verdana, sans-serif; }</pre> <p>└ The div element gets the Verdana system font.</p>
HTML	<pre><div> The clean, modern look of a sans serif typeface makes it ideal for web page text. </div></pre>



Lesson 4.3: Setting the Type Size

Covers: The font-size property

REMEMBER

You can specify font sizes in units other than pixels. I take you through all the available CSS units of measurement in Chapter 7.

➡ Online: wdpg.io/2/4-3-0

In the same way that the web browser defines a default typeface for each element, it defines default type sizes, particularly for the heading elements h1 (largest) through h6 (smallest). Again, these defaults are usually reasonable, but I'm going to urge you to forget about the defaults and set up your own type sizes. Why? One of the secrets of good web design is assuming control of every aspect of the design, which is the only way to be sure that the web page looks the way you or your client wants it to look. One of your main jobs as a web page designer is to set your own type sizes not only for headings but also for all your page elements, including body text, captions, sidebars, and navigation.

You specify the type size of an element by setting the font-size property equal to a value in pixels, which you indicate with the unit px. The example that follows tells the web browser to render all text that appears within a div element at a text size of 24 pixels. By comparison, the example also shows some text within a p element displayed in the default size, which is 16 pixels in all modern browsers.

► Example

➡ Online: wdpg.io/2/4-3-1

This example formats the div element with a text size of 24 pixels.

WEB PAGE	<p>From Milan to Markup ← The h1 element</p> <p>The strange-but-true story of one woman's epic journey from fashion designer to web geek. ← The div element</p> <p>Hyperia Marcupala always loved design, but one day she discovered she'd rather work with pixels than pleats. ← The p element</p>
CSS	<pre>div { font-size: 24px; }</pre> <p>← The div element is given a font size of 24px</p>



HTML

```
<h1>From Milan to Markup</h1>

<div>
  The strange-but-true story of one woman's epic journey from
  fashion designer to web geek.
</div>

<p>
  Hyperia Marcupala always loved design, but one day she discovered
  she'd rather work with pixels than pleats.
</p>
```

Working with Text Styles

When you have your typeface picked out and your page elements set up with different type sizes, you're well on your way to making typographically pleasing web pages. But to make your pages stand out from the herd, you need to know two more CSS properties related to styling text. The next couple of sections take you through these styles.

Lesson 4.4: Making Text Bold

Covers: The font-weight property

➡ Online: wdpg.io/2/4-4-0

In Chapter 2, you learned that you can display text as bold by using the `` tag or the `` tag. You use these tags when the affected text has semantic significance: the `strong` element is for important text, whereas the `b` element is for keywords. But what if you have text that doesn't fit into either of these semantic categories, but you want it to appear bold anyway for the sake of appearance? In that case, you can turn to the CSS property `font-weight`. Table 4.1 lists the weights and keywords you can assign to this property.

USE IT

Nonsemantic uses for bold text include a title used at the beginning of each item in a bulleted list, the lead words or the lead sentence in a paragraph, and contact information.

BEWARE

Not all the values in table 4.1 work in all systems. If whatever typeface you're using doesn't support one or more of the weights, specifying that weight won't have any effect.



FAQ

When would I ever use the normal (or 400) value? You would use this when you're working with an element that defaults to bold styling, such as a heading. To prevent such an element from appearing with bold text, assign its font-weight property a value of normal (or 400).

► **Table 4.1** Possible values for the **font-weight** property

Weight	Keyword	Description
100		Thin text
200		Extra light text
300		Light text
400	normal	Regular text
500		Medium text
600		Semibold text
700	bold	Bold text
800		Extra-bold text
900		Black text

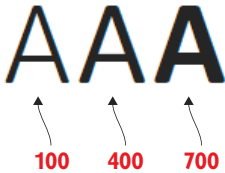
The following example gives you a taste of what bold text looks like by applying the weights 100, 400, and 700 to several span elements. (Recall from Chapter 2 that you use span to create an inline container that applies to a word or three.)

► Example

➡ Online: wdpg.io/2/4-4-1

This example demonstrates the weights 100, 400, and 700 of the Calibri typeface by applying each weight to a separate span element.

WEB PAGE



CSS

```
span {  
  font-family: Calibri, sans-serif;  
  font-size: 5em;  
}
```

HTML

```
<span style="font-weight: 100">A</span>  
<span style="font-weight: 400">A</span>  
<span style="font-weight: 700">A</span>
```

The span elements apply the various weights to the letter A.



Lesson 4.5: Making Text Italic

Covers: The font-style property

➡ Online: wdpg.io/2/4-5-0

As you learned in Chapter 2, you can display text in italics semantically by using the `` tag when you want to emphasize text or the `<i>` tag when you want to format alternative text. If you have text that isn't semantic, but you want it to appear italic anyway, use the CSS property `font-style`, and set it to the value `italic`. An example follows.

USE IT

Nonsemantic uses for italic text include pull quotes, the lead words or the lead sentence in a paragraph, and article metadata (such as the author's name and the date).

► Example

➡ Online: wdpg.io/2/4-5-1

This example applies the italic font style to the `span` element. There are two instances: the `span` that's nested within the `h1` element and the `span` that's nested at the beginning of the `div` element.

WEB PAGE	<h2>Italic Text: A History</h2> <p>The first use of italics came in 1500 when Aldus Manutius of the Aldine Press wanted a typeface that resembled the handwritten humanist script that was then in common use. He asked his typesetter Francesco Griffo to make the typeface, which Manutius first used in the frontispiece of a book of the letters of Catherine of Siena. He produced the first book set entirely in italics the next year.</p>
CSS	<pre>body { font-family: Georgia, serif; } span { font-style: italic; } div { font-size: 1.25em; }</pre> <p>The span element is formatted as italic.</p>
HTML	<pre><h1>Italic Text: A History</h1> <div> The first use of italics came in 1500 when Aldus Manutius of the Aldine Press wanted a typeface that resembled the handwritten humanist script that was then in common use. He asked his typesetter Francesco Griffo to make the typeface, which Manutius first used in the frontispiece of a book of the letters of Catherine of Siena. He produced the first book set entirely in italics the next year. </div></pre> <p>The first span instance</p> <p>The second span instance</p>



REMEMBER

When you're working with an element that defaults to italic styling, such as `cite` or `var` (see Chapter 16), you can prevent that element from appearing with italic text by assigning the keyword `normal` to its `font-style` property.

Styling Paragraphs

When (or perhaps I should say *if*) people think of typography, they tend to look at individual letters or letter combinations. That's important, for sure, but it's only the "trees" view of typography. If you want your web pages to look their best, you also need to take in the "forest" view, which encompasses the larger text blocks on the page, including titles, subtitles, headings, and especially paragraphs. As you'll see in the next couple of sections, paying attention to important styling touches such as alignment and indents can go a long way toward changing your pages from drab to fab.

Lesson 4.6: Aligning Paragraphs Horizontally

Covers: The `text-align` property

USE IT

For most web page text blocks, left-aligned text is easiest to read. Centered text is useful for page titles and subtitles. Use justified alignment when you want your text to have a more elegant look.

➡ Online: wdpg.io/2/4-6-0

To control how a paragraph or block of text is aligned horizontally—that is, with respect to the left and right page margins—use the CSS `text-align` property, which takes any of the keywords shown in table 4.2.

► **Table 4.2** Possible values for the `text-align` property

Keyword	Description
<code>left</code>	Aligns the left edge of the text block with the left margin; the right edge of the text block is not aligned (and so is said to be <i>ragged</i>). This is the default in languages that read left to right.
<code>right</code>	Aligns the right edge of the text block with the right margin; the left edge of the text block is not aligned (ragged). This is the default in languages that read right to left.
<code>center</code>	Centers each line of the text block between the left and right margins; both the left and right edges of the text block are ragged.
<code>justify</code>	Aligns the left edge of the text block with the left margin and the right edge of the text block with the right margin.

BEWARE

The web browser justifies text by adding spaces between words in a line. If your text block is narrow or includes one or more long words, you can end up with large, unsightly gaps in the text.



The four modes of alignment (centered, justified, flush left, and flush right) form the basic grammar of typographic composition. —Ellen Lupton

The following example tries out each of the four `text-align` values.



► **Example** ➡ Online: wdpg.io/2/4-6-1

This example shows the four alignment styles at work: centered for the title and subtitle, and left, right, and fully justified text blocks.

WEB PAGE	<p>Centered → Aligning Web Page Text</p> <p>Centered → Notes From the Field</p> <p>Left-aligned { We read text (in English, anyway) from left to right. This means that when we get to the end of each line, to continue we must jump down one line and then scan to the beginning of that line. That leap-and-scan is most easily made when we "know" where the next line begins. That's why left-justified text is the easiest alignment to read.</p> <p>Compare the left-justified text block above with this right-justified paragraph. In this case, when you reach the end of each line, jumping down to the next isn't a problem, but because the left side of the text block is set ragged, the beginning of each line isn't in a predictable place, which makes right-justified text a tad more difficult to read.</p> <p>Many books are set with justified paragraphs because it looks more elegant without the right-ragged edges. However, pro book designers use sophisticated layout software to manage things like hyphenation (particularly if the text includes a long word such as <i>honorificabilitudinitatibus</i>). These aren't available for the web, so it's often best not to justify.</p> <p>Right-aligned</p> <p>Justified</p>
CSS	<pre>h1, h2 { text-align: center; }</pre> <p>Centers the h1 and h2 elements</p>
HTML	<pre><h1>Aligning Web Page Text</h1> <h2>Notes From the Field</h2> <div style="text-align: left;"> We read text (in English, anyway) from left to right. This means that when we get to the end of each line, to continue we must jump down one line and then scan to the beginning of that line. That leap-and-scan is most easily made when we "know" where the next line begins. That's why left-justified text is the easiest alignment to read. </div> <div style="text-align: right;"> Compare the left-justified text block above with this right- justified paragraph. In this case, when you reach the end of each line, jumping down to the next isn't a problem, but because the left side of the text block is set ragged, the beginning of each line isn't in a predictable place, which makes right-justified text a tad more difficult to read. </div> <div style="text-align: justify;"> Many books are set with justified paragraphs because it looks more elegant without the right-ragged edges. However, pro book designers use sophisticated layout software to manage things like hyphenation (particularly if the text includes a long word such as <i>honorificabilitudinitatibus</i>). These aren't available for the web, so it's often best not to justify. </div></pre> <p>Left-aligns the first paragraph</p> <p>Right-aligns the second paragraph</p> <p>Justifies the third paragraph</p>



Lesson 4.7: Indenting Paragraph Text

Covers: The text-indent property

LEARN

Some browsers support the text-align-last property, which sets the alignment of the last line in a text block when the text-align property is set to justify. Possible values include left, right, center, and justify. See <https://caniuse.com/#feat=css-text-align-last> to follow the support for this property.

REMEMBER

A commonly used value for a paragraph indent is 16px.

BEWARE

If you want to create an outdent for a text block, make sure that the block has a left margin that's wide enough to accommodate the outdented text. See Chapter 9 to learn how to set the left margin for a text block.

➞ Online: wdpg.io/2/4-7-0

You can indent paragraph text by using the CSS text-indent property, which takes either of the values shown in table 4.3. Note that the indent applies only to the beginning of the first line of the text block.

► **Table 4.3** Values you can apply to the text-indent property

Value	Description
length	A numeric value entered with a unit, such as px.
percentage	A percentage value. The computed indent is the width of the text block multiplied by the percentage.

As with most things typographical, much debate exists about whether text blocks should be indented. Some typographers eschew indents because they believe that nonindented text is more aesthetically pleasing; others embrace indents because they believe that indented text is more readable. Whichever side you end up on, keep the following points in mind:

- Never indent the first paragraph of the page or the first paragraph after a heading. The purpose of an indent is to separate the paragraph from the one above it, but that doesn't apply to the first paragraph.
- If you indent your paragraphs, you don't need to add space between paragraphs.
- If you don't indent your paragraphs, you should add some margin or padding between the paragraphs for readability. See Chapter 9 to find out how to set the margins and padding.



Using paragraph spacing and indents together squanders space and gives the text block a flabby, indefinite shape. —Ellen Lupton



► **Example** ⇨ **Online:** wdpg.io/2/4-7-1

This example displays the three possible indent styles: flush (the first paragraph); a positive indent (second paragraph); and a negative indent (third paragraph), which is usually called an outdent or a hanging indent.

WEB PAGE	<p>Flush → The first word of the first line is the critical word of that particular body of text. Let it start flush, at least. —William Addison Dwiggins</p> <p>Indented → Typographers generally take pleasure in the unpredictable length of the paragraph while accepting the simple and reassuring consistency of the paragraph indent. —Robert Bringhurst</p> <p>Outdented → OUTDENTS work well when dramatic effect is desired. They sometimes have a second emphasis factor, such as a style or case change, that contrasts with the body text. —Kristin Cullen</p>
HTML	<pre> <div> The first word of the first line is the critical word of that particular body of text. Let it start flush, at least. —William Addison Dwiggins </div> <div style="text-indent: 16px;"> Typographers generally take pleasure in the unpredictable length of the paragraph while accepting the simple and reassuring consistency of the paragraph indent. —Robert Bringhurst </div> <div style="text-indent: -64px;"> Outdents work well when dramatic effect is desired. They sometimes have a second emphasis factor, such as a style or case change, that contrasts with the body text. —Kristin Cullen </div> </pre> <p>↖ The text-indent property isn't set, so the first line is flush with the rest of the paragraph.</p> <p>↖ Indents the first line of the paragraph</p> <p>↖ Outdents the first line of the paragraph</p>



REMEMBER

In each grayscale keyword, you can replace the word gray with the word grey, and the result will be the same color for all browsers. The keywords darkgray and darkgrey produce the same shade, for example.

Working with Colors

By default, most web browsers display the page by using black text on a white background. That combination is certainly readable but not interesting. Our marvelous eyes are capable of distinguishing millions of colors, so a palette of only black and white seems wrong somehow. Fortunately, CSS enables you to put your designer eyes to good use by offering several methods for accessing any of the 16 or so million colors that are available in the digital realm. Alas, most of those methods are a bit complicated, so I'm going to put them off until later (see Chapter 17).

For now, you get access to colors using the keywords that CSS defines. Table 4.4 lists the keywords for a few common colors.

► **Table 4.4** The CSS keywords for nine common colors

Keyword	Color
red	red
lime	lime
blue	blue
yellow	yellow
magenta	magenta
cyan	cyan
black	black
gray	gray
white	white

There are more than 140 defined keywords in all, so you shouldn't have any trouble finding the right shade (or shades) for your next web project. I've put the complete list of color keywords on the Web Design Playground at wdpg.io/2/colorkeywords. Figure 4.1 shows a partial list.



Color	Keyword	RGB Value		lightpink	#ffb6c1		pink	#ffb0cb
	crimson	#dc143c		lavenderblush	#fff0f5		palevioletred	#db7093
	hotpink	#ff69b4		deeppink	#ff1493		mediumvioletred	#c71585
	orchid	#da70d6		thistle	#d8bfd8		plum	#dda0dd
	violet	#ee82ee		magenta	#ff00ff		fuchsia	#ff00ff
	darkmagenta	#8b008b		purple	#800080		rebeccapurple	#663399
	mediumorchid	#ba55d3		darkviolet	#9400d3		darkorchid	#9932cc
	indigo	#4b0082		blueviolet	#8a2be2		mediumpurple	#9370db
	mediumslateblue	#7b68ee		slateblue	#6a5acd		darkslateblue	#483d8b
	lavender	#e6e6fa		ghostwhite	#f8f8ff		blue	#0000ff
	mediumblue	#0000cd		midnightblue	#19197c		darkblue	#00008b
	navy	#000080		royalblue	#4169e1		cornflowerblue	#6495ed
	lightsteelblue	#b0c4de		lightslategray	#778899		slategray	#708090
	dodgerblue	#1e90ff		aliceblue	#f0f8ff		steelblue	#4682b4
	lightskyblue	#87cefa		skyblue	#87ceeb		deepskyblue	#00bfff
	lightblue	#add8e6		powderblue	#b0e0e6		cadetblue	#5f9ea0
	azure	#f0ffff		lightcyan	#e0ffff		paleturquoise	#afeeee

► **Figure 4.1** To see a complete list of the CSS color keywords on the Web Design Playground, surf to wdpg.io/2/colorkeywords.

Lesson 4.8: Applying Color to Text

Covers: The color property

➡ Online: wdpg.io/2/4-8-0

Several CSS properties have a color component, including borders, backgrounds, and shadows. You learn about all those properties and more in this book (including backgrounds in the next section), but so far you know about text, so I'll start there. Here's the general CSS syntax for applying color to a text element:

```
selector {
  color: keyword;
}
```

The text item to which you want the color applied

The color property and its value

The selector can be an HTML element, such as an h1 heading or a p element, or it can be any of the CSS selectors that you'll see in Chapter 7. The real work is done by the color property and its associated value, which can be any of the CSS color keywords (or any of the other color values supported by CSS, which you learn about in Chapter 17). The following example shows the color definition for purple h1 text.



► Example

⇒ Online: wdpg.io/2/4-8-1

This example uses a keyword to assign the color purple to the h1 element.

WEB PAGE	<h1>Royalty: A History</h1> ← <code><h1></code>
CSS	<pre>h1 { color: purple; }</pre> <p>Specify the h1 element to style.</p> <p>Use the keyword purple to set the color property value.</p>
HTML	<code><h1>Royalty: A History</h1></code>

Lesson 4.9: Applying Color to a Background

Covers: The background-color property

PLAY

Style the a element to display the link text as yellow. Then add a second rule that displays the link text red and underlined when you hover the mouse over the link. ⇒ Online: wdpg.io/2/4-8-4

⇒ Online: wdpg.io/2/4-9-0

So far, I've looked only at setting the color of the foreground—the web page text—but you can use CSS to apply a color to a background. This color could be the background of the entire page (that is, the body element), a heading, a paragraph, a link, or part of a page such as a `<div>` or `` tag.

Here's the general CSS syntax for applying a background color to a web page item:

```
selector {
  background-color: keyword;
}
```

The item to which you want the background color applied

The background-color property and its value

The selector can be an HTML element or any of the CSS selectors that you learn about in Chapter 7. The key is the background-color property and its associated value, which can be any of the color keywords you learned about earlier.

The following example shows a web page with a Table of Contents sidebar that has a black background and white text. The example also gives you a partial look at the HTML and CSS used to set it up.



► **Example** ➞ Online: wdpg.io/2/4-9-1

This example shows a web page with a Table of Contents sidebar that has a black background and white text.

WEB PAGE

Using Colors Effectively

"There are only 3 colors, 10 digits, and 7 notes; its what we do with them that's important." —Jim Rohn

"Some colors reconcile themselves to one another, others just clash." —Edvard Munch

"All colors are the friends of their neighbors and the lovers of their opposites." —Marc Chagall

Color Psychology

When selecting colors, think about the psychological impact that your scheme will have on your users. Studies have shown that "cool" colors such as blue and gray evoke a sense of dependability and trust. Use these colors for a more business-like appearance. For pages that require a little more excitement, "warm" colors such as red, yellow, and orange can evoke a festive, fun atmosphere. For a safe, comfortable ambiance, try using brown and yellow. For an environmental touch, use green and brown.

Color Schemes

<div>

Table of Contents

Color Psychology
Color Schemes
Color Caveats
A Few Examples
Best Practices
CSS and Color

CSS

```
div {
  background-color: black;
  color: white;
  float: right;
  font-size: 16px;
  font-weight: bold;
  margin-left: 0.5em;
  padding: 0 10px 5px 10px;
  text-align: left;
}
```

The background-color property sets the <div> background to black.

These properties apply various styles to the <div>.

The color property sets the <div> text to white.

HTML

```
<div>
  <h3>Table of Contents</h3>
  Color Psychology<br>
  Color Schemes<br>
  Color Caveats<br>
  A Few Examples<br>
  Best Practices<br>
  CSS and Color
</div>
```

The <div> tag and its associated HTML and text



Formatting Your Web Page

PLAY

How would you modify the CSS in this example to display the Table of Contents sidebar with light gray text on a purple background?
⇒ Online: wdpg.io/2/4-9-2

PLAY

Write a CSS rule that styles links with blue text and a yellow background.
⇒ Online: wdpg.io/2/4-9-4

Summary

- You can use the `font-family` property to assign a typeface to a page element. This typeface can be one of the five generic fonts—`serif`, `sans-serif`, `monospace`, `cursive`, or `fantasy`—or a system font that’s already installed on the user’s computer.
- Use the `font-size` property to control the size of your text elements.
- Use the `font-weight` property to apply bolding nonsemantically.
- Use the `font-style` property to apply italics nonsemantically.
- Use `text-align` to set the horizontal alignment, such as centering headings and left-aligning text.
- Use `text-indent` to indent or outdent the first line of a text block.
- To color an element’s text, use the `color` property.
- To color an element’s background, use the `background-color` property.



PROJECT: Creating a Personal Home Page



This chapter covers

- Planning and sketching your personal home page
- Choosing typefaces for your page
- Adding the header and navigation links
- Adding the body text

With four chapters under your belt, it's time to put your newfound HTML and CSS knowledge to work by building something substantial. Specifically, this chapter takes you through the process of putting together a simple personal home page. *Simple* is the operative word here because you don't yet know enough HTML tags and CSS properties to construct anything complex. Fortunately, you know more than enough to create a great-looking home page for yourself. You know about headings and paragraphs; you know how to create sections by using the `<div>` and `` tags; you know how to create bulleted and numbered lists; you know how to create links; you know how to add typographic touches such as bold and italics; and you know how to apply colors to the background and to the text. As you'll see in this chapter, all that is more than enough to create a home page to be proud of.



What You'll Be Building

This project is a basic “Look, Ma, I’m on the web!” home page that enables you to take the tools and techniques you learned in this book’s first four chapters and apply them in the virtual world of the web. The result is a simple but beautiful page that enables you to stake out a bit of online turf. To what end? That depends on you, but most personal home pages serve as an introduction to anyone who comes surfing by: who you are, what you like (and even what you dislike), what you’ve done in the past, what you’re doing now, and what you’d like to do in the future. As I go along, I’ll show you an example based on my information, but naturally, you’ll want to replace my text with your own. Your web page is your house, and you can fill it with whatever you want.

Sketching the Layout

All your web projects should begin with a pen or pencil and a cocktail napkin or other handy writing surface. Creating a web page is first and foremost a *design* process, so before you start slinging code, you need to have a decent idea of what you’re building. Sure, you can construct a mental image of the page, but it’s better to begin with the more tactile approach afforded by pen and paper.

As you can see in Figure 5.1, this sketch doesn’t have to be detailed. Lay out the main sections of the page with a phrase or sentence that describes the content of each section.

► **Figure 5.1**
Before starting to code your HTML and CSS, use a pen or pencil to work up a quick sketch of the page layout and content.

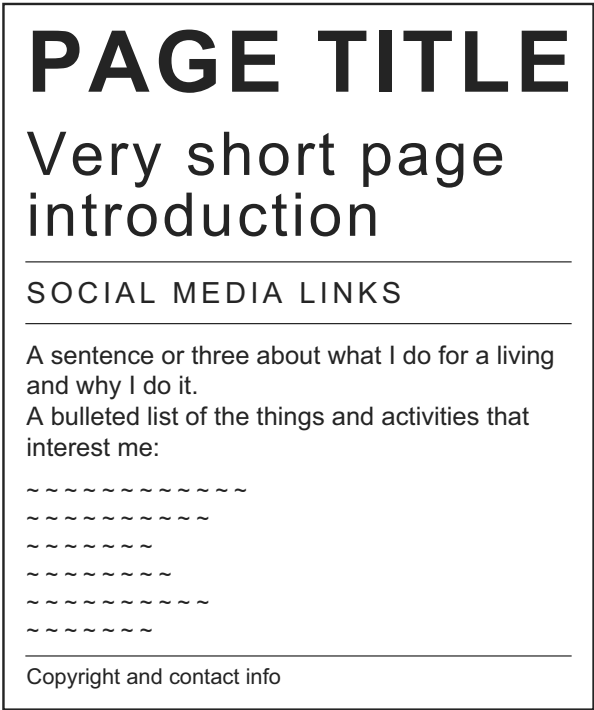




Figure 5.1 shows the layout of a page with the following six sections:

- Title of the page
- Short introduction to the page
- Links to social media sites such as Facebook and Twitter
- Text about what I do for a living
- Text and a bulleted list of things that interest me
- Page footer with a copyright notice and contact info

Your next page-planning task is deciding which typefaces you want to use for your page.

Choosing Typefaces

Because I haven't discussed images yet in this book, this first version of your personal home page is dominated by text, particularly what's known as *body text*—the large blocks of nonheading text that comprise the bulk of your page. Because a good chunk of your audience will be reading your page on devices such as laptops, tablets, and smartphones, it's important to take a bit of time up front to choose typefaces that will be legible and readable on these smaller screens.

You could build your page with a single typeface, but mixing two typefaces—one for headings and the other for body text—adds dynamism and contrast to the page. My preferred use is a sans-serif typeface for headings and a serif typeface for body text, but feel free to reverse them or to use two serifs or sans serifs. The only criterion to look for is two typefaces that work in harmony.

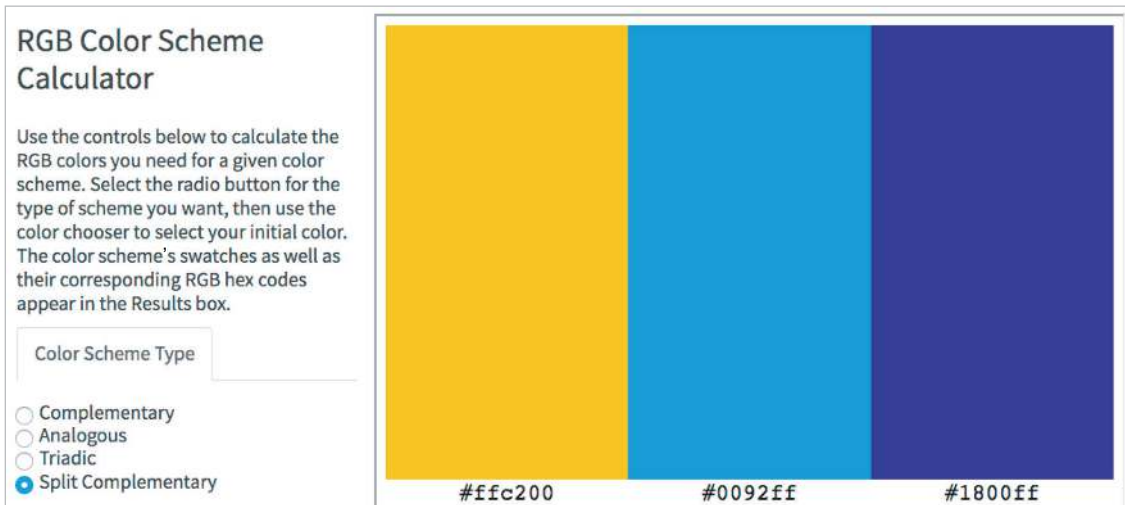
For this project, I'm going to use two perennial web favorites: the sans-serif typeface Verdana for the headings and the serif typeface Georgia for the body text. In my CSS, I'll use the following rules to specify these families:

```
font-family: Georgia, serif;  
font-family: Verdana, sans-serif;
```

With the page layout in place and your typefaces chosen, the next step is to pick out a color scheme.

Choosing a Color Scheme

In this simple page, colors won't play a huge role, but you'll want to inject some color to avoid the monotony of all black text on a white background. You can add a background color or even a gradient by using the Web Design Playground's Gradient Construction Kit (see wdpg.io/2/kits/gradient). I prefer a simple white background for this project, so my own colors focus on the text. Using the Web Design Playground's RGB Color Scheme Calculator (see wdpg.io/2/colorcalc), I chose a color scheme based on the color value #ffcc00, as shown in Figure 5.2. You, of course, should choose a color scheme that suits your style.



► **Figure 5.2** A split complementary color scheme based on the hex color value `#ffc200`

With the page layout in place and your colors chosen, it's time to translate this rough sketch into precise HTML and CSS code.

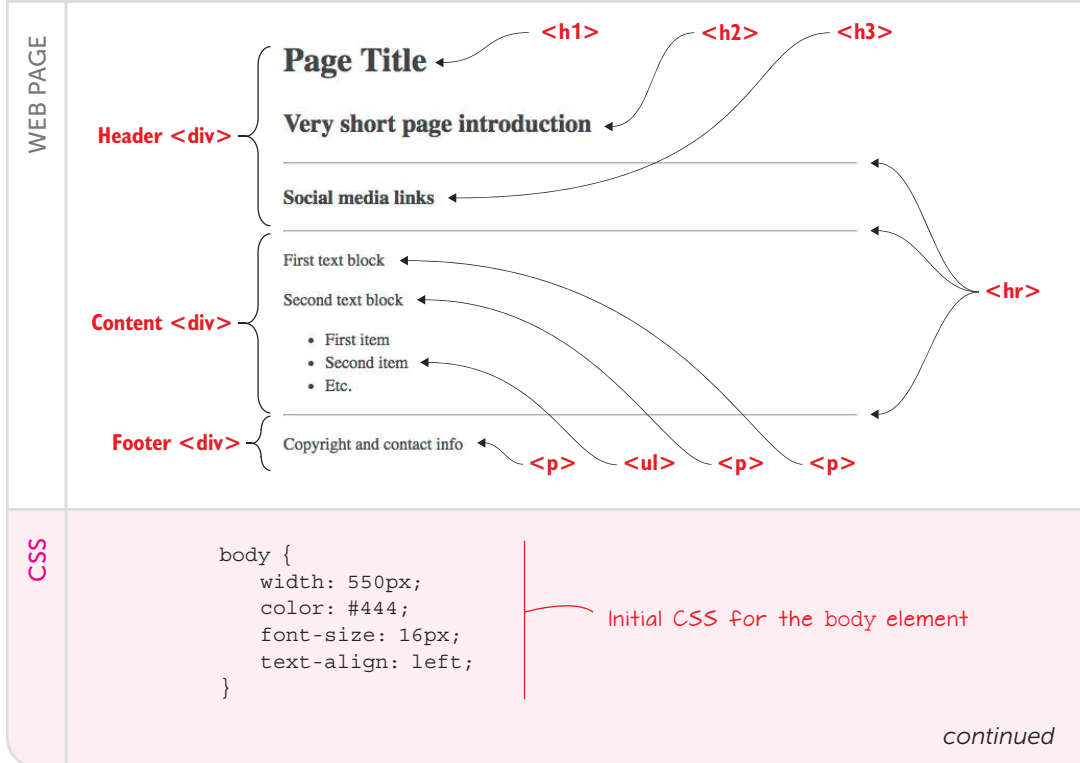
Building the Page

To build your personal home page, you'll start with the skeleton code that I introduced you to in Chapter 2. From there, you'll go section by section, adding text, HTML tags, and CSS properties.

The Initial Structure

To start, take the basic page structure from Chapter 2 and add the tags and some placeholder text for each of the page's six sections. Here's a summary of those tags:

- The page title is an `h1` heading element.
- The page introduction is an `h2` heading element.
- The social media links are within an `h3` heading element.
- The first text block is a `div` element.
- The second text block is another `div` element, which is followed by a `ul` element for the bulleted list.
- The page footer is another `div` element.

**► Try This****⇒ Online:** wdpg.io/2/projects/home-page/1*Here are the elements that make up the personal home page's initial structure.*



Project: Creating a Personal Home Page

HTML

```
<!--START OF HEADER-->
<div>
  <h1>Page Title</h1>
  <h2>Very short page introduction</h2>
  <hr>
  <h3>Social media links</h3>
  <hr>
</div>
<!--END OF HEADER-->
<!--START OF CONTENT-->
<div>
  <p>
    First text block
  </p>
  <p>
    Second text block
  </p>
  <ul>
    <li>First item</li>
    <li>Second item</li>
    <li>Etc.</li>
  </ul>
</div>
<!--END OF CONTENT-->
<!--START OF FOOTER-->
<div>
  <hr>
  <p>
    Copyright and contact info
  </p>
</div>
<!--END OF FOOTER-->
```

Comments denote the beginning and end of each section.

The header section

The content section (two paragraphs and a bulleted list)

The footer section

PLAY

I've left-aligned everything in the page to get a nice clean line down the left side of the page. There's no reason why you couldn't mess with the alignment, however. Try centering the three page header elements (title, introduction, and social media links). ➡ Online: wdpg.io/2/projects/home-page/2

Notice that the initial structure also includes a few CSS properties applied to the body element. These global properties set the width of the page and the default values for the text color, font size, and alignment. The most surprising might be the width value of 550px. Why restrict the width at all, and why use such a relatively small value? One key element in good web typography is line length. If your lines are too long, they become hard to scan, and if they're too short, the text becomes choppy. In both cases, the resulting text is difficult to read. For screen text, the optimum line length is between 65 and 75 characters, so you need to set the width so that all or most of the lines in your body text fit within that range.



Here are a few other things to note about the HTML tags used in the initial structure:

- The page is divided into three sections: a header, the content, and a footer.
- Each section is embedded within a `<div></div>` block. This block organizes the structure and enables you to apply a style (such as a font family) to everything within a particular section.
- Each section of the page is surrounded by special tags called *comments* that mark the beginning (for example, `<!--START OF HEADER-->`) and the end (for example, `<!--END OF HEADER-->`) of the section. I use all-uppercase characters to help the comments stand out from the regular code, but that practice is optional. See Chapter 16 to learn more about using comments in your code.

The Page Title

Not surprisingly, you want your page title to be more prominent than the rest of the page text. Setting the text within an `h1` element is a good start, but you'll likely need to style the text even more to get the effect you want. Here are some ideas:

- *Apply a different color.* If you make the color unique, the title will stand out from the rest of the text.
- *Apply a larger font size.* Because your page title may be something as simple as your name, a larger size makes it pop.

In the following example, I used my name as the title, but feel free to use whatever text you prefer. I applied the sans-serif system font Verdana to the header section's `div` element (which means that this font is also applied to the rest of the headings). I also styled the page title (the `h1` element) with one of the colors from my color scheme (`#1800ff`) and a 52px font size.

FAQ

Why didn't you use #000 or black as the default text color? With a white page background, pure black text can be difficult to read because of the extreme contrast between the two colors. Backing off the text color to #444 or #333 makes it easier to read.

PLAY

To help you get a feel for the ideal line lengths for onscreen reading, I've set up an exercise on the Web Design Playground. Given a paragraph of text, adjust the body element's width property to bring the line lengths into the ideal range of 65-75 characters. Try changing the font-size property to see what effect that change has on line length.
 ➞ [Online: wdp.io/2/projects/home-page/3](https://wdpg.io/2/projects/home-page/3)

REMEMBER

Don't be shy about adding comments to your code. Comments help you keep track of the page structure, and they're often indispensable when someone else needs to read your code or when you haven't looked at your page code for a few months.



Project: Creating a Personal Home Page

► Try This

➡ Online: wdpg.io/2/projects/home-page/4

This example styles the personal home page title with a color, font, and larger font size.

WEB PAGE	<h1>PAUL MCFEDRIES</h1>	← <code><h1></code>
CSS	<pre>h1 { color: #1800ff; font-size: 52px; }</pre>	The CSS code for the h1 element
HTML	<pre><div style="font-family: Verdana, sans-serif;"> <h1>PAUL MCFEDRIES</h1></pre>	The header section's div element with the font applied The h1 element with text added

PLAY

If your page title is long, it will likely wrap to a second line. That's fine, but you'll want to reduce the line height to bring the two lines closer together. For the `h1` element, try setting the `line-height` property to a value below 1 (such as 0.8 or 0.9).
➡ Online: wdpg.io/2/projects/home-page/5

The Page Introduction

The page introduction acts as a kind of subtitle. It should be a brief snippet of text that introduces you to the reader. Because the text is a subtitle, the font size should be smaller than the title text but larger than the body text. Again, setting the text within an `h2` element should do the job, but you'll want to set the size yourself, depending on what you used for the title.

In the following example, I styled my page introduction with gray text (#666) and a 22px font size. I also used an inline `` tag to style a key phrase—*technical writer*—with another color from my color scheme (#ffc200). Note as well that this `h2` element inherits the font that I applied to the header's `<div>` tag in the preceding section.



► Try This

➡ Online: wdpg.io/2/projects/home-page/6

This example styles the personal home page introduction with a color and a larger font size. Within the text, a `` tag applies a different color to the key phrase technical writer.

WEB PAGE	<p>I'm a technical writer specializing in HTML, CSS, web design, and web typography ← <code><h2></code></p>
CSS	<pre>h2 { color: #666; font-size: 22px; }</pre> <p>The CSS code for the h2 element</p>
HTML	<p>An inline span element applies a different color to the enclosed phrase.</p> <pre><h2>I'm a technical writer specializing in HTML, CSS, web design, and web typography</h2></pre>

The Social Media Links

The final element of the page header is the collection of links to your social media sites, such as Facebook, Twitter, and Pinterest. This collection is a key element of the page, so you should make it stand out from regular body text by using a larger font size or a unique color (or both).

For my own page, as shown in the following example, I styled the social media text with a sans-serif font and a 16px font size, and I typed the names in uppercase letters. For the links, I applied the third color from my color scheme (`#0092ff`) and removed the underline. Hovering over each link changes the text to the `#ffc200` color and adds underlining. Note, too, the use of a vertical-bar symbol (`|`) to separate items.

PLAY

The page introduction should be short—ideally, no more than two lines. At the same time, it should be balanced visually on the screen, with each line extending as close to the right edge of the text block as possible. I've set up an exercise on the Web Design Playground to help give you some practice doing this.

➡ Online: wdpg.io/2/projects/home-page/7




Project: Creating a Personal Home Page

► Try This

➡ Online: wdpg.io/2/projects/home-page/8

This example styles the personal home page's social media text with a font, font size, uppercase letters, and link colors; it also underlines that change when each link is hovered over.

WEB PAGE	
CSS	<pre>h3 { font-size: 16px; } a { color: #0092ff; text-decoration: none; } a:hover { color: #ffc200; text-decoration: underline; }</pre> <p>The CSS code for the h3 element</p> <p>The CSS code for the regular link text</p> <p>The CSS code for the link text when the reader hovers over it using the mouse pointer</p>
HTML	<pre><h3> FACEBOOK TWITTER PINTEREST CODEPEN LINKEDIN</h3></pre>

FAQ

What happened to the `<hr>` tags? In the initial page structure, I used horizontal rules above and below the social media links to separate them from the other page text. With the styles I've applied to the links, however, they already appear fully separate from the rest of the text, so the horizontal rules became redundant.

In the CSS code, note the following rule:

```
a:hover {
  color: #ffc200;
  text-decoration: underline;
}
```

The `:hover` code is called a *pseudo-class* and tells the web browser to apply the rule's style declarations when the user hovers the mouse over the specified element. In this example, whenever the user hovers the mouse pointer over an a element, the browser temporarily changes the link color and adds an underline. When the user moves the mouse pointer off the element, the browser returns the link to its original color and removes the underline.

The Body Text

The bulk of the personal home page is taken up by text that describes who you are, what you do for a living, what you do for fun, and so on. This text is the page's *body text*, and its content is entirely up to you.

You've already set the default text color, font size, and text alignment for the body element, and those values are inherited by the `div` element that contains the content section of the page. All that remains is to apply the body text typeface, which in my example is the serif font Georgia. To ensure that this typeface gets applied to the entire content section, I add the font to the `div` element's `font-family` property.



► Try This

➡ Online: wdpg.io/2/projects/home-page/10

This example styles the personal home page text with the Georgia typeface. It also changes the bulleted list's bullets to circles.

WEB PAGE	<p>I've been a professional technical writer for more than 30 years. I have over 100 books to my credit, which have sold more than four million copies worldwide. I've been building websites since 1996, so I have intimate knowledge of HTML, CSS, and web design. My passion is to write books and articles to pass along that knowledge and to create tools that help people build awesome web pages.</p> <p>That's my work side, so what about my personal side? That is, what do I do in my spare time? I'm glad you asked! Here's a partial (and alphabetical) list of things and activities that interest me:</p> <ul style="list-style-type: none"> ◦ Chariot racing ◦ Dog polishing ◦ Duck herding ◦ Extreme ironing ◦ Navel fluff sculpture ◦ Staycationing
CSS	<pre>ul { list-style-type: circle; }</pre> <p>The list-style-type property is set to circle to change the bullet.</p>
HTML	<p>A <code><p></p></code> block is used for each paragraph.</p> <pre><div style="font-family: Georgia, serif;"> <p> I've been a professional technical writer for more than 25 years. I have over 90 books to my credit, which have sold more than four million copies worldwide. I've been building websites since 1996, so have intimate knowledge of HTML, CSS, and web design. My passion is to write books and articles to pass along that knowledge and to create tools that help people build awesome web pages. </p> <p> That's my work side, so what about my personal side? That is, what do I do in my spare time? I'm glad you asked! Here's a partial (and alphabetical) list of things and activities that interest me: </p> Chariot racing Dog polishing Duck herding Extreme ironing Navel fluff sculpture Staycationing </div></pre> <p>The content section's div element with the Georgia system font applied</p>



Project: Creating a Personal Home Page

MASTER

Your body text also helps you determine the optimum width for the page. When you set text left-aligned, the right side of each text block is ragged, meaning that each line ends at a different point. Ideally, you should adjust the width so that your text blocks aren't too ragged (that is, one or more lines have too much whitespace at the end).

In this example, note two things:

- I embedded each of the two paragraphs inside a `<p></p>` block to honor the semantic role of the text.
- To give the bulleted list a bit of pizzazz, I set the `ul` element's `list-style-type` property to `circle` to change the default bullets.

The Page Footer

The final element of the personal home page is the page footer. As you can see in the following example, I used the footer to display a copyright notice and my contact information (which, in this case, consists of my email address). Feel free to use the footer to add any other information you see fit, such as a "thank you for reading" message, a slogan or favorite epigram, or extra contact details.

► Try This

➡ Online: wdpg.io/2/projects/home-page/12

This example separates the footer text from the body text by adding a horizontal rule and by styling the footer text with a lighter gray color, a smaller font size, and italics.

WEB PAGE	© 2023 Paul McFedries Contact: mail at my-last-name dot com	
CSS	<pre>hr { color: #666; }</pre>	The <code>hr</code> element is given a lighter color.
HTML	<pre><div style="font-family:Georgia, serif; color: #666; font-size: 14px; font-style: italic;"> <hr> &copy; 2023 Paul McFedries
 Contact: mail at my-last-name dot com </div></pre> <p>The <code>div</code> element is styled with a font, lighter color, smaller font size, and italics.</p> <p>The email address is obfuscated.</p>	



From Here

The final version of the personal home page (mine is shown in Figure 5.3) is pretty much what you'd expect: a simple, straightforward page that establishes your first home on the web. (If you're itching to get your code out there for all to see, check out the appendix to get the details.)



► **Figure 5.3** A personal home page, ready for the web

Even though you're only getting started with HTML and CSS, you still have plenty of ways to add personal touches to your humble home page. You can always add more text, of course, including a numbered list (such as a top-10 list of your favorite books or bands). You can also play with the colors, try different typefaces, mess with typographical details such as the font size and alignment, and add some links.

If you find yourself slightly disappointed with your page, that's to be expected. After all, at this early stage in your web design education, you have only limited control of the elements on the page, and you're missing key design ingredients such as images, margins, and page layout. Not to worry—you'll be learning all that and more in Part 2.

PLAY

Although dark gray (#333 or #444) text is most often used with a white background, other text colors can achieve subtle effects. A dark brown text color exudes warmth, for example. On the Web Design Playground, I've set up an example. ➡ [Online wdpg.io/2/projects/home-page/11](https://wdpg.io/2/projects/home-page/11)

FAQ

Why does your email address look so weird? If you're going to include your email address in your contact info, never display the address in plain text; you run the risk of the address being harvested by spammers. Instead, obfuscate the address in a way that foils the spammers' bots but is still easy for a human to figure out.

BEWARE

When adding a copyright notice, you may be tempted to include both the word Copyright and the copyright symbol (©), but this format is redundant. Use one or the other, but not both.



Project: Creating a Personal Home Page

Summary

- Sketch out the page you want to build.
- Choose the typefaces for the headings and body text.
- Choose a color scheme.
- Build the initial page structure: the barebones HTML tags and the global CSS properties applied to the `body` element.
- Fill in and style each section one by one: the title, the introduction, the social media links, the body text, and the footer.

Part 2

Working with Images and Styles

HTML tags are vital parts of every web designer's toolbox. You must familiarize yourself with all the basic HTML tags—from `<a>` to `<var>`—to build a decent page. But even if you memorized all the 100 or so tags in the HTML5 specification, any page you make that consisted only of tags and text would look, well, boring. It would also look utterly generic because the default renderings for things such as text, headings, and lists are more or less the same in all modern browsers.

I know you're not reading this book because you want to be boring and generic! So here in Part 2, you expand your web design horizons with tools and techniques that go well beyond the basics. You learn about images, video, and audio in Chapter 6, and you gain advanced-but-practical style sheet know-how in Chapter 7. In Chapter 8, you learn how to position web page elements like a pro, and Chapter 9

introduces you to the all-important CSS box model, which lets you size elements and add borders and margins around elements.

Finally, in Chapter 10, you summon all your newfound HTML and CSS knowledge and use it to build a slick landing page for a product.



Adding Images and Other Media



This chapter covers

- Embedding an image on a web page
- Working with background images
- Optimizing images for the web
- Adding videos, music, and other media

When you come across a page that's nothing but text, how does it make you feel? It probably makes you feel disappointed or perhaps even sad. Unless the text is absorbing and the typography exceptionally good, it also probably makes you want to click the Back button and look for some place where your sore eyes can catch a break. You don't want people feeling disappointed, sad, or eager to leave your site, so throw them a visual bone or two by sprucing up your pages with images and perhaps even a video once in a while. In this chapter, I show you how it's done.



Lesson 6.1: Adding an Image to the Page

Covers: The `img` element

FAQ

Do I have to include the `alt` attribute? Yes. Your web page won't validate unless every one of your `` tags has an `alt` attribute present. If your page uses decorative or other nonessential images, set the `alt` attribute equal to the empty string (`" "`). That way, your page is still valid, but you're not annoying people using assistive technology, such as screen readers, who don't want to hear descriptions of purely decorative images.

REMEMBER

If you don't yet have the image you want to use but you know the image's final dimensions, you can insert a placeholder image to occupy the same space on the page until the image is ready to use. You have several ways to do this, but the easiest is to use a placeholder server, such as <https://placeholder.com>. In the `` tag, add `src="https://via.placeholder.com/wxh"`, where `w` and `h` are the width and height, respectively.

➡ Online: wdpg.io/2/6-1-2

➡ Online: wdpg.io/2/6-1-0

So far in this book, you've seen that the innards of a web page are text with a few HTML tags and CSS rules sprinkled strategically here and there. So, you may be wondering how images fit into this text-only landscape. The short answer is that they don't! Unlike with a word processing document or a presentation, you don't insert images directly into a web page. Instead, you upload the image as a separate file to your website and then insert into your page text a special HTML tag that tells the browser where to locate the image. Then the browser retrieves the file from the server and displays the image on the page in the location you specified.

The special tag that gets the browser to add an image to a web page is the `img` element, which uses the partial syntax shown in Figure 6.1.

The location of the image A description of the image

``

Tooltip text for the image

► **Figure 6.1** You insert an image into a web page by using the `` tag.

You have three attributes to consider here:

- **src**—This attribute (short for *source*) specifies where the image file is located. If the file is on a remote server, use the full URL of the file; if the file is in the same directory as the HTML file, use the name of the file; otherwise, use the image's path and filename. If you've created in your site's main folder a subfolder named `images`, and your image file is `logo.png`, your `src` value would be `/images/logo.png`.
- **alt**—This attribute (short for *alternative*) is a word or short phrase that describes the image and that could be used in place of the image if the image file can't be displayed. A company logo, for example, might use the alternative text `logo`, preceded by the company name. Alt text is also used by screen readers and Braille apps to give the user some idea of what the image is.
- **title**—This optional attribute is used to specify tooltip text that appears when the user hovers the mouse pointer over the image, as shown in the example that follows.




The following example shows an `img` element in action.

► Example

➡ Online: wdpg.io/2/6-1-1

This example shows you how to use the `` tag to add an image to a web page.

WEB PAGE	
CSS	<pre>span { font-family: Optima, Verdana, sans-serif; font-size: 3em; }</pre>
HTML	<pre> Atomic Web Design</pre> <p>Location of the image file</p> <p>Alternative text</p> <p>Tooltip text</p>

“Your website needs a proper balance between textual and visual content. Awesome images or videos without text will give your visitor little to no useful data, but you might find it hard to engage users with large slabs of plain text. —Helen Stark

Understanding Image File Formats

In the preceding example, you may have noticed that the image file was named `atomic-logo.png`, meaning that it uses the PNG image file format. That format is common on the web, but it's not the only one you can use. In fact, the web has standardized on four formats that account for almost all web imagery, as summarized in table 6.1.



Adding Images and Other Media

► **Table 6.1** Image file formats

Name	Extension	Description	Uses
GIF	.gif	This is the original web graphics format (the name is short for Graphics Interchange Format, which is pronounced <i>giff</i> or <i>jiff</i>). GIFs are limited to 256 colors, can have transparent backgrounds, and can be combined into short animations.	Use GIFs if you want to combine multiple images into a single animated image.
JPEG	.jpg .jpeg	This format (which gets its name from Joint Photographic Experts Group and is pronounced <i>jay-peg</i>) supports complex images that have many millions of colors. The main advantage of JPEG files is that they're compressed, so even digitized photographs and other high-quality images can be a reasonably small size for faster downloading. Note, however, that JPEG compression is <i>lossy</i> , which means that it makes the image smaller by discarding redundant pixels. The higher the compression, the more pixels are discarded and the less sharp the image appears.	If you have a photo or similarly complex image, JPEG is almost always the best choice because it gives the smallest file size. How small is small enough for the web? You learn about that topic in the "Optimizing Images" section later in this chapter.
PNG	.png	This format (short for Portable Network Graphics and pronounced <i>p-n-g</i> or <i>ping</i>) supports millions of colors. It's a compressed format, but unlike JPEGs, PNGs use <i>lossless</i> compression. Images retain sharpness, but the file sizes can get quite big. PNG also supports transparency.	If you have an illustration or icon that uses solid colors, or a photo that contains large areas of near-solid color, PNG is best because it gives you a reasonably small file size while retaining excellent image quality. You can also use PNG if you need transparency effects.
SVG	.svg	This format (short for Scalable Vector Graphics) uses vectors rather than pixels to generate an image. These vectors are encoded as a set of instructions in XML format, meaning that the image can be altered in a text editor and can be manipulated to produce animations.	If you have a logo or icon and have a graphics program that can save files as SVG (such as Adobe Illustrator or Inkscape), this format is a good choice because it produces small files that can be scaled to any size without distortion.

LEARN

If you want to join the animated-GIF fun, lots of sites on the web can help. The easiest route is to use an online service such as GIPHY (<http://giphy.com/create/gifmake>) or Canva (www.canva.com/create).

Getting Graphics

The text part of a web page is, at least from a production standpoint, a piece of cake for most folks. Graphics, on the other hand, are another kettle of digital fish entirely. Creating a snazzy logo or eye-catching illustration requires a modicum of artistic talent, which is a bit harder to come by than basic typing skills.



If you have such talent, however, you're laughing: create the image in your favorite graphics program and save it in JPEG or PNG format. The nonartists in the crowd have to obtain their graphics goodies from other sources. Besides uploading your own photos or scanning your own images, you can find no shortage of other images floating around. Here are some ideas:

- Many programs (including Microsoft Office and most paint and illustration programs) come with clip art libraries. Clip art is professional-quality artwork that you can incorporate into your own designs. In almost all cases, you're free to use the clip art in your own designs without worrying about copyright.
- Take advantage of the many graphics archives online. Sites all over the web store hundreds, and even thousands, of images: stock photos, illustrations, icons, and more. Many of these images are free, but check each site's terms of use.
- Grab an image from a web page. When your browser displays a web page with an image, the corresponding graphics file is stored temporarily on your computer's hard disk. In most browsers, you can right-click the image to save that file permanently. As I elaborate in the note off to the side, however, there are copyright concerns because you shouldn't use images that you don't own without permission and/or credit.

BEWARE

Don't forget that many images are the property of the people or companies that created them in the first place. Unless you're absolutely sure that a picture is in the public domain (for example, it comes with a Creative Commons license that lets you reuse the image), you need to get permission from the owner before using it. Either way, be sure to give credit to the image owner on your site.

Inserting an HTML5 Figure

Although many of your images are purely decorative or designed to catch a site visitor's eye, you may also use plenty of graphics that tie in with your page text. When you reference an image directly in the text, that image is known as a *figure*. In HTML5, a figure is a semantic page element that you designate with the `figure` element. If the figure has a caption, that caption is also a semantic element that you designate with the `figcaption` element. Here's the basic structure to use:

```
<figure>
  
  <figcaption>Caption text</figcaption>
</figure>
```

Following is an example.



Adding Images and Other Media

► Example

➡ Online: wdpg.io/2/6-1-4

This example shows you how to use the `figure` and `figcaption` elements to designate an image as a figure.

WEB PAGE

During our recent rebranding, we came up with a snazzy new logo, shown in Figure 8.3.



Figure 8.3: The new Atomic Web Design logo

HTML

```
<p>
  During our recent rebranding, we came up with a
  snazzy new logo, shown in Figure 8.3.
</p>
<figure>
  
  <figcaption>
    Figure 8.3: The new Atomic Web Design logo
  </figcaption>
</figure>
```

Encloses the image in the figure element.

Encloses the caption in the figcaption element.

Setting Up an Image as a Link

You already know that you can set up a word or phrase as a link, but you can do the same with images. You arrange things in the same way, surrounding the `` tag with the `<a>` and `` tags, like so:

```
<a href="url"></a>
```

Here's an example.



► Example

➡ Online: wdpg.io/2/6-1-6

This example shows you how to use the `a` element and the `img` element to turn an image into a link.

WEB PAGE	 <h1>Atomic Web Design</h1> <input type="text" value="atomicwebdesign.io"/>
HTML	<pre> Atomic Web Design</pre> <p>Encloses the image in the <code>a</code> element.</p>

Using an Image as a Custom Bullet

As you learned in Chapter 2, CSS offers the `list-style-type` property that enables you to specify another type of bullet character to use with an unordered list. You can kick that property up a notch by using the `list-style-image` property to specify an image to use as a custom bullet:

```
ul {
  list-style-image: url(file);
}
```

As with the `` tag, the `file` value specifies the location of the image file. Note, however, that you don't have to surround the value with quotation marks. Following is an example.

BEWARE

I've shown the code for turning an image into a link on one line for a purpose. If you place these tags on separate lines—particularly the closing `` tag—you end up with weird artifacts in the text (essentially, underlined carriage returns).



Adding Images and Other Media

► Example

➡ Online: wdpg.io/2/6-1-7

This example shows you how to use the `list-style-image` property to specify an image as a custom bullet.

WEB PAGE

Prepare Images for the Web:

- ✓ Remove unnecessary images
- ✓ Choose the correct image format
- ✓ Size the images appropriately
- ✓ Compress JPEGs as needed
- ✓ Optimize PNGs

CSS

```
ul {  
  list-style-image: url(/images/checkmark.png);  
}
```

Sets the `list-style-image` property to the image file location

HTML

```
<h3>  
  Prepare Images for the Web:  
</h3>  
<ul>  
  <li>Remove unnecessary images</li>  
  <li>Choose the correct image format</li>  
  <li>Size the images appropriately</li>  
  <li>Compress JPEGs as needed</li>  
  <li>Optimize PNGs</li>  
</ul>
```

Aligning Images and Text

The `` tag is an inline element, so you can insert it into, say, a paragraph or similar block element, and it will flow along with the rest of the content. By default, the bottom edge of the image aligns with the baseline of the current line, but you can control that vertical alignment by using the `vertical-align` property:

```
element {  
  vertical-align: baseline | bottom | middle | top;  
}
```

- **baseline**—The bottom of the image is aligned with the baseline of the current line (the default).



- **bottom**—The bottom of the image is aligned with the bottom of the current line (that is, the bottommost extent of descending letters such as y and g).
- **middle**—The middle of the image is aligned with the baseline of the current line, plus one half of the x-height of the current font.
- **top**—The top of the image is aligned with the top of the current line.

MASTER









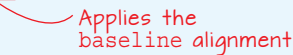

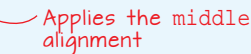

If you need even finer control of the vertical placement of an image, you can specify a length value, in pixels (px), for the vertical-align property. To move the image up, specify a negative value.

The following example shows the vertical-align property at work.

► Example

➡ Online: wdpg.io/2/6-1-10

This example shows you how to use the vertical-align property to align an image vertically with surrounding content.

WEB PAGE	
	<div>  Animal path </div> <div>  Bridleway </div> <div>  Coffin trail </div> <div>  Desire line </div>
	<div>  Baseline </div> <div>  Bottom </div> <div>  Middle </div> <div>  Top </div>
HTML	
	<pre> <div> Animal path </div> <div> Bridleway </div> <div> Coffin trail </div> <div> Desire line </div> </pre> <div>  Applies the baseline alignment </div> <div>  Applies the bottom alignment </div> <div>  Applies the middle alignment </div> <div>  Applies the top alignment </div>



Lesson 6.2: Working with Background Images

Covers: background-image and related properties

➡ Online: wdpg.io/2/6-2-0

To add some visual interest to an element, you can use the background-image property to specify an image file to use as the background:

```
element {  
  background-image: url(file);  
}
```


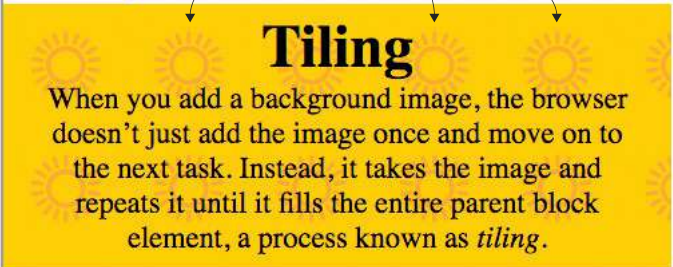
The *file* value specifies where the image file is located. If the file is on a remote server, use the full URL of the file; if the file is in the same directory as the HTML file, use the name of the file; otherwise, use the image's path and filename.

The following example shows this property in action.

► Example

➡ Online: wdpg.io/2/6-2-1

This example shows you how to use the background-image property to apply an image as the background of an element.

WEB PAGE	<div data-bbox="235 908 913 1393"><p>Original image</p><p>Tiled background images</p><p>Tiling</p><p>When you add a background image, the browser doesn't just add the image once and move on to the next task. Instead, it takes the image and repeats it until it fills the entire parent block element, a process known as <i>tiling</i>.</p></div>
CSS	<pre>div { background-image: url(/images/bg.png); width: 500px; height: 200px; }</pre> <p>← The div element gets a background image.</p>



HTML

```

<div>
  <h1>Tiling</h1>
  <p>When you add a background image, the browser doesn't just
  add the image once and move on to the next task. Instead, it takes
  the image and repeats it until it fills the entire parent block
  element, a process known as <i>tiling</i>.
  </p>
</div>
```

The image is displayed on its own for comparison.

When working with background images, you should assume that the image may not load properly for some reason. Therefore, it's always a good idea to specify the `background-color` property with a value that matches the main color of the image. Here's an example:

```
div {
  background-color: #fec72f;
  background-image: url(/images/bg.png);
}
```

Controlling the Background Repeat

You saw in the preceding example that the browser's default behavior for a background image that's smaller than the element is to repeat the image horizontally and vertically until the element is filled. This behavior is called *tiling* the background, and it's usually the behavior you want. However, you can control whether the background repeats horizontally, repeats vertically, or doesn't repeat at all by using the `background-repeat` property:

```
element {
  background-image: url(file);
  background-repeat: repeat|repeat-x|repeat-y|round|space|no-repeat;
}
```

- `repeat`—Tiles the image horizontally and vertically (the default)
- `repeat-x`—Tiles the image only horizontally, as shown in Figure 6.2
- `repeat-y`—Tiles the image only vertically, as shown in Figure 6.3
- `round`—Stretches each repeated image as needed to fill the container
- `space`—Tiles the image as much as possible without clipping the image
- `no-repeat`—Displays the image once

BEWARE

A background image can add a nice bit of eye candy to a page, but it leaves a bitter taste if it interferes with the legibility of your page text. Always ensure that you've got lots of contrast between the text and the background.

PLAY

You can try out all the `background-repeat` values interactively in the Web Design Playground. ➞ [Online: wdpg.io/2/6-2-2](https://wdpg.io/2/6-2-2)

REMEMBER

The `repeat` value is the default, so declaring `background-repeat: repeat` is optional.



Adding Images and Other Media

► Figure 6.2

With `background-repeat: repeat-x`, the background image repeats horizontally.

► Figure 6.3

With `background-repeat: repeat-y`, the background image repeats vertically.

PLAY

You can try out all the background-position keywords interactively in the Web Design Playground.
➡ Online: wdpg.io/2/6-2-3

REMEMBER

The left top value is the default, so declaring `background-position: left top` is optional. Note, too, that this value is equivalent to `background-position: 0% 0%` or `background-position: 0px 0px`.

Tiling

When you add a background image, the browser doesn't just add the image once and move on to the next task. Instead, it takes the image and repeats it until it fills the entire parent block element, a process known as *tiling*.

Tiling

When you add a background image, the browser doesn't just add the image once and move on to the next task. Instead, it takes the image and repeats it until it fills the entire parent block element, a process known as *tiling*.

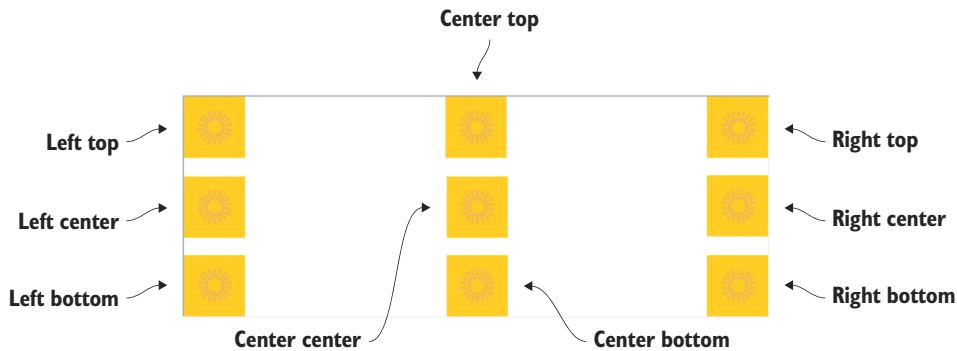
Setting the Background Position

By default, the background image tiling starts in the top-left corner of the parent element. You can change that setting by applying the `background-position` property:

```
element {  
  background-image: url(file);  
  background-position: horizontal vertical;  
}
```

- **horizontal**—Specifies the starting horizontal position of the background image tiling. You can use the keywords `left`, `center`, or `right`; a percentage; or a pixel value (or any of the CSS length units you'll learn about in Chapter 7).
- **vertical**—Specifies the starting vertical position of the background image tiling. You can use the keywords `top`, `center`, or `bottom`; a percentage; or a pixel value (or any of the CSS length units you'll learn about in Chapter 7).

Figure 6.4 is a composite that shows the nine possible positions when you use the three horizontal keywords (`left`, `center`, and `right`) and three vertical keywords (`top`, `center`, and `bottom`). Note that in each case, I set the `background-repeat` property to `no-repeat`.



► **Figure 6.4** The nine possible keyword-based positions for the `background-position` property

Adding a Hero Image

One of the most popular web design trends of the past few years is the *hero image*: an eye-catching photo or illustration that takes up the entire width (and usually the entire height) of the browser window when you first land on a page. Using a hero image is a great way to grab a visitor's attention right off the bat.

To set up a hero image, you need to do the following:

- 1 Begin the page with a block element (such as a `div`) that's styled to take up the entire browser window:


```
width: 100vw;
height: 100vh;
```
- 2 For that same block element, add a background image and set its position to `background-position: center center`.
- 3 Add the declaration `background-size: cover`, which tells the browser to size the image so that it covers the entire background of the block element.

Following is an example.

PLAY

Another way to use an image as a custom bullet is to set the image as the background for the `li` element, which enables you to use `background-position` to control the alignment of the bullet and the item text.
 ➡ Online: wdpg.io/2/6-2-4

REMEMBER

The `vw` and `vh` units represent one one-hundredth of the browser window's width and height, respectively. For more on these units, see Chapter 7.



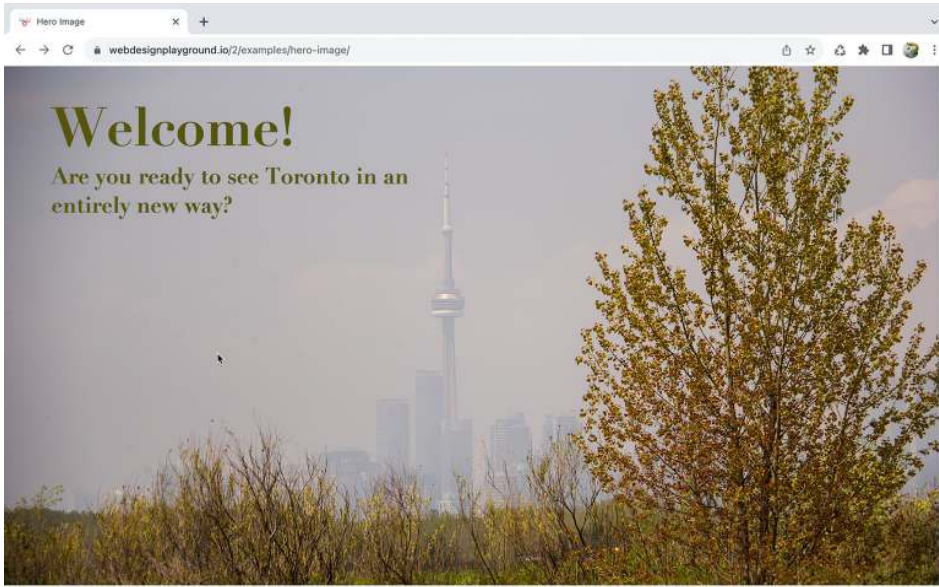
Adding Images and Other Media

► Example

➡ Online: wdpg.io/2/6-2-5

This example shows you how to add a hero image to a page.

WEB PAGE



CSS

```
.hero-image {  
  width: 100vw;  
  height: 100vh;  
  background-image: url(/images/toronto.jpg);  
  background-position: center center;  
  background-size: cover;  
}
```

Element sized to the browser window

The image covers the entire element.

The image is displayed and centered.

HTML

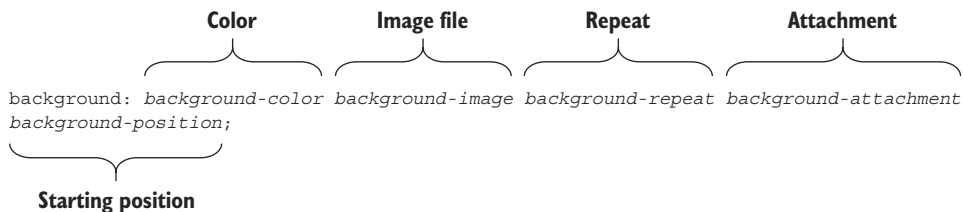
```
<div class="hero-image">  
  <h1>Welcome!</h1>  
  <h2>Are you ready to see Toronto in an entirely new way?</h2>  
</div>  
<div class="main">  
  The main page content goes here.  
</div>
```

Container element for the hero image



The Background Shorthand Property

CSS has five main background-related components: color, image, repeat, attachment, and position. These components are represented, respectively, by the CSS properties `background-color`, `background-image`, `background-repeat`, `background-attachment`, and `background-position`. (CSS has three other background-related properties—`background-size`, `background-origin`, and `background-clip`—that I don't cover in this book.) Handily, you can apply any or all of these properties with a single statement by using the background shorthand property, which takes the simplified syntax shown in Figure 6.5.



► **Figure 6.5** You can apply up to five background properties at the same time by using the background property.

This syntax is a straightforward repetition of everything you've learned so far, and you're free to enter the properties in any order you prefer.

Optimizing Images

"Color is free on the web" is a common saying in web design circles that means you can add colors to text, backgrounds, borders, and other elements without paying a performance price. This is decidedly *not* the case with images, which, thanks to their potential to be huge (particularly those hero images I talked about earlier), can come with high performance costs indeed. To help ensure that your pages aren't bandwidth hogs that take ages to load, here are a few tips to bear in mind for optimizing the images you use:

- **Don't use unnecessary images.** Before adding an image to a page, ask yourself whether the image is needed to convey your message. If so, go for it. If not, leave it behind. Your users will thank you.
- **Watch your image sizes.** Web browsers can resize images as needed, but they shouldn't have to. If you want a 100 × 100 logo in the top-left corner, don't upload a 2,048 × 2,048 version of that image and force the browser to resize (by, say, specifying the smaller width and height in your CSS). That bigger file will take a long time to download, which is a waste of bandwidth.
- **Choose your file format wisely.** As a general rule, you should use the image file format that produces the smallest file size while still retaining a satisfactory level of image quality for the job at hand. A hero image should look good, but a tiny thumbnail doesn't have to be a high-resolution image.

PLAY

You can make the background stay in place while you scroll the rest of the page by adding the declaration `background-attachment: fixed`.
 ➡ Online: wdpg.io/2/6-2-6

PLAY

One of the most surprising aspects of background images is that you can use multiple backgrounds on the same element. You can repeat the same background image in two or more places or use two or more background images (or both!). ➡ Online: wdpg.io/2/6-2-7

BEWARE

If you plan to overlay text on your hero image, make sure that the image includes an area that's not too busy so that your text will be readable. In addition, ensure that you have sufficient contrast between the colors of your image and your text.



Adding Images and Other Media

LEARN

If you need to use 24-bit PNGs, software tools are available that can help reduce the size of those files. If you use a Mac, try ImageAlpha (<https://pngmini.com>); if you run Windows, check out PNGoo (<https://pngquant.org>).

- *Take advantage of JPEG compression.* If you're saving your image in the JPEG format, your imaging software allows you to choose a compression level for the file. You'll need to experiment a bit to get the right level, but for most uses, a compression level in the range of 60% to 75% is a good place to start. More compression usually leads to poor image quality, and less compression usually results in large file sizes.
- *Optimize PNG images.* When you're working with a PNG image, decide whether you can get away with 8-bit color, which is a mere 256 colors. For a simple logo or icon, 8-bit color may be more than enough, and you'll end up with quite a small file. For more complex images, you'll probably need the full 24-bit palette.

Adding Video and Audio to the Page

You know that people love their cat videos and podcasts, so you want a piece of the action by adding video or audio content to your own web pages. Great idea! I'll begin with the good news: HTML5 comes with the `<video>` and `<audio>` tags, which offer a somewhat straightforward way to embed media content in a page. Notice that I said *somewhat*. Why the hedge? Ah, that's where the bad news rears its complexifying head. Right now, web media is a crazy quilt of standards, compression algorithms, and file formats. It's borderline absurd, but if you want to serve your visitors sights or sounds, you need to wade into the deep end. I'll begin by defining two aspects of web media formats:

- *Container*—The file format, called a *container* because it acts like the media equivalent of a zip file—that is, it's an archive that contains multiple items, particularly the media codecs (discussed next) and the media metadata.
- *Codec*—The algorithm used to encode and compress the video or audio in a digital format and to decode and decompress the media for playback. (The word *codec* is a blend of *code/decode* and *compress/decompress*.)

So, a web media file that you'd embed in a page comes in a specific media format that uses a particular container, and within that container are all the codecs that the format supports. Sounds simple enough, right? The absurdity comes into play when you understand that there's no such thing as a standard or universal media format.



Web Video Formats

For video, in fact, you have three main formats to worry about:

- **WebM**—This format uses the WebM container, inside which is either the VP8 or VP9 video codec, as well as the Vorbis or Opus audio codec. This format is open source and royalty free. File extension: `.webm`.
- **Ogg**—This format uses the Ogg container, inside which is the Theora video codec, as well as the Vorbis or Opus audio codec. This format is open source and royalty free. File extension: `.ogg` or `.ogv`.
- **MPEG-4**—This format uses the MPEG-4 container, inside which is the H.264 video codec, as well as the AAC audio codec. This format is patented but free for end users. File extension: `.mp4`.

Which one should you use? Most of the time, you can get away with using the MPEG-4 format, which is supported by all major browsers. That support is a bit problematic, however. First, Firefox doesn't support MPEG-4 natively; instead, it relies on the operating system's built-in support for MPEG-4. Second, Google has hinted that it may not support MPEG-4 in future releases of Chrome. It's a good idea to serve your visitors both an MPEG-4 version and a WebM version (which is newer and better supported than Ogg).

Web Audio Formats

For audio, there are even more formats:

- **MP3**—This format is both the container and the audio codec. This format is patented but free for end users. File extension: `.mp3`.
- **WAV**—This format is both the container and the audio codec. File extension: `.wav`.
- **WebM**—This format uses the WebM container, inside which is the Vorbis or Opus audio codec. This format is open source and royalty free. File extension: `.webm`.
- **Ogg**—This format uses the Ogg container, inside which is the Vorbis or Opus audio codec. This format is open source and royalty free. File extension: `.ogg` or `.oga`.
- **MPEG-4**—This format uses the MPEG-4 container, inside which is the AAC audio codec. This format is patented but free for end users. File extension: `.m4a`.

Things are a bit saner in the audio world, where every browser now supports the MP3 format, so you can get away with using the one file type.

LEARN

Many tools are available to convert videos to formats supported by HTML5. Two online tools that are worth checking out are Zamzar (www.zamzar.com) and Online-Convert (www.online-convert.com/).

LEARN

The two online tools I mentioned earlier also support the HTML5 web audio formats. You may also want to have a look at Media.io (<https://media.io>).



Lesson 6.3: Embedding Video in a Web Page

Covers: The video element

➡ Online: wdpg.io/2/6-3-0

HTML5's video element offers a no-nonsense way of embedding video content in your web page. Well, *no-nonsense* may be wishful thinking. You can use two syntaxes, depending on the number of video file formats you want to serve.

First, here's the syntax to use if you're offering a single video format:

```
<video src="file"
      poster="file"
      width="value"
      height="value"
      controls
      autoplay
      loop>
</video>
```

- **src**—Specifies the location of the video file, so it's much the same as the **src** attribute for the `` tag
- **poster**—Specifies the location of an image, such as a title frame or still frame from the video, to display before video playback begins
- **width** and **height**—Specify the dimensions of the video playback window
- **controls**—When included, tells the browser to display the playback controls in the video window
- **autoplay**—When included, tells the browser to automatically start playing the video as soon as it has downloaded enough of the video file to play it back smoothly
- **loop**—When included, tells the browser to begin playback from the beginning each time the video ends

Following is an example.



► Example

➡ Online: wdpg.io/2/6-3-1

This example shows you how to embed a single video-file format in a web page.

WEB PAGE



HTML

```
<video src="/videos/movie.mp4"
      poster="/images/movie-poster.jpg"
      width="625"
      height="480"
      controls
      autoplay
      loop>
</video>
```

To offer two or more video formats, you need to remove the `src` attribute from the `<video>` tag and add multiple source elements, one for each format you want to offer:

```
<video poster="file"
      width="value"
      height="value"
      controls
      autoplay
      loop>
  <source src="file"
        type='type; codecs="codecs"'>
</video>
```

- **src**—As before, the `src` attribute for each `<source>` tag specifies the name and/or location of the video file.



Adding Images and Other Media

- **type**—This string (surrounded by single quotation marks) specifies the video format type (as shown earlier in this chapter in the “Web Video Formats” section), a comma-separated and double-quotation-mark-surrounded list of the format’s video and audio codecs.

- **MPEG-4**—Use the following:

```
type='video/mp4; codecs="avc1.4D401E, mp4a.40.2"'
```

- **WebM**—Use one of the following:

```
type='video/webm; codecs="vp8, vorbis"'\ntype='video/webm; codecs="vp9, vorbis"'\ntype='video/webm; codecs="vp9, opus"'
```

- **Ogg**—Use one of the following:

```
type='video/ogg; codecs="theora, vorbis"'\ntype='video/ogg; codecs="theora, opus"'
```

Here’s an example.

► Example

➡ Online: wdpg.io/2/6-3-2

This example shows you how to embed multiple video file formats in a web page.

WEB PAGE





HTML

```
<video poster="/images/movie-poster.jpg"
        width="625"
        height="480"
        controls
        autoplay
        loop>
  <source src="/videos/movie.mp4"
          type='video/mp4; codecs="avc1.4D401E, mp4a.40.2"'>
  <source src="/videos/movie.webm"
          type='video/webm; codecs="vp8, vorbis"'>
  <source src="/videos/movie.ogv"
          type='video/ogg; codecs="theora, vorbis"'>
</video>
```

Lesson 6.4: Embedding Audio in a Web Page

Covers: The audio element

➞ Online: wdpg.io/2/6-4-0

You'll be delighted to hear that embedding audio in a web page is nearly identical to embedding video because the `<audio>` and `<video>` tags have many of the same attributes. First, here's the syntax to use if you're offering a single audio format:

```
<audio src="file"
        controls
        autoplay
        loop>
</audio>
```

- `src`—Specifies the location of the audio file
- `controls`—When included, tells the browser to display the playback controls in the audio window
- `autoplay`—When included, tells the browser to automatically start playing the audio as soon as it has downloaded enough of the audio file to play it back smoothly
- `loop`—When included, tells the browser to begin playback from the beginning each time the audio ends

Following is an example.



Adding Images and Other Media

► Example

➡ Online: wdpg.io/2/6-4-1

This example shows you how to embed a single audio file format in a web page.

WEB PAGE



HTML

```
<audio src="/audio/music.mp3"
      controls
      autoplay
      loop>
</audio>
```

To offer two or more audio formats, remove the `src` attribute from the `<audio>` tag and add multiple `<source>` tags, one for each format you want to offer:

```
<audio controls
      autoplay
      loop>
  <source src="file"
          type="type">
</audio>
```

- `src`—As before, the `src` attribute for each `<source>` tag specifies the name and/or location of the audio file.
- `type`—This specifies the audio format type (as shown earlier in the “Web Audio Formats” section.)

Here’s an example.



► Example

➡ Online: wdpg.io/2/6-4-2

This example shows you how to embed multiple audio file formats in a web page.

WEB PAGE



HTML

```
<audio controls
  autoplay
  loop>
  <source src="/audio/music.mp3"
    type="audio/mp3">
  <source src="/audio/music.wav"
    type="audio/wav">
  <source src="/audio/music.webm"
    type="audio/webm">
  <source src="/audio/music.ogg"
    type="audio/ogg">
  <source src="/audio/music.m4a"
    type="audio/mp4">
</audio>
```

Summary

- There are four main image-format types—GIF, JPEG, PNG, and SVG—although most of your pages will use JPEG for photos and complex images, and PNG for illustrations, logos, and icons that use mostly solid colors and/or transparency.
- To add an image to the page, use the `` tag:

```

```

- To infuse your images with HTML5 semantic flavor, surround the `img` element with the `figure` element, and, optionally, add a `figcaption` element.
- To make an image do double duty as a link, surround the `img` element with the `a` element.



Adding Images and Other Media

- You can set up an image as an element background by adding the following property to the element's CSS:

```
background-image: url(file);
```

- You can control the background image's display by adding one or more of the following properties: `background-repeat`, `background-position`, and `background-attachment`.
- You can set all three of these properties, as well as the `background-color` and `background-image` properties, by using the background shorthand property.
- You embed a video in a web page by using the `<video>` tag, and you embed sound in a web page by using the `<audio>` tag.
- With both the `<video>` tag and the `<audio>` tag, you can specify multiple formats by adding a separate `<source>` tag for each.



Learning More About Styles



This chapter covers

- Learning the three methods for adding styles to a web page
- Adding power and flexibility with classes
- Understanding the units of measurement you can use in your CSS

How do you craft pages that rise above the humdrum? How do you design pages that go beyond the same old, same old? One word: *styles*. If you've seen a well-designed web page, know that the page uses styles to achieve that look. If there's a web designer whose work you admire, know that the designer mastered styles that make her work stand out. You saw several useful styles in Part 1 of the book, but those styles are only a taste of what's out there. To help you get started down the road to becoming truly style savvy, this chapter takes your style knowledge to the next level.



REMEMBER

A style is an instruction to the browser to modify how it displays something on the page, and a style sheet (the SS part of CSS) is a collection of styles. So, throughout this book, I use the terms CSS and styles interchangeably.

► Figure 7.1

The syntax of a property-value pair

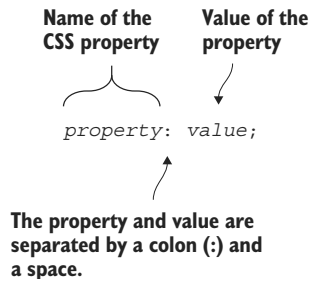
FAQ

Do I have to add a space after the colon? Strictly speaking, no, as the space isn't required. I do recommend adding the space, however, because it makes your styles more readable.

Adding Styles to a Page

I mentioned in Chapter 1 that a web page is a text file filled with words, numbers, and a few strategically placed HTML tags that provide structure for the text. You'll be happy to hear that CSS is also a text-based business, so you don't need anything grander than a simple text editor (or this book's handy Web Design Playground) to get started with styles.

That said, although *what* styles consist of is simple enough, *how* you add styles to a web page is a bit more complex. First, recall from Chapter 1 that a single style declaration consists of a property-value pair that uses the syntax shown in Figure 7.1.



The *property* name is almost always written in lowercase letters (although it doesn't have to be). If the *value* includes one or more spaces, numbers, or punctuation characters other than a hyphen (-), surround the value with quotation marks.

The added complexity of CSS comes from the fact that you have not one, not two, but *three* ways to tell the web browser what style declarations you want to use:

- Inline styles
- Internal styles
- External styles

The next three lessons introduce you to these methods.

Lesson 7.1: Inserting Inline Styles

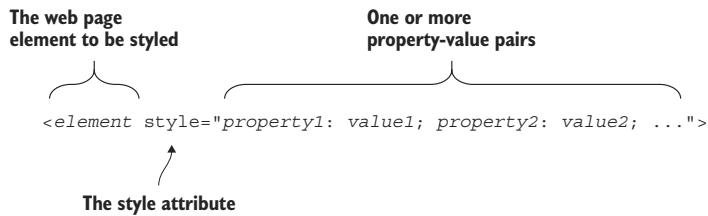
Covers: The `style` attribute

USE IT

A good use for inline styles is to perform a quick test of a CSS property or two. If you're getting started with a page and haven't yet set up an external style sheet (see Lesson 7.3), inline styles are a quick way to test-drive some CSS.

⇒ Online: wdpg.io/2/7-1-0

Probably the most straightforward way to add styles to your web page is to insert them directly into the element you want to modify. This technique is called an *inline style*, and you insert a style by including the `style` attribute within the HTML element you want to change. Figure 7.2 shows the general syntax to use.



► **Figure 7.2** The syntax to use for inline styles

Here are a few points to keep in mind when you use inline styles:

- If you want to include two or more property-value pairs in a single inline style, be sure to separate each pair with a semicolon (;).
- If a value needs to be quoted, use single quotation marks (').
- An inline style affects only the element in which you place the style attribute.

Following are a couple of examples of inline styles.

BEWARE

Because the style attribute's value is itself surrounded by double quotation marks, be careful if one of your property-value pairs requires quotation marks of its own. In that case, surround the value with single quotation marks (for example, `style="font-family: 'PT Sans' ;"`).

► **Example** Online: wdpg.io/2/7-1-1

This example shows an inline style applied to a `<p>` tag, as well as an inline style with multiple property-value pairs applied to a `` tag.

WEB PAGE

The *snowclone* is a kind of *phrasal template* since it comes with one or more empty "slots" that get filled with words to create a new phrase. Some examples:

The `<p>` text

- I'm not an X, but I play one on TV
- In X, no one can hear you Y
- X and Y and Z, oh my!

The `` text

continued



HTML

The `p` element's inline style sets the font size.

```
<p style="font-size: 1.5em"> The <i>snowclone</i> is a kind of
<i>phrasal template</i> since it comes with one or more empty
"slots" that get filled with words to create a new phrase. Some
examples:</p>
<ul style="color: darkgreen; font-family: 'Trebuchet MS',
sans-serif; font-size: 1.25em;">
  <li>I'm not an X, but I play one on TV</li>
  <li>In X, no one can hear you Y</li>
  <li>X and Y and Z, oh my!</li>
</ul>
```

The `ul` element's inline styles set the text color, typeface, and size.

PLAY

Can you spot the style attribute error in the following `<a>` tag? ` ➡ Online: wdpg.io/2/7-1-3`

Although inline styles are the easiest way to add CSS code to your page, they're not the most convenient method for anything other than the simplest of pages because they require you to add the `style` attribute directly to every element you want styled. If your page consists of, say, a dozen `h2` elements, and you want to apply the same style to them all, you must add a dozen `style` attributes. Even worse, if you later decide to change how your `h2` elements appear, you have to change every instance of the `style` value. That's a lot of work, so most web designers eschew inline styles or use them only for specific instances.

What do these designers do instead? Ah, that's where internal styles come in.

Lesson 7.2: Adding an Internal Style Sheet

Covers: The `style` element

➡ Online: wdpg.io/2/7-2-0

The second method for getting styles into a web page involves adding a `<style></style>` tag pair in the page's head section (that is, between the page's `<head>` and `</head>` tags) and then defining the styles within those tags. This method is called an *internal style sheet* (or sometimes an *embedded style sheet*), and it uses the following general syntax:



The web page elements
to be styled

```
<style>
  selectorA {
    propertyA1: valueA1;
    propertyA2: valueA2;
    ...
  }
  selectorB {
    propertyB1: valueB1;
    propertyB2: valueB2;
    ...
  }
  ...
</style>
```

Declarations are
surrounded by opening
and closing braces.

One or more
declarations

Style rule

From this syntax, you can see that an internal style sheet consists of one or more *style rules*, each of which defines one or more property-value pairs to be applied to the specified web page elements. Each rule has the following characteristics:

- A *selector* that specifies the web page elements to which you want the style applied. This selector is often a tag name, but it can also specify any other type of CSS selector (such as the class selector, described in Lesson 7.4).
- An opening left brace: {.
- One or more property-value pairs, separated by semicolons.
- A closing right brace: }.

In CSS lingo, a property-value pair is called a *declaration*, and the collection of declarations applied to a selector—that is, the braces and the property-value pairs between them—is called a *declaration block*. The combination of a selector and its declaration block is called a *style rule*. The following example uses an internal style sheet to format the `dt` element.



Learning More About Styles

► Example

➡ Online: wdpg.io/2/7-2-1

This example uses an internal style sheet to apply a font size and bolding to each of the `<dt>` tags.

WEB PAGE	<p>Some movie jobs to commit to memory:</p> <ul style="list-style-type: none">Gaffer The head electrician.Best Boy The gaffer's assistant.Grip A person who moves equipment.
CSS	<pre><style> dt { font-size: 18px; font-weight: bold; } </style></pre> <p>The CSS rule for the <code>dt</code> element</p>
HTML	<pre><p>Some movie jobs to commit to memory:</p> <dl> <dt>Gaffer</dt> <dd>The head electrician.</dd> <dt>Best Boy</dt> <dd>The gaffer's assistant.</dd> <dt>Grip</dt> <dd>A person who moves equipment.</dd> </dl></pre> <p>The <code><dt></code> tags and text</p>

MASTER

Declaration blocks can get quite long, with some containing a dozen or more property-value pairs. One way to make reading and working with these big blocks easier is to add the declarations in alphabetical order by property name.

Here, you see one of the great advantages of using internal styles. If your page has a dozen `dt` elements, this one style applies to them all, which gives the page a consistent look. Even better, if you decided that a size of 20px would look better for your `dt` text, you'd have to change the value only once in the style declaration; that change would be reflected automatically in all your `dt` elements.

Internal styles work beautifully if your site consists of a single web page. Such sites aren't rare, but it's far more likely that your or your client's site will consist of several pages, perhaps even several dozen. If you want your pages to have a consistent look—and you should, because consistency



across pages is one of the hallmarks of good web design—using internal style sheets means copying the same `<style>` tag to each and every page. In addition, if you change even one aspect of any style rule, you must make the same change to the same rule in every page. The bigger your site is, the less appealing all that maintenance sounds and the more likely you'll be to switch to external style sheets.

Lesson 7.3: Referencing an External Style Sheet

Covers: The `link` element

➡ Online: wdpg.io/2/7-3-0

The third and final method for adding styles to a page involves creating a second text file that you use to define your style rules. This method is called an *external style sheet*, and by tradition, its filename uses the `.css` extension (as in `styles.css`). Within that file, you use the same syntax that you saw earlier for an internal style sheet, but you do without the `style` element:

```

selectorA {
  propertyA1: valueA1;
  propertyA2: valueA2;
  ...
}
selectorB {
  propertyB1: valueB1;
  propertyB2: valueB2;
  ...
}
  
```

Web page elements to be styled

Declarations are surrounded by opening and closing braces.

One or more declarations

Style rule

To let the web browser know that you have an external style sheet, you add a `<link>` tag to your web page's head section. Figure 7.3 shows the syntax.

```

<link href="location/filename.css" rel="stylesheet">
  
```

Where the external style sheet file is located

Tells the web browser that the linked file is a style sheet

The name of the external style sheet file

REMEMBER

Traditionally, you save an external style sheet text file with the `.css` extension (e.g., `styles.css`).

► Figure 7.3

The `<link>` tag syntax for attaching an external style sheet to a web page



REMEMBER

As with the `<style>` tag, you may see some CSS external file `<link>` tags that include the `type="text/css"` attribute. That attribute was required to validate with HTML 4.01, but you don't need it with HTML5.

In this syntax, the *location* value is perhaps the trickiest. There are four possibilities:

- *Reference a CSS file in the same directory.* Leave out the location and reference only the filename, like so:

```
<link href="styles.css" rel="stylesheet">
```

- *Reference a CSS file in a subdirectory of the web page directory.* The location is the name of the subdirectory. If the subdirectory is named `css`, for example, you'd use the following:

```
<link href="css/styles.css" rel="stylesheet">
```

- *Reference a CSS file in a subdirectory of the website's main subdirectory.* The location is the root directory (`/`) followed by the name of the subdirectory. If the subdirectory is named `css`, for example, you'd use the following:

```
<link href="/css/styles.css" rel="stylesheet">
```

- *Reference a CSS file on a remote server.* The location is the full URL of the CSS file. Here's an example:

```
<link href="https://fonts.googleapis.com/css?family=Lato"
rel="stylesheet">
```

Using an external style sheet brings three major advantages to your web pages:

- *Makes applying a consistent look across multiple pages much easier*—If you attach the same external style sheet to several pages, and that CSS styles, say, your `h1` elements, those tags will look exactly the same on all the pages.
- *Makes updating and maintaining your pages much easier*—If you make a change to the CSS in an external style sheet, that change is automatically propagated to every web page that links to the CSS file.
- *Enhances the separation between structure and presentation*—By using an external style sheet, you separate your project into two distinct layers: a *structural layer* of files that contain only HTML tags and a *presentation layer* of files that contain only CSS rules. Nice.



This isn't to say that you should use only external style sheets rather than inline styles or internal style sheets. You have plenty of good reasons to use the `style` element, and you'll find that some web page design problems are most easily solved by using a `style` attribute in an HTML tag. There's no need for taking a dogmatic approach to CSS; do what works.

Lesson 7.4: Using Class Selectors

Covers: The class selector

➡ Online: wdpg.io/2/7-4-0

Earlier, you learned that when you're defining a style rule, the first thing you specify is the web page object you want styled, followed by the declaration block:

```
selector {  
  property1: value1;  
  property2: value2;  
  ...  
}
```

The specified object is called a *selector*, and so far in this book, you've seen it used only with element names, such as `h1` and `div`. This selector is known as the *type selector* because it targets a specific type of HTML element.

Type selectors are handy, and you'll use them frequently in your web design career, but it doesn't take long before you come across a conundrum: What are you supposed to do when you have multiple instances of the same type of element that need different styling? A web page can easily have a few dozen `<div>` tags, so what's a coder to do if some of those `divs` require, say, right-aligned, italic, light-gray text set at 20 px, and others require centered, bold, dark-gray text set at 24 px? You could insert all these styles as inline styles, sure, but that task quickly gets unwieldy when you're working with more than a half dozen elements.

You work around this and similar problems by taking advantage of the many other types of CSS selectors available. CSS derives most of its tremendous flexibility and power through these selectors. I don't think I'm exaggerating in the least when I say that if you want to become a CSS wizard—or (which is sort of the same thing) if you want to make yourself irresistibly hireable as a web designer—mastering selectors is the royal road to that goal. To get started down that road, check out perhaps the most powerful CSS selector: the class selector.

One of the most common web design scenarios is having multiple page objects that require the same styling. Whenever you have a set of elements that require the same styling, you can group those elements under a single HTML and CSS umbrella. In HTML, that umbrella takes the form of the `class` attribute, and the syntax appears in Figure 7.4.

REMEMBER

Although exceptions occur, for purposes of this book, your class names must begin with a letter; the rest of the name can include any combination of letters, numbers, hyphens (-), and underscores (_). ➡ Online: wdpg.io/2/7-4-3/.



Learning More About Styles

► Figure 7.4

Use the `class` attribute to assign a class name to an HTML element.

BEWARE

Class names are case-sensitive, meaning that the browser treats, say, `myClassName` and `myclassname` as two separate classes.

The web page element

The name of the class

```
<element class="class-name">
```

The class attribute

The following code assigns the class name `custom-bullet-text` to a `` tag:

```
<span class="custom-bullet-text">
```

The key point here—and the source of the power inherent in using classes—is that you can assign the same class to multiple elements. When that's done, you can use an

internal or external style sheet to define the styles for that class by using the class name, preceded by a dot (`.`) as the selector in your CSS:

```
.class-name {  
    property1: value1;  
    property2: value2;  
    ...  
}
```

The following example shows you how to use a class selector.

► Example

➡ Online: wdpg.io/2/7-4-1

This example assigns a class name to each `` tag and then uses a CSS class selector to apply a rule to those `span` elements.

WEB PAGE

Cube, Dice, or Mince? What's the Diff?

- Chop: To cut into small pieces.
- Cube: To cut into cube-shaped pieces.
- Dice: To cut into small, cube-shaped pieces.
- Mince: To cut into very small pieces.
- Shred: To cut or tear into long, thin irregular strips.

`class="custom-bullet-text"`

The styles aren't applied to the bullets.

CSS

```
.custom-bullet-text {  
    color: brown;  
    font-size: 18px;  
    line-height: 1.5;  
}
```

Rule for the `custom-bullet-text` class



HTML

```
<h3>Cube, Dice, or Mince? What's the Diff?</h3>
<ul>
  <li><span class="custom-bullet-text">Chop: To cut into small
pieces.</span></li>
  <li><span class="custom-bullet-text">Cube: To cut into cube-
shaped pieces.</span></li>
  <li><span class="custom-bullet-text">Dice: To cut into small,
cube-shaped pieces.</span></li>
  <li><span class="custom-bullet-text">Mince: To cut into very
small pieces.</span></li>
  <li><span class="custom-bullet-text">Shred: To cut or tear
into long, thin irregular strips.</span></li>
</ul>
```

The `custom-bullet-text` class is assigned to each `span` element.

Units of Measurement in CSS

Many web page styles require measurement values, including font sizes, border widths, and margin sizes. So far in this book, I've used pixels (px) to specify measurements, but you can use several other units, which I've laid out in Table 7.1.

► **Table 7.1** Units of measurement for CSS properties

Unit	Name	Description
px	Pixel	An absolute measurement equal to 1/96 of an inch
pt	Point	An absolute measurement equal to 1/72 of an inch
em	Em	A relative measurement equal to the element's default, inherited, or defined font size
rem	Root em	A relative measurement equal to the font size of the root element of the web page
vw	Viewport width	A relative measurement equal to 1/100 of the current width of the browser window
vh	Viewport height	A relative measurement equal to 1/100 of the current height of the browser window

MASTER

Why not apply the CSS to the `li` element in this example? Such a rule would also style the bullet. By wrapping each list item in a ``, you can style only the text.



BEWARE

Don't confuse the `em` unit of measurement with the `em` element used to emphasize text in HTML.

REMEMBER

The root element of a web page is the `html` element. This element is automatically assigned either the browser's default type size (usually 16 px) or the type size set by the user in the browser's preferences.

PLAY

Classes are even more powerful than I've shown here because you can apply multiple classes to a single element by separating class names with a space in the class attribute value. The code ``, for example, applies both the `red-text` class and the `big-text` class to a span element.

➞ Online: wdpg.io/2/7-4-2

Table 7.1 lists two types of units: absolute and relative. *Absolute* measures have a fixed size—a pixel is a pixel, for example—so you can be sure that an element sized with an absolute measure always appears consistently. As a designer, you may think this fact is a good thing, but it isn't always—especially on the web, where users sometimes change the default size of text in their browser settings. As a designer, your job should be to honor that change, not override it. Absolute values are frowned upon because they overrule type size changes set by the user, which is a design no-no. In addition, as you'll see in Chapter 14, absolute values make your page design too rigid, so it doesn't show up well on both large and small screens.

Therefore, modern web design best practices eschew absolute units in favor of relative units, usually `rem`s or percentages. Relative measures don't have a fixed size. Instead, they're based on whatever size is supplied to the element. This size could be inherited from the parent element, or it could be the default specified by the user. If the browser's default type size is 16 px, and you set your `<p>` type to `1.5rem`, your paragraph text will be rendered at 24 px. If the user bumped up the default text size to 20 px your paragraphs will render at 30 px, thus preserving the relative size of the text. In addition, relative measures scale well on devices of different sizes, so a design that looks good on a desktop screen can be made to look as good on a smartphone screen. (Again, Chapter 14 is the place to get the details.)

Summary

- Inline styles are added directly to a tag using the `style` attribute.
- You create an internal style sheet by adding your definitions to the `<style>` tag.
- An external style sheet exists as a separate `.css` file and is referenced through a `<link>` tag.
- A *class selector* applies CSS rules to any element that uses the specified class name.
- For CSS properties that require measurement values, use one of the following units: `px`, `pt`, `em`, `rem`, `vw`, or `vh`.



Floating and Positioning Elements



This chapter covers

- Learning how elements flow down the page
- Interrupting the normal flow by floating elements
- Using floats to create drop caps and pull quotes
- Interrupting the normal flow by positioning elements

Left to its own devices, the web browser imposes an inflexible structure on your web pages, and your site is in danger of becoming boring (at least from a design perspective). To avoid that fate, you need to take control of your page elements and free them from the web browser's fixed ideas about how things should be laid out. You do that by wielding two of the most powerful CSS tools in the web designer's arsenal: floating and positioning. With these tools, you can break out of the browser's default element flow and build interesting, creative pages that people will be itching to visit. This chapter tells you everything you need to know.



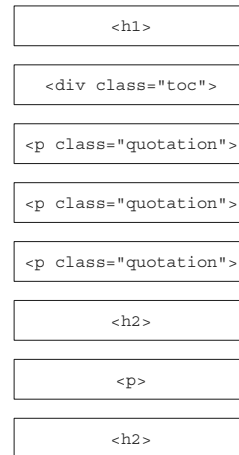
Floating and Positioning Elements

Understanding the Default Page Flow

When you add elements to a web page, the browser lays out those elements in the order in which they appear in the HTML file according to the following rules:

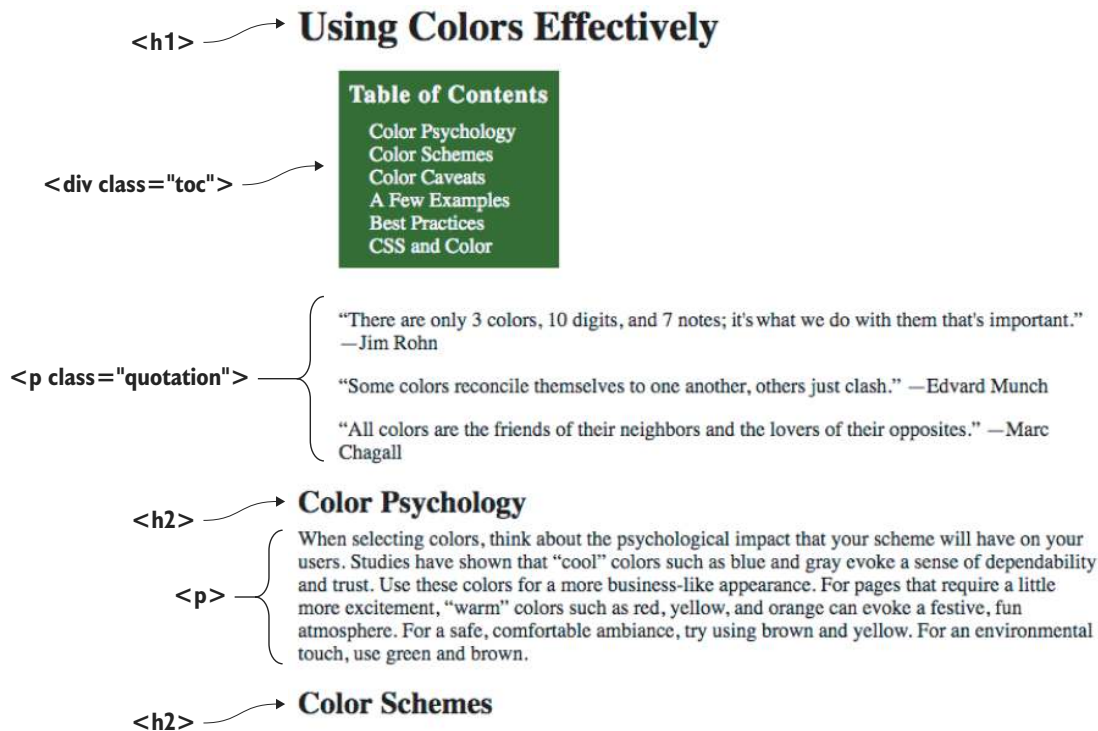
- Block-level elements are stacked vertically, with the first element on top, the second element below it, and so on.
- Each inline element is rendered from left to right (in English and other left-to-right languages) within its parent block element.

Figure 8.1 shows a schematic diagram of a few block-level elements, stacked as the browser would render them. Figure 8.2 shows the corresponding web page with inline elements added.



► **Figure 8.1**

The browser stacks block-level elements one on top of another.



► **Figure 8.2** The block-level elements from Figure 8.1, filled with inline elements



Lesson 8.1: Floating Elements

Covers: The `float` property

⇒ Online: wdpg.io/2/8-1-0

You can interrupt the top-to-bottom flow of elements by *floating* one or more elements to the left or right. *Floating* means that the browser takes the element out of the usual flow and places it as far as possible to the left or to the right (depending on the value you provide) and as high as possible (depending on other content) in its parent element. Then the rest of the page content flows around the floated element. You float an element by setting its `float` property:

```
element {
  float: left|right|none;
}
```

In Figure 8.2, for example, the page would look nicer and make better use of space if the table of contents could be pushed to the right with the quotations flowing around it. That's readily done with the `float` property, as shown in the following example.

MASTER

Because the nearby nonfloated page elements wrap around the floated element, you should ensure that adequate whitespace exists between them by adding a margin around the floated element.

REMEMBER

Unlike with a nonfloated element, the top and bottom margins of a floated element do not collapse. See Chapter 9 to learn more about collapsing margins.

► **Example** ⇒ Online: wdpg.io/2/8-1-1

This example uses the `float` property to float the table of contents to the right.

WEB PAGE

Using Colors Effectively

"There are only 3 colors, 10 digits, and 7 notes; it's what we do with them that's important." —Jim Rohn

"Some colors reconcile themselves to one another, others just clash." —Edvard Munch

"All colors are the friends of their neighbors and the lovers of their opposites." —Marc Chagall

Color Psychology

When selecting colors, think about the psychological impact that your scheme will have on your users. Studies have shown that "cool" colors such as blue and gray evoke a sense of dependability and trust. Use these colors for a more business-like appearance. For pages that require a little more excitement, "warm" colors such as red, yellow, and orange can evoke a festive, fun atmosphere. For a safe, comfortable ambiance, try using brown and yellow. For an environmental touch, use green and brown.

Color Schemes

Table of Contents

- Color Psychology
- Color Schemes
- Color Caveats
- A Few Examples
- Best Practices
- CSS and Color
- Color Resources

continued



Floating and Positioning Elements

CSS

```
.toc {  
  float: right;  
  margin-left: 2em;  
  margin-bottom: 2em;  
  etc.  
}
```

The float property applied to the toc class

HTML

```
<h1>Using Colors Effectively</h1>  
<div class="toc">  
  <h3>Table of Contents</h3>  
  <div>Color Psychology</div>  
  <div>Color Schemes</div>  
  <div>Color Caveats</div>  
  <div>A Few Examples</div>  
  <div>Best Practices</div>  
  <div>CSS and Color</div>  
  <div>Color Resources</div>  
</div>  
<p class="quotation">  
  "There are only 3 colors, 10 digits, and 7 notes; it's what we do  
  with them that's important." —Jim Rohn  
</p>  
etc.
```

This <div> tag uses the toc class.

BEWARE

If you float an inline element, be sure to give it a width so that the browser knows how much space to give the element.

FAQ

Can I float only block-level elements? No, you can also apply the float property to an inline element, such as a span. When you do, however, the browser takes the element out of the normal flow, turns it into a block-level element, and then floats it.

Clearing Floated Elements

In the preceding example, notice that not only do the three quotations wrap around the floated table of contents but so does the first h2 element ("Color Psychology") and part of the paragraph that follows it. That behavior normally is what you want. But what if, for aesthetic or other reasons, you prefer that the h2 element and its text do *not* wrap around the table of contents?

You can do that by telling the browser that you want the h2 element to *clear* the floated element. *Clearing* an element from a floated item means that the browser renders the element after the end of the floated item. You clear an element by setting its clear property:

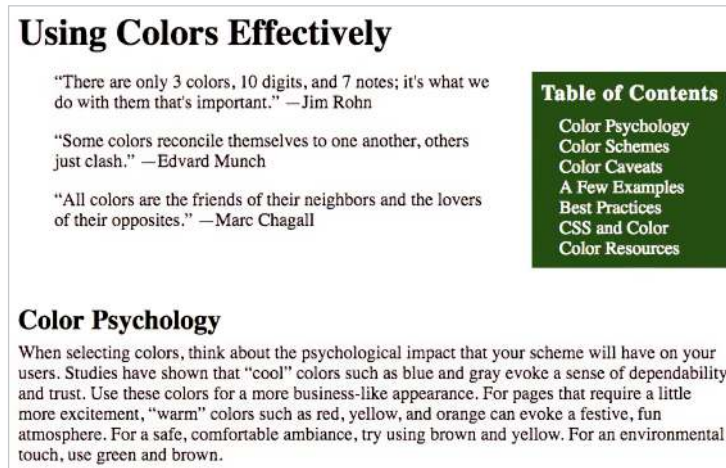
```
element {  
  clear: left|right|both|none;  
}
```

You use left to clear element of any elements that have been floated left, right to clear element of any elements that have been floated right, or both to clear element of both left- and right-floated elements. To clear the h2 element in the example, I'd use the following code:

```
h2 {  
  clear: right;  
}
```




Figure 8.3 shows the page with the h2 (Color Psychology) now clearing the floated table of contents.



► **Figure 8.3**

The Color Psychology h2 element now clears the floated table of contents.

Preventing Container Collapse

Floated elements have a few gotchas that you need to watch for. The biggest one is that under certain circumstances, a floated element will overflow or drop right out of its parent container. To see what I mean, look at the following code (see Figure 8.4), which has two `<p>` tags in a `<div>` container that has been styled with a light-blue background and a red border:

CSS:

```
div {
  border: 1px solid red;
  background-color: lightcyan;
}
```

HTML:

```
<div>
  <p>
    If you float two consecutive elements, the second floated
    element will always appear either beside the first floated element
    or below it.
  </p>
  <p>
    For example, if you float the elements left, the second
    will appear to the right of the first. If there isn't enough room
    to the right, it will appear below the first element.
  </p>
</div>
```

PLAY

You can float multiple elements. ➡ [Online: wdpg.io/2/8-1-3](https://wdpg.io/2/8-1-3)



Floating and Positioning Elements

► Figure 8.4

Two `<p>` elements inside a `<div>` container

If you float two consecutive elements, the second floated element will always appear either beside the first floated element or below it.

For example, if you float the elements left, the second will appear to the right of the first. If there isn't enough room to the right, it will appear below the first element.

Figure 8.5 shows the result when I style the `<p>` tags with a width and float them to the left:

CSS:

```
.col {  
    float: left;  
    width: 300px;  
}
```

HTML:

```
<p class="col">
```

► Figure 8.5

When I float the `<p>` elements, the `<div>` container collapses on itself.

The `<div>` has collapsed.

If you float two consecutive elements, the second floated element will always appear either beside the first floated element or below it.

For example, if you float the elements left, the second will appear to the right of the first. If there isn't enough room to the right, it will appear below the first element.

Bizarrely, the `<div>` container nearly disappears! That red line across the top is all that's left of it. What happened? When I floated the `<p>` elements, the browser took them out of the normal flow of the page. The `<div>` container saw that it no longer contained anything, so it collapsed on itself. This always occurs when a parent element contains only floated child elements.

To fix this problem, you can tell the parent element to clear its own child elements, thus preventing it from collapsing. Figure 8.6 shows a class that does this.



After the parent...

```
.self-clear::after {
  content: "";
  display: block;
  clear: both;
}
```

...insert an empty string...

...make it a block...

...and clear both left and right.

► Figure 8.6

A class that enables a parent element to clear its own child elements

REMEMBER

*This solution is sometimes called a **clearfix hack**.*

This class tells the browser to insert an empty string, rendered as a block-level element, and have it clear both left- and right-floated elements. The following example shows the fix in action and the full code.

► Example

➡ Online: wdpg.io/2/8-1-5

This example fixes the collapsing parent problem by telling the parent to self-clear its own floated child elements.

WEB PAGE

If you float two consecutive elements, the second floated element will always appear either beside the first floated element or below it.

For example, if you float the elements left, the second will appear to the right of the first. If there isn't enough room to the right, it will appear below the first element.

CSS

```
div {
  border: 1px solid red;
  background-color: lightcyan;
  width: 675px;
}
.col {
  float: left;
  width: 300px;
}
.self-clear::after {
  content: "";
  display: block;
  clear: both;
}
```

This rule styles the div element.

This class adds a width and floats the element.

This class prevents the parent from collapsing.

continued



Floating and Positioning Elements

HTML

```
<div class="self-clear">
  <p class="col">
    If you float two consecutive elements, the second floated
    element will always appear either beside the first floated element
    or below it.
  </p>
  <p class="col">
    For example, if you float the elements left, the second will
    appear to the right of the first. If there isn't enough room to the
    right, it will appear below the first element.
  </p>
</div>
```

Container collapse is a weird artifact of floating elements, but don't let that weirdness dissuade you from using floats. There are many good uses for floated elements, including the ever-popular drop cap, which you'll learn about next.

Floating a Drop Cap

Floats have many uses, but one of my favorites is creating a *drop cap*, which is a paragraph's large first letter that sits below the baseline and "drops" a few lines into the paragraph. The trick is to select the opening letter by using the `::first-letter` pseudo-element and float that letter to the left of the paragraph. Then you mess around with font size, line height, and padding to get the effect you want, as shown in the following example.

► Example

➡ Online: wdpg.io/2/8-1-6

This example uses float and the `::first-letter` pseudo-element to create a drop cap.

WEB PAGE

Drop cap

Starting an article doesn't have to be boring! Get your text off to a great beginning by rocking the opening paragraph with a giant first letter. You can use either a *raised cap* (also called a *stick-up cap* or simply an *initial*) that sits on the baseline, or you can use a *drop cap* that sits below the baseline and nestles into the text.



CSS	<pre> .first-paragraph::first-letter { float: left; padding-top: .1em; padding-right: .1em; color: darkred; font-size: 5em; line-height: .6em; } </pre> <p>1. Select the first letter.</p> <p>2. Float it to the left.</p> <p>3. Style to taste.</p>
HTML	<pre> <p class="first-paragraph"> Starting an article doesn't have to be boring! Get your text off to a great beginning by rocking the opening paragraph with a giant first letter. You can use either a <i>raised cap</i> (also called a <i>stick-up cap</i> or simply an <i>initial</i>) that sits on the baseline, or you can use a <i>drop cap</i> that sits below the baseline and nestles into the text. </p> </pre>

Drop caps add a professional flair to your web pages and are just a small sample of what floated elements can do. In the next section, you also learn how to create one of the most common features in big-time websites: the pull quote.

Floating a Pull Quote

Another great use for floats is to add a pull quote to an article. A *pull quote* is a short but important or evocative excerpt from the article that's set off from the regular text. A well-selected and well-designed pull quote can draw in a site visitor who might not otherwise read the article.

You create a pull quote by surrounding the excerpted text in an element such as a `span` and then floating that element, usually to the right. Now, style the element as needed to ensure that it stands apart from the regular text with top and/or bottom margins; a different font size, style, or color; and so on. Following is an example.

MASTER

If you prefer a raised cap to a drop cap, you can modify the example code to accommodate this preference. You need to remove the float declaration and the padding-top and padding-right declarations.



Floating and Positioning Elements

► Example

➡ Online: wdpg.io/2/8-1-7

This example uses `float` to create a pull quote.

WEB PAGE

A *pull quote* is a short excerpt or an important phrase or quotation that has been copied (“pulled”) from a piece of text and displayed as a separate element between or, more often, to one side of the regular text.

It’s important that the pull quote be styled in a way that not only makes it stand apart from the regular text (with, for example, a different font size, style, or color), but also makes it stand out for the reader. After all, it’s the job of the pull quote to entice the would-be reader and create a desire to read the article.

“ *It’s the job of the pull quote to entice the would-be reader.* ”

Pull quote

CSS

```
.pullquote {  
  float: right;  
  width: 50%;  
  margin: 1.25em 0 1em .25em;  
  padding-top: .5em;  
  border-top: 1px solid black;  
  border-bottom: 1px solid black;  
  font-size: 1.05em;  
  font-style: italic;  
  color: #666;  
}  
.pullquote::before {  
  content: "\0201c";  
  float: left;  
  padding: .1em .2em .4em 0;  
  font-size: 5em;  
  line-height: .45em;  
}
```

This code floats the element.

This code styles the pull quote.

Creates an optional large quotation mark



HTML

```
<p>
A <i>pull quote</i> is a short excerpt or an important phrase or
quotation that has been copied ("pulled") from a piece of text and
displayed as a separate element between or, more often, to one
side of the regular text.
<span class="pullquote">
It's the job of the pull quote to entice the would-be reader.
</span>
It's important that the pull quote be styled in a way that not only
makes it stand apart from the regular text (with, for example, a
different font size, style, or color), but also makes it stand out
for the reader. After all, it's the job of the pull quote to entice
the would-be reader and create a desire to read the article.
</p>
```

The pull quote element

Despite head-scratching behaviors such as parent collapse, floats are useful for breaking elements out of the default flow to achieve interesting layouts and effects. Floats get the browser to do most of the work, but if you want even more control of the look of your pages, you need to get more involved by specifying the positions of your elements.

Lesson 8.2: Positioning Elements

Covers: The position property

➞ Online: wdpg.io/2/8-2-0

I mentioned earlier in this chapter that the default layout the browser uses for page elements renders the elements in the order in which they appear in the HTML file, stacking block-level elements and allowing inline elements to fill their parent blocks left to right. This system rarely produces a compelling layout, so another technique you can use (besides floating elements) to break out of the default flow is positioning one or more elements yourself, using the CSS position property combined with one or more of the CSS offset properties:

```
element {
  position: static|relative|absolute|fixed|sticky;
  top: measurement|percentage|auto;
  right: measurement|percentage|auto;
  bottom: measurement|percentage|auto;
  left: measurement|percentage|auto;
  z-index: integer|auto;
}
```



Floating and Positioning Elements

For the first four offset properties—`top`, `right`, `bottom`, and `left`—you can use any of the CSS measurement units you learned about in Chapter 7, including `px`, `em`, `rem`, `vw`, and `vh`. You can also use a percentage or `auto` (the default). The `z-index` property sets the element's position in the *stacking context*, which defines how elements are layered “on top of” and “under” one another when they overlap. An element with a higher `z-index` value appears layered over one with a lower value.

For the `position` property, here's a quick summary of the five possibilities:

- **static**—Ignores the offset properties (the default positioning used by the browser)
- **relative**—Positions the element offset from its default position while keeping the element's default position within the page flow
- **absolute**—Positions the element at a specific place within the nearest ancestor that has a nonstatic position while removing the element from the page flow
- **fixed**—Positions the element at a specific place within the browser viewport while removing the element from the page flow
- **sticky**—Starts the element off as relatively positioned until its containing block crosses (because the user is scrolling the page, for example) a specified threshold, at which point, the element remains “stuck” in place

The next few sections give you a closer look at relative, absolute, fixed and sticky positioning.

Relative Positioning

When you position an element relatively, the element's default position remains in the normal page flow, but the element is shifted by whatever value or values you specify as the offset:

- If you supply a `top` value, the element is shifted down.
- If you supply a `right` value, the element is shifted from the right.
- If you supply a `bottom` value, the element is shifted up.
- If you supply a `left` value, the element is shifted from the left.

Having the element's default page flow position maintained by the browser can lead to some unusual rendering, as shown in the following example.

REMEMBER

These shifts assume that you supply positive values to each property. Negative values are allowed (and are used often in web design circles) and result in shifts in the opposite direction. A negative `top` value shifts the element up, for example.



► **Example** ➞ Online: wdpg.io/2/8-2-1

This example sets the `span` element to relative positioning with a `top` offset.

WEB PAGE	<p>Relative positioning shifts an element out of its default position while preserving the element's original space in the page flow. This can cause page weirdness. For example, if you set the <code>top</code> property, the element <code>shifts down</code>. This leaves a gap where the element would have been, which can look odd.</p> <p>Gap where the span element would have been</p> <p>The shifted span element</p>
CSS	<pre>span { position: relative; top: 3em; border: 2px solid blue; }</pre> <p>Applies relative positioning and a top offset to the span element</p>
HTML	<pre><div> Relative positioning shifts an element out of its default position while preserving the element's original space in the page flow. This can cause page weirdness. For example, if you set the top property, the element <code>shifts down</code>. This leaves a gap where the element would have been, which can look odd. </div></pre> <p>The span element</p>

You probably won't use relative positioning much for laying out page elements directly, but as you'll see in the next section, it comes in handy when you want to prepare elements to use absolute positioning.

PLAY

Use relative positioning to add watermark text to a paragraph. ➞ Online: wdpg.io/2/8-2-2



Floating and Positioning Elements

PLAY

You can use absolute positioning to add tooltips (pop-up descriptions) to your links. ➡ Online: wdpg.io/2/8-2-4

REMEMBER

As with relative positioning, negative values are allowed and position the element in the opposite direction. A negative `left` value moves the element left with respect to the ancestor's left edge, for example.

Absolute Positioning

When you position an element absolutely, the browser does two things: it takes the element out of the default page flow, and it positions the element with respect to its nearest nonstatic (that is, positioned) ancestor. Figuring out this ancestor is crucial if you want to get absolute positioning right:

- Move up the hierarchy to the element's parent, grandparent, and so on. The first element you come to that has had its `position` property set to something other than `static` is the ancestor you seek.
- If no such ancestor is found, the browser uses the viewport, meaning that the element's absolute position is set with respect to the browser's content area.

With the ancestor found, the browser sets the element's absolute position with respect to that ancestor as follows:

- If you supply a `top` value, the element is moved down from the ancestor's top edge.
- If you supply a `right` value, the element is moved left from the ancestor's right edge.
- If you supply a `bottom` value, the element is moved up from the ancestor's bottom edge.
- If you supply a `left` value, the element is moved right from the ancestor's left edge.

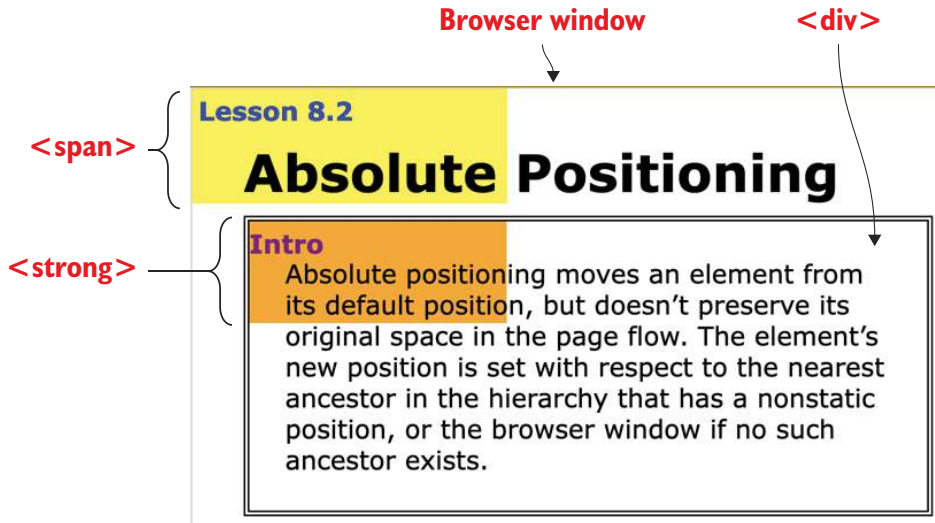


► Example

➡ Online: wdpg.io/2/8-2-3

This example sets the `span` element to relative positioning with a top offset.

WEB PAGE



CSS

```
h1, div {
  position: relative;
  z-index: 2;
}
span {
  position: absolute;
  top: 0;
  left: 0;
  z-index: 1;
  padding: 0.25em 6em 3em 0.25em;
  background-color: yellow;
  color: blue;
}
strong {
  position: absolute;
  top: 0;
  left: 0;
  z-index: -1;
  padding: 0.25em 5em 2.5em 0;
  background-color: orange;
  color: purple;
}
```

The `div` element is nonstatic.

The `span` and `strong` elements are positioned absolutely.

continued



Floating and Positioning Elements

HTML

```
<h1>
Absolute Positioning
</h1>
<div>
```

Absolute positioning moves an element from its default position, but doesn't preserve its original space in the page flow. The element's new position is set with respect to the nearest ancestor in the hierarchy that has a nonstatic position, or the browser window if no such ancestor exists. Intro

```
</div>
<span>Lesson 8.2</span>
```

← The span element

← The strong element

SEE IT

To see an animation of how the browser positions the elements in this example, open the example in the *Web Design Playground*, and click the *See It* button.
➞ Online: wdpg.io/2/8-2-3

MASTER

This example also demonstrates the *z-index* property. The *h1* and *div* elements have been given a *z-index* value of 2. The *span* element is given a *z-index* of 1; therefore, it appears "behind" the *h1*. The *strong* element is given a *z-index* of -1; therefore, it appears "behind" the *div*.

In this example, two elements are positioned absolutely:

- **span**—This element has no nonstatically positioned ancestor, so it's positioned with respect to the browser window. When you set both *top* and *left* to 0, the *span* element moves to the top-left corner of the window.
- **strong**—This element is nested inside a *div* element that's positioned relatively. Therefore, the *strong* element's absolute position is with respect to the *div*. In this case, when you set both *top* and *left* to 0, the *strong* element moves to the top-left corner of the *div*.

You'll use absolute positioning frequently to get certain elements placed just so on the page, but there are still two more positioning tools to consider, including fixed positioning, next.

Fixed Positioning

The next position property value that I'll cover is *fixed*. This value works just like *absolute*, except for two things:

- The browser always computes the position with respect to the browser window.
- The element doesn't move after it has been positioned by the browser, even when you scroll the rest of the page content.

As you might imagine, this value would be useful for adding a navigation bar that's fixed to the top of the screen or a footer that's fixed to the bottom. You see an example of the latter in Chapter 15.



Sticky Positioning

The final `position` property value that I'll discuss is `sticky`. This value is a kind of combination of `relative` and `fixed`. That is, the element starts with relative positioning until the element's position crosses a specified threshold (usually because the user is scrolling the page), at which point, the element switches to fixed positioning. If the boundary of the element's parent block then scrolls to where the element is stuck, the element reverts to relative positioning and scrolls with the parent.

For example, suppose your page has a `div` element, and inside that `div` is an `h2` element that you've styled as sticky. If the user starts scrolling up, the `div` and `h2` elements scroll up together until the `h2` crosses whatever threshold you specified, at which point, the `h2` stops scrolling and "sticks" in place. The `div` keeps scrolling up, however, so what happens when the bottom of the `div` reaches the stuck `h2` element? At that point, the `h2` becomes "unstuck" (that is, it reverts to relative positioning) and resumes scrolling up with the `div`.

What is the threshold that tells the element to become stuck in place? It's one or more of the CSS offset properties: `top`, `right`, `bottom`, and `left`. For example, consider the following CSS rule:

```
.nav-links {  
  position: sticky;  
  top: 5px;  
}
```

In this example, an element with the `nav-links` class will scroll up with the rest of the page until the element's top comes to within 5 px of the top of the viewport. At that point, the element stops scrolling and remains stuck 5 px from the top of the viewport.

One common use for sticky positioning is when you have a page that has a header with the page title and an image at the top, followed by a row of site navigation links. As the user scrolls down the page, it's fine if the header elements scroll past the top of the page, but it would be a nice touch if the row of navigation links "stuck" when it hit the top. You see an example of this in Chapter 15.

It's important to note that a stickily positioned element isn't necessarily stuck forever. If the element has a parent container, then once the boundary of the parent reaches the stuck element, the element loses its stickiness and scrolls off with its parent. You can take advantage of this to stick headings at the top of the page while the content scrolls, then have the next heading become the stuck element, and so on, as demonstrated in the following example.



► Example

➡ Online: wdpg.io/2/8-2-7

This example sets the h2 elements to sticky positioning

WEB PAGE

Stuck h2 element

Your internet service provider (ISP)

features such as bandwidth and disk space at the lower end of the scale.

A free web hosting provider

Many services will host your web pages without charge. The catch is that you usually have fairly severe restrictions on most hosting features, particularly bandwidth and disk space, and you almost always get only a single website. Some free web hosts also display ads, although that's becoming rare these days.

A commercial web hosting provider

If you want to get a reasonable set of features for your web presence, you need to shell out money to rent space with a

CSS

```
h2 {  
  position: sticky;  
  top: 0;  
  background-color: lightblue;  
}
```

The h2 elements are positioned stickily.

Each h2 element sticks when it reaches the top of the viewport.



HTML

```
<h1>
  Getting a Web Host
</h1>
<p>
  When you're looking for a web host, you have three main
  choices:
</p>
<div>
  <h2>
    Your internet service provider (ISP)
  </h2>
  The company or institution you use to access the internet may
  also offer a web hosting service. Many ISPs offer free web hosting
  for simple personal websites, and some organization networks
  include a web server that you can use.
</div>
<div>
  <h2>
    A free web hosting provider
  </h2>
  Many services will host your web pages without charge. The
  catch is that you usually have fairly severe restrictions on most
  hosting features, particularly bandwidth and disk space, and you
  almost always get only a single website.
</div>
<div>
  <h2>
    A commercial web hosting provider
  </h2>
  If you want to get a reasonable set of features for your
  web presence, you need to shell out money to rent space with a
  commercial web hosting provider. Popular hosts such as Bluehost
  and HostGator offer feature-packed hosting usually for less than
  $5 per month.
</div>
```

The h2 elements



Floating and Positioning Elements

FAQ

Why did you use `-1` for the strong element's `z-index`? *The strong element is a descendant of the `div` element, and, in CSS, the only way to make a descendant appear lower in the stacking context than its ancestor is to give the descendant a negative `z-index` value.*

Summary

- In the default page flow, block-level elements are stacked vertically, and inline elements are rendered from left to right within their parent blocks.
- To pull an element out of the default page flow, set its `float` property to `left` or `right`.
- To position an element, set its `position` property to `relative`, `absolute`, or `fixed`; then specify the new position with `top`, `right`, `bottom`, and `left`.
- Set an element's position within the stacking context by using the `z-index` property, which layers higher-value elements over smaller-value elements.



Styling Sizes, Borders, and Margins



This chapter covers

- Understanding the CSS box model
- Setting the width and height of an element
- Adding padding around an element's content
- Applying a border to an element
- Surrounding an element with a margin

When you learn about design, one of the first concepts that comes up is the *principle of proximity*: related items should appear near one another, and unrelated items should be separated. This practice gives the design clear visual organization, which makes it easier for the reader to understand and navigate the design. The principle of proximity applies to your web page designs as well, but there's a problem. If you stick with the browser's default styling, your web page elements have no proximity structure; no elements are grouped or separated, so there's no organization. Fortunately, CSS offers a robust set of properties that enable you to apply the principle of proximity by sizing, spacing, and separating elements on the page. You learn about web page layout in earnest in Part 3, but this chapter introduces you to some vital foundations.



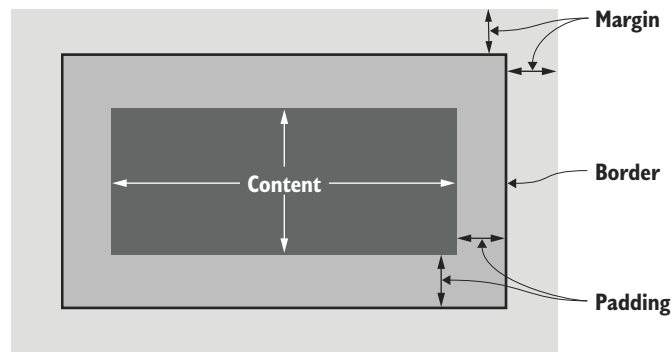
The Anatomy of an Element Box

The key to getting your web page content to bend to your will is to understand that every element you add to a page—every `<div>`, every `<p>`, every ``, even every `` and every ``—is surrounded by an invisible box. Why is that such a big deal? Because you can use CSS to control many aspects of that box, including its height, width, spacing, borders, and position on the page. To get there, you need to become acquainted with the various parts of the box.

Figure 9.1 gives you an abstract look at the basic box parts, and Figure 9.2 shows how these same parts affect some actual page content.

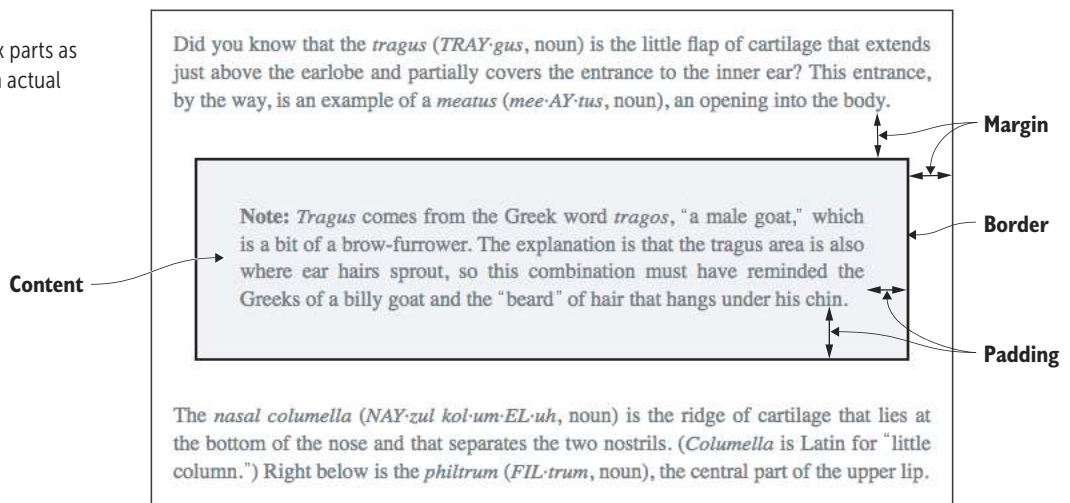
► **Figure 9.1**

The main parts of an element box



► **Figure 9.2**

The element box parts as they appear with actual page content





“*At the risk of over-repeating myself: every element in web design is a rectangular box. This was my ah-ha moment that helped me really start to understand CSS-based web design and accomplish the layouts I wanted to accomplish.* —Chris Coyier

There are four parts to each element box:

- **Content**—This area is the inner rectangle of the box, consisting of the content—such as some text or an image—that’s contained within the box.
- **Padding**—This area between the content and the border represents extra whitespace added outside the top, right, bottom, and left edges of the content area.
- **Border**—This part runs along the outer edges of the padding area and surrounds the content and padding with lines.
- **Margin**—This area is the outer rectangle of the box, representing extra whitespace added outside of the top, right, bottom, and left borders.

The combination of the content area, padding, border, and margin is known in CSS circles as the *box model*. Surprisingly, this box model applies not only to the usual block-level suspects (such as `<div>`, `<h1>`, and `<p>`) but also to all inline elements (such as ``, ``, and `<a>`). Why is the box model so important? There are two main reasons: appearance and positioning.

Appearance is crucial because the box model enables you to control the *whitespace*—the padding and margins—that surround the content. As any designer will tell you, making good use of whitespace is a key part of any successful layout.

Positioning is vital because CSS also gives you quite a bit of control over where the element boxes appear on the page. Rather than the default—and *boring*—layout of one element stacked on the next all the way down the page, CSS offers box model–related properties that let you shift each box to the position that gives you the layout you prefer.

Keeping all this in mind the best you can, it’s time to turn your attention to the useful and powerful CSS properties that enable you to manipulate any element box. First up is changing the box dimensions.



Lesson 9.1: Setting the Width and Height

Covers: The width and height properties

REMEMBER

I should clarify here that these calculations apply only to block-level elements such as `<div>` and `<p>`. Inline elements such as `` and `<a>` flow with the text, so width and height are ignored.

MASTER

If you want to work with an inline element's width, height, and other block-related properties but keep the element inline, add `display: inline-block` to the element's CSS. To make the element a true block-level element, add `display: block`, instead.

BEWARE

You should rarely, if ever, set an element's height property. Setting the height is useful for images, but with text, there are too many variables to know for sure whether everything will fit into the height you specify. Let the content create the element's height naturally.

➡ Online: wdpg.io/2/9-1-0

Web browsers perform a great many automatic calculations when they load a page. Two of those automatic values are the width and the height of each element box on the page, which are set according to the following guidelines:

- The width of each element box is set to the width of the element's container, which by default is the width of the browser window.
- The height of each element box is set to a value that's tall enough to contain all the element's content.

One of the main tenets of good web design is that you should override these and similar browser defaults so that you have maximal control of the look and layout of your page. To do that with the dimensions of any block-level element box, use the CSS width and height properties. These properties take any of the CSS measurement units you learned about in Chapter 7, including px, em, rem, vw, and vh. You can also set width or height to a percentage or to auto (the default, which allows the browser to set the dimensions automatically).

At this point, you may be asking yourself an important question: When you set the width or height, which of the element box's four rectangular areas—content, padding, border, or margin—are you sizing? Intuitively, you might guess the border, because that area contains the content and padding, or what feels like the “inside” of the element box. Surprisingly, that's not the case. By default, the width and height properties apply only to the content area. That's most unfortunate because to get an element's true size as rendered on the page you must add the values of its padding and border. If that sounds like an unnecessarily complicated way to go about things, you're right. Instead, you can set the box-sizing property to border-box for the element:

```
element {  
    box-sizing: border-box;  
}
```

This code tells the web browser to apply the width and height values all the way out to (and including) the border of the element box. Note that the margin is *not* included in the width and height.



The width property is useful for setting the text line length for optimum reading. For ideal screen reading, your body text blocks should contain between 50 and 80 characters per line (including spaces and punctuation). In most cases, a line length of around 65 characters is optimum, but it's okay to set a longer line if you're using a larger font size or a shorter line if you're using a smaller font size. You set the line length by adjusting the text block's width property. Consider the text shown in Figure 9.3.

On March 19, 1988, a man named Robert Muller Jr. was a passenger in a car driving along US Route 441 in Florida. At some point in the journey, the car was cut off (or, at least, it appeared that way), enraging the car's occupants. Unfortunately, Mr. Muller had access to a gun, which he subsequently used to shoot out the back window of the other car, wounding 20-year-old Cassandra Stewart in the neck. Police described the shooting as an incident of "road rage," and a name for an all-too-common form of motorist madness was born.

► **Figure 9.3** In the default width on a large screen, the line lengths of this text are too long for comfortable reading.

With line lengths of well over 150 characters, this text is hard to scan. You can fix that problem by adjusting the width of the text's containing element, as shown in the following example.

MASTER

Rather than apply box-sizing to individual elements, assign it once by using the universal selector (), and it will be applied to every element. In addition, if you ever want to return to the default sizing behavior for an element, use the declaration box-sizing: content-box.*

PLAY

If you set the height of an element, you may find that its content overflows its element box. To control this behavior, you can use the overflow property.
 ➡ Online: wdpg.io/2/9-1-4

► Example ➡ Online: wdpg.io/2/9-1-1

This example reduces the width of the containing div element to make the line lengths easier to read.

WEB PAGE

On March 19, 1988, a man named Robert Muller Jr. was a passenger in a car driving along US Route 441 in Florida. At some point in the journey, the car was cut off (or, at least, it appeared that way), enraging the car's occupants. Unfortunately, Mr. Muller had access to a gun, which he subsequently used to shoot out the back window of the other car, wounding 20-year-old Cassandra Stewart in the neck. Police described the shooting as an incident of "road rage," and a name for an all-too-common form of motorist madness was born.

630px

continued



Styling Sizes, Borders, and Margins

CSS	<pre>div { box-sizing: border-box; width: 630px; }</pre> <p><i>border-box is applied.</i></p> <p><i>The width is set for the ideal line length.</i></p>
HTML	<pre><div> On March 19, 1988, a man named Robert Muller Jr. was a passenger in a car driving along US Route 441 in Florida. At some point in the journey, the car was cut off (or, at least, it appeared that way), enraging the car's occupants. Unfortunately, Mr. Muller had access to a gun, which he subsequently used to shoot out the back window of the other car, wounding 20-year-old Cassandra Stewart in the neck. Police described the shooting as an incident of "road rage," and a name for an all-too-common form of motorist madness was born. </div></pre>

With the width (and occasionally the height) of the box set, it's time to focus on the various components of the box model, starting with the padding.

Lesson 9.2: Adding Padding

Covers: The padding-* properties

PLAY

You can specify a maximum width for an element by using the `max-width` property; similarly, you can set the minimum width by using the `min-width` property. ➡ Online: wdpg.io/2/9-1-3

➡ Online: wdpg.io/2/9-2-0

In the element box, the padding is the whitespace added above, below, to the left, and to the right of the content. If you add a border to your element, as described in Lesson 9.3, the padding is the space between your content and the border. The padding gives the element a bit of room to breathe within its box, ensuring that the content isn't crowded by its own border or by nearby elements. You set the padding by applying a value to one or more of the four sides:

```
element {  
  padding-top: top-value;  
  padding-right: right-value;  
  padding-bottom: bottom-value;  
  padding-left: left-value;  
}
```

Each value can take any of the standard CSS measurement units, including px, em, rem, vw, and vh, or you can set the value to a percentage. Here's an example:

```
.pullquote {  
  padding-top: 1em;  
  padding-right: 1.5em;  
  padding-bottom: .75em;  
  padding-left: 1.25em;  
}
```



You can also use a padding shorthand property to set all the padding values with a single declaration. You can use four syntaxes with this property, as shown in Figure 9.4.

Applies value to all four sides

Applies value1 to the top and bottom and value2 to the right and left

Applies value1 to the top, value2 to the right and left, and value3 to the bottom

Applies value1 to the top, value2 to the right, value3 to the bottom, and value4 to the left

```
padding: value;
padding: value1 value2;
padding: value1 value2 value3;
padding: value1 value2 value3 value4;
```

► Figure 9.4

The syntaxes of the padding shorthand property

You can duplicate the rule in the preceding example by using the shorthand syntax as follows:

```
.pullquote {
  padding: 1em 1.5em .75em 1.25em;
}
```

To see how you can use padding to make your web page more readable, consider the simple navigation bar shown in Figure 9.5.

HOME RESEARCH PAPERS BLOG CONTACT INFO

The big problem is that it's impossible to tell by looking how many navigation items there are. You could have as many as six (Home, Research, Papers, Blog, Contact, and Info) or as few as three (Home, Research Papers Blog, and Contact Info). To fix this problem, you can use padding to add some horizontal breathing room between the items, as shown in the following example.

“Horizontal navigation with tight spacing between nav items is a common issue I often encounter on otherwise well-designed sites. Without adequate padding, navigation items begin to run together and become more difficult to quickly scan. —Jeremiah Shoaf

► Figure 9.5

A navigation bar without any horizontal padding

MASTER

This example transforms an unordered list into a navigation menu by doing two things: setting the `ul` element's `list-style-type` property to `none` to hide the bullets, and setting the `li` element's `display` property to `inline-block`, which tells the browser to treat the items as blocks but display them inline.

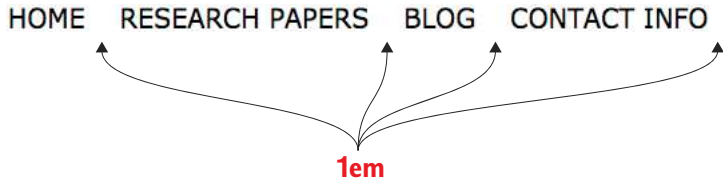


Styling Sizes, Borders, and Margins

► Example

⇒ Online: wdpg.io/2/9-2-1

This example uses the `padding-right` property to create space between elements in a navigation menu.

WEB PAGE	
CSS	<pre>ul { list-style-type: none; text-transform: uppercase; } li { display: inline-block; padding-right: 1em; }</pre> <p>padding-right is applied to the li elements.</p>
HTML	<pre> Home Research Papers Blog Contact Info </pre> <p>The li elements</p>

Okay, you've got your content nicely padded. Your next stop in the box model is the border that surrounds the padding.

Lesson 9.3: Applying a Border

Covers: The `border-*` properties

SEE IT

To see an animation of how the browser adds the padding in the preceding example, open the example in the Web Design Playground and click the See It button.

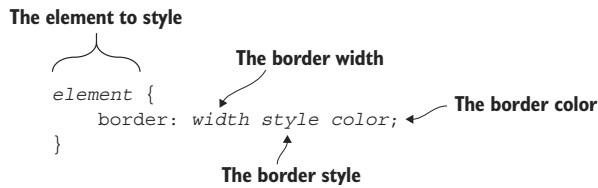
⇒ Online: wdpg.io/2/9-2-1

⇒ Online: wdpg.io/2/9-3-0

In the element box, the *border* is the line that defines the outer edge of the padding on four sides: top, right, bottom, and left. In this way, the border comes between the element's padding and its margin. The border is optional, but it's often useful for providing the reader with a visual indicator that the enclosed content is separate from any nearby content.



To create a basic border around an element, use the `border` property, as shown in Figure 9.6.



► **Figure 9.6** The syntax of the `border` property

The *width* value can take any standard CSS measurement unit, including `px`, `em`, `rem`, `vw`, and `vh`. You can also set the value to any of the following keywords: `thin`, `medium`, or `thick`. For the *style* value, you can use any of the following keywords: `dotted`, `dashed`, `solid`, `double`, `groove`, `ridge`, `inset`, `outset`, `hidden`, or `none`. For the *color* parameter, you can use any of the color names that you learned about in Chapter 4.

Here's an example:

```

.pullquote {
  border: 1px solid black;
}

```

This rule defines the `pullquote` class with a one-pixel-wide, solid, black border. The following example takes the navigation list from Lesson 9.2 and adds a border around it.

► **Example**

➡ **Online:** wdpg.io/2/9-3-1

This example adds a border around the navigation menu.

WEB PAGE

Border

HOME RESEARCH PAPERS BLOG CONTACT INFO

continued

USE IT

Add a border to an element to provide a visual indication that the content is self-contained or separate from the surrounding page content.



Styling Sizes, Borders, and Margins

CSS	<pre>ul { border: 1px solid black; padding-top: .75em; padding-bottom: .75em; list-style-type: none; text-align: center; text-transform: uppercase; } li { display: inline-block; padding-right: 1em; } li:first-child { padding-left: 1em; }</pre> <p>The border</p> <p>Padding added to the top and bottom</p> <p>The items are centered.</p> <p>Extra padding on the left</p>
HTML	<pre> Home Research Papers Blog Contact Info </pre>

PLAY

The CSS box model can be confusing at first because it's hard to visualize the box that surrounds each element. To help, use the `outline` property, which adds a line around the outside edge of the box border. The `outline` property uses the same syntax as the `border` property.

➡ Online: wdpg.io/2/9-3-3



Use a border when you need to separate content into logical sections if your design requires content to be separate, and without it the design would appear cluttered. —Andrew Stoker

One odd detail may have you furrowing your brow: The `li:first-child` element gets a `padding-left` value of `1em`. What's going on? Recall from Lesson 9.2's example that you needed to add `1em` of padding between the menu items to separate them. You did that by using the `padding-right` property, but doing so also meant adding `1em` of padding to the right of the Contact Info item. To compensate for that extra padding on the right, you need to add an equal amount on the left so the menu centers properly. The `li:first-child` rule adds the required padding to the first `li` element.

Your box is filling in quite nicely with its content, padding, and border. Now you have to worry about keeping other elements at bay, and you do that by adding some margin space around your box.



Lesson 9.4: Controlling the Margins

Covers: The `margin-*` properties

➡ Online: wdpg.io/2/9-4-0

In the element box, the *margin* is the whitespace added above, below, to the left, and to the right of the border. The margin lets you control the space between elements. Positive margin values, for example, keep the page elements from bumping into one another or overlapping, and also keep the elements from brushing up against the edges of the browser viewport. On the other hand, if your design requires elements to overlap, you can achieve this effect by using negative margin values.

You apply the margin by setting a value to one or more of an element's four sides:

```
element {
  margin-top: top-value;
  margin-right: right-value;
  margin-bottom: bottom-value;
  margin-left: left-value;
}
```

Each margin value can use any of the standard CSS measurement units, such as px, em, rem, vw, and vh. You can also use a percentage or the auto keyword (to have the browser set the margin automatically to fit the available space). Here's an example:

```
.pullquote {
  margin-top: 1.5em;
  margin-right: 2.5em;
  margin-bottom: 2em;
  margin-left: 3em;
}
```

As with padding, a margin shorthand property lets you apply the margins by using a single declaration. Figure 9.7 shows the four syntaxes you can use with this property.

Applies value to all four sides

Applies value1 to the top and bottom and value2 to the right and left

Applies value1 to the top, value2 to the right and left, and value3 to the bottom

Applies value1 to the top, value2 to the right, value3 to the bottom, and value4 to the left

```
margin: value;
margin: value1 value2;
margin: value1 value2 value3;
margin: value1 value2 value3 value4;
```

MASTER

Positive margin values serve to push the element away from surrounding elements (or the edges of the browser viewport). Sometimes, however, you'll want to bring elements closer, and you can do that by setting a negative margin value.

➡ Online: wdpg.io/2/9-4-5

USE IT

Margins are especially useful for establishing the spacing between your page's text blocks, particularly its paragraphs. A good general rule for spacing each paragraph is to set the bottom margin to 1em.

► Figure 9.7

The syntax possibilities of the margin shorthand property



Styling Sizes, Borders, and Margins

MASTER

If you get serious about web design, then you should include a professional CSS reset, such as [Normalize.css](https://github.com/necolas/normalize.css/) (download here: <https://github.com/necolas/normalize.css/>) in all your projects. This type of reset gets your projects off to the best possible start.

You can rewrite the rule in the preceding example by using the shorthand syntax like so:

```
.pullquote {  
    margin: 1.5em 2.5em 2em 3em;  
}
```

It's important to remember that the web browser sets a default margin for all the elements by using its internal style sheet. That sounds handy, but one of the key principles of web design is to gain maximum control of the look of the page by styling everything yourself. A big step in that direction is adding the following code to the top of your style sheet:

```
html, body, abbr, article, aside, audio, blockquote, button,  
canvas, code, div, dl, dt, embed, fieldset, figcaption,  
figure, footer, form, h1, h2, h3, h4, h5, h6, header, iframe,  
img, input, label, legend, li, nav, object, ol, option, p,  
pre, q, section, select, table, tbody, td, tfoot, th, thead,  
tr, ul, video {  
    margin: 0;  
    padding: 0;  
    box-sizing: border-box;  
}
```

This code gets rid of the browser's default margins and padding on all these elements, enabling you to adjust these settings yourself as needed on your page. If your page is small, you can use the following simplified version:

```
* {  
    margin: 0;  
    padding: 0;  
    box-sizing: border-box;  
}
```

Note, however, that you *do* need to set your margins. To see why, Figure 9.8 shows the simple navigation bar when the margins have been reset to 0.



We think of our CSS as modifying the default look of a document—but with a “reset” style sheet, we can make that default look more consistent across browsers, and thus spend less time fighting with browser defaults. —Eric Meyer



► **Figure 9.8**

The navigation bar without any margins

As you can see, the navigation bar is rendered tight to the top, right, and left edges of the browser window, with little room between the bottom of the navigation bar and the text. To fix this problem, you can set the navigation bar's margins to add some welcome whitespace around it, as shown in the following example.

PLAY

You can also use a margin trick to center a child element vertically within its parent.

➡ Online: wdpg.io/2/9-4-4.

► Example

➡ Online: wdpg.io/2/9-4-1

This example uses the margin properties to create space around the navigation menu.





Styling Sizes, Borders, and Margins

CSS

```
ul {
  border: 1px solid black;
  margin-top: .75em;
  margin-right: 2em;
  margin-bottom: 1em;
  margin-left: 2em;
  padding-top: .75em;
  padding-bottom: .75em;
  list-style-type: none;
  text-align: center;
  text-transform: uppercase;
}
div {
  margin-right: 2em;
  margin-left: 2em;
}
```

Margin properties applied to the ul element

Margin properties applied to the div element

HTML

```
<ul>
  <li>Home</li>
  <li>Research Papers</li>
  <li>Blog</li>
  <li>Contact Info</li>
</ul>
<div>
  Welcome! You've landed at the web home of Monday Morning Ideas,
  the inventors of the Helium Paperweight, the Water-Resistant
  Sponge, the Teflon Bath Mat, and the world-famous Inflatable
  Dartboard.
</div>
```

Margins are a crucial box model concept, and the whitespace they create is an essential part of web design. But margins can be tricky to master and can have some surprising—even maddening!—effects, such as the collapsing margins that I discuss next.

PLAY

If you've set an element's width, you can quickly center the element horizontally by using the declaration `margin: top/bottom auto`, where `top/bottom` is the value for both the top and bottom margins.
➡ Online: wdpg.io/2/9-4-3.

Watch Out for Collapsing Margins!

In the preceding example, I added `margin-bottom: 1em` to the `ul` element to separate it from the `div` text. Suppose that I decide I want 2em of space between these elements, so I adjust the `div` rule as follows (Figure 9.9 shows the result):

```
div {
  margin-top: 1em;
  margin-right: 2em;
  margin-left: 2em;
}
```

Top margin added to the div element



► **Figure 9.9** The div text with a 1em top margin added

No, your eyes aren't deceiving you: the space between the navigation bar and the div text is exactly the same as it was before! What's going on here is a tricky CSS phenomenon known as *collapsing margins*. When one element's bottom margin meets another element's top margin, the web browser doesn't add the two values, as you might expect. Instead, it determines which of the two margin values is larger, and it uses that value as the vertical margin between the two elements. It throws out the smaller margin value, thus collapsing the two margins into a single value.

If you ever find that the top or bottom margins of one or more page elements are behaving strangely—that is, are bigger or smaller than you think they should be—there's an excellent chance that collapsing margins are the culprit.

Summary

- The four main parts of a CSS element box are the content, the padding around the content, the border around the padding, and the margin around the border.
- You specify an element's dimensions by setting its width and height properties.
- You add padding around an element's content by using the four padding properties: padding-top, padding-right, padding-bottom, and padding-left. Alternatively, use a padding shortcut property, such as padding: top right bottom left.
- The simplified border syntax is border: width style color.
- You add a margin around an element by using the four margin properties: margin-top, margin-right, margin-bottom, and margin-left. Alternatively, use a margin shortcut property, such as margin: top right bottom left.

MASTER

If you do want extra vertical space between two elements, you can increase the larger of the two margin values (setting margin-bottom: 2em on the ul element, for example). Alternatively, change the collapsing margin to padding (such as by replacing the margin-top property with padding-top: 1em on the div element).

REMEMBER

The left and right margins never collapse. In addition, margin collapse doesn't occur for elements that are floated or positioned absolutely (see Chapter 8).



PROJECT: Creating a Landing Page



This chapter covers

- Planning and sketching your landing page
- Choosing fonts and colors for the page
- Understanding and implementing banded content
- Adding the images and text

Okay, you're nine chapters into this adventure, and you've come a long way. Here in Part 2 alone, you've mastered using images and media; making style sheets; using classes; floating elements; using absolute and relative positioning; and manipulating sizes, borders, and margins. That's a lot, and (most importantly) it's enough know-how to start building some amazing pages. As proof, in this project, you'll be putting all those HTML and CSS skills to good use to create a professional-looking page for a marketing campaign for a product or service. If that project sounds out of your depth, not to worry: you know more than enough to ace this assignment, and I'll be building my own (rather silly, as you'll see) landing page right alongside you. If you get stuck, I (or, at least, my code) will be right there with you to help or give you a nudge in the right direction. Let's get started!



What You'll Be Building

In its most general sense, a *landing page* is the page visitors first see when they navigate to (land on) your website. That's often your home page, but it could also be any page that the person comes across via a Google search or a link that someone else posts to social media.

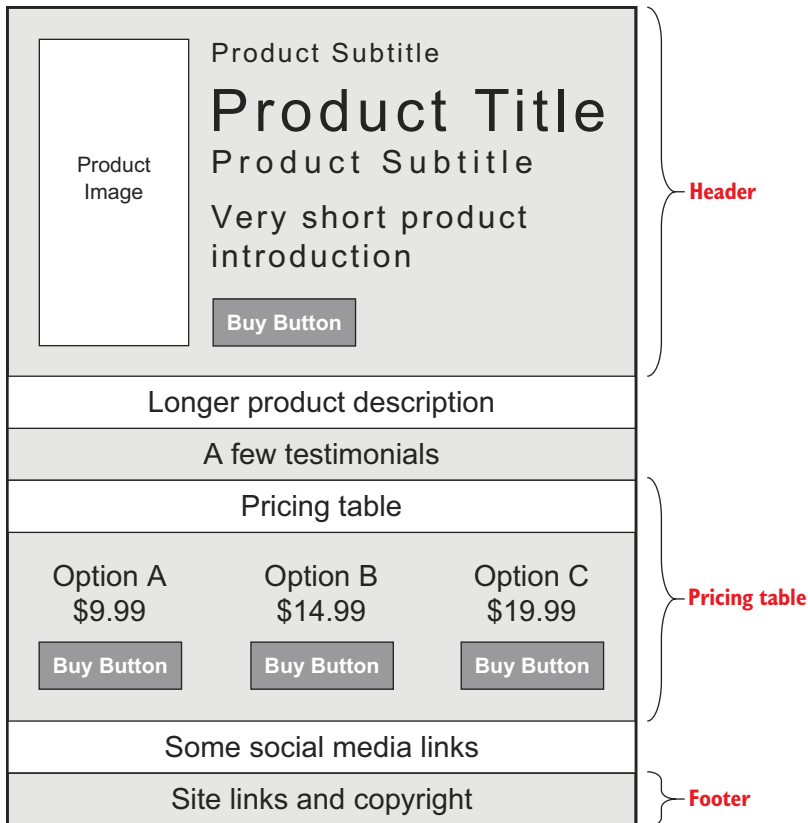
But a more specific sense of the term is relevant to this project. In this sense, a *landing page* is the first page that people see when they click a link in an ad, blog post, or social media update that's part of a marketing or awareness campaign for a specific product or service. The landing page's job is to explain the product or service and to induce the user to perform some action, such as buy the item, subscribe to the service, or sign up for a newsletter.

This project takes the HTML and CSS skills you learned in the preceding nine chapters and shows you how to use them to build a basic landing page for a product or service. It includes images, descriptive text, and "call-to-action" buttons that ask the reader to perform some action (such as buy or subscribe). The general structure of the page uses a popular modern layout called *banded content*, in which the text and images appear in horizontal strips that run the full width of the browser window. As you go along, I'll build an example landing page based on a fictitious book that I'm "selling," but, of course, you'll want to build your own page with your own text and images.

Sketching the Layout

Because you've likely seen a landing page or two in your day, you may have a reasonable idea of what you want your landing page to look like. If so, great! You're way ahead of most people at this stage of the project. But believe me, a design that exists only in your head is hard to translate into HTML and CSS code. To make the transition from design to code much easier, you need to get that design out of your head and into concrete form. You can use a graphics program such as Adobe Photoshop or Illustrator for this purpose, but I prefer to sketch the basic components of the page with pencil and paper.

As Figure 10.1 shows, your sketch doesn't have to be a work of art or even all that detailed. Draw the main sections of the page, and include some text that describes the content of each section.



► **Figure 10.1**

Before you begin coding, grab a pencil and paper, and create a quick sketch of the page layout and content.

Your next page-planning task is deciding which typefaces you want to use for your landing page.

Choosing Typefaces

As a rule, landing pages shouldn't burden the user with tons of text. You want to highlight the key features of your product or service, give the users reasons why they should want it, and then give them the opportunity to get it. So, if you're building a page without lots of body text, your typeface needs to be clean and legible, and it shouldn't call attention to itself (and thus take attention away from the product).



PROJECT: Creating a Landing Page

REMEMBER

When you specify multiple typefaces in the font-family property, the web browser checks to see whether they're installed on each user's computer in the order in which they appear and uses the first typeface it finds.

In such cases, a sans-serif typeface is often the best choice because the lack of serifs gives these fonts a clean appearance. Sans serifs also have a more modern feel than serifs, which gives you the added advantage of making your product look new and fresh.

One of my favorite system fonts is Optima, a gorgeous sans-serif designed by Hermann Zapf (whom you may know from the famous Zapf Dingbats typeface available on most PCs). Alas, although Optima is installed on all Mac computers, it's available on few Windows PCs. So as a backup font for Windows, I'll also specify the Calibri typeface, which has similar characteristics. In my CSS, I'll use the following rule to apply these families to all the page text:

```
body {  
    font-family: Optima, Calibri, sans-serif;  
}
```

With your page layout sketched and your typeface chosen, the next step is picking out a color scheme.

Choosing a Color Scheme

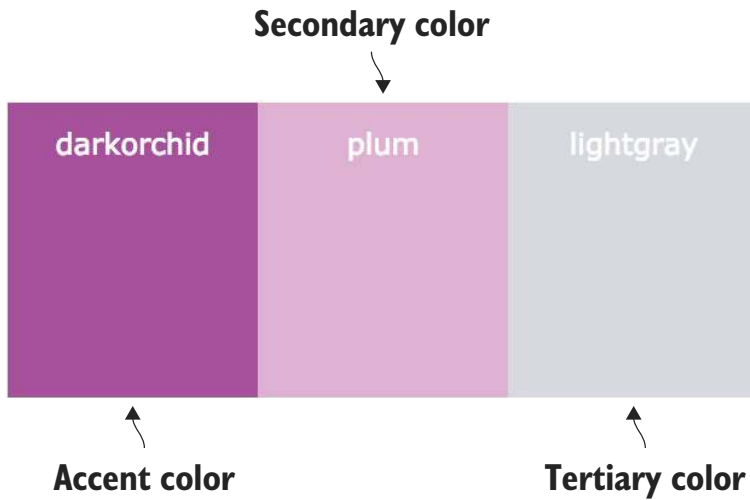
Because the landing page uses a single typeface, you need to turn to other page elements to add some dynamism and contrast. A good place to do that is the color scheme:

- **Accent color**—This color is used as the background for page elements such as the call-to-action buttons and text that you want to make sure the reader doesn't miss. As such, it should be a bold, unmistakable hue that stands out.
- **Secondary color**—This color is mostly used as the background for some of the content bands. It should be similar to the accent color: bold enough to tell the reader that the content is important but not so bold that it clashes with or overshadows the accent color.
- **Tertiary color**—This color is used as the background for content that's less important.

Figure 10.2 shows the colors I chose for my landing page. You, of course, should choose a color scheme that suits your style. With the page layout in place and your fonts and colors chosen, it's time to bring everything together by slinging some HTML and CSS code.

LEARN

If you're not comfortable choosing colors, a great online tool called the Color Wheel (www.canva.com/colors/color-wheel/) can help. Select your initial color, and the Color Wheel suggests a compatible color.



► **Figure 10.2**

The color scheme for my landing page

Building the Page

To construct your landing page, start with the skeleton code that I introduced in Chapter 1. From there, go section by section, adding text, HTML tags, and CSS properties.

The Initial Structure

To get started, take the basic page structure from Chapter 1, and add the tags, a placeholder image, and some placeholder text for each of the page's main sections.

► Try This

⇒ Online: wdpg.io/2/projects/landing-page/1

Here are the elements that make up the landing page's initial structure.





PROJECT: Creating a Landing Page

HTML

```
<div class="header">
  <div class="header-image">
    
  </div>
  <div class="header-info">
    Product title, subtitle, intro, etc.
  </div>
</div>
<div class="description">
  Product description
</div>
<div class="testimonials">
  Product testimonials
</div>
<div class="product-versions">
  Pricing table for the different versions of the product
</div>
<div class="social">
  Social media links
</div>
<div class="footer">
  Site links and copyright notice
</div>
```

Header content band

Description content band

Testimonials content band

Social media content band

Footer content band

Pricing table content band

Here are a few things to note about the HTML tags used in the initial structure:

- The page is divided into six sections: header, description, testimonials, pricing table, social media, and footer.
- Each section is embedded within a `<div></div>` block.
- Each `div` element is assigned a class, which enables you to apply CSS properties to everything within that section.

The Header

The header is probably the most important section of the landing page because it's the first section that visitors see when they arrive. You want the header not only to have an effect, but also to start the job of selling your product. The project's header accomplishes these goals by including the following features:

- **Hero background image**—This image should be visually striking or should tell a story that's relevant to your product. Either way, be sure that the image doesn't interfere with the readability of the header text.
- **Product image**—This image should be a simple illustration or photo that enables the would-be buyer to see what the product looks like.



- **Product info**—At a minimum, this info should include the product name or title, a short (two or three sentences) introduction, and the price. I've also chosen to include a surtitle (a descriptive word or phrase above the title, which could be something like *Available Now!* or *Special Offer!*) and a subtitle.
- **Call-to-action button**—The user clicks this button to perform the action you want, such as buying, subscribing to, or downloading the product.

Because the header is so crucial to the success of a landing page, take it slow and build the header one feature at a time, beginning with the hero background.

The Hero Background Image

You may recall from Chapter 6 that a hero image is an eye-catching photo or illustration that takes up the entire width, and often the entire height, of the browser window when you first land on a page. The following example shows the header for my fictitious product with a hero background image applied.

► ***Try This***

⇒ Online: wdpg.io/2/projects/landing-page/2

This example shows a landing-page header's hero background.

WEB PAGE



continued



PROJECT: Creating a Landing Page

CSS

```
.header {  
  background: url(/images/landing-page-header-bg.jpg);  
  background-attachment: fixed;   
  background-position: right center;  
  background-size: cover;  
  padding-bottom: 1em;  
  width: 100vw;  
  height: 100vh;  
}
```

Prevents the hero image from scrolling with the content

HTML

```
<div class="header">  
</div>
```

REMEMBER

I added the height: 100vh definition to give the header some height, because it has no content. Later, after I add the header content, I'll take out that definition.

This photo (which you'll barely recognize as a blurred image of a nighttime city scene) uses the standard code for a hero image that you learned in Chapter 6. I added the property `background-attachment: fixed` to prevent the image from scrolling with the rest of the page, which is a nice effect.

The Product Image

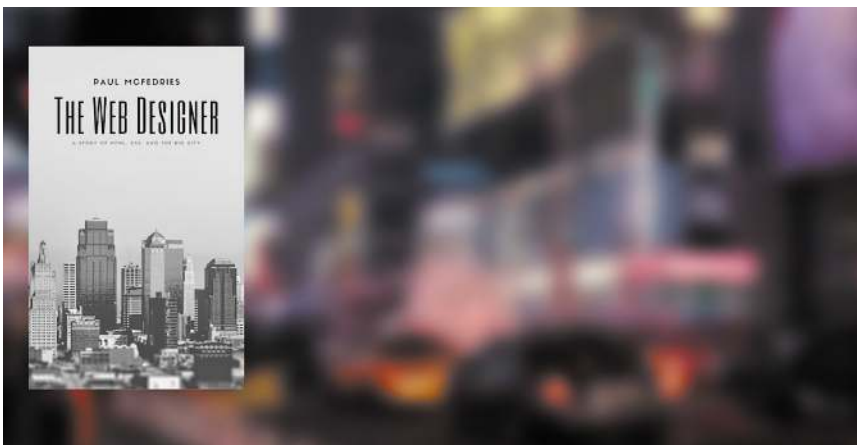
Next, add the photo or illustration that shows the user the product. This image should be a decent size, big enough to give the reader a good idea of what the product looks like but not so big that it overwhelms your hero background. Following is an example.

► Try This

➡ Online: wdpg.io/2/projects/landing-page/3

This example adds the product image to the landing-page header.

WEB PAGE





CSS	<pre>.header-image { float: left; width: 33%; margin-top: 3em; padding-right: 3em; text-align: right; }</pre> <p>The CSS code for the image</p>
HTML	<pre><div class="header"> <div class="header-image"> </div> </div></pre> <p>The image is added as a standard HTML img element.</p>

The image is floated to the left and given some margins and padding to provide some separation from the rest of the content.

The Product Info

Now it's time to add the product info to the header. Again, this info needs to include at least the product title and a brief introduction, but feel free to add elements such as a surtitle and subtitle, as shown in the following example.

► Try This

➡ Online: wdpg.io/2/projects/landing-page/4

This example adds the product info to the landing-page header.

WEB PAGE	 <p>continued</p>
----------	---



PROJECT: Creating a Landing Page

CSS

```
.header-info {  
  float: right;  
  width: 67%;  
  margin-top: 4em;  
  padding-left: 1em;  
  color: white;  
}
```

The CSS code for the product info div

HTML

```
<div class="header">  
  <div class="header-image">  
      
  </div>  
  <div class="header-info">  
    <div class="surtitle">Coming Soonish!</div>  
    <h1 class="title">The Web Designer</h1>  
    <h3 class="subtitle">  
      A story of HTML, CSS, and the big city</h3>  
    <p class="intro">  
      She knew HTML. She knew CSS. But did she know love? Read  
this destined-to-be-remaindered novel that <em>The New York Times  
Book Review</em> described as "reasonably grammatical" and the  
<em>Times Literary Supplement</em> called "bathroom-worthy."  
Pre-order your paperback copy now for just $14.99.  
    </p>  
  </div>  
</div>
```

The info is added within a div element.

The div element that holds all the product info is floated to the right and given some margins. The various bits of product info—the surtitle, title, subtitle, and intro—appear in their own block-level elements. To save space, I haven't shown the CSS properties applied to these block-level elements, but they include styles such as margins and font sizes. (See the online version of the example for the complete code.)

The Call-to-Action Button

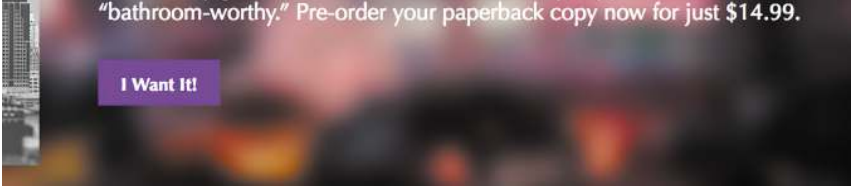
The final piece of the header puzzle is the call-to-action button that the reader can click to order, subscribe, download, or do whatever your preferred action is for the landing page. This button should be easy to find, so make it visible and bold, as shown in the following example.



► Try This

➡ Online: wdpg.io/2/projects/landing-page/5

This example adds the call-to-action button to the landing-page header.

WEB PAGE	
CSS	<pre>.btn { border: none; padding: .75em 1.25em; font-family: inherit; font-size: 1em; font-weight: bold; color: white; background-color: darkorchid; }</pre> <p>The CSS code for the button</p>
HTML	<pre><button class="btn" type="button">I Want It!</button></pre> <p>The button element</p>

I use the `<button>` tag to create the button, and then I apply various styles to make the button stand out, including my accent color (`darkorchid`) as the background and bold white text as the foreground.

The Product Description

The next element of the landing page is a brief description of the product, which is your first chance to try to sell the user on your product or service. How you go about that depends on the product and on your comfort level when it comes to playing the huckster, but here are a few ideas:

- A simple paragraph that explains the product
- A bulleted list of the product's main features
- A paragraph or list that tells the user why the product is right for her
- A paragraph or list that briefly outlines a series of problems and explains how the product solves them

For my landing page, I went with a short recap of the book's plot, as shown in the following example.

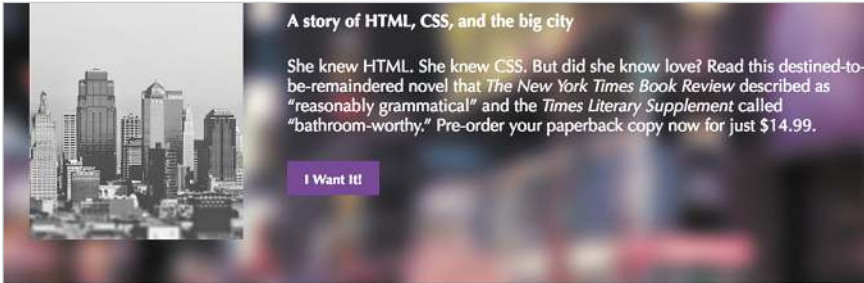


PROJECT: Creating a Landing Page

► Try This

➔ Online: wdpg.io/2/projects/landing-page/6

This example shows the product description added to the landing page.

WEB PAGE	 <p>A story of HTML, CSS, and the big city</p> <p>She knew HTML. She knew CSS. But did she know love? Read this destined-to-be-remastered novel that <i>The New York Times Book Review</i> described as “reasonably grammatical” and the <i>Times Literary Supplement</i> called “bathroom-worthy.” Pre-order your paperback copy now for just \$14.99.</p> <p>I Want It!</p> <p>At High Falutin High, the arts high school in her hometown, Daisy Fontana fell in love. Not with a boy, or even with a girl, for that matter, but with something altogether more interesting: web design. Instead of a BFF, she had CSS. Instead of singing and dancing with the other kids, she spent her time coding alone. But when she graduated and moved to the city to find a job, she knew everything about HTML, but nothing about life. Will the town eat her alive, or will she survive and rise to the top of the cutthroat world of coding websites? Daisy Fontana is a nerd heroine for our times, and <i>The Web Designer</i> tells her gripping tale.</p>
CSS	<pre>.description { width: 100%; padding: 1em 0; font-size: 1.25em; background-color: white; }</pre> <p>The CSS code for the description class</p>
HTML	<pre><div class="description"> At High Falutin High, the arts high school in her home town, Daisy Fontana fell in love. Not with a boy, or even with a girl, for that matter, but with something altogether more interesting: web design. Instead of a BFF, she had CSS. Instead of singing and... </div></pre>

With your product description in place, you now need to pause adding content for a bit to set up the content bands that you'll use.

Setting Up the Content Bands

At this point in the construction of your landing page, you've run into a problem. In the preceding example, the text in the description extends across the entire width of the browser window, which makes the line lengths too long for comfortable reading. The solution is to structure the landing page by using horizontal bands of content that have two characteristics:

- A background color or image that extends across the entire browser window.



- Foreground content that's given a maximum width to retain readability and that usually appears in the center of the browser window

Depending on the width of the browser window and the maximum width you assign to the content block, however, that block takes up only part of the window width. The problem, then, is how to get the background to extend across the entire width of the window while restricting the content to some subset of that width. The answer is to structure each content band with two `div` elements:

- An outer `div` element that spans the width of the browser window and is styled with the background color or image you want to use with the band
- A nested `div` element that contains the content, is given a maximum width, and is centered horizontally within the browser window

In the following example, I've applied the nested `div` (using a class named `container`) to both the header and the product description.

► Try This

⇒ Online: wdpg.io/2/projects/landing-page/7

This example shows the nested `div` element that will hold the content within each content band.

WEB PAGE



continued



PROJECT: Creating a Landing Page

CSS

```
.container {  
  max-width: 800px;  
  margin: 0 auto;  
  clear: both;  
}
```

The CSS code for the content container

```
.container::after {  
  content: "";  
  display: block;  
  clear: both;  
}
```

This CSS enables the container to clear its own floats.

HTML

```
<div class="header">  
  <div class="container">  
    ...  
  </div>  
</div>  
...  
<div class="description">  
  <div class="container">  
    ...  
  </div>  
</div>
```

The nested div elements that hold the band content

The container class does three things:

- Uses `max-width` to set a maximum width of 800 pixels for the content.
- Uses the `margin: 0 auto` shorthand to center the element horizontally. This declaration sets the top and bottom margins to 0 and the left and right margins to `auto`. The latter tells the web browser to set the margins automatically based on the element width. Because both left and right margins are set together, the browser parcels out the same margin size to each, thus centering the element.
- Uses `clear: both` to place the element after any floated elements that come before it in the document flow.

The `container::after` pseudo-element uses the clearfix trick that you learned about in Chapter 8, enabling the element to clear any floated elements that it contains and preventing the container from collapsing.




The Product Testimonials

It's always a good idea to add some third-party positivity to your landing page, such as glowing reviews from the media, favorable user ratings from another site, or positive feedback you've received directly from product testers or users. The following example shows my landing page with a few reviews added, as well as a related illustration.

► Try This

➡ Online: wdpg.io/2/projects/landing-page/8

This example adds the testimonials section to the landing page.

WEB PAGE	<p>Daisy Fontana is a nerd heroine for our times, and <i>The Web Designer</i> tells her gripping tale.</p> <div> <p>"I've never seen a novel with so much HTML and CSS code. I mean there is a <i>lot</i> of code in this book! So much code. Code, code, code." —T. J. Murphy, Nowhere, OK</p> <p>"I particularly loved the scenes where Daisy is by herself in her room writing HTML and CSS. It's hard to make writing tags and properties interesting, and the author almost does it." —M. Dash, Tightwad, MO</p> <p>"I couldn't put it down. No, really, I could <i>not</i> physically put this book down. Thanks to the cheap cover stock, the book was literally glued to my hands. I had to go to the emergency room to get the thing off me." —A. Pendergast, Walla Walla, WA</p>  </div>
CSS	<pre> .testimonials { width: 100%; padding: 1em 0; font-size: 1.25em; background-color: plum; } .testimonials-text { float: left; width: 75%; } .testimonial { margin-bottom: .75em; } .testimonials-image { float: right; } </pre> <div> <p>The CSS code for the testimonials content band</p> <p>The CSS code for the testimonials text container</p> <p>The CSS code for an individual testimonial</p> <p>The CSS code for the testimonials image</p> </div> <p><i>continued</i></p>



PROJECT: Creating a Landing Page

HTML

```
<div class="testimonials">
  <div class="container">
    <div class="testimonials-text">
      <p class="testimonial">"I've never seen a novel with so much HTML
      and CSS code. I mean there is a <em>lot</em> of code in this book!
      So much code. Code, code, code." -T. J. Murphy, Nowhere, OK</p>
      <p class="testimonial">"I particularly loved the scenes where
      Daisy is by herself in her room writing HTML and CSS. It's hard
      to make writing tags and properties interesting, and the author
      almost does it." -M. Dash, Tightwad, MO</p>
      <p class="testimonial">"I couldn't put it down. No, really, I
      could <em>not</em> physically put this book down. Thanks to the
      cheap cover stock, the book was literally glued to my hands. I
      had to go to the emergency room to get the thing off me." -A.
      Pendergast, Walla Walla, WA</p>
    </div>
    <div class="testimonials-image">
      
    </div>
  </div>
</div>
```

The testimonials content
band element

The testimonials text container

The testimonials
image

An individual
testimonial

In this example, the content band is a `div` element with a class named `testimonials`, which is styled with the plum background color. Within the content container, a `testimonials-text` element is floated left and a `testimonial-image` element is floated right.

USE IT

On most landing pages, the preferred option is the one that returns the seller the highest net profit. You can use other criteria to determine which option you want to feature, such as most popular, most cost-effective, and best overall value.

The Pricing Table

In your ideal world, someone visiting your landing page will be so enamored of your product or service that he'll click the call-to-action button that you've placed in the page header. Failing that, you need to give the person a second chance to purchase or subscribe. One of the best ways to do that is to create a *pricing table*, which outlines the versions of your product that are available and the pricing for each version. If your product doesn't have versions (or even if it does), you can create packages that include other items, such as a companion e-book, a newsletter subscription, a discount coupon for future purchases, and so on.



The pricing table should have at least two versions or packages but generally not more than four. One of those versions should be your preferred version—the one you ideally want each person to choose. That version may be the one that nets you the most money, offers the best value to the user, or has some other advantage over the others. This preferred version should stand out from the others in some way. You could add a *Best Value!* heading over it, for example, or use one of the bold accent colors in your color scheme.

On my own landing page, I precede the pricing table with a content band that acts as a kind of title but is in fact an exhortation to the user to choose a package, as you can see in the following example.

<p>► Try This ➞ Online: wdpg.io/2/projects/landing-page/9 This example adds a content band before the pricing table.</p>	
WEB PAGE	
CSS	<pre>.product-versions-title { padding: 1em 0; font-size: 2em; text-align: center; }</pre> <p>The CSS code for the content band</p>
HTML	<pre><div class="container"> <h2 class="product-versions-title">Select the version that's right for you!</h2> </div></pre> <p>The HTML code for the content band</p>

For the pricing table itself, the standard format is to place each version or package in a vertical column that tells the reader everything she needs to know: the title, price (if any), and features. Then, you add a call-to-action button at the bottom of the column. The following example shows one column from the pricing table on my fictitious landing page.



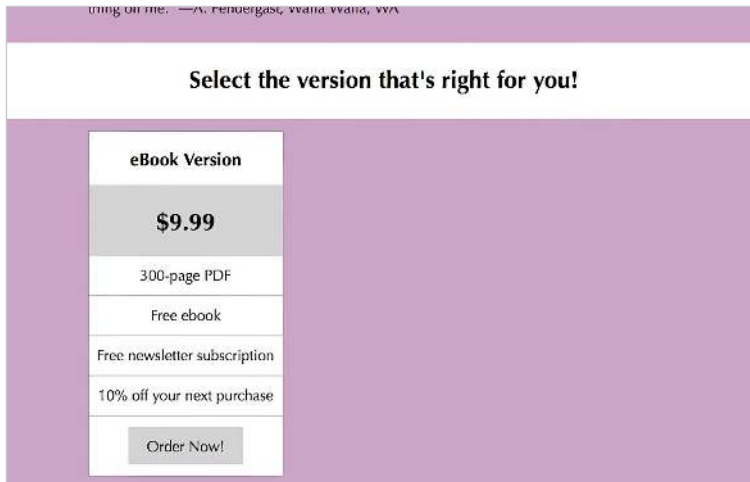
PROJECT: Creating a Landing Page

► Try This

➔ Online: wdpg.io/2/projects/landing-page/10

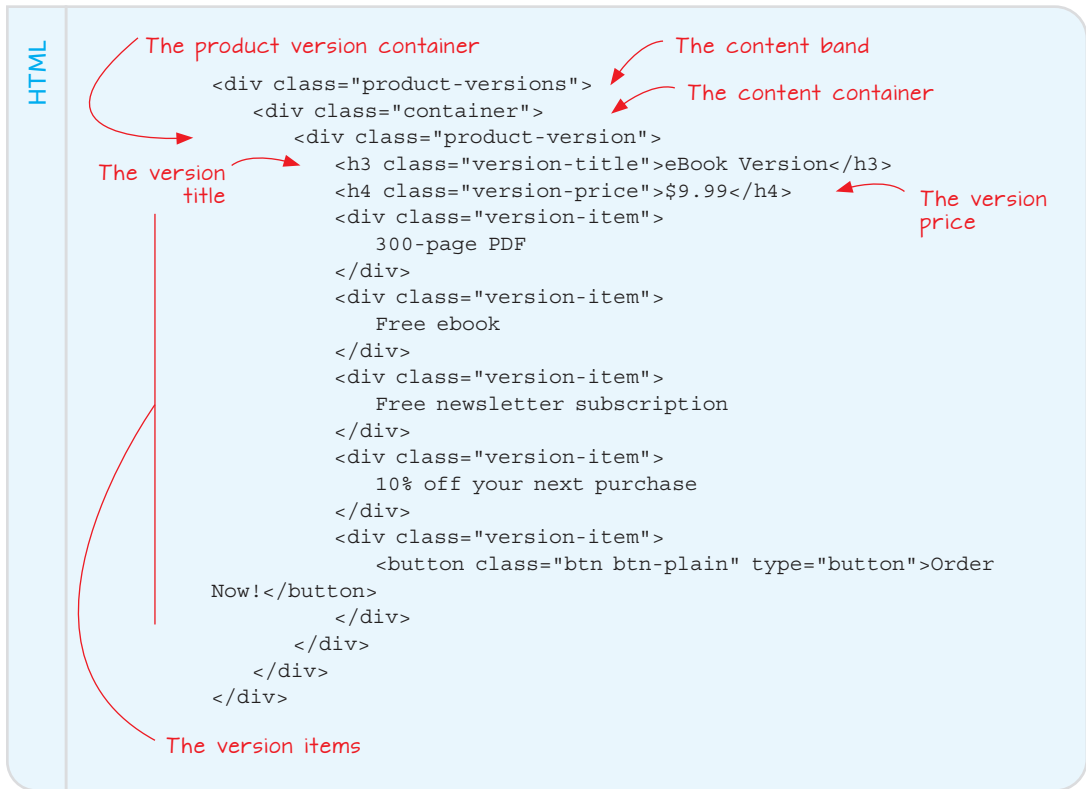
This example adds the first column of the pricing table.

WEB PAGE



CSS

```
.product-versions {
  padding: 1em 0;
  background-color: plum;
}
.product-version {
  float: left;
  width: 33.33%;
  border: 1px solid gray;
  text-align: center;
  background-color: white;
}
.version-title {
  padding: .75em 0;
  font-size: 1.5em;
}
.version-price {
  padding: .75em 0;
  font-size: 2em;
  background-color: lightgray;
}
.version-item {
  border-bottom: 1px solid gray;
  width: 100%;
  padding: .75em 0;
  font-size: 1.25em;
}
.version-item:last-child {
  border-bottom: 0;
}
.btn-plain {
  font-weight: normal;
  color: black;
  background-color: lightgray;
}
```



Seven classes are used here, and this is what they do:

- `product-versions`—This outer div creates the content band. It's given a plum background.
- `container`—This class is the content div.
- `product-version`—This div creates the column for a single version or package. It's floated left and, because there are three columns, is given a 33.33% width.
- `version-title`—This div holds the title of the version or package.
- `version-price`—This div holds the price of the version or package. For most of the versions, the price is given a plain gray background.



PROJECT: Creating a Landing Page

REMEMBER

When you specify two classes on an element—as I do in the following example in the second `h4` element—the web browser applies the properties of both classes to the element.

- `version-item`—This class holds the rest of the items in the version or package, with one `div` for each feature plus another at the bottom for the call-to-action button.
- `btn-plain`—This class is used for call-to-action buttons that you don't want to highlight. The text is given a normal weight; the text color reverts to black; and the background is set to light gray.

To complete the pricing table, you add the versions or packages, using the same styles as before, but styling your optimum version in a way that highlights it for the reader, as shown in the next example.

► Try This

➡ Online: wdpg.io/2/projects/landing-page/11

This example completes the pricing table, including one column that highlights a version for the reader.

WEB PAGE

eBook Version	Print Version	eBook+Print Bundle
\$9.99	\$14.99	\$19.99
300-page PDF	300-page paperback	PDF and paperback versions
Free ebook	Free ebook	Free ebook
Free newsletter subscription	Free newsletter subscription	Free newsletter subscription
10% off your next purchase	10% off your next purchase	15% off your next purchase
Order Now!	Order Now!	Order Now!

CSS

```
.version-price-featured {  
  color: white;  
  background-color: darkorchid;  
}
```

The CSS code for highlighting an item price



HTML

```

<div class="product-version">
  <h3 class="version-title">Print Version</h3>
  <h4 class="version-price">$14.99</h4>
  <div class="version-item">
    300-page paperback
  </div>
  <div class="version-item">
    Free ebook
  </div>
  <div class="version-item">
    Free newsletter subscription
  </div>
  <div class="version-item">
    10% off your next purchase
  </div>
  <div class="version-item">
    <button class="btn btn-plain" type="button">Order Now!</
button>
  </div>
</div>
<div class="product-version">
  <h3 class="version-title">eBook+Print Bundle</h3>
  <h4 class="version-price version-price-featured">$19.99</h4>
  <div class="version-item">
    PDF <em>and</em> paperback versions
  </div>
  <div class="version-item">
    Free ebook
  </div>
  <div class="version-item">
    Free newsletter subscription
  </div>
  <div class="version-item">
    15% off your next purchase
  </div>
  <div class="version-item">
    <button class="btn" type="button">Order Now!</button>
  </div>
</div>

```

The HTML code
for the highlighted
price

Almost done! With your full pricing table laid out, it's time to add your social media links.

MASTER

If your CSS specifies two classes on an element, and those classes have one or more properties in common, the properties in the second class (that is, the class that appears later in the CSS file) take precedence.



PROJECT: Creating a Landing Page

The Social Media Links

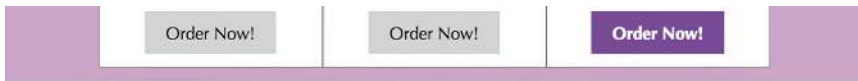
The next content band on the landing page is a collection of social media links, which appears centered on the page, with each social network's icon used as the link. The following example shows the links I set up for my landing page.

► Try This

➡ Online: wdpg.io/2/projects/landing-page/12

This example adds the social media links content band to the landing page.

WEB PAGE



Follow Logophilia Books on social media:



CSS

```
.social {  
  padding: 1em 0;  
  font-size: 1.5em;  
  text-align: center;  
}  
#A  
.social-links {  
  margin-top: .75em;  
}  
.social-link {  
  margin: 0 .25em;  
}
```

The CSS code
for the social
media links

HTML

```
<div class="social">  
  <div>  
    Follow Logophilia Books on social media:  
  </div>  
  <div class="social-links">  
    <a href="#" class="social-link"></a>  
    <a href="#" class="social-link"></a>  
    <a href="#" class="social-link"></a>  
    <a href="#" class="social-link"></a>  
  </div>  
</div>
```

The HTML
code for
the social
media links



Three classes are used here:

- **social**—This outer div creates the content band. It's given a white background, and the text-align property is set to center.
- **social-links**—This div creates the container for all the links.
- **social-link**—This class is used to style the individual links.

Note that you don't need a container element in this content band because the text and links are centered on the page.

The Page Footer

The final element of the landing page is the footer. As you can see in the following example, I used the footer to display a copyright notice and my contact information (which consists of my email address). Feel free to use the footer to add any other information you see fit, such as a "thank you for reading" message, a slogan or favorite epigram, or extra contact details.

► Try This

➡ Online: wdpg.io/projects/2/landing-page/13

This example separates the footer text from the body text by styling the footer with a light-gray background color, a smaller font size, and italics.

WEB PAGE



CSS

```
.footer {
  padding: 1em 0;
  font-variant: small-caps;
  text-align: center;
  background-color: lightgray;
}

.footer-links {
  margin-bottom: .75em;
  font-size: 1.5em;
}

.footer-link {
  margin: 0 .5em;
}

.copyright {
  font-style: italic;
  font-size: 1em;
}
```

The CSS code
for the footer

continued



PROJECT: Creating a Landing Page

HTML

```
<div class="footer">
  <div class="footer-links">
    <a href="#" class="footer-link">About</a>
    <a href="#" class="footer-link">Contact</a>
    <a href="#" class="footer-link">Site Map</a>
    <a href="#" class="footer-link">Privacy</a>
  </div>
  <div class="copyright">
    Copyright 2023 Logophilia Books
  </div>
</div>
```

The HTML
code for
the footer

Four classes are used here:

- **footer**—This outer div creates the content band. It's given a lightgray background, and the text-align property is set to center.
- **footer-links**—This div creates the container for all the footer links. Note that each link URL points to #, which is a placeholder that, when clicked, takes the user to the top of the page. In a production landing page, you'd replace each # with the URL of a file on your site.
- **footer-link**—This class styles the individual footer links.
- **copyright**—This class styles the copyright notice.

Again, you don't need a container element in this band because the content is already centered on the page.

From Here

Considering that you're only halfway through the book, I have to say that the final version of the landing page (mine is shown in Figure 10.3) is a fine-looking web page. It's easy to read, easy to understand, and isn't boring. (If you're as pleased with your landing page as I think you ought to be and are looking forward to getting your code online, check out the appendix to get the details.)





COMING SOONISH!

The Web Designer

A story of HTML, CSS, and the big city

She knew HTML. She knew CSS. But did she know love? Read this destined-to-be-remaindered novel that *The New York Times Book Review* described as “reasonably grammatical” and the *Times Literary Supplement* called “bathroom-worthy.” Pre-order your paperback copy now for just \$14.99.

[I Want It!](#)

At High Falutin High, the arts high school in her hometown, Daisy Fontana fell in love. Not with a boy, or even with a girl, for that matter, but with something altogether more interesting: web design. Instead of a BFF, she had CSS. Instead of singing and dancing with the other kids, she spent her time coding alone. But when she graduated and moved to the city to find a job, she knew everything about HTML, but nothing about life. Will the town eat her alive, or will she survive and rise to the top of the cutthroat world of coding websites? Daisy Fontana is a nerd heroine for our times, and *The Web Designer* tells her gripping tale.

“I’ve never seen a novel with so much HTML and CSS code. I mean there is a *lot* of code in this book! So much code. Code, code, code.”
—T. J. Murphy, Nowhere, OK

“I particularly loved the scenes where Daisy is by herself in her room writing HTML and CSS. It’s hard to make writing tags and properties interesting, and the author almost does it.” —M. Dash, Tightwad, MO

“I couldn’t put it down. No, really, I could *not* physically put this book down. Thanks to the cheap cover stock, the book was literally glued to my hands. I had to go to the emergency room to get the thing off me.” —A. Pendengast, Walla Walla, WA



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► **Figure 10.3**

The landing page for my book



PROJECT: Creating a Landing Page

If there's a problem with the landing page, it's that we had to use lots of padding and margin fiddling (among other CSS hacks) to get things to line up somewhat neatly. That fussing happened because we're not using a true page layout. With our elements floated here and there, we're almost in layout land, but not quite. But that's no problem because page layouts are the topic of Part 3, so you'll soon learn all you need to know to create rock-solid layouts for your landing pages and all your other pages.

Summary

- Sketch out the page you want to build.
- Choose the typeface for the text.
- Choose a color scheme.
- Build the initial page structure: the barebones HTML tags and the global CSS properties.
- Fill in and style each section one by one: header, description, testimonials, pricing table, social media links, and footer.

Part 3

.....

Laying Out a Web Page

A big part of designing web pages is the ability to lay out the page elements in a way that's not only pleasing to the eye, but also easy to understand and navigate. That sounds like a tall order, I'm sure, but the chapters in Part 3 will help you do that. You start with a look at some page layout basics in Chapter 11, including learning the important HTML5 semantic page tags such as `<header>` and `<article>`. From there, Chapter 12 takes you on a tour of one of the hottest and most powerful modern page layout technologies: Flexbox. Chapter 13 covers CSS Grid, which is the page layout technology that web designers have been waiting for.

Modern web design is all about responsiveness, which enables pages to look good and work well on any size screen, and that's the subject of Chapter 14. Finally, you put all this newfound page layout know-how to work in Chapter 15 as you build a sophisticated photo gallery page.



Learning Page Layout Basics



This chapter covers

- Understanding web page layout types, technologies, and strategies
- Getting to know the HTML5 semantic page layout elements
- Examining modern, real-world page layouts

The first half of this book served to lay down a solid foundation for creating web pages. When you got past the basics of HTML and CSS, you learned about text tags, fonts, colors, CSS classes, the box model, floating and positioning elements, and images and other media. So, congratulations are in order: you've graduated from being able merely to *build* web pages to being able to *design* them.



Alas, you'll have little time to bask in your newfound glory because this chapter dives right into the next stage of web design. Here, you take a step back from the "trees" of HTML tags and CSS properties to examine the "forest" of page layout. This refers to the overall structure and organization of a web page, and if that sounds trivial or unimportant, consider this: every single person who visits your page will, consciously or not, be asking a bunch of questions. What is the page about? Am I interested? Does this page have the information I'm looking for? If so, where can I find it?

All those questions are—or, at least, *should* be—answerable by glancing at your layout. If your structure is wonky or your organization is haphazard, I guarantee you that most people will move on after a few seconds. Avoiding that fate means taking a bit of time to plan and code a layout that shows your content in its best, visitor-friendliest light.

The Holy Grail Layout

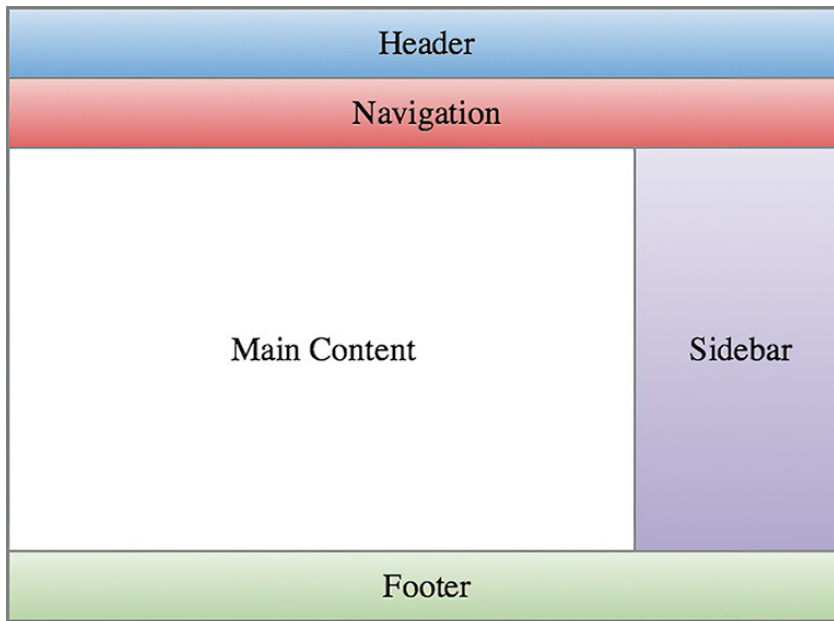
To help you learn the various web page layout techniques, I'm going to use a version of the so-called *holy grail* layout that consists of the following parts:

- A header at the top of the page
- A navigation bar below the header
- Two full-height columns consisting of the main page content in the left column and a sidebar of related content in the right (or sometimes the left) column
- A footer at the bottom of the page

USE IT

The holy grail layout is useful for blog posts, articles, essays, how-tos, and similar content-focused pages.

There are several variations on this theme, depending on how strictly you want to define the layout. You may want three columns between the navigation bar and the footer instead of two, for example. Another common variation is to have the footer appear at the bottom of the browser window if the content doesn't extend that far. Figure 11.1 shows a schematic of the layout you're going to build.



► **Figure 11.1**

A version of the holy grail web page layout

To build this layout, you need to understand the available page layout methods.

Understanding Web Page Layout Methods

As I mentioned in Chapter 7, by default, the web browser lays out HTML content with the blocks stacked in the order in which they appear in the source document. Within each block, the text runs left to right (for languages that read that way). For the simplest web pages (such as the personal home page you built in chapter 5), that default layout is fine, but at this point in your web design career, you're already way beyond that. At this level, you need to know how to break out of that default layout to gain some control of how web content appears on the page. Fortunately, you have no shortage of ways to do that, but you need to know about two main methods:

- *Flexbox*—This CSS module enables you to organize page content in containers that can wrap, grow, and shrink in flexible ways. See Chapter 12 to learn how it works.
- *CSS Grid*—This powerful CSS module enables you to organize page content as though you were positioning and aligning elements according to an invisible grid. See Chapter 13 for all the details.

Which one should you use? The key point to remember is that Flexbox is one-dimensional in the sense that you use it to lay out page items either



REMEMBER

An older and now largely abandoned page layout system uses floated elements (see Chapter 8) to organize page content. If you want to know how this works, see my tutorial on the Web Design Playground: wdpg.io/2/11-2-0.

REMEMBER

Another deprecated page layout technology is inline blocks, although you might still see this used on the web. To understand how it works, see my tutorial on the Web Design Playground: wdpg.io/2/11-3-0.

horizontally or vertically, while Grid is two-dimensional in the sense that you use it to lay out page items both horizontally and vertically. Therefore, in every project where you need your page elements to break out of the default browser flow, you should use Grid to set up the overall layout of the page, and then augment that system with Flexbox whenever you need to lay out multiple items either horizontally or vertically.



Grid is designed to be used with Flexbox, not instead of it. —Ollie Williams

The last piece of the page layout puzzle you need to know before getting started is the collection of HTML5 elements that enable you to create semantic layouts.

Learning the HTML5 Semantic Page Elements

It's important for your web page layouts to be semantic because every page you upload to the web will be read and parsed in some way by automated processes, such as search engine crawlers and screen readers for the disabled. If your page is nothing but a collection of anonymous `<div>` and `` tags, that software will be less likely to analyze the page to find the most important content.

To help you solve that problem, HTML5 offers a collection of semantic elements that you can use to specify the type of content contained in each area of your page. There are quite a few of these tags, but the following seven are the most important:

```
<header>
<nav>
<main>
<article>
<section>
<aside>
<footer>
```

The next few sections explain each of these elements.



Proper semantics . . . increase accessibility, as assistive technologies such as screen readers can better interpret the meaning of our content. —Anna Monus



Lesson 11.1: Adding a Semantic Header Element

Covers: The header element


➡ Online: wdpg.io/2/11-1-1

You use the header element to define a page area that contains introductory content. This content is most often the site title (which should be marked up with a heading element, such as `h1`), but it can also include things such as a site logo. Following is an example.

► Example

➡ Online: wdpg.io/2/11-1-1

This example shows the header semantic page element in action.

WEB PAGE	
CSS	<pre>header { background-color: #6fa8dc; }</pre> <p>Background color applied to the header element</p>
HTML	<pre><header> <h1>Semantics Depot</h1> </header></pre> <p>The header element</p>

After adding a header to your page, the most common semantic element to add next is a navigation section.



Lesson 11.2: Adding a Semantic Navigation Element

Covers: The nav element


⇒ Online: wdpg.io/2/11-1-2

You use the nav element to define a page area that contains navigation content, such as links to other sections of the site or a search box. This element can appear anywhere on the page but typically appears right after the page's main header element, as shown in the following example.

► Example

⇒ Online: wdpg.io/2/11-1-2

This example adds a nav semantic element to the page.

WEB PAGE	
CSS	<pre>nav { background-color: #eb9f9f; text-transform: uppercase; padding: .25em; }</pre> <p>Background color applied to the nav element</p>
HTML	<pre><header> <h1>Semantics Depot</h1> </header> <nav> Home Blog Contact About Us </nav></pre> <p>The nav element</p>



With your header and navigation elements in place, you're ready to lay out your page's content, which usually begins with the semantic main element.

Lesson 11.3: Adding a Semantic Main Element

Covers: The `main` element

⇒ Online: wdpg.io/2/11-1-3

The `main` element is used as a container for the content that's unique to the current page. Whereas the `header`, `nav`, `aside`, and `footer` elements are often common to all or most of the pages on the site, the `main` element is meant to mark up the content that's unique. You can only have one `main` element per page. The `main` element typically appears after the `header` and `nav` elements, as shown in the following example.

► Example

⇒ Online: wdpg.io/2/11-1-3

This example adds a main semantic element to the page.

WEB PAGE	<p>Unique content goes here.</p>
HTML	<pre> <header> <h1>Semantics Depot</h1> </header> <nav> Home Blog Contact About Us </nav> <main> Unique content goes here </main> </pre> <p>The main element</p>



Now that you have your page's main element in place, you can start adding content to it, usually beginning with the semantic article element.

Lesson 11.4: Adding a Semantic Article Element

Covers: The article element

➡ Online: wdpg.io/2/11-1-4

The article element is used to mark up a complete, self-contained composition. The model here is the newspaper or magazine article, but this element can also apply to a blog entry, a forum post, or an essay. Most pages have a single article element nested within the main element, as shown in the following example.

► Example

➡ Online: wdpg.io/2/11-1-4

This example adds an article semantic element to the page.

WEB PAGE	
HTML	<pre><header> <h1>Semantics Depot</h1> </header> <nav> Home Blog Contact About Us </nav> <main> <article> Article content goes here </article> </main></pre> <p>The article element</p>



It's perfectly acceptable to have multiple article elements within a single main element. Note, too, that it's okay to nest a header element inside an article element if doing so is semantically appropriate:

```
<article>
  <header>
    <h2>Isn't It Semantic?</h2>
    <p>By Paul McFedries</p>
  </header>
  Article content goes here.
</article>
```

If your article contains multiple sections, your next semantic chore is to mark up those parts of the page with section elements.

Lesson 11.5: Adding a Semantic Section Element

Covers: The `section` element

⇒ Online: wdpg.io/2/11-1-5

You use the `section` element to surround any part of a page that you'd want to see in an outline of the page. That is, if some part of the page consists of a heading element (`h1` through `h6`) followed by some text, you'd surround the heading and its text with `<section>` tags. This typically happens within an article element, as shown in the following example.

► Example

⇒ Online: wdpg.io/2/11-1-5

This example adds several section semantic elements to the page.

WEB PAGE



Semantics Depot

[HOME](#) [BLOG](#) [CONTACT](#) [ABOUT US](#)

Introduction

Introduction text

Argument

Argument text

Summary

Summary text

continued



HTML

```
<header>
  
  <h1>Semantics Depot</h1>
</header>
<nav>
  <a href="#">Home</a>
  <a href="#">Blog</a>
  <a href="#">Contact</a>
  <a href="#">About Us</a>
</nav>
<main>
  <article>
    <section>
      <h3>Introduction</h3>
      Introduction text
    </section>
    <section>
      <h3>Argument</h3>
      Argument text
    </section>
    <section>
      <h3>Summary</h3>
      Summary text
    </section>
  </article>
</main>
```

The section
elements

If your web page includes content that's separate from the main content, then next on your semantic to-do list is to place that content within an aside element.



Lesson 11.6: Adding a Semantic Aside Element

Covers: The `aside` element

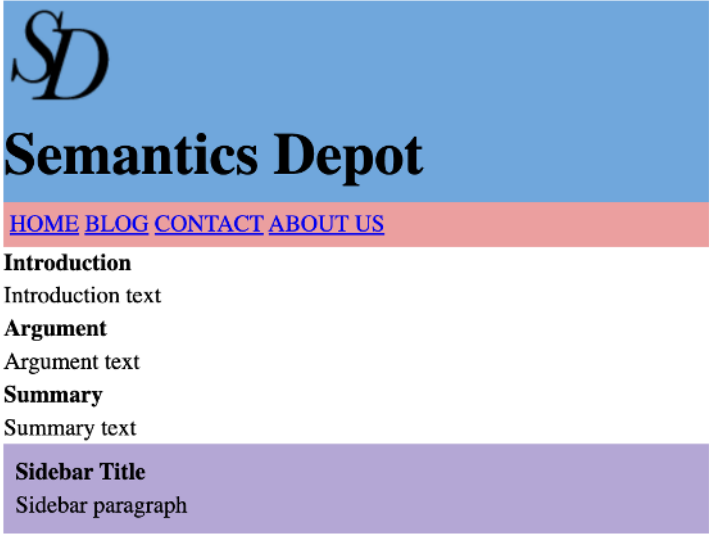
➞ Online: wdpg.io/2/11-1-6

You use the `aside` element to mark up a page area that isn't directly related to the page's unique content. A typical example is a sidebar that contains the latest site news, a Twitter feed, and so on. The `aside` element can appear anywhere within the main element (and, indeed, can appear multiple times on the page), but it's a best practice to have the `aside` appear after the page's article element, as shown in the following example.

► Example

➞ Online: wdpg.io/2/11-1-6

This example adds an `aside` semantic element to the page.

WEB PAGE	
CSS	<pre> aside { background-color: #b4a7d6; } </pre> <p>Background color applied to the <code>aside</code> element</p> <p><i>continued</i></p>



HTML

```
<header>
  
  <h1>Semantics Depot</h1>
</header>
<nav>
  <a href="#">Home</a>
  <a href="#">Blog</a>
  <a href="#">Contact</a>
  <a href="#">About Us</a>
</nav>
<main>
  <article>
    <section>
      <h3>Introduction</h3>
      Introduction text
    </section>
    <section>
      <h3>Argument</h3>
      Argument text
    </section>
    <section>
      <h3>Summary</h3>
      Summary text
    </section>
  </article>
  <aside>
    <h3>Sidebar Title</h3>
    <p>
      Sidebar paragraph
    </p>
  </aside>
</main>
```

The aside
element

With your page's header, navigation, and main elements all in place, your next and final semantic task is to add a footer element.



Lesson 11.7: Adding a Semantic Footer Element

Covers: The footer element

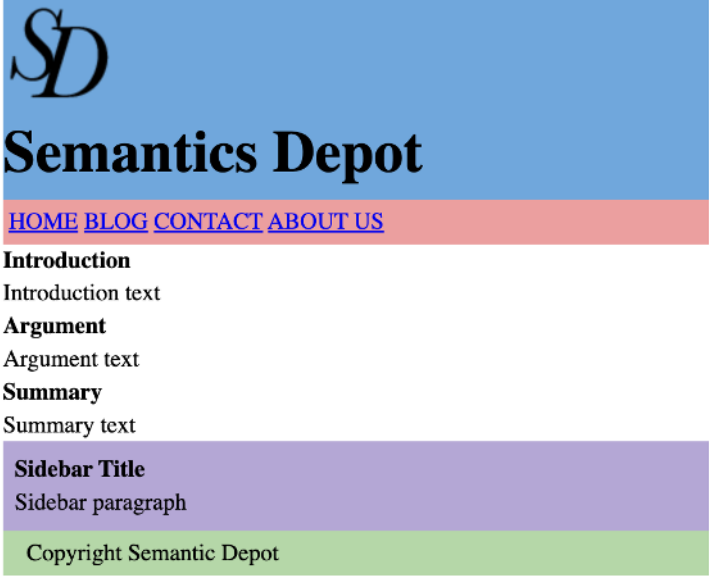
➡ Online: wdpg.io/2/11-1-7

You use the footer element to define a page area that contains closing content, such as a copyright notice, address, and contact information. Here's an example that demonstrates the semantic layout of an HTML5 page.

► Example

➡ Online: wdpg.io/2/11-1-6

This example adds an aside semantic element to the page.

WEB PAGE	
CSS	<pre> footer { background-color: #b6d7a8; } </pre> <p>Background color applied to the footer element</p> <p><i>continued</i></p>



HTML

```
<header>
  
  <h1>Semantics Depot</h1>
</header>
<nav>
  <a href="#">Home</a>
  <a href="#">Blog</a>
  <a href="#">Contact</a>
  <a href="#">About Us</a>
</nav>
<main>
  <article>
    <section>
      <h3>Introduction</h3>
      Introduction text
    </section>
    <section>
      <h3>Argument</h3>
      Argument text
    </section>
    <section>
      <h3>Summary</h3>
      Summary text
    </section>
  </article>
  <aside>
    <h3>Sidebar Title</h3>
    <p>
      Sidebar paragraph
    </p>
  </aside>
</main>
<footer>
  <p>Copyright Semantic Depot</p>
</footer>
```

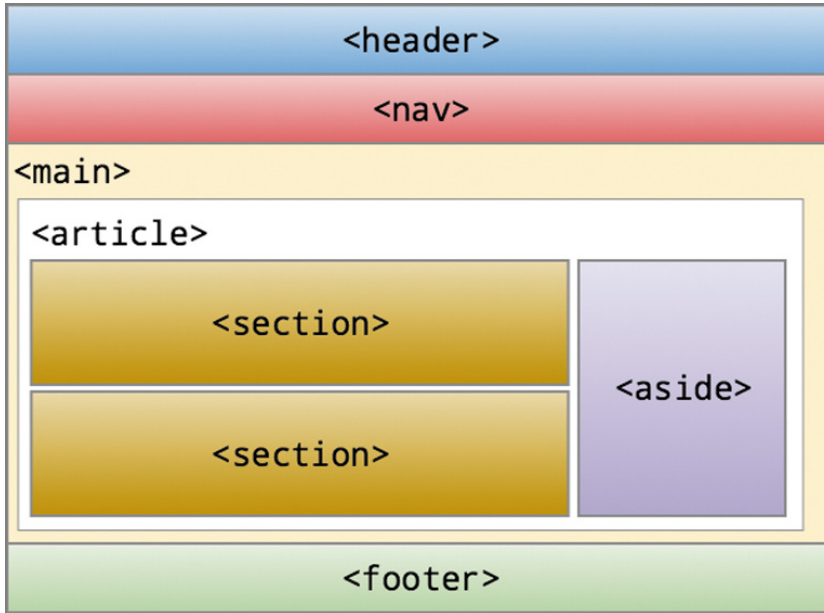
The footer
element

Now that you've built a complete page with all the semantic elements, it's time to return to the holy grail layout to see how these semantic elements fit into that picture.



The Holy Grail Layout, Revisited

Earlier, you learned about the holy grail layout, which I can reintroduce within the context of the HTML5 semantic page elements. Figure 11.2 shows the same schematic that you saw in Figure 11.1 but with HTML5 semantic layout tags identifying each part.



► **Figure 11.2**

The holy grail web page layout with HTML5 semantic tags

Here's the bare-bones HTML code for the layout:

```
<header>
  
  <h1>Site Title</h1>
</header>
<nav>
  <ul>
    <li>Item 1</li>
    etc.
  </ul>
</nav>
<main>
  <article>
    <section>
      <h2>Article Title</h2>
      <p>Article paragraph</p>
      etc.
    </section>
    <aside>
      <p>Sidebar paragraph</p>
      etc.
    </aside>
  </article>
</main>
```



```
<footer>
  <p>Footer paragraph</p>
  etc.
</footer>
```

You'll notice that the example page I built in this chapter's lessons doesn't look much like the holy grail layout in Figure 11.2. That's because I let the browser use its default flow with each semantic element. Breaking out of that flow is the subject of the next two chapters.

Summary

- You can make your pages more semantic by using the HTML5 page layout tags: `<header>`, `<nav>`, `<main>`, `<article>`, `<section>`, `<aside>`, and `<footer>`.
- The `header` element is where you define a page area that contains introductory content.
- Use the `nav` element to define a page area that contains navigation content.
- Your page can only have one `main` element, which you use as a container for the content that's unique to the current page.
- The `article` element is where you mark up a complete, self-contained composition.
- Use the `section` element to surround any part of a page that you'd want to see in an outline of the page.
- If you have text that isn't directly related to the page's unique content, place the text inside an `aside` element.
- The `footer` element is where you define a page area that contains closing content.



Creating Page Layouts with Flexbox



This chapter covers

- Understanding how Flexbox works
- Learning the techniques for working with Flexbox containers and items
- Putting Flexbox to good use with real-world ideas
- Building the holy grail layout with Flexbox

In Chapter 11, you saw that HTML5 offers a long list of page elements, from `header` to `footer`, and from `article` to `aside`. These elements have only semantic value, however, meaning that they don't perform any actual layout duties. To get your web pages laid out the way you want, you need to break out of the web browser's default page flow using the modern and powerful layout technologies of Flexbox and Grid.

You learn all about Grid in Chapter 13, but in this chapter, the focus is squarely on Flexbox. Here you learn what Flexbox is, what it can do, and how it works. It's true that Flexbox has a reputation for being difficult to learn, but here you'll see that you can quickly get up to speed with Flexbox just by asking a few simple questions.



Understanding Flexbox

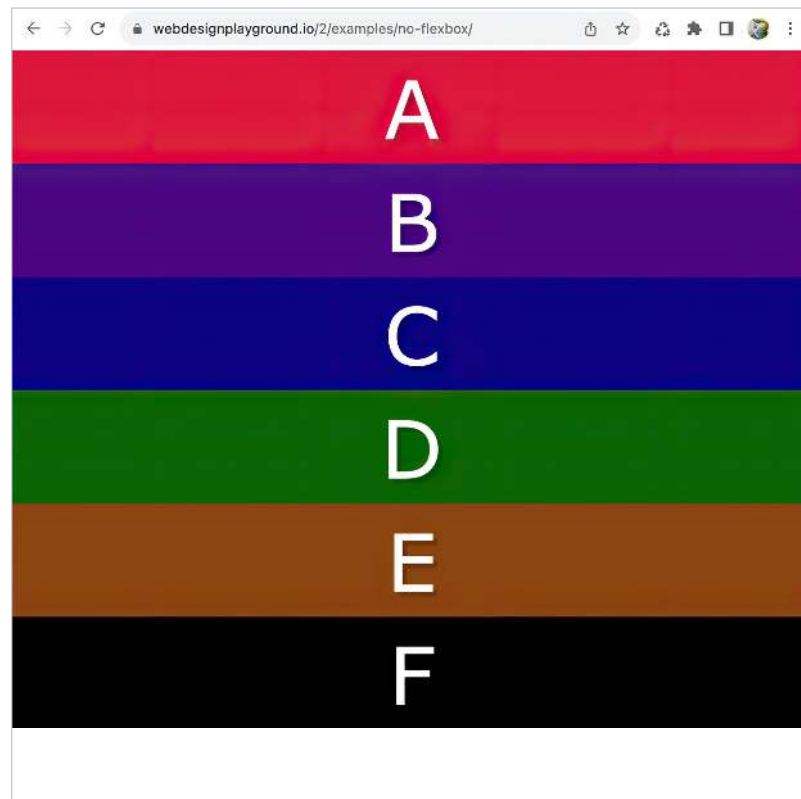
Flexbox is the welcome shorthand for this method's cumbersome official moniker: Flexible Box Layout Module. The underlying principle behind Flexbox is to provide a way around the rigid, cumbersome way that the browser handles blocks of content. The default is to stack them. Consider the following collection of `div` elements:

```
<div class="container">
  <div class="item itemA">A</div>
  <div class="item itemB">B</div>
  <div class="item itemC">C</div>
  <div class="item itemD">D</div>
  <div class="item itemE">E</div>
  <div class="item itemF">F</div>
</div>
```

Not shown here are the classes I've applied to give each item element a unique background color. Figure 12.1 shows the results, and, as you can see, the `div` elements are stacked and extend to the width of the browser window.

► **Figure 12.1**

The default browser layout of the `div` elements





Sure, you can break out of this default flow with floats or inline blocks (as I describe in Chapter 8), but the uncomfortable sense remains that the browser is still in charge and is fitting your blocks where *it* thinks they should go. Yes, you can tame the browser somewhat by styling your floats and inline blocks just so, but there's a brittleness to these tweaks.

Flexbox rides to the rescue by offering simple but extremely powerful methods for laying out, distributing, aligning, sizing, and even ordering the child elements in a parent container. The *flex* part of the name comes from one of this technology's main tenets: the child items in a container should be able to change dimensions (width *and* height) by growing to fill in empty space if there's too much of it or by shrinking to allow for a reduction in space. This happens whether the number of content changes or the size of the screen changes (such as by maximizing a window or by changing a device's screen orientation).

So, Flexbox is perfect, then? No, it's not. It has two main drawbacks:

- Due to its inherent flexibility, it sometimes behaves in ways that appear nonsensical. It can be maddening at first, but when you've used it a few times, you begin to see why Flexbox behaves the way it does.
- It's not suitable for large-scale layouts. Flexbox works wonderfully for one-dimensional components of a page—such as a header or a sidebar—and is fine for small-scale layouts (such as the holy grail practice layout). But big, complex projects are almost always too much for Flexbox to handle. That's okay, though, because larger-scale layouts are the province of CSS Grid Layout, which you'll learn about in Chapter 13.

When you work with Flexbox, you work with two kinds of page objects: containers and items. A *flex container* is any type of parent block element—`div`, `p`, any of the HTML semantic page elements you learned in Chapter 11, even the `body` element—that surrounds one or more elements. These child elements are called *flex items*.

Okay, that's enough theory. It's time to start learning how Flexbox works.

Working with Flexbox Containers

Before you can do anything with Flexbox, you need to decide which block-level element will be the flex container. When you've done that, you convert that element to a container with a single CSS declaration: `display: flex`. The following rule turns the `header` element into a flex container:

```
header {  
  display: flex;  
}
```



PLAY

You can try out all the flex-direction values interactively on the Playground. [Online: wdpg.io/2/12-1-2](https://wdpg.io/2/12-1-2)

REMEMBER

The row value is the default, so declaring flex-direction: row is optional.

REMEMBER

If you applied flex-direction: column to this example, you'd get the layout shown in Figure 12.1 earlier in this chapter; the main axis would run from top to bottom, and the cross axis would run from left to right. If you applied flex-direction: column-reverse, you'd get the same layout with the div elements in reverse order; the main axis would run bottom to top, and the cross axis would remain left to right.

The container's child elements automatically become flex items; no extra rules, declarations, or code are required. From there, you can start customizing your flex container and its items to suit the task at hand.

I find that the best way to learn about and use Flexbox is to ask yourself a series of questions—one set for containers and another for items. Here are the container questions:

- In which direction do you want the container to run?
- How do you want the items arranged along the main axis?
- How do you want the items arranged along the cross axis?
- Do you want the items to wrap?
- How do you want multiple lines arranged along the cross axis?

(Don't worry if you're not sure what I mean by *main axis* and *cross axis*. All will be revealed in the next section.) The next few sections ask and show you the possible answers to each of these questions.

In Which Direction Do You Want the Container to Run?

The first thing that's flexible about Flexbox is that it doesn't dictate one and only one direction for the container's items. Although the browser's default layout rigidly enforces a vertical direction, and although floats and inline blocks only work horizontally, Flexbox is happy to go either way. With Flexbox, *you* decide.

Perhaps the most important Flexbox concept to grasp right from the get-go is the notion that Flexbox containers always have two axes:

- **Main**—The axis that runs in the same direction as the container's items
- **Cross**—The axis that runs perpendicular to the main axis (the cross axis is also called the *secondary axis*)

You determine the main-axis direction when you set the flex-direction property on a container:

```
container {
  display: flex;
  flex-direction: row|row-reverse|column|column-reverse;
}
```

- **row**—Sets the main axis to horizontal, with items running from left to right (the default)
- **row-reverse**—Sets the main axis to horizontal, with items running from right to left
- **column**—Sets the main axis to vertical, with items running from top to bottom
- **column-reverse**—Sets the main axis to vertical, with items running from bottom to top

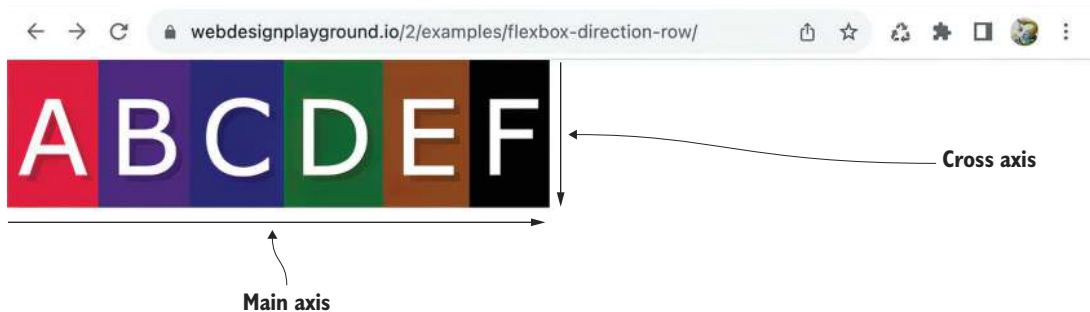


I should mention that the `row` value only runs items left to right if that's the text direction of the language you're using. If you're using a language that reads right to left (such as Arabic), then the `row` value runs items from right to left (and so `row-reverse` would run items from left to right).

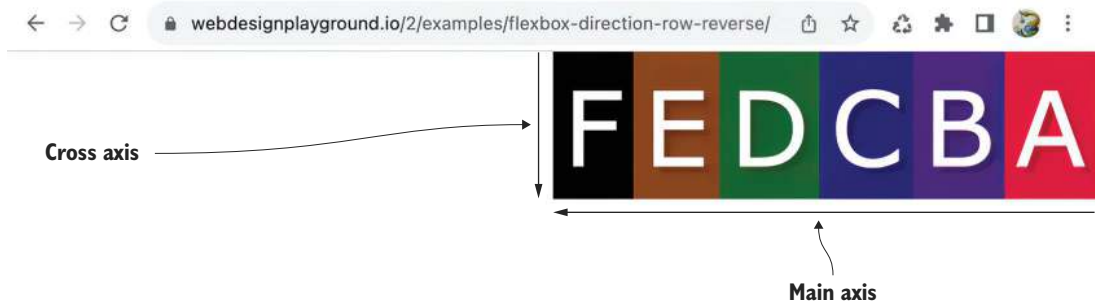
Using the `div` elements shown in Figure 12.1 earlier in this chapter, here's how you'd turn the parent `div` into a flex container that uses the `row` direction value:

```
.container {  
  display: flex;  
  flex-direction: row;  
}
```

Figure 12.2 shows the results, and Figure 12.3 shows what happens when you use `flex-direction: row-reverse`.



► **Figure 12.2** The `div` elements with a flex container and the `row` direction applied



► **Figure 12.3** The `div` elements with a flex container and the `row-reverse` direction applied

Figure 12.2 shows the same result as using `float: left` or `display: inline-block`, and Figure 12.3 shows the same result as using `float: right` (and isn't possible with inline blocks). With Flexbox, however, you get the result by adding a couple of declarations to the container rather than styling each child element, as you do with floats and inline blocks. Right off the bat, you can see that Flexbox is easier and more efficient.

PLAY

How would you use Flexbox to display a numbered list in reverse order? ➡ Online: [wdpg.io/2/12-1-4](https://webdesignplayground.io/2/12-1-4)



REMEMBER

The `flex-start` value is the default, so declaring `justify-content: flex-start` is optional.

How Do You Want the Items Arranged Along the Main Axis?

When you've used `flex-direction` to set the main axis for the container, your next decision is how you want the items to be arranged along that axis. Use the `justify-content` property on a container:

```
container {
  display: flex;
  justify-content: flex-start | flex-end | center | space-between | space-around | space-evenly;
}
```

- `flex-start`—Places the items at the beginning of the container (the default)
- `flex-end`—Places the items at the end of the container
- `center`—Places the items in the middle of the container
- `space-between`—Places the items with the first item at the beginning of the container, the last item at the end, and the rest of the items evenly distributed in between
- `space-around`—Distributes the items within the container by supplying most items with the same amount of space on either side, but the first item gets half that space to the left and the last item gets half that space to the right
- `space-evenly`—Distributes the items evenly within the container by supplying each item the same amount of space on either side

Figure 12.4 shows the effect that each value has on the arrangement of the items within the container when the main axis is horizontal. (Note that I've added an outline around each container so you can visualize its boundaries.)

PLAY

You can play around with the `justify-content` values interactively on the Playground. ➞ Online: wdpg.io/2/12-1-5

How Do You Want the Items Arranged Along the Cross Axis?

With the items arranged along the main axis, your next task is choosing an arrangement along the cross axis. You set this by using the container's `align-items` property:

```
container {
  display: flex;
  align-items: stretch | flex-start | flex-end | center | baseline;
}
```

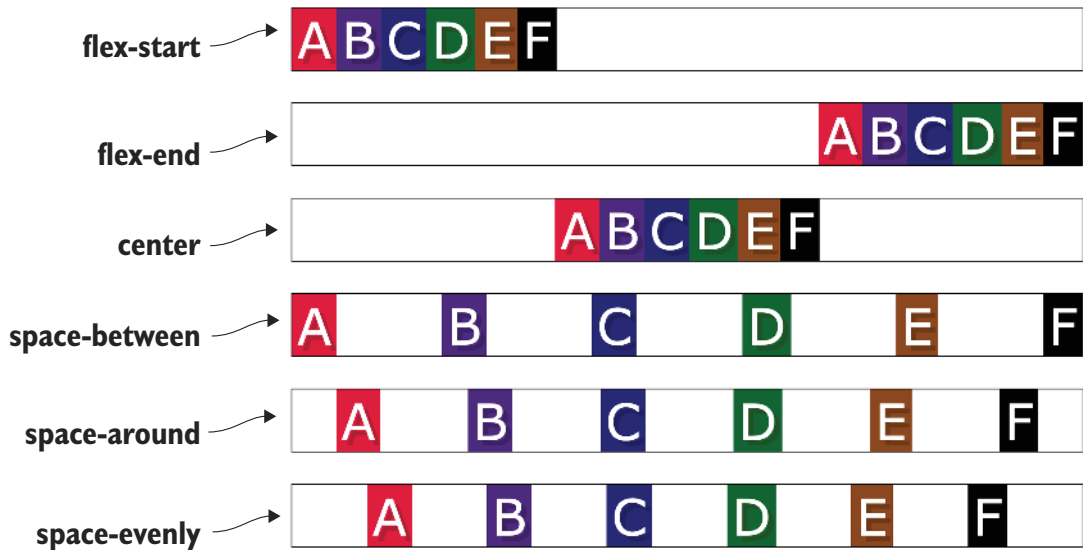
REMEMBER

The `stretch` value is the default, so declaring `align-items: stretch` is optional.

- `stretch`—Expands each item along the cross axis to fill the container (the default)
- `flex-start`—Aligns the items with the beginning of the cross axis
- `flex-end`—Aligns the items at the end of the cross axis



- **center**—Aligns the items in the middle of the cross axis
- **baseline**—Aligns the items along their baseline of the first line of text in the flex container



► **Figure 12.4** The `justify-content` values at work

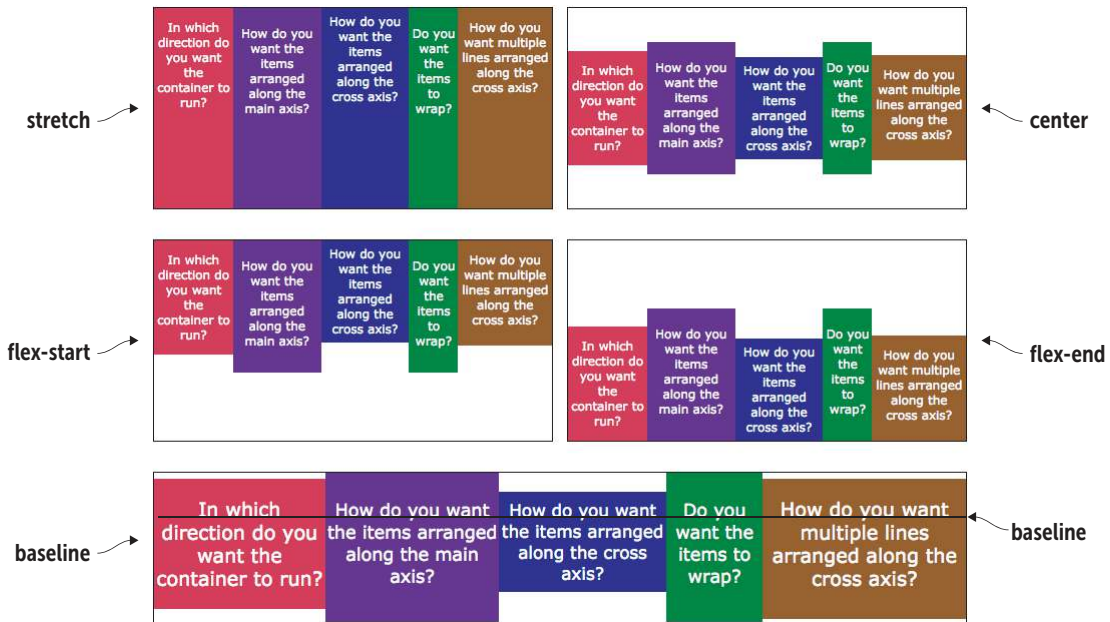
Figure 12.5 shows the effect that each value has on the arrangement of the items within the container when the cross axis is vertical. (I've added an outline around each container so you can visualize its boundaries.)

REMEMBER

If you want some space between the items in each column of your flex container, set the `column-gap` property to the amount of space you want. To add space between the rows of your flex container, use the `row-gap` property.



Creating Page Layouts with Flexbox



► **Figure 12.5** The `align-items` values in action

FAQ

Are these alignment options confusing, or is it just me? Almost everyone getting started with Flexbox finds alignment to be the most confusing part. It may help to think of the main axis as the justification axis because you use the `justify-content` property to arrange items on that axis. Similarly, think of the cross axis as the alignment axis, because you arrange items on it using the `align-items` property.

Do You Want the Items to Wrap?

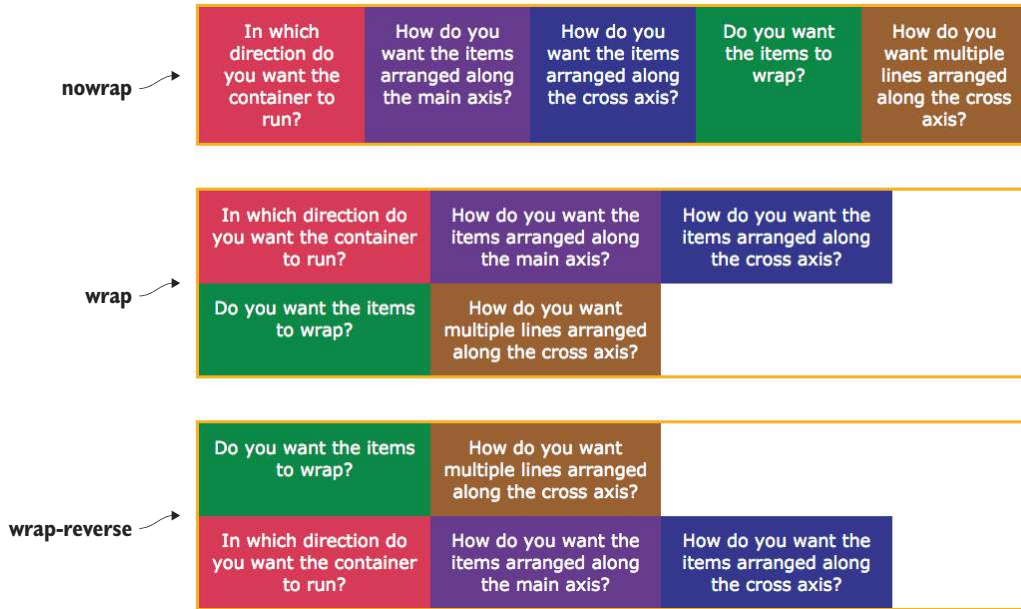
By default, Flexbox treats a container as a single row (if you've declared `flex-direction` as `row` or `row-reverse`) or as a single column (if you've declared `flex-direction` as `column` or `column-reverse`). If the container's items are too big to fit into the row or column, Flexbox shrinks the items along the main axis to make them fit. Alternatively, you can force the browser to wrap the container's items to multiple rows or columns rather than shrinking them. You do this by using the container's `flex-wrap` property:

```
container {
  display: flex;
  flex-wrap: nowrap|wrap|wrap-reverse;
}
```

- `nowrap`—Doesn't wrap the container's items (the default)
- `wrap`—Wraps the items to as many rows or columns as needed
- `wrap-reverse`—Wraps the items at the end of the cross axis



Figure 12.6 shows the effect that each value has on the arrangement of the items within the container when the main axis is horizontal. (I've added an orange outline around each container so you can visualize its boundaries.)



► **Figure 12.6** How the flex-wrap values work

How Do You Want Multiple Lines Arranged Along the Cross Axis?

Your final container-related decision is how you want multiple lines—that is, multiple rows or columns—arranged along the cross axis. This is similar to arranging individual flex items along the main axis, except that here, you're dealing with entire lines of items. You control this arrangement by using the container's `align-content` property:

```
container {
  display: flex;
  align-content: stretch|center|flex-start|flex-end|space-between|space-around|space-evenly;
}
```

- **stretch**—Expands the wrapped lines along the cross axis to fill the container height (the default)
- **center**—Places the lines in the middle of the cross axis
- **flex-start**—Places the lines at the beginning of the cross axis
- **flex-end**—Places the lines at the end of the cross axis
- **space-between**—Places the first line at the beginning of the cross axis, the last line at the end, and the rest of the lines evenly distributed in between

PLAY

You can try out the different `align-items` values interactively on the Playground.

➡ Online: wdpg.io/2/12-1-6

REMEMBER

The `nowrap` value is the default, so declaring `flex-wrap: nowrap` is optional.

PLAY

You can wrap your head around the three flex-wrap values by trying them out interactively on the Playground.

➡ Online: wdpg.io/2/12-1-8



Creating Page Layouts with Flexbox

REMEMBER

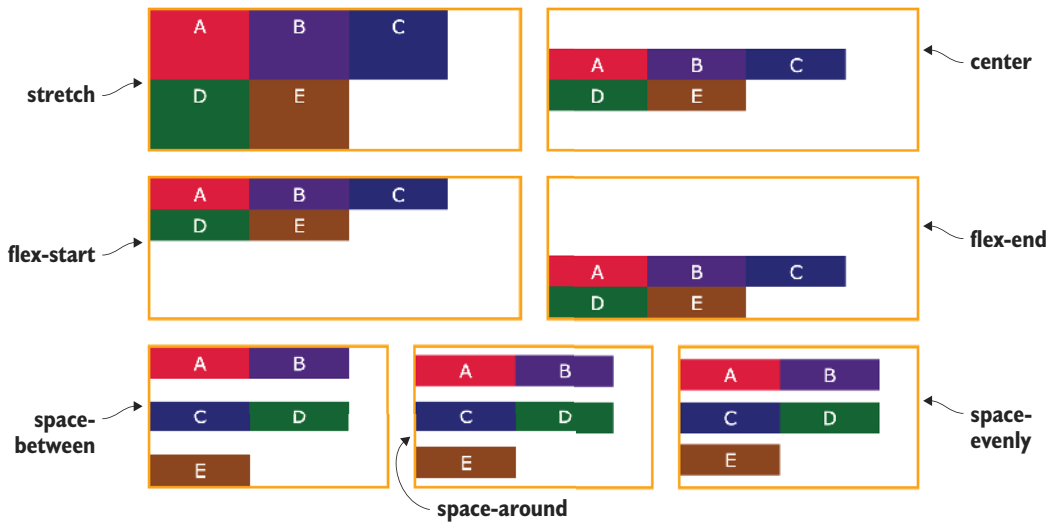
The stretch value is the default, so declaring `align-content: stretch` is optional.

PLAY

You can try out all the align-content values interactively on the Playground. ➡ Online: wdpg.io/2/12-1-10

- `space-around`—Distributes most of the lines evenly within the container by supplying each line with a set amount of space on either side, the first item getting half that space before it and the last item getting half that space after it
- `space-evenly`—Distributes the lines evenly within the container by supplying each line the same amount of space before and after

Figure 12.7 shows the effect that each value has on the arrangement of the lines within the container when the main axis is horizontal. (I've added an orange outline around each container so you can visualize its boundaries.)



► **Figure 12.7** Using the align-content values

Lesson 12.1: Dead-Centering an Element with Flexbox

Covers: `flex` and other flex container properties

➡ Online: wdpg.io/2/12-1-0

By far, the most common question related to web page layouts is a deceptively simple one: How do you center an element horizontally and vertically? That is, how can you use CSS to place an element in the dead center of the browser window? Over the years, many clever tricks have been created to achieve this goal, with most of them using advanced and complex CSS rules. Fortunately, you don't have to worry about any of that because Flexbox lets you dead-center any element with four lines of CSS, as shown in the following example.



► Example

➡ Online: wdpg.io/2/12-1-1

This example shows you how to center an `h1` element horizontally and vertically within the browser window.

WEB PAGE	
CSS	<pre>div { display: flex; justify-content: center; align-items: center; height: 100vh; }</pre> <p>Centers the h1 horizontally</p> <p>Centers the h1 vertically</p> <p>Sets the div to the height of the window</p>
HTML	<pre><div> <h1>Center Me!</h1> </div></pre>

This example works by turning the `div` element into a flex container, which automatically converts the `h1` element to a flex item. By setting both `justify-content` and `align-items` to `center`, and by giving the `div` the full height of the browser window (it's the width of the browser window by default), you center the `h1` in the window.

Working with Flexbox Items

Now that you know everything that's worth knowing about Flexbox containers, turn your attention to the Flexbox items inside those containers. As before, learning about and using flex items is best approached by asking yourself a series of questions:

- Do you want the item to grow if there's extra room?
- Do you want the item to shrink if there's not enough room?
- Do you want to suggest an initial size for an item?
- Do you want to change an item's order?
- Do you want to override an item's alignment?



The next few sections discuss these questions and provide some answers.

Do You Want the Item to Grow if There's Extra Room?

If you look back at Figure 12.4, notice that in the `flex-start` example, the flex items are bunched up at the beginning of the container, leaving a chunk of empty space to the right. This effect may be what you want, or you may prefer to have the items fill that empty space. You can do that by applying the `flex-grow` property to the item you want to expand:

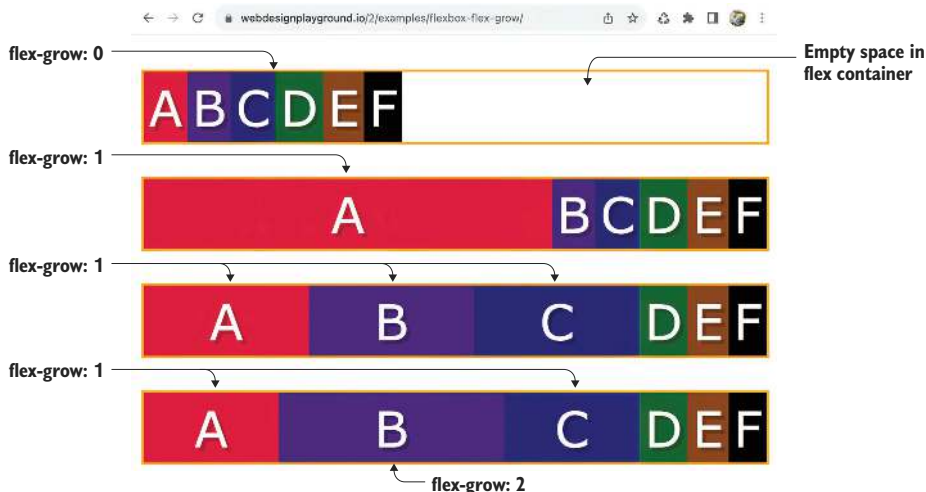
```
item {  
  flex-grow: value;  
}
```

By default, all flex items are given a `flex-grow` value of 0. To grow items to fill a container's empty space, you assign positive numbers to those items as follows (see Figure 12.8):

- If you assign any positive number to one flex item in a container, the amount of empty space in the container is added to that item.
- If you assign the same positive number to multiple flex items in a container, the amount of empty space in the container is divided evenly among those items.
- If you assign different positive numbers to multiple flex items in a container, the amount of empty space in the container is divided proportionally among those items, based on the values you provide. If you assign the values 1, 2, and 1 to three items, those items get 25%, 50%, and 25% of the empty space, respectively.

MASTER

To calculate what proportion of the empty space is assigned to each item, add all the `flex-grow` values for a given container and then divide the individual `flex-grow` values by that total. Values of 1, 2, and 1 add up to 4, for example, so the percentages are 25 (1 divided by 4), 50 (2 divided by 4), and 25 (1 divided by 4), respectively.



► **Figure 12.8** The effect of different `flex-grow` values



Do You Want the Item to Shrink if There's Not Enough Room?

The opposite problem of expanding flex items to fill a container's empty space is shrinking flex items when the container doesn't have enough space. This shrinking is activated by default, so if the browser detects that the flex items are too large to fit the container, it automatically reduces the flex items to fit.

How much each item shrinks depends on its size in relation to the other items and the size of the container. Suppose that you're working with a horizontal main axis (that is, `flex-direction` is set to `row`) and that the container is 1,200 px wide, but each of its five items is 400 px wide. That's 2,000 px total, so the browser must reduce the items by 800 px to fit the container. In this case, because all the items are the same width, the browser reduces the width of each by 160 px.

If the items have different widths, the calculations get more complicated, so I won't go into them here. Suffice it to say that the amount each item's width gets reduced depends on its initial width. The greater the initial width is, the more the item shrinks.

Rather than let the browser determine how much each item gets reduced, you can specify that a particular item be reduced more than or less than the other items. You do that by applying the `flex-shrink` property to the item:

```
item {  
  flex-shrink: value;  
}
```

By default, all flex items are given a `flex-shrink` value of 1, which means that they're all treated equally when it comes time to calculate the shrink factor. To control the shrink factor yourself, assign positive values to those items as follows (see Figure 12.9):

- If you set `flex-shrink` to a number greater than 1, the browser shrinks the item more than the other items by a factor that's somewhat proportional to the value you provide. (Again, the math is quite complicated.)
- If you set `flex-shrink` to a number greater than 0 but less than 1, the browser shrinks the item less than the other items.
- If you set `flex-shrink` to 0, the browser doesn't shrink the item.

PLAY

You can play with various flex-grow values interactively on the Playground.

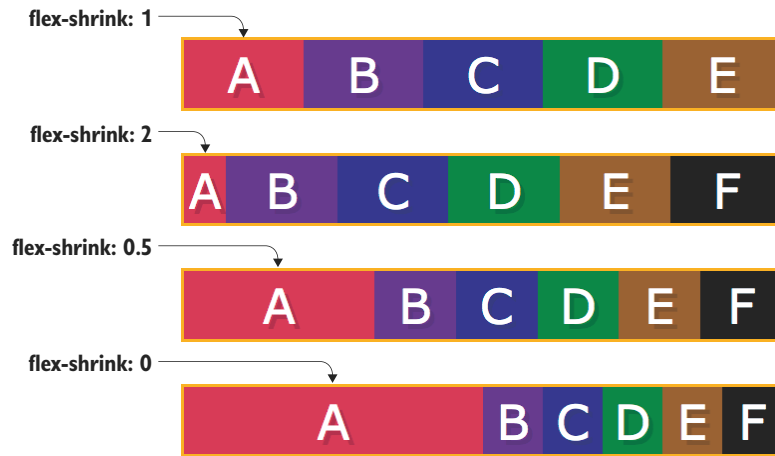
➡ Online: wdpg.io/2/12-2-2

LEARN

Mike Riethmuller has a lucid explanation of the math involved in calculating item shrinkage here: <https://madebymike.com.au/writing/understanding-flexbox>.

BEWARE

The browser won't shrink an item to a size less than the minimum required to display its content. If you keep increasing an item's `flex-shrink` value, and the item refuses to get smaller, the item is probably at its minimum possible size.



► **Figure 12.9** The effect of different `flex-shrink` values. Each item is 300 px, and the container is 600 px.

PLAY

You can try out various `flex-shrink` values interactively on the [Playground](https://wdpg.io/2/12-2-5). ➡ Online: wdpg.io/2/12-2-5

Do You Want to Suggest an Initial Size for an Item?

You've seen that flex items can grow or shrink depending on how they fit in the container and that you have some control of this process via the `flex-grow` and `flex-shrink` properties. But when I say that flex items can grow or shrink, what are they growing and shrinking *from*? That depends:

- If the item has a declared width value (if `flex-direction` is set to `row`) or a declared height value (if `flex-direction` is set to `column`), the item grows or shrinks from this initial size.
- If the item doesn't have a declared width or height, the item's dimensions are set automatically by the browser to the minimum values required to fit the item's content. The item can grow from this initial value, but it can't shrink to a smaller value.

The latter case—that is, not having a declared width (for `flex-direction: row`) or height (for `flex-direction: column`)—causes two problems. First, it prevents an item from shrinking smaller than its content. Second, the initial size (that is, the minimum required to display the content) may be smaller than you require. You can solve both problems by declaring a *flex basis*, which is a suggested size for the item. You do that by applying the `flex-basis` property:

```
item {  
  flex-basis: value|auto|content;  
}
```

- **value**—Sets a specific measure for the width (with `flex-direction: row`) or height (with `flex-direction: column`). You can use any of the CSS measurement units you learned



about in Chapter 7, including `px`, `em`, `rem`, `vw`, and `vh`. You can also set `value` to a percentage.

- `auto`—Lets the browser set the initial value based on the item's `width` or `height` property (the default). In the absence of a declared `width` or `height`, `auto` is the same as `content`, discussed next.
- `content`—Sets the initial `width` or `height` based on the content of the item.

Using the Flex Shorthand Property

You should know that Flexbox offers a shorthand property for `flex-grow`, `flex-shrink`, and `flex-basis`. This property is named `flex`, and it uses any of the following syntaxes:

```
item {  
  flex: flex-grow flex-shrink flex-basis;  
  flex: flex-grow flex-shrink;  
  flex: flex-grow flex-basis;  
  flex: flex-grow;  
  flex: flex-basis;  
}
```

Here's an example declaration that uses the default values for each property:

```
flex: 0 1 auto;
```

This example sets `flex-grow` to 1 and `flex-shrink` to 0:

```
flex: 1 0;
```

This final example styles an item with a fixed size of 10 `em`:

```
flex: 0 0 10em;
```

Do You Want to Change an Item's Order?

One of the most surprising—and surprisingly handy—tricks offered by Flexbox is the ability to change the order of the items in a container. When would you use this feature? Here are two common scenarios:

- One of the important tenets of accessibility is to place a page's main content as near the top of the page as possible. If you have ads or other nonessential content in, say, a left sidebar, that content necessarily appears first in the source document. With Flexbox, however, you can put the sidebar's code after the main content and then change its position so that it still appears on the left side of the page.
- A similarly important tenet of mobile web design is to place the main content on the initial screen seen by mobile users. If you don't want to restructure the content for desktop users, you can add a CSS media query that uses Flexbox to change the content order, depending on the device being used.



Creating Page Layouts with Flexbox

MASTER

Negative order values are allowed, so an easy way to move an item to the front of its container is to set its order value to -1.

PLAY

You can mess around with some order values interactively on the Playground. ➡ Online: wdpg.io/2/12-2-6

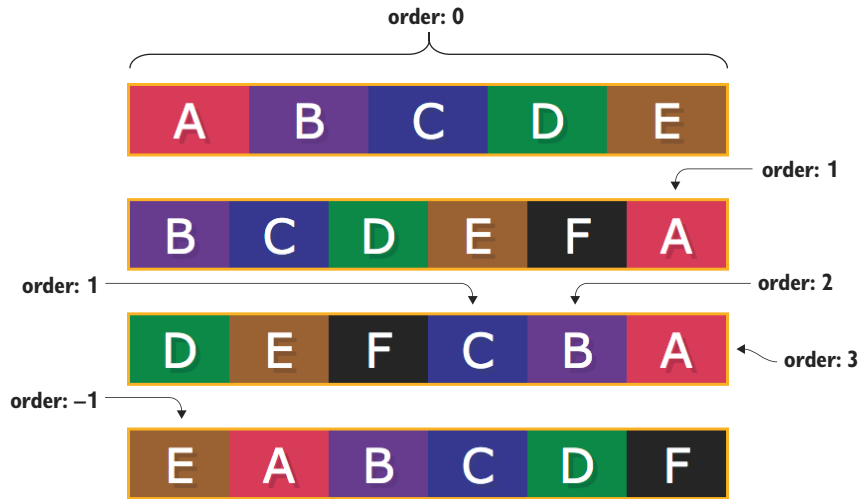
You change the order of a flex item by using the order property:

```
item {  
  order: value;  
}
```

By default, all the items in a flex container are given an order value of 0. You can manipulate the item order as follows:

- The higher an item's order value, the later it appears in the container.
- The item with the highest order value appears last in the container.
- The item with the lowest order value appears first in the container.

Figure 12.10 puts a few order values through their paces.



► **Figure 12.10** The effect of different order values

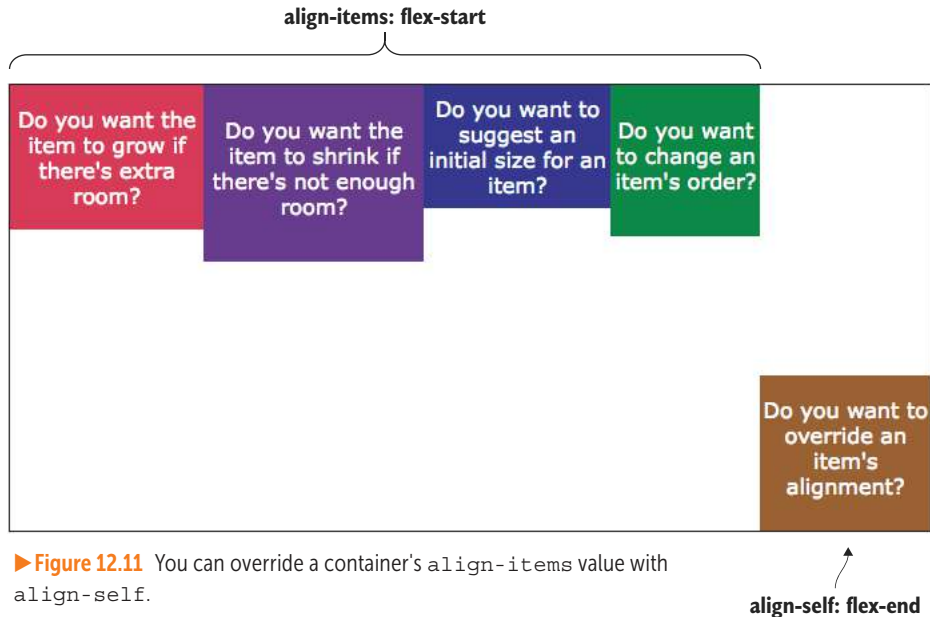
Do You Want to Override an Item's Alignment?

You saw earlier that you can use the align-items property to arrange items along a container's cross axis. Rather than align all the items the same way, you may prefer to override this global alignment and assign a different alignment to an item. You can do that by setting the item's align-self property:

```
item {  
  align-self: stretch|flex-start|flex-end|center|baseline;  
}
```



The possible values act in the same manner as I outlined earlier (see "How do you want the items arranged along the cross axis?"). You can also assign the value `auto` to revert the item to the current `align-items` value. Figure 12.11 shows a container with `align-items` set to `flex-start` but with the last item having `align-self` set to `flex-end`.



► **Figure 12.11** You can override a container's `align-items` value with `align-self`.

Lesson 12.2: Creating a Thumbnail List

Covers: The `flex-grow` and `flex-shrink` properties

➡ Online: wdpg.io/2/12-2-0

A common web page component is a simple thumbnail list that has a thumbnail image on the left and a description or other information on the right. These elements are used for photo galleries, user directories, book lists, project summaries, and much more. Getting the image and the text to behave is tricky with garden-variety CSS, but it's a breeze with Flexbox, as shown in the following example.



Creating Page Layouts with Flexbox

► Example

➡ Online: wdpg.io/2/12-2-1

This example shows you how to use Flexbox to create a thumbnail list of items.

WEB PAGE	<div>animal path A footpath or track made by the constant and long-term walking of animals.</div> <div>bridleway A footpath that is also suitable for a horse and rider.</div> <div>coffin trail A footpath used for transporting a coffin to a cemetery for burial.</div> <div>desire line An informal path that pedestrians prefer to take to get from one location to another rather than using a sidewalk or other official route.</div>
CSS	<pre>.dictionary-container { list-style-type: none; } .dictionary-item { display: flex; } .dictionary-image { flex-shrink: 0; } .dictionary-entry { flex-grow: 1; }</pre> <p>Each li becomes a flex container</p> <p>Prevents the thumbnail from shrinking</p> <p>Allows the text to use the rest of the container</p>
HTML	<pre><ul class="dictionary-container"> <li class="dictionary-item"> <div class="dictionary-image"> </div> <div class="dictionary-entry"> <h4>animal path</h4> <p>A footpath or track made by the constant and long- term walking of animals.</p> </div> etc. </pre>



Lesson 12.3: Creating the Holy Grail Layout with Flexbox

Covers: Layout with `flex` and other Flexbox properties

➡ Online: wdpg.io/2/12-3-0

Okay, now you can turn your attention to building Chapter 11's holy grail layout with Flexbox. The holy grail includes three instances in which you need content side by side: the header, the navigation bar, and the content columns. In all three instances, you'll place the elements in a Flexbox container with a horizontal main axis.

First, however, note that you want these elements stacked, which means they need a flex container that uses a vertical main axis. The `<body>` tag does the job nicely, so set `body` as a flex container with a vertical main axis and the content starting at the top:

```
body {  
  display: flex;  
  flex-direction: column;  
  justify-content: flex-start;  
  max-width: 50em;  
  min-height: 100vh;  
}
```

Note, too, that I specified a maximum width for the container and a minimum height. You'll see why I used `100vh` when I talk about adding a footer a bit later. Now do the header, as shown in the following example.

REMEMBER

Placing containers with horizontal main axes inside a larger container with a vertical main axis, as I do in this example, is a hack that enables Flexbox to perform light-duty two-dimensional layout chores. However, a better solution for most web pages is to use CSS Grid to create two-dimensional layouts. See Chapter 13 for more.

▶ Example ➡ Online: wdpg.io/2/12-3-1

This example shows you how to use Flexbox to get the header logo and title side by side.

WEB PAGE

YOUR
LOGO
HERE

Site Title



Creating Page Layouts with Flexbox

CSS

```
header {  
  display: flex;  
  justify-content: flex-start;  
  align-items: center;  
  border: 1px solid black;  
  padding: 1em;  
}  
header img {  
  flex-shrink: 0;  
}  
h1 {  
  flex-grow: 1;  
  padding-left: .5em;  
  font-size: 2.5em;  
}
```

Displays the header element as a flex container

Prevents the logo from shrinking

Lets the h1 element use the rest of the header space

HTML

```
<header>  
    
  <h1>Site Title</h1>  
</header>
```

In this code, I converted the header element to a flex container with the items arranged at the start of the main (horizontal) axis and centered on the cross (vertical) axis.

Now convert the navigation bar to a horizontal flex container, as shown in the following example.

► Example

➡ Online: wdpg.io/2/12-3-2

This example shows you how to use Flexbox to get the navigation bar items side by side.

WEB PAGE

Home Item Item Item

continued



CSS

```
nav {
  padding: .5em;
  border: 1px solid black;
}
nav ul {
  display: flex;
  justify-content: flex-start;
  list-style-type: none;
  padding-left: .5em;
}
nav li {
  padding-right: 1.5em;
}
```

Displays the ul element
as a flex container

HTML

```
<nav>
  <ul>
    <li>Home</li>
    <li>Item</li>
    <li>Item</li>
    <li>Item</li>
  </ul>
</nav>
```

In this case, the `ul` element is converted to a flex container, meaning that the `li` elements become flex items arranged horizontally from the start of the container.

Next, convert the main element's `<article>` and `<aside>` tags to flex items, which gives you the two-column content layout. The following example shows how it's done.

► Example Online: wdpg.io/2/12-3-3

This example shows you how to use Flexbox to get the article and aside elements side by side in a two-column layout.

WEB PAGE

Article Title	Sidebar Title
Article paragraph 1	Sidebar paragraph
Article paragraph 2	



Creating Page Layouts with Flexbox

CSS

```
main {
  display: flex;
  flex-grow: 1;
}
article {
  flex-grow: 3;
  border: 1px solid black;
}
aside {
  flex-grow: 1;
  border: 1px solid black;
}
```

Displays main as a flex container

Lets it grow vertically

Lets article use three units of space

Lets aside use one unit of space

HTML

```
<main>
  <article>
    <h2>Article Title</h2>
    <p>Article paragraph 1</p>
    <p>Article paragraph 2</p>
  </article>
  <aside>
    <h3>Sidebar Title</h3>
    <p>Sidebar paragraph</p>
  </aside>
</main>
```

MASTER

Note, too, that the article and aside items are the same height—a pleasant bonus that comes courtesy of the body container's default stretch value for align-items. You get a true full-height sidebar and don't have to resort to any CSS tricks to get it.

A couple of interesting things are going on here. First, note that the main element does double duty: it acts as the flex container for the article and aside elements, *and* it's a flex item in the body element's flex container. Setting flex-grow to 1 for the main element tells the browser to give main all the empty vertical space in the body container. Again, why you're doing this will become apparent when you get to the footer.

For the article and aside flex items, I assigned flex-grow values of 3 and 1, respectively, meaning that article gets 75% of the available horizontal space, and aside gets the remaining 25%.

Finally, add the footer element, which doesn't require any Flexbox properties. Figure 12.12 shows the result.



► **Figure 12.12** The complete holy grail layout using Flexbox

Notice that the footer element appears at the bottom of the browser window, which is where it should be in a true holy grail layout. You got that nice touch by doing three things:

- Turning the `body` element into a flex container with a vertical main axis
- Declaring `min-height: 100vh` on the `body` element, which forces the `body` element to always be at least the same height as the browser window
- Setting `flex-grow: 1` on the main element to force it to use any available empty vertical space in the `body` container

PLAY

How would you modify this layout to display the sidebar on the left instead of the right?

⇒ Online: wdpg.io/2/12-3-5

PLAY

How would you modify this layout to display three content columns: a sidebar to the left and to the right of the article element? ⇒ Online:

wdpg.io/2/12-3-6



Summary

- In which direction do you want the container to run? Use `flex-direction`.
- How do you want the items arranged along the main axis? Use `justify-content`.
- How do you want the items arranged along the cross axis? Use the `align-items` property.
- Do you want the items to wrap? Use `flex-wrap`.
- How do you want multiple lines arranged along the cross axis? Add the `align-content` property.
- Do you want the item to grow if there's extra room? Use `flex-grow`.
- Do you want the item to shrink if there's not enough room? Use `flex-shrink`.
- Do you want to suggest an initial size for an item? Use the `flex-basis` property.
- Do you want to change an item's order? Use the `order` property.
- Do you want to override an item's alignment? Use `align-self`.



Creating Page Layouts with Grid



This chapter covers

- Understanding how CSS Grid Layout works
- Learning how to work with Grid containers, rows, and columns
- Working with Grid gutters, areas, and alignment
- Building the holy grail layout with Grid

For what seems like centuries, web designers have been using unwieldy libraries such as Bootstrap to lay out page elements using one or more rows and one or more columns. This *grid* layout gave designers decent control over where each page element appeared. The cost, though, was high because grid layout libraries were often complex and almost always weighed down by too much extraneous CSS or even JavaScript code.

That's changing fast as a new CSS technology called CSS Grid Layout (usually shortened to CSS Grid or just Grid) comes online. Supported now by the current and recent versions of all the major browsers, CSS Grid is the standards-friendly and no-library-required way to implement a grid layout on your pages. This chapter introduces you to the basics of CSS Grid. You learn what Grid is, what it can do, and how it works.



Understanding CSS Grid Layout

In Chapter 12, you learned that Flexbox enables you to break out of the browser's default object flow by creating flexible containers that give you exquisite control to arrange items either horizontally or vertically. Wouldn't it be great if there was some way to create a container that gave you pinpoint control over your page objects *both* horizontally and vertically?

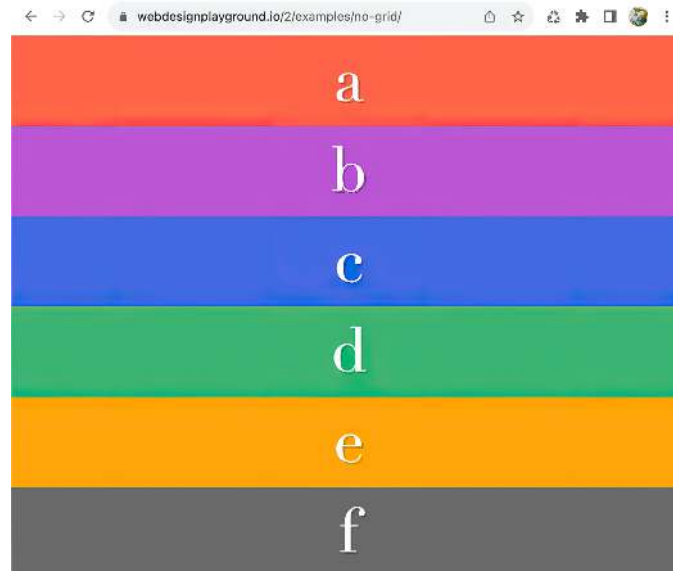
Well, I'm happy to report that CSS Grid Layout Module Level 1—which I'll refer to as CSS Grid or just Grid—does exactly that. The basic idea underlying Grid is to give you as a web designer a way to break out of the standard way that the browser deals with blocks of content. The default browser flow is to stack the elements one on top of another. Consider the following collection of `div` elements:

```
<div class="container">
  <div class="item itema">a</div>
  <div class="item itemb">b</div>
  <div class="item itemc">c</div>
  <div class="item itemd">d</div>
  <div class="item iteme">e</div>
  <div class="item itemf">f</div>
</div>
```

Behind the scenes, I've set up rules for the classes to give each item a unique background color, among other things. Figure 13.1 shows the results, which is that the `div` elements are stacked vertically and extend to the width of the browser window.

► **Figure 13.1**

The default browser stacking of the `div` elements





As you learned in Chapter 8, you can take one or more elements out of this default flow by using floats or inline blocks; and as you learned in Chapter 12, you can use Flexbox to lay out child elements either horizontally or vertically within a parent container. These are great and useful technologies, but now we're after bigger game. That is, now we want full layout control not just of individual elements, not just of a row or column of elements, but of all the items within a container, both horizontally *and* vertically.

This kind of control is the strong suit of CSS Grid Layout. When you work with Grid, you work with two kinds of page objects: containers and items. A *grid container* is any type of parent block element—`div`, `p`, any of the HTML semantic page elements you learned in Chapter 11, even the `body` element—that surrounds one or more child elements. These child elements are called *grid items*. Okay, it's time to start learning how CSS Grid Layout works.

Lesson 13.1: Working with Grid Containers

Covers: The `display: grid` declaration

⇒ Online: wdpg.io/2/13-1-0

To get started with Grid, you designate a block-level element to be the grid container by using a single CSS declaration: `display: grid`. For example, the following rule turns the `body` element into a grid container:

```
body {  
  display: grid;  
}
```

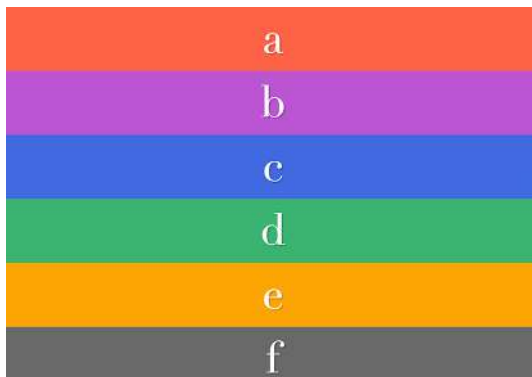
The container's child elements automatically become grid items; no extra rules, declarations, or code are required. From there, you can start customizing your grid container and its items to suit the task at hand.

► Example

⇒ Online: wdpg.io/2/13-1-0

This example shows you how to convert an element to a grid container..

WEB PAGE





Creating Page Layouts with Grid

CSS	
	<pre>.container { display: grid; }</pre> <p>The container class is converted to a grid container</p>
HTML	<pre><div class="container"> <div class="item itema">a</div> <div class="item itemb">b</div> <div class="item itemc">c</div> <div class="item itemd">d</div> <div class="item iteme">e</div> <div class="item itemf">f</div> </div></pre> <p>The div element is now a grid container</p> <p>These div elements are now grid items</p>

In the example, note that I've set up a div element with the class container. In the CSS, I've applied `display: grid` to the `.container` class. As you can see in the results, it looks like nothing much has happened since the child div elements still appear to be displayed using the default flow. (I say "appear to" because the default layout has actually been converted to a one-column grid, so it only looks like the items are still following the default browser flow.) To fix that, you need to specify your grid rows and columns, which you'll do next.

Lesson 13.2: Defining Grid Columns and Rows

Covers: The `grid-template-columns` and `grid-template-rows` properties

REMEMBER

If you omit the `grid-template-rows` property, the web browser will automatically set the row heights to accommodate the height of the tallest element in each row.

➡ Online: wdpg.io/2/13-2-0

To get your grid container to do something useful, you need to specify the numbers of columns and rows you want in your grid, which is known as a *grid template*. You create such a template by declaring the `grid-template-columns` and `grid-template-rows` properties on the grid container:

```
container {  
  display: grid;  
  grid-template-columns: col-values;  
  grid-template-rows: row-values;  
}
```




► Example

➡ Online: wdpg.io/2/13-2-1

This example applies a grid template to the grid container..

WEB PAGE	
CSS	<pre>.container { display: grid; grid-template-columns: 100px 200px 300px; grid-template-rows: 100px 150px; }</pre> <p>The container's grid template</p>
HTML	<pre><div class="container"> <div class="item itema">a</div> <div class="item itemb">b</div> <div class="item itemc">c</div> <div class="item itemd">d</div> <div class="item iteme">e</div> <div class="item itemf">f</div> </div></pre>

The col-values and row-values are space-separated lists of the sizes you want to use for each column and row in your grid. The sizes can be numbers expressed in any of the standard CSS measurement units (px, em, rem, vw, or vh), a percentage, or the keyword auto, which tells the browser to automatically set the size based on the other values you specify.

In the example, I've updated the `.container` class to define a grid of three columns (with widths of 100 px, 200 px, and 300 px) and two rows (with heights of 100 px and 150 px).

FAQ

How can I style a column to be only as wide as its widest item? *Instead of a specific value for that column, use the keyword `max-content`.*

➡ Online: wdpg.io/2/13-2-2



Lesson 13.3: Introducing the fr Unit

Covers: The fr measurement unit

REMEMBER

To use the `fr` unit for one or more rows, you need to set an explicit height for the grid container, which otherwise is only as tall as its content or the sum of your `grid-template-rows` values. For example, try adding the declaration `height: 100vh` to the `.container` class and then setting a row's height to `1fr`. ➡ Online: wdpg.io/2/13-3-2

➡ Online: wdpg.io/2/13-3-0

For the `grid-template-columns` and `grid-template-rows` property values, you can also use a new CSS Grid unit called `fr`, which represents a fraction of the free space available in the grid container, either horizontally (for columns) or vertically (for rows). For example, if you assign the value `1fr` to one of your columns, then that column's width is expanded until it takes up all the free horizontal space in the grid container. See the upcoming example.

Similarly, if you assign the value `1fr` to one column and the value `3fr` to another column, then the first column expands to use up 25% of the free horizontal space in the grid container, and the second column expands to use up the remaining 75% of the free space.

► Example

➡ Online: wdpg.io/2/13-3-1

This example uses the `fr` measurement unit to give the final column all the remaining free horizontal space in the grid container.

WEB PAGE	
CSS	<pre>.container { display: grid; grid-template-columns: 100px 200px 1fr; grid-template-rows: 100px 150px; }</pre> <p>A value of <code>1fr</code> is applied to the final column.</p>
HTML	<pre><div class="container"> <div class="item itema">a</div> <div class="item itemb">b</div> <div class="item itemc">c</div> <div class="item itemd">d</div> <div class="item iteme">e</div> <div class="item itemf">f</div> </div></pre>



Lesson 13.4: Adding Grid Gaps

Covers: The `column-gap` and `row-gap` properties

➡ Online: wdpg.io/2/13-4-0

By default, CSS Grid doesn't add any horizontal space between columns or any vertical space between rows. To create some separation between your grid items, use the `column-gap` and `row-gap` properties in your grid container:

```
container {  
  display: grid;  
  column-gap: col-gap-value;  
  row-gap: row-gap-value;  
}
```

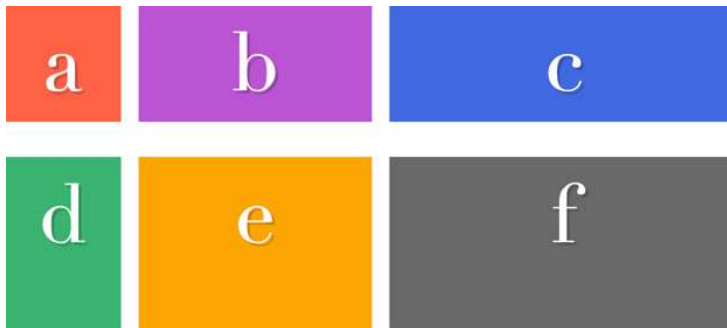
The `col-gap-value` and `row-gap-value` are numbers expressed in any of the standard CSS measurement units (`px`, `em`, `rem`, `vw`, or `vh`). The resulting spaces between the columns and rows are called *gutters*.

► Example

➡ Online: wdpg.io/2/13-4-1

This example updates the `.container` class to define a grid gap of 15px for the columns and 20px for the rows.

WEB PAGE



CSS

```
.container {  
  display: grid;  
  grid-template-columns: 100px 200px 300px;  
  grid-template-rows: 100px 150px;  
  column-gap: 15px;  
  row-gap: 20px;  
}
```

Defines the gap between each column

Defines the gap between each row



HTML

```
<div class="container">
  <div class="item itema">a</div>
  <div class="item itemb">b</div>
  <div class="item itemc">c</div>
  <div class="item itemd">d</div>
  <div class="item iteme">e</div>
  <div class="item itemf">f</div>
</div>
```

You can also add grid gaps using the shorthand gap property:

```
container {
  display: grid;
  gap: col-gap-value row-gap-value;
}
```

Lesson 13.5: Using the repeat() Function

Covers: The repeat () function

⇒ Online: wdpg.io/2/13-5-0

If your grid layout uses multiple columns and/or rows of the same size, you can save time by specifying those columns or rows using the repeat () function:

```
repeat(number, size)
```

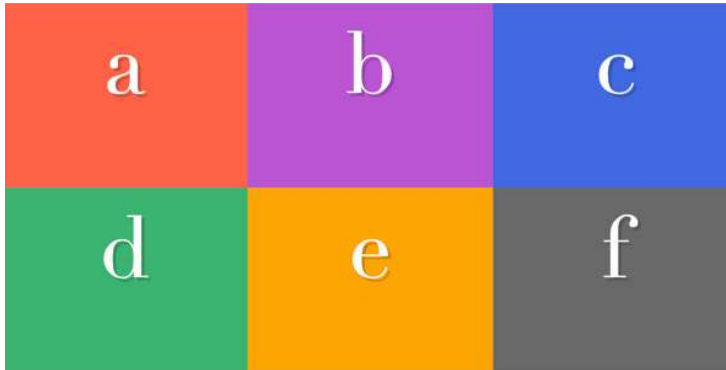
Replace *number* with the number of columns or rows you want to create, and replace *size* with the size you want to use for each of those columns or rows. For example, the following two declarations are equivalent:

```
grid-template-columns: 200px 200px 200px;
grid-template-columns: repeat(3, 200px);
```

**► Example****➡ Online:** wdpg.io/2/13-5-1

This example updates the `.container` class to use the `repeat()` function to define three equal-sized columns and two equal-sized rows.

WEB PAGE



CSS

```
.container {  
  display: grid;  
  grid-template-columns: repeat(3, 200px);  
  grid-template-rows: repeat(2, 150px);  
}
```

Creates three repeated columns

Creates two repeated rows

HTML

```
<div class="container">  
  <div class="item itema">a</div>  
  <div class="item itemb">b</div>  
  <div class="item itemc">c</div>  
  <div class="item itemd">d</div>  
  <div class="item iteme">e</div>  
  <div class="item itemf">f</div>  
</div>
```



Lesson 13.6: Placing Items Within the Grid

Covers: The `grid-column-*` and `grid-row-*` properties

⇒ Online: wdpg.io/2/13-6-0

Here are three important Grid terms you need to know:

- **Grid cell**—The grid rectangle that results from the intersection between a row and a column.
- **Grid lines**—The notional horizontal and vertical lines that create the grid and enclose the grid items. These lines are numbered, starting from 1. For example, the top-left cell in a grid is enclosed by four grid lines: row lines 1 and 2, and column lines 1 and 2.
- **Grid area**—A portion of the grid that spans one or more cells.

By default, the web browser populates the grid automatically based on the widths of your columns and the heights of your rows. In these automatic assignments, each grid item is given a single cell. If you want your grid items to span multiple cells either horizontally or vertically (or both), then you need to tell the browser the specific location where you want each grid item placed within the grid.

To do this, you assign the following four values to each of your grid items:

```
item {  
  grid-column-start: col-start-value;  
  grid-column-end: col-end-value;  
  grid-row-start: row-start-value;  
  grid-row-end: row-end-value;  
}
```

Each value is a grid line number. You must specify values for both the `grid-column-start` and `grid-row-start` properties. The `grid-column-end` property is optional and works like this:

- You can omit this property, which means the item is placed only in the starting column.
- You can use the keyword `end`, which means the item runs from its starting column through to the last column in the grid.
- You can use the keyword `span` followed by a space and then a number, which specifies the number of columns you want the item to span across the grid. For example, the following two sets of declarations are equivalent:



```
grid-column-start: 2;  
grid-column-end: 5;  
  
grid-column-start: 2;  
grid-column-end: span 3;
```

The `grid-row-end` property is also optional and works like this:

- You can omit this property, which means the item is placed only in the starting row.
- You can use the keyword `end`, which means the item runs from its starting row through to the last row in the grid.
- You can use the keyword `span` followed by a space and then a number, which specifies the number of rows you want the item to span down the grid. For example, the following two sets of declarations are equivalent:

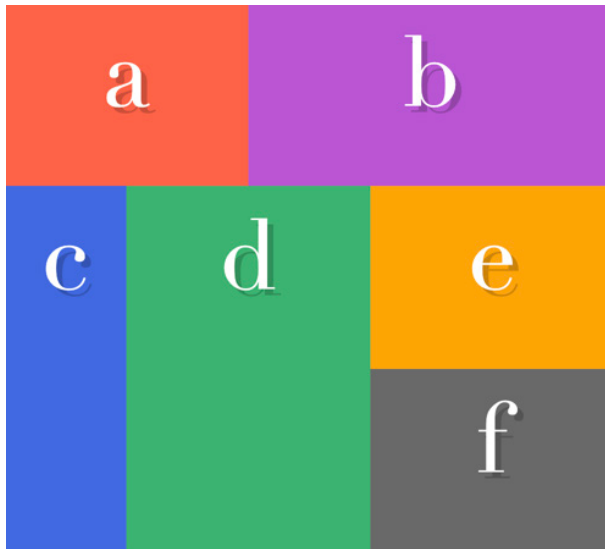
```
grid-row-start: 1;  
grid-row-end: 3;  
  
grid-row-start: 1;  
grid-row-end: span 2;
```

► Example

⇒ Online: wdpg.io/2/13-6-1

This example updates the item classes with `grid-column-` and `grid-row-*` declarations to place the items within the five-column and three-row grid.*

WEB PAGE





Creating Page Layouts with Grid

CSS

```
.container {
  display: grid;
  grid-template-columns: repeat(5, 100px);
  grid-template-rows: repeat(3, 150px);
}
.itema {
  grid-column-start: 1;
  grid-column-end: 3;
  grid-row-start: 1;
  grid-row-end: 1;
}
.itemb {
  grid-column-start: 3;
  grid-column-end: span 3;
  grid-row-start: 1;
  grid-row-end: 1;
}
.itemc {
  grid-column-start: 1;
  grid-column-end: 1;
  grid-row-start: 2;
  grid-row-end: end;
}
.itemd {
  grid-column-start: 2;
  grid-column-end: 4;
  grid-row-start: 2;
  grid-row-end: end;
}
.iteme {
  grid-column-start: 4;
  grid-column-end: span 2;
  grid-row-start: 2;
  grid-row-end: 2;
}
.itemf {
  grid-column-start: 4;
  grid-column-end: span 2;
  grid-row-start: 3;
  grid-row-end: 3;
}
```

Columns 1 and 2; row 1

Columns 3, 4, and 5; row 1

Column 1; rows 2 and 3

Columns 2 and 3; rows 2 and 3

Columns 4 and 5; row 2

Columns 4 and 5; row 3

HTML

```
<div class="container">
  <div class="item itema">a</div>
  <div class="item itemb">b</div>
  <div class="item itemc">c</div>
  <div class="item itemd">d</div>
  <div class="item iteme">e</div>
  <div class="item itemf">f</div>
</div>
```




CSS has a couple of shorthand properties you can use for placing items in the grid:

```
item {
  grid-column: col-start-value / col-end-value;
  grid-row: row-start-value / row-end-value;
}
```

Lesson 13.7: Using Named Grid Areas

Covers: The `grid-template-areas` and `grid-area` properties

➡ Online: wdpg.io/2/13-7-0

Rather than using row and column line numbers to place your grid items, you can define named grid areas—such as `header` and `sidebar`—and assign grid items to those names. To set this up, you first augment your grid template with the named areas by adding the `grid-template-areas` property:

```
container {
  display: grid;
  grid-template-columns: col-values;
  grid-template-rows: row-values;
  grid-template-areas:
    'grid-row1-names'
    'grid-row2-names'
    ...
    'grid-rowN-names';
}
```

Here, `grid-row1-names`, `grid-row2-names`, and so on are space-separated lists of names that you want to apply to each row in your grid. Here are some notes:

- You provide a name for every cell in your grid.
- If you want a named area to span more than one column, add the name as many times as necessary in the column to get the horizontal span size you want.
- If you want a named area to span more than one row, add the name as many times as necessary to consecutive rows to get the vertical span size you want.
- To designate an empty cell or area, use one or more periods (.) in each cell.

With your template of named grid areas complete, you then assign a name to each grid item using the `grid-area` property:

```
item {
  grid-area: grid-area-name;
}
```



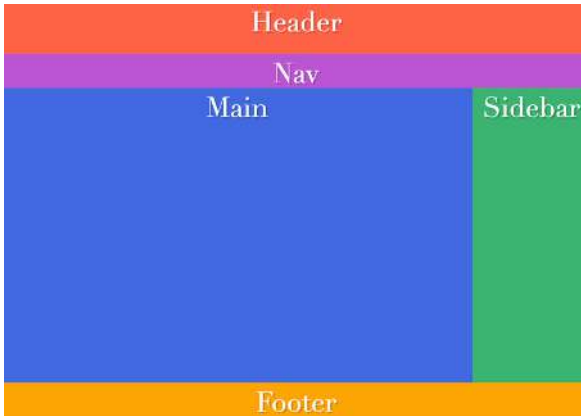
Creating Page Layouts with Grid

► Example

➡ Online: wdpg.io/2/13-7-1

This example updates the container class to create a grid of five even columns and four rows. I've also included five named areas: header, nav, main, sidebar, and footer. I've assigned these names to four grid items (class `itema` is assigned to header, class `itemb` is assigned to nav, and so on).

WEB PAGE



CSS

```
.container {  
  height: 100vh;  
  display: grid;  
  grid-template-columns: repeat(5, 1fr);  
  grid-template-rows: 75px 50px 1fr 50px;  
  grid-template-areas:  
    'header header header header header'  
    'nav nav nav nav nav'  
    'main main main main sidebar'  
    'footer footer footer footer footer';  
}  
.itema {  
  background-color: tomato;  
  grid-area: header; ←  
}  
.itemb {  
  background-color: mediumorchid;  
  grid-area: nav; ←  
}  
.itemc {  
  background-color: royalblue;  
  grid-area: main; ←  
}  
.itemd {  
  background-color: mediumseagreen;  
  grid-area: sidebar; ←  
}  
.iteme {  
  background-color: orange;  
  grid-area: footer; ←  
}
```

Defines
the named
grid areas

Assigned to the
header area

Assigned to the
nav area

Assigned to the
main area

Assigned to the
sidebar area

Assigned to the
footer area



HTML

```
<div class="container">
  <div class="item itema">Header</div>
  <div class="item itemb">Nav</div>
  <div class="item itemc">Main</div>
  <div class="item itemd">Sidebar</div>
  <div class="item iteme">Footer</div>
</div>
```

You'll likely recognize the preceding example as Chapter 11's holy grail layout. With just a half-dozen declarations in the container and a single grid-area declaration for each layout item, we were able to build a classic layout with very little coding.

Lesson 13.8: Aligning Grid Items

Covers: The `justify-*` and `align-*` properties

➞ Online: wdpg.io/2/13-8-0

Because CSS Grid Layout is two-dimensional, dealing with alignment means you have to bear in mind two different axes:

- **Inline axis or row axis**—The axis that lies in the same direction as the current writing mode (that is, the direction that words run when written out). In languages such as English and Arabic, the writing mode direction is horizontal, so the grid's inline axis is also horizontal. The inline axis direction is also the direction that content flows within a grid row, so the inline axis is also known as the *row axis*.
- **Block axis or column axis**—The axis that lies perpendicular to the inline axis. In languages such as English and Arabic where the inline axis is horizontal, the grid's block axis is vertical. The block axis direction is also the direction that content flows within a grid column, so the block axis is also known as the *column axis*.

You can align grid items along the row and/or column axis either with respect to the entire grid container or with respect to just the column or row within which the item resides. First, consider the case of aligning items along the row and/or column axis with respect to the entire grid container, which is the topic of the next two sections.



REMEMBER

The stretch value is the default, so declaring `justify-content: stretch` is optional.

PLAY

You can try out all the `justify-content` values interactively on the Playground.

➡ Online: wdpg.io/2/13-8-1

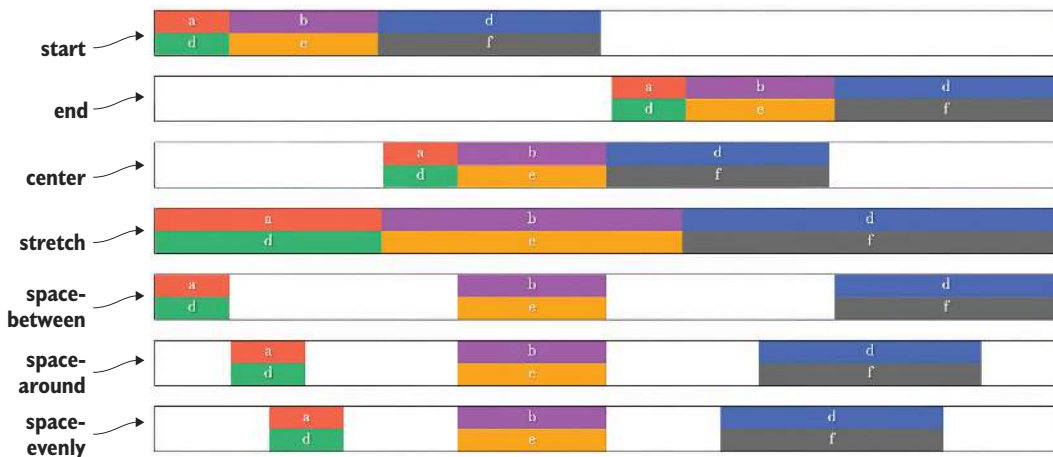
Aligning Grid Items Along the Row Axis

You can align your grid items along the row axis by applying the `justify-content` property on your grid container:

```
container {  
  display: grid;  
  justify-content: start|end|center|stretch|space-between|space-around|space-evenly;  
}
```

- `start`—Aligns each row's items at the beginning
- `end`—Aligns each row's items at the end
- `center`—Aligns each row's items in the middle
- `stretch`—Aligns each row's items by expanding them across the row axis (the default)
- `space-between`—Aligns each row's items with the first item at the beginning of the row, the last item at the end, and the rest of the items evenly distributed in between
- `space-around`—Distributes each row's items by supplying most items with the same amount of space on either side, but the first item gets half that space before, and the last item gets half that space after
- `space-evenly`—Distributes each row's items evenly by supplying each item the same amount of space on either side

Figure 13.2 shows the effect that each value has on the arrangement of the items within each container when the row axis is horizontal. (I've added an outline around each container so you can visualize its boundaries.)



► Figure 13.2 Using the `justify-content` values



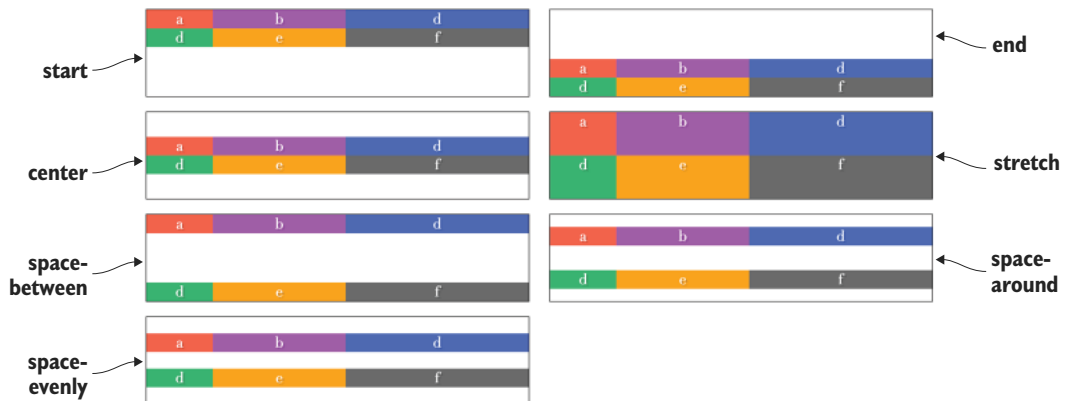
Aligning Grid Items Along the Column Axis

You can align your grid items along the column axis by applying the `align-content` property on your grid container:

```
container {
  display: grid;
  align-content: start | end | center | stretch | space-between | space-around | space-evenly;
}
```

- **start**—Aligns each column's items at the beginning
- **end**—Aligns each column's items at the end
- **center**—Aligns each column's items in the middle
- **stretch**—Aligns each column's items by expanding them across the column axis (the default)
- **space-between**—Aligns each column's items with the first item at the beginning of the column, the last item at the end, and the rest of the items evenly distributed in between
- **space-around**—Distributes each column's items by supplying most items with the same amount of space on either side, but the first item gets half that space before, and the last item gets half that space after
- **space-evenly**—Distributes each column's items evenly by supplying each item the same amount of space on either side

Figure 13.3 shows the effect that each value has on the arrangement of the items within each container when the column axis is vertical. (I've added an outline around each container so you can visualize its boundaries.)



► **Figure 13.3** Visualizing the `align-content` values

REMEMBER

The **stretch** value is the default, so declaring `align-content: stretch` is optional.

PLAY

You can try out all the `align-content` values interactively on the Playground. [➡ Online: wdpg.io/2/13-8-2](https://wdpg.io/2/13-8-2)



REMEMBER

The stretch value is the default, so declaring `justify-items: stretch` is optional.

PLAY

You can try out all the `justify-items` values interactively on the Playground. [➡ Online: wdpg.io/2/13-8-3](https://wdpg.io/2/13-8-3)

MASTER

If you want to override the `justify-items` alignment of a particular item, apply the `justify-self` property to that item. The `justify-self` property takes the same values as `justify-items`.

Now let's consider the case of aligning items along the row and/or column axis with respect to the individual columns or rows (as opposed to the entire grid container), which is the topic of the next two sections.

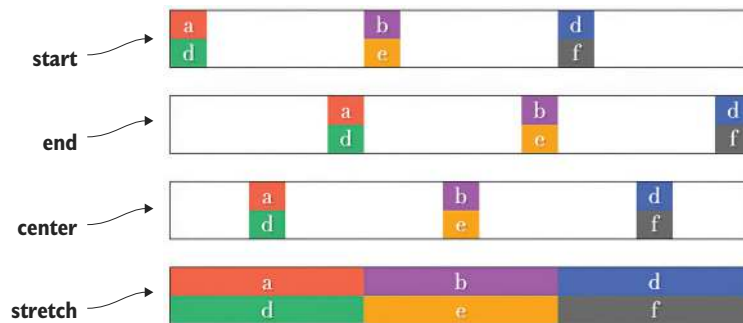
Aligning Grid Items Within a Column

You can align your grid items along the row axis within a particular column by applying the `justify-items` property on your grid container:

```
container {  
  display: grid;  
  justify-items: start|end|center|stretch;  
}
```

- **start**—In each row, aligns each column's items at the beginning of the column
- **end**—In each row, aligns each column's items at the end of the column
- **center**—In each row, aligns each column's items in the middle of the column
- **stretch**—In each row, aligns each column's items across the column (the default)

Figure 13.4 shows the effect that each value has on the arrangement of the items within each column when the row axis is horizontal. (I've added an outline around each container so you can visualize its boundaries.) In each case, the grid container has three same-width columns (and two same-height rows).



► **Figure 13.4** Trying out the `justify-items` values



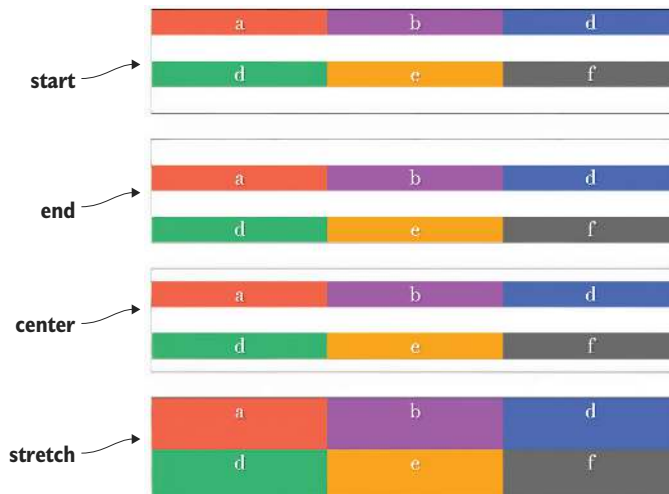
Aligning Grid Items Within a Row

You can align your grid items along the column axis within a particular row by applying the `align-items` property on your grid container:

```
container {
  display: grid;
  align-items: start|end|center|stretch;
}
```

- **start**—In each column, aligns each row's items at the beginning of the row
- **end**—In each column, aligns each row's items at the end of the row
- **center**—In each column, aligns each row's items in the middle of the row
- **stretch**—In each column, aligns each row's items across the row (the default)

Figure 13.5 shows the effect that each value has on the arrangement of the items within each row when the column axis is vertical. (I've added an outline around each container so you can visualize its boundaries.) In each case, the grid container has two same-height rows (and three same-width columns).



► **Figure 13.5** Demonstrating the `align-items` values

REMEMBER

The `stretch` value is the default, so declaring `align-items: stretch` is optional.

PLAY

You can try out all the `align-items` values interactively on the [Playground](https://wdpg.io/2/13-8-4). ➡ Online: wdpg.io/2/13-8-4

MASTER

If you want to override the `align-items` alignment of a particular item, apply the `align-self` property to that item. The `align-self` property takes the same values as `align-items`.



Summary

- To convert a block element to a grid container, use `display: grid`.
- To specify the number and size of your columns, use the `grid-template-columns` property. To specify the number and size of your rows, use the `grid-template-rows` property.
- Use the CSS Grid unit `fr` to represent a fraction of the free space available in the grid container, either horizontally (for columns) or vertically (for rows).
- To add gutters between columns, use the `column-gap` property. To add gutters between rows, use the `row-gap` property.
- Rather than typing out a long list of same-size columns or rows, use the `repeat()` function.
- To specify the columns within the grid where you want an item to appear, use the `grid-column-start` and `grid-column-end` properties. To specify the rows within the grid where you want an item to appear, use the `grid-row-start` and `grid-row-end` properties.
- To define the named areas within the grid, use the `grid-template-areas` property. To assign an item to a named area, use the `grid-area` property.
- To align grid items along the row axis, use the `justify-content` property on your grid container. To align grid items along the column axis, use the `align-content` property on your grid container.
- To align grid items along the row axis within a particular column, use the `justify-items` property on your grid container. To align grid items along the column axis within a particular row, use the `align-items` property on your grid container.



Designing Responsive Web Pages



This chapter covers

- Creating page layouts that are liquid and flexible
- Making adaptive layouts via media queries
- Creating mobile-first layouts
- Making fluid images respond to screen size
- Specifying responsive font sizes and responsive measurements

I'll begin by defining what makes a web page responsive: A *responsive* page is one that automatically adapts its layout, typography, images, and other content to fit whatever size screen a site visitor is using to access the page. In other words, the page content should be usable, readable, and navigable regardless of the dimensions of the screen it's being displayed on.



Responsive web design—or RWD, as it's colloquially known in the web design community—wouldn't be a big deal if only the occasional site user were surfing with a smartphone or tablet. However, sometime back in 2014, the worldwide percentage of web users on mobile devices *surpassed* that of users with desktop browsers.

“*The most important thing about responsive design is flexibility. Everything must be flexible: layouts, image sizes, text blocks—absolutely everything. Flexibility gives your site the fluidity it needs to fit inside any container.* —Nick Babich

There are many reasons why it's good practice to make all your pages responsive, and you'll learn about many of them as you progress through this chapter. But arguably the most important reason is also the most basic: *when reading a web page, nobody should have to scroll horizontally.*

Although it's true that a few pages are designed to be navigated by scrolling from left to right, the vast majority of pages are oriented vertically, so you read or scan them from top to bottom. One of the most annoying web page experiences occurs when a page doesn't fit the width of your screen, so seeing all the content requires scrolling to the right, back to the left, then to the right again, and so on. It's maddening and a sure way to drive people to another site—any site—within seconds.

Lesson 14.1: *Why Fixed-Width Layouts Are the Enemy*

Covers: Fixed-width page layouts

⇒ **Online:** wdpg.io/2/14-1-1

Why don't web pages fit whatever screen they're being displayed on? In most cases, the culprit is the use of large, fixed-width elements. These elements stay the same size no matter how wide a screen they're shown on, so if their width is greater than that of the screen, the dreaded horizontal scrollbar appears. To see what I mean, consider the following example.



► **Example** ➞ **Online:** wdpg.io/2/14-1-1

This example shows you the bare-bones version of a typical fixed-width layout.

CSS

```
.container {
  display: grid;
  grid-template-columns: repeat(3, 320px);
  grid-template-areas:
    "header header header"
    "article article sidebar"
    "footer footer footer";
}
header {
  grid-area: header;
  padding: 16px;
}
article {
  grid-area: article;
  padding: 16px;
}
aside {
  grid-area: sidebar;
  padding: 12px;
}
footer {
  grid-area: footer;
  padding: 16px;
}
```

The container class is a grid container with three fixed-width columns of 320px.

HTML

```
<div class="container">
  <header>
    <h1>Responsive Web Design</h1>
  </header>
  <article>
    <h2>A Brief History</h2>
    <p>Early in the new millennium, etc.</p>
  </article>
  <aside>
    <h3>Links</h3>
    etc.
  </aside>
  <footer>
    <p>&copy; Logophilia Limited</p>
  </footer>
</div>
```

This example is a basic three-column CSS grid layout where the grid container defines three columns, each of which has a fixed width of 320 pixels. Note, too, that all the padding declarations use fixed values in pixels. If the browser viewport is at least 960 pixels wide, this web page displays well, as shown in Figure 14.1. But what happens when the page is accessed

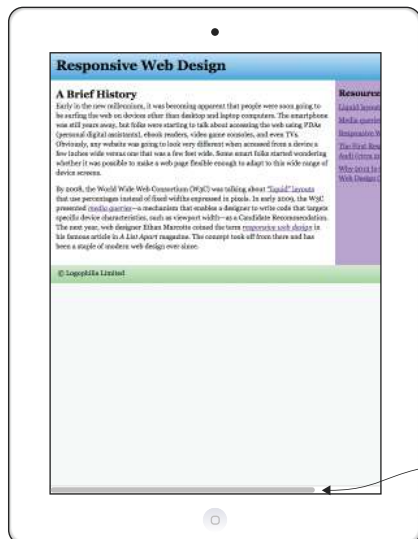


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by a smaller screen? As you can see in Figure 14.2, a tablet in portrait mode isn't wide enough, so some content gets cut off, and the horizontal scrollbar appears. Even worse is the page on a smartphone screen, as shown in Figure 14.3, where even less of the content is visible, which means even more horizontal scrolling for the poor reader.

► **Figure 14.1**

The web page fits a desktop screen.



► **Figure 14.2** The web page is a bit too wide for a tablet screen.



► **Figure 14.3** The web page is far too wide for a smartphone screen.



“Developing fixed-size web pages is a fundamentally flawed practice. Not only does it result in web pages that remain at a constant size regardless of the user’s browser size, but it fails to take advantage of the medium’s flexibility. —Jim Kalbach

Creating a Responsive Layout

Now that you know fixed-width layouts are bad, you can take steps to make sure that your layouts display nicely on any size screen. There are several ways to achieve this responsive ideal, and the next few sections take you through these methods. But before that, you need to take care of some prerequisites.

First, you need to make sure that all your block-level elements are being sized out to the border and not to the content, which is the default sizing. As I explained in Chapter 9, the easiest way to do this is to include the following rule at the top of your CSS:

```
* {
  box-sizing: border-box;
}
```

Second, you need to configure the browser viewport’s default width and scale by adding the following tag somewhere within your page’s <head> section:

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
```

By setting width=device-width, you’re telling the browser to set the width of the page to be the same as the width of whatever device the page is being displayed on. By setting initial-scale=1.0, you’re telling the browser to display the page initially without zooming in or out. With those tweaks added, you’re ready to get responsive.

REMEMBER

The Web Design Playground’s panes can be resized, but to really try out the examples responsively, you need to download and work with the examples outside of the Playground. You can access all the example files using the book’s GitHub repository: <https://github.com/paulmcf/wdpg2-example-files>.

Lesson 14.2: Creating a Liquid Layout

Covers: Using fr units or percentages for liquid layouts

➡ Online: wdpg.io/2/14-2-0

As you saw earlier, the real problem with a fixed-width layout is setting the grid-template-columns property to an absolute value, such as 320px for each column. You can remedy that problem by converting your absolute width values to relative widths that use percentages or CSS Grid’s fr unit instead of pixels. This solution is often called a *liquid layout*.

The following updates the earlier example with a liquid layout by converting the grid columns’ pixel values to fr units.

REMEMBER

A layout that uses relative measurement units, such as fr or percentages, is known as a liquid layout.



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► Example

➡ Online: wdpg.io/2/14-2-1

This code shows the conversion of the fixed-width layout to a liquid layout.

CSS

```
body {  
  max-width: 960px;  
}  
.container {  
  display: grid;  
  grid-template-columns: repeat(3, 1fr);  
  grid-template-areas:  
    "header header header"  
    "article article sidebar"  
    "footer footer footer";  
}
```

The body element now has a maximum width.

The grid columns now use fr units.

HTML

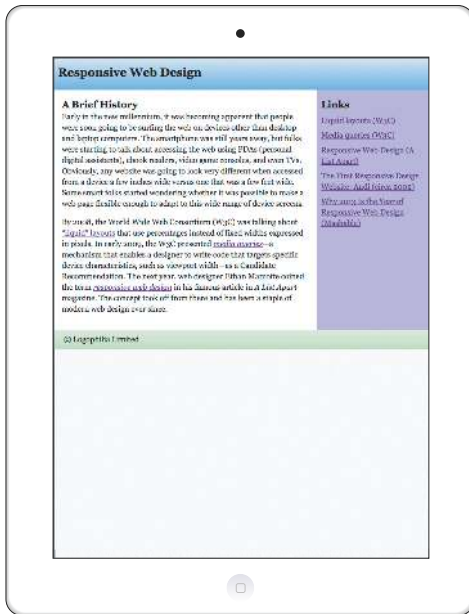
```
<div class="container">  
  <header>  
    <h1>Responsive Web Design</h1>  
  </header>  
  <article>  
    <h2>A Brief History</h2>  
    <p>Early in the new millennium, etc.</p>  
  </article>  
  <aside>  
    <h3>Links</h3>  
    etc.  
  </aside>  
  <footer>  
    <p>&copy; Logophilia Limited</p>  
  </footer>  
</div>
```

PLAY

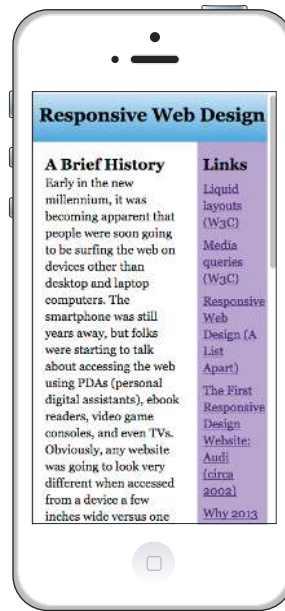
You can get some practice converting a fixed-width layout to a liquid layout on the Playground. ➡ Online: wdpg.io/2/14-2-2

With the liquid layout in place, you can see in Figure 14.4 that a tablet in portrait mode displays the web page content completely. Looking good! Figure 14.5 shows that a smartphone screen also displays the content without requiring the reader to scroll horizontally. Nice.

In Figure 14.5, you can also clearly see that the resulting columns are alarmingly narrow, which makes reading difficult. To fix that problem, you need to learn another responsive design technique. But first, consider the following aside on viewport units.



► **Figure 14.4** With a liquid layout, the web page fits a tablet screen perfectly.



► **Figure 14.5** The liquid layout also fits a smartphone screen but at the cost of too-narrow columns.

Liquid Layouts with Viewport Units

When dealing with percentage units, it's important to remember that assigning a percentage width to an element means that you're styling that element to be a percentage of its *parent's* width. If a parent element is 800 pixels wide, and you declare `width: 75%` on a child element, that child is 600 pixels wide. It doesn't matter whether the browser's screen width is 2,000 pixels; that child takes up only 600 pixels across the screen.

What if you want that child element to be 75% of the screen instead of its parent? In that case, you need to switch from percentages to viewport units, which act as percentage-like units that apply to the entire browser viewport. You can use the following four units:

- **vw**—The viewport width unit, where `100vw` equals 100% of the current viewport width. If the viewport is 1,600 pixels wide, `1vw` is equivalent to 16px.



PLAY

You can try out this full-height image technique on the Playground.

⇒ Online: wdpg.io/2/14-2-4

- **vh**—The viewport height unit, where `100vh` equals 100% of the current viewport height. If the viewport is 2,000 pixels high, `1vh` is equivalent to 20px.
- **vmin**—The viewport minimum unit, where `100vmin` equals 100% of the smaller of the two viewport dimensions. If the viewport is 800 pixels wide and 600 pixels high, `1vmin` is equivalent to 6px (because, in this case, the viewport height is the smaller of the two dimensions).
- **vmax**—The viewport maximum unit, where `100vmax` equals 100% of the larger of the two viewport dimensions. If the viewport is 1,200 pixels wide and 1,024 pixels high, `1vmax` is equivalent to 12px (because the viewport width is the larger of the two dimensions).

Suppose that you want to display an image so that it automatically takes up the entire height of the viewport. You can do that by applying the following rule to the image:

```
.image-full {  
  height: 100vh;  
  width: auto;  
}
```

I added the `width: auto` declaration to tell the browser to calculate the width automatically based on the height, which maintains the image's original aspect ratio.

Lesson 14.3: Creating an Adaptive Layout

Covers: Using @media queries

⇒ Online: wdpg.io/2/14-3-0

The liquid layout works well until the screen width gets too small, at which point, the columns get too narrow for comfortable reading (especially the sidebar). Look back at Figure 14.5. See how the page title (Responsive Web Design) barely fits the width of the smartphone viewport? If that element were even a few pixels bigger or a few letters longer, it would wrap and look quite awful, as shown in Figure 14.6.



► **Figure 14.6**

Increase the size of the page title a bit, and the design breaks.

How are these two scenarios related? You can solve the underlying problems by asking questions about the width of the browser viewport:

- Is the viewport width less than 450 pixels? If so, modify the grid layout so that the page elements display in the default stacked layout.
- Is the viewport width less than 350 pixels? If so, reduce the type size of the page title to 24pixels.

You can ask these and many other types of questions by defining *media queries* within your CSS. A *media query* is an expression accompanied by a code block consisting of one or more style rules. The expression interrogates some feature of the screen, such as its width. If that expression is true for the current device, the browser applies the media query's style rules; if the expression is false, the browser ignores the media query's rules. A layout that uses media queries is often called an *adaptive layout* because it adapts itself to the screen on which it's displayed.

Here's the general syntax:

```
@media (expression) {
  selector {
    declarations
  }
  etc.
}
```

The *expression* is most often min-width or max-width, followed by a colon and a value.

REMEMBER

A layout that uses media queries to adjust page elements and properties based on screen features such as width is known as an adaptive layout.

REMEMBER

Technically, the @media rule can be followed by a keyword that specifies the type of media, such as print or tv. The default keyword is screen, however, which is the value you want on the web, so you can leave this out.



LEARN

The vast majority of the media queries you'll write use min-width or max-width in the expression. But you can query several other media features, including height, resolution, and aspect ratio. To see the complete list, check out the Mozilla Developer Network page at https://developer.mozilla.org/en-US/docs/Web/CSS/@media#Media_features.

PLAY

Given a three-column flexbox layout, write a media query that displays the middle column first on smaller screens. ➡ Online: wdpg.io/2/14-3-3

If you want to apply styles on a screen no wider than a specified value, use max-width. The following code tells the browser to display the h1 element with a type size of 24px whenever the screen width is less than or equal to 350 pixels:

```
@media (max-width: 350px) {  
  h1 {  
    font-size: 24px;  
  }  
}
```

If you want to apply styles on a screen that's at least as wide as a specified value, use min-width. The following code sets display: inline-block on the aside element whenever the screen width is greater than or equal to 1,024 pixels:

```
@media (min-width: 1024px) {  
  aside {  
    display: inline-block;  
  }  
}
```

The following code updates the example to use a media query that reconfigures the grid layout to use the default stacked flow (as well as reduces the size of the header text) whenever the screen width drops to 450 pixels or less.



► **Example** ⇨ **Online:** wdpg.io/2/14-3-1

This code uses a media query to reconfigure the grid layout to use the default stacked flow, as well as reduce the size of page title text.

CSS

```
.container {
  display: grid;
  grid-template-columns: repeat(3, 1fr);
  grid-template-areas:
    "header header header"
    "article article sidebar"
    "footer footer footer";
}
h1 {
  font-size: 32px;
}
@media (max-width: 450px) {
  .container {
    grid-template-columns: 1fr;
    grid-template-areas:
      "header"
      "article"
      "sidebar"
      "footer";
  }
  h1 {
    font-size: 24px;
  }
}
```

The media query applies to screen widths up to 450px.

The grid layout is changed to a single column with the elements stacked on top of each other.

The page title is reduced to 24px.



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Figure 14.7 shows how the page layout appears on a screen with a width greater than 450 pixels. As shown in Figures 14.8 and 14.9, however, the layout changes on a screen with a width of 450 pixels or less.

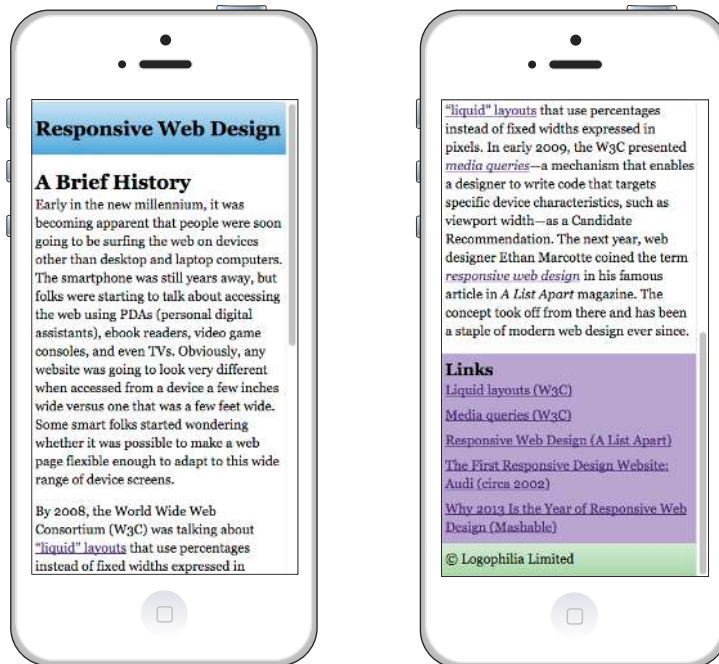
► **Figure 14.7**

Here's the page layout you see when the screen width is greater than 450 pixels.



PLAY

Given a version of the example layout in which the aside element is hidden by default, write a media query that displays the aside element when the viewport is at least 1,024 pixels wide. ➞ Online: wdpg.io/2/14-3-2



► **Figure 14.8** Here's the top portion of the page layout that appears on a screen that is less than 450 pixels wide.

► **Figure 14.9** The bottom portion of the screen confirms that the grid layout now displays all elements stacked on top of each other.



A Note About Media Query Breakpoints

You may be tempted to set up your media queries to target specific device widths, such as 320 pixels for older iPhones, 400 pixels for certain older Samsung devices, 768 pixels for older iPads, and so on. Alas, that way lies madness. There are just too many devices with too many different widths for you to have any hope of targeting them all. Even if you could somehow do that, your code would be out of date by the end of the day, because new devices with new widths are being released constantly. Forget it.

Instead, it's much better to let your content dictate the `min-width` and `max-width` values you use in your media queries. On a desktop screen, for example, you might determine that your text lines are at their most readable when they have about 75 characters per line. If you can get that line length when the container element is 600 pixels wide, it makes sense to set that element's `max-width` property to 600px. Suppose that you also determine that your lines remain readable down to about 50 characters per line and that you get that line length when the container element is 400 pixels wide.

Experiment with different screen widths to see when that container's width falls below this 400-pixel threshold. This depends on your overall page layout, but suppose that it happens when the screen width falls below 550 pixels because you've got a sidebar that gets too narrow beyond that point. Your page becomes less readable below that width, so the design *breaks* at 550 pixels. That value becomes the *breakpoint* for a media query:

```
@media (max-width: 550px) {  
  .container {  
    float: none;  
    width: 100%;  
  }  
}
```

In general, you vary the width of the browser window and watch for widths at which the design breaks: text lines getting too short or too long, a type size becoming too big, a block element that ends up in a weird place, and so on. Then, you can use the width as a breakpoint for a media query.



Designing Responsive Web Pages

Lesson 14.4: Creating a Mobile-First Layout

Covers: Using @media for nonmobile screens

REMEMBER

A layout that begins with a structure designed for mobile devices and adds complexity only when the screen is wide enough is known as a mobile-first layout.

REMEMBER

You don't necessarily have to start with a width as small as 320 pixels. If you have access to your site analytics, they should tell you what devices your visitors use. If you find that all or most of your mobile users are on devices that are at least 400 pixels wide, you should start there.

⇒ Online: wdpg.io/2/14-4-0

In Lesson 14.3, you saw how to use media queries to target mobile screens and adjust layout features such as the grid structure. That works fine, but one school of web design thought says that all CSS should be additive instead of subtractive. That is, your CSS should add or modify property values, but never remove them. Why? In a sense, CSS is like cooking; it's a lot easier to add salt and other seasonings than to remove them. In your web design kitchen, it's always best to start with the most minimal layout that works and then add things to it.

In almost every conceivable web page scenario, the most minimal layout is the one that's designed to work on the smallest devices, which these days means smartphones. The idea, then, is to build your page to look and work well on the smallest smartphone screen (typically, 320 pixels wide). Only then do you add to and modify the layout for larger screens. This layout is called a *mobile-first layout*, and it's at the heart of responsive web design today.

One of the tenets of mobile-first design is to include in the initial, mobile-focused layout only those page elements that are essential to the user's experience of the page. Many mobile users are surfing over slow connections with limited data plans, so as a conscientious web designer, it's your job to ensure that these users are served nothing frivolous. What counts as frivolous or nonessential is often a tough call because what's trivial to one person might be vital to another. You'll need to exercise some judgment here, but that's why they pay you the big bucks.



Mobile devices require software development teams to focus on only the most important data and actions in an application. There simply isn't room in a 320 by 480 pixel screen for extraneous, unnecessary elements. You have to prioritize. —Luke Wroblewski

As an illustration, suppose that you modify the example page so that it includes a second aside element on the left, which you'll use to display a quotation related to responsive web design. This touch is nice but not essential, particularly because in the normal flow of the web page, this element would appear before the article element. As shown in the following code, add this new aside element with the `display: none` declaration to hide it by default. Then use a media query to display the element on screens that are at least 750 pixels wide.



► **Example** ➡ **Online:** wdpg.io/2/14-4-1

This code uses a media query to display the otherwise-hidden `<aside class="quotation">` element on screens that are at least 750 pixels wide.

CSS

```
.container {
  display: grid;
  grid-template-columns: 1fr;
  grid-template-areas:
    "header"
    "article"
    "sidebar"
    "footer";
}
.quotation {
  display: none;
}
@media (min-width: 750px) {
  .container {
    grid-template-columns: repeat(4, 1fr);
    grid-template-areas:
      "header header header header"
      "quotation article article sidebar"
      "footer footer footer footer";
  }
  .quotation {
    display: block;
    grid-area: quotation;
  }
}
```

By default, the mobile-friendly layout is a one-column, stacked grid.

The quotation class is hidden by default.

The large-screen layout is a four-column grid.

On screens at least 750px wide, the quotation is displayed.

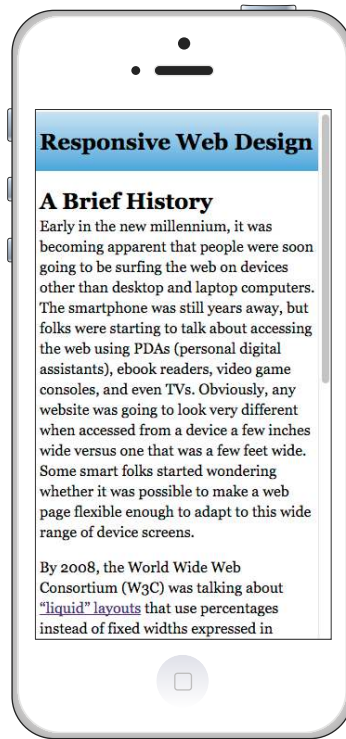
HTML

```
<header>
  <h1>Responsive Web Design</h1>
</header>
<main>
  <aside class="quotation">
    <h3>Quote</h3>
    etc.
  </aside>
  <article>
    <h2>A Brief History</h2>
    <p>Early in the new millennium, etc.</p>
  </article>
  <aside>
    <h3>Links</h3>
    etc.
  </aside>
</main>
<footer>
  <p>&copy; Logophilia Limited</p>
</footer>
```

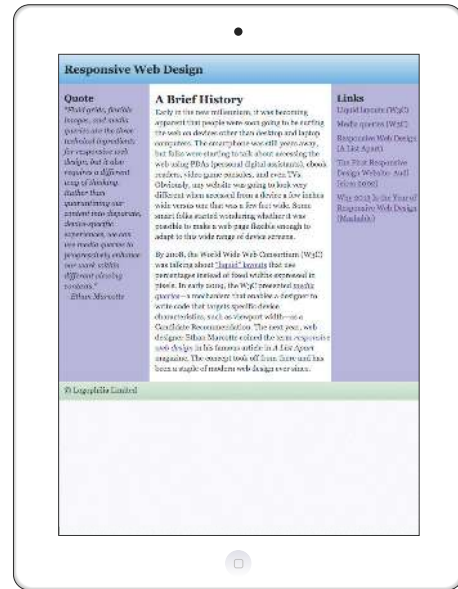
The new quotation element



Figure 14.10 shows that on a smartphone, the layout doesn't include the quotation sidebar, but it does appear on a wider screen like the tablet shown in Figure 14.11.



► **Figure 14.10** The quotation sidebar doesn't appear on a narrow smartphone screen.



► **Figure 14.11** The quotation sidebar does appear on a wider screen, such as a tablet.

REMEMBER

A layout that uses relative measurement units, a flexible grid, media queries, and a mobile-first approach is known as a responsive layout.

Which Layout Is the Responsive One?

That's a good question. The answer is that, together, they *all* add up to the modern conception of a responsive layout: one that uses relative measurements, a flexible grid, and media queries, all presented with a mobile-first approach. If you incorporate these concepts into your pages, you'll be well along the road to your ultimate destination: a fully responsive web design.

But you're not quite there yet. To complete the journey, you need to know how to make your images and text responsive, and these are the topics of the rest of this chapter.



Making Images Responsive

Making an image responsive is one of the biggest challenges web designers face. The scale of the challenge comes from two problems associated with making images responsive:

- Making a fixed-size image fit into a container with fluid dimensions. An image that's 600 pixels wide will fit nicely inside an element that's 800 pixels wide, but it overflows if that element is scaled down to 400 pixels wide. Solving this problem requires making images fluid so that the size adjusts to the changing screen size.
- Delivering a version of an image that's sized appropriately for the user's screen dimensions. It's one thing to offer up a 2,000 x 1,500-pixel image to desktop users, but sending the same image to smartphone users is a waste of upload time and bandwidth.

The next two lessons show you some basic methods for overcoming these problems.

Lesson 14.5: *Creating Fluid Images*

Covers: Styling the `img` element for responsiveness

⇒ Online: wdpg.io/2/14-5-0

An image comes with a predetermined width and height, so, at first blush, it seems impossible to overcome these fixed dimensions. Fortunately, an `` tag is another page element. Yes, by default, the image is displayed at its full width and height, like a `div` or any other block element. But in the same way that you can make a block element fluid by using percentages, you can make an image fluid.

You need to be a bit careful when working with images:

- In most cases, you don't want the image to scale larger than its original size since, for most images, this scaling will result in ugly pixelation and jagged edges.
- If you change one dimension of an image, it will almost certainly appear to be skewed because its original aspect ratio—the ratio of the width to the height of the image—will have been altered. Therefore, you have to change both the width and the height proportionally to retain the image's original aspect ratio. Fortunately, you can get the browser to do some of the work for you.



Designing Responsive Web Pages

PLAY

In some cases, you don't want the image height to scale larger than its original height, so you need to set `max-height: 100%` and `width: auto` on the image. ➡ Online: wdpg.io/2/14-5-2

To handle both concerns, you can create a fluid image that responds to changes in screen size by applying the following rule:

```
img {  
  max-width: 100%;  
  height: auto;  
}
```

Setting `max-width: 100%` allows the image to scale smaller or larger as its parent container changes size but also specifies that the image can never scale larger than its original width. Setting `height: auto` tells the browser to maintain the image's original aspect ratio by calculating the height based on the image's current width.

The following code shows an example.

► Example

➡ Online: wdpg.io/2/14-5-1

This code creates a fluid image that scales smaller or larger as the screen size changes but doesn't scale larger than its original dimensions.

CSS

```
img {  
  max-width: 100%;  
  height: auto;  
}
```

Makes images fluid

HTML

```
<header>  
  <h1>Responsive Web Design</h1>  
</header>  
<main>  
  <aside class="quotation">  
    <h3>Quote</h3>  
    etc.  
  </aside>  
  <article>  
    <h2>A Brief History</h2>  
    <p>Early in the new millennium, etc.</p>  
  </article>  
  <aside>  
    <h3>Links</h3>  
    etc.  
      
  </aside>  
</main>  
<footer>  
  <p>&copy; Logophilia Limited</p>  
</footer>
```

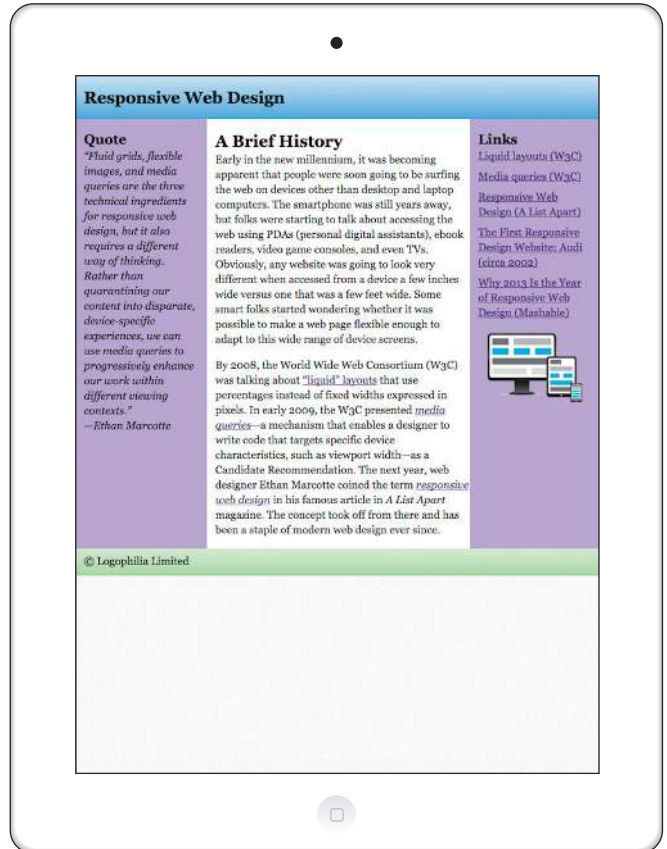
An image added to the aside element



Figures 14.12 and 14.13 show how the image size changes as the width of its parent aside element changes.



► **Figure 14.12** The image as it appears when its `aside` parent element is given the full width of a smartphone screen



► **Figure 14.13** When the `aside` element is displayed at a narrower width, the image scales down accordingly.

Scaling images based on screen size is a useful technique, but that doesn't mean you should deliver the same image to every device. For example, if you have a very large image, it's fine to deliver that image to desktops, but it would be better to send a smaller version to smartphones. In the next section, you learn some `img` element attributes that enable you to deliver different versions of an image to different devices.



Lesson 14.6: Delivering Images Responsively

Covers: The `sizes` and `srcset` attributes

➡ Online: wdpg.io/2/14-6-0

BEWARE

When you're testing the `srcset` attribute by changing the browser window size, you may find that the browser doesn't always download a different-size image. Although the browser may detect that a smaller image should be used based on the `srcset` values, it may opt to resize the existing image, because it has already downloaded that image.

REMEMBER

The default image—that is, the image specified with the `src` attribute—is the fallback image that will be displayed in older browsers that don't support the `srcset` attribute. Good mobile-first practice is to make the default image the one you prefer to deliver to mobile users.

The other side of the responsive-image coin involves delivering to the user a version of the image that has a size that's appropriate for the device screen. You might deliver a small version of the image for smartphone screens, a medium version for tablets, and a large version for desktops. In the past, you needed a script to handle this task, but in HTML5, you can do everything right in your `` tag thanks to two new attributes: `sizes` and `srcset`.

The `sizes` attribute is similar to a media query in that you use an expression to specify a screen feature, such as a minimum or maximum height, and then specify how wide you want the image to be displayed on screens that match that configuration. You can specify multiple expression-width pairs, separated by commas. Here's the general syntax:

```
sizes="(expression1) width1,  
      (expression2) width2,  
      etc.,  
      widthN"
```

Notice that if the last item doesn't specify an expression, the specified width applies to any screen that doesn't match any of the expressions. Suppose that you want images to be displayed with width `90vw` on screens that are less than or equal to `500px` and `50vw` on all other screens. Here's how you'd set that up:

```
sizes="(max-width: 500px) 90vw, 50vw"
```

Next, add the `srcset` attribute to your `` tag, which you set to a comma-separated list of image file locations, each followed by the image width and the letter `w`. Here's the general syntax:

```
srcset="location1 width1w,  
       location2 width2w,  
       etc.">
```

This code gives the browser a choice of image sizes, and it picks the best one based on the current device's screen dimensions and the preferred widths you specified in the `sizes` attribute. Here's an example:

```
srcset="/images/small.tif 400w,  
       /images/medium.tif 800w,  
       /images/large.tif 1200w">
```

The following example puts everything together to show you how to deliver images responsively.



► **Example** ➡ Online: wdpg.io/2/14-6-1

This code creates a fluid image that scales smaller or larger as the screen size changes but doesn't scale larger than its original dimensions.

HTML

```

```

The default image
for older browsers

The sizes to
display the image

The images that
the browser can
choose from

Figures 14.14 through 14.16 show how the image that's delivered to the browser changes as the size of the screen changes.



► **Figure 14.14**

A wide browser viewport gets the large image.



► **Figure 14.15** A tablet-size viewport gets the medium image.



► **Figure 14.16** A smartphone-size viewport gets the small image.

With your images being delivered responsively, it's time to turn your attention to your page's most important asset: text. In the rest of this chapter, you learn some techniques for making your page typography responsive.

Making Typography Responsive

Is your goal to enrage some of the people who visit your website? I thought not, but you may be doing that if you use pixels for your site typography. Web browsers such as Google Chrome and Mozilla Firefox enable users to specify a default font size, which is set to 16px in all modern browsers, but people with aging eyesight or visual impairments often bump this default to 24px, 32px, or even higher. If you use the declaration `font-size: 16px` for, say, your page's body text, *all* your visitors—and in particular those who increased their default font size—will see your text at that size. Cue the rage.

Fortunately, it's easy to avoid that scenario by switching to relative units for your font-size values. One possibility is the `em` unit, where 1em

REMEMBER

To run your own tests in Chrome, change the default font size by clicking the Menu icon, choosing Settings > Appearance, and then using the Font Size list slider to set the size you want.



corresponds to the browser's default font size—or, crucially, the *user's* specified default font size. If that default is 16px, 1.5em corresponds to 24px, and 3em corresponds to 48px. If the default is 24px, 1.5em would render at 36px, and 3em would render at 72px.

That solution may seem to be perfect, but there's an inheritance fly in this responsive soup. First, let me point out that *inheritance* means that for certain CSS properties, if a parent element is styled with the `font-size` property, its child and descendant elements are automatically styled the same way. (See Chapter 19 to learn more about this crucial CSS concept.) To see the problem, first consider the following HTML and CSS, and then answer one question: If the default font size is 16px, what is the font size, in pixels, of the `h1` element?

HTML:

```
<body>
  <header>
    <h1>What's My Font Size?</h1>
  </header>
</body>
```

CSS:

```
body {
  font-size: 1em;
}
header {
  font-size: 1.5em;
}
h1 {
  font-size: 2em;
}
```

Your intuitive guess may be that because the `h1` element is declared with `font-size: 2em`, it must get rendered at 32px. Alas, that's not the case, and to understand why, you need to know that the `font-size` property is inherited, which leads to the following sequence:

- 1 The `body` element's font size (1em) is set to 16px.
- 2 The `header` element inherits the font size from the `body` element, so the `header` element's font size (1.5em) is set to 24px.
- 3 The `h1` element inherits the font size from the `header` element, so the `h1` element's font size (2em) is set to 48px.

That's not a deal-breaker when it comes to using `em` units; you need to be aware of this fact and take the inherited font sizes into account.

If you don't feel like doing the math required to work successfully with `em` units, there's an alternative: the `rem` unit. `rem` is short for *root em* and refers to the font size of the page root, which is the `html` element. Two things to note:

- Because the root's font size is the same as the default font size, and because the `rem` unit scales in the same way as the `em` unit, the `rem` unit is responsive.

REMEMBER

To run your own tests in Firefox, change the default font size by clicking the Menu icon, choosing Settings, selecting the General tab, and then using the Size list in the Fonts section to set your preferred size.



- Because the `rem` unit always inherits its font size only from the `html` element, there are no inheritance gotchas to worry about. An `h1` element declared with `font-size: 2rem` will always render at twice the default font size.

This isn't to say that you should always use `rem` over `em`. There may be situations in which you want a child element's font size to be relative to its parent's font size, in which case `em` units are the best choice.

Lesson 14.7: Using Responsive Font Sizes

Covers: Using `rem` units for `font-size`

➡ Online: wdpg.io/2/14-7-0

The following code updates the example page to replace the `font-size` property's absolute `px` units with relative `rem` units.

► Example

➡ Online: wdpg.io/2/14-7-1

This code updates the example page to replace the `font-size` property's absolute `px` units with relative `rem` units.

CSS

```
h1 {  
  font-size: 2rem;  
}  
h2 {  
  font-size: 1.5rem;  
}  
h3 {  
  font-size: 1.25rem;  
}  
@media (min-width: 750px) {  
  h1 {  
    font-size: 2.5rem;  
  }  
  h2 {  
    font-size: 2rem;  
  }  
  h3 {  
    font-size: 1.5rem;  
  }  
}
```

The header elements are given mobile-first rem font sizes.

The header elements are also given large-screen rem font sizes.



Lesson 14.8: Using Responsive Measurements

Covers: Using `rem` units for measurements

➡ Online: wdpg.io/2/14-8-0

Unfortunately, the bad design results that come from using absolute units such as `px` aren't restricted to font sizes. To see what I mean, consider the following code, the results of which are shown in Figure 14.17:

```
HTML:
<header>
  <h1>Responsive Web Design</h1>
</header>
CSS:
header {
  height: 64px;
}
h1 {
  font-size: 2rem;
}
```

Responsive Web Design

► **Figure 14.17** The `h1` text looks good at `2rem`.

Looks good! But what happens when I change the default font in my web browser (Firefox) to `30px`? Figure 14.18 shows the sad story.

Responsive Web Design

► **Figure 14.18** The element doesn't render so well when a larger default font is used.

At the larger default size, the heading is larger than the `header` element in which it's contained, resulting in an overall crowded feel to the text and (much worse) cutting off the descenders of the *p* and *g*.

Why did this happen? The `header` element's `height` property uses an absolute value of `64px`. That height won't budge a pixel no matter what font size you use as the default. But consider the following revised code and the result shown in Figure 14.19:

```
HTML:
<header>
  <h1>Responsive Web Design</h1>
</header>
CSS:
header {
  height: 4rem;
}
h1 {
  font-size: 2rem;
}
```

REMEMBER

This example is artificial because, in practice, you'd rarely set an explicit height on an element. Instead, it's always better to let the content dictate an element's height naturally.



Responsive Web Design

► **Figure 14.19** With the `header` element's `height` property now using relative `rem` units, the `header` scales along with the text as the default font size changes.

The only change I made was to declare `height: 4rem` on the `header` element. Using the relative unit makes the height responsive, so it increases (or decreases) along with the font size when the default font value is changed.

How you use relative units for measurements depends on many factors, not least of which is the design effect you're trying to achieve. I can suggest a few guidelines, however:

BEWARE

Because a percentage is relative to the parent element's width, you may find that using percentages for padding or margins leads to unexpected or bizarre results. In such cases, you should switch to `rem` units for more control.

- For vertical measures such as `padding-top`, `padding-bottom`, `margin-top`, and `margin-bottom`, use `rem` units.
- For horizontal measures such as `width`, `padding-right`, `padding-left`, `margin-right`, and `margin-left`, use percentages.
- For horizontal measures in which you want more control of properties such as `width`, `max-width`, and `min-width`, use `rem` units.
- For vertical measures that you want to scale in relation to the viewport height, use `vh` units.
- For horizontal measures that you want to scale in relation to the viewport width, use `vw` units.

**► Example** **Online:** wdpg.io/2/14-8-1

This code updates the example page to replace all the absolute px measurements with relative rem or percentage units.

CSS

```
.container {  
  max-width: 60rem;  
}  
header {  
  padding: 1rem 1.67%;  
}  
h1 {  
  padding-left: 1.67%;  
}  
.quotation {  
  padding-right: 1.67%;  
}  
article {  
  flex-basis: 20rem;  
  padding-top: 1rem;  
  padding-left: 1.67%;  
}  
p {  
  margin-bottom: 1rem;  
}  
aside {  
  flex-basis: 10rem;  
  padding: 1rem 1.67%;  
}  
div {  
  padding-bottom: .5rem;  
}  
footer {  
  padding: 1rem 1.67%;  
}
```

rem units used for greater control

rem units used on all vertical measures

Percentages used on all the other horizontal measures

By using rem units on vertical measures and percentages on horizontal measures, you maximize control over this aspect of your design while still keeping things responsive. Win-win!



Summary

- Avoid fixed-width layouts in which page elements are sized by using absolute measurements such as pixels.
- Use liquid layouts in which horizontal measures such as widths, paddings, and margins are expressed in percentages.
- To create an adaptive layout, use media queries to adjust element sizes, change the layout, and hide or display elements depending on the screen size.
- Use a mobile-first approach in which your initial page layout is optimized for a smartphone, and use media queries to add features and change the layout as needed for larger screens.
- Make your images fluid by styling them with the declarations `max-width: 100%` and `height: auto`.
- In your `` tags, add the `sizes` and `srcset` attributes to scale and deliver images that are appropriate for any screen size.
- When styling font sizes, avoid absolute pixel values in favor of `rem` units.
- Also use `rem` units when styling vertical measures such as height, padding, and margins.



PROJECT: Creating a Photo Gallery



This chapter covers

- Planning and sketching your photo gallery
- Choosing typefaces for your page
- Adding the header and navigation links
- Adding the image thumbnails
- Adding dynamic captions and links to full-size images

Unlike with your first two projects—the personal home page that you built in Chapter 5 and the landing page you built in Chapter 10—you now know enough to create a page that looks like it was designed and coded by a professional. If that seems like a stretch at this point in your web design journey, this chapter will prove that I'm right. Here, I'll take you through the construction of a full-featured photo gallery, complete with dynamically generated captions, links to full-size versions of each thumbnail, and much more. You'll be using many of the tools and techniques that you've learned so far, including class selectors, the CSS box model, images (of course), and layouts. Let's get to work!



PROJECT: Creating a Photo Gallery

MASTER

If you're not sure what size thumbnails you want to use, use a single image for now and repeat it throughout the gallery. When you've settled on the ideal size, you can process the rest of the photos you want to use.

BEWARE

Your full-size images can theoretically be any size, but bear in mind that large photos may weigh in the double-digit megabytes. You don't want to use too much compression on these versions, so keep the size within reason. I used 2048 × 1365 images in my project.

What You'll Be Building

This project is an online gallery for showing off your photos. The page will consist of at least half a dozen *thumbnails*, which are reduced-size versions of your images. The idea is that a site visitor should be able to click one of these thumbnails to display the full-size version of the image. Each thumbnail should also display a short caption that describes the image.

On the surface, this project is a simple one. Truthfully, the resulting page will *look* simple as well. It will look *nice*, mind you, but it will project to the visitor an air of simplicity. The fact that the site *looks* unsophisticated, however, doesn't mean that it's built that way. As you'll soon learn, this page has some rocking technology under the hood, including a Flexbox-based layout, viewport-based sizing, and sophisticated positioning techniques.

Getting Your Photos Ready

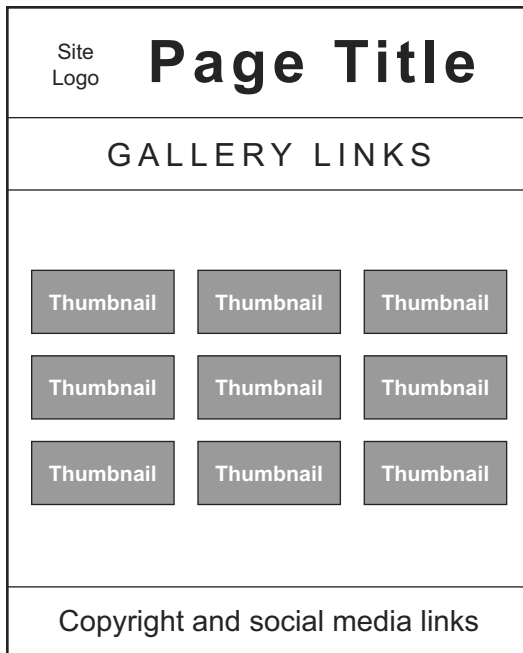
You should begin this project by getting at least some of your photos ready to use. You'll want to use JPEGs for everything because they give you smaller file sizes than PNGs while maintaining good photo quality. You'll also need two versions of each image: a regular-size version and a thumbnail version. In the page layout I use, all the thumbnails need to be the same size. It doesn't matter what size you use, but in my project, I resized all my thumbnails to a 300-pixel width and a 200-pixel height. The full-size versions can be whatever size you want.

Sketching the Layout

As you've seen in the earlier projects (Chapters 5 and 10), your web projects should begin with a pencil and paper (or whatever variation on that theme you're most comfortable with). You're learning how to design web pages, and any design worthy of the name always begins with a quick sketch to get an overall feel for the page dimensions and components. *Quick* is the operative word. You don't need to create an artist's rendering of the final page. You need to lay out the main sections of the page and indicate the approximate location, size, and contents of each section; for example, Figure 15.1 shows a page layout with the following four sections:

- A header with a site logo and title
- A navigation area with links to other gallery pages
- The main section of the page containing the image thumbnails
- The page footer with a copyright notice and links to social media sites

With that out of the way, it's time to turn your attention to the typeface or typefaces you want to use for the page.



► **Figure 15.1**

Before diving into the page's HTML and CSS details, use pencil and paper to get a sense of the overall page layout and content.

Choosing Typefaces

This page has little type, so the choice of a typeface shouldn't take up too much of your time. There are three areas where your choice of typeface will come into play:

- **Heading**—Something that looks handwritten would be nice. For my project, I'm going to keep things simple and use the default *cursive* typeface. For something that has good coverage on both Windows PCs and Macs, you could go with Brush Script MT.
- **Navigation and footer**—The text here consists mostly of links, so a nice, clean sans-serif font is a good choice. For my project, I'm going with Calibri (installed on most Windows PCs) and Optima (installed on most Macs).
- **Thumbnail-image captions**—These captions are fairly small, so I recommend a typeface that remains readable even at small sizes. I'll stick with Calibri and Optima for my captions.

In my CSS, I'll use the following declarations to specify these families:

```
font-family: cursive;  
font-family: Optima, Calibri, sans-serif;
```

Now, you can turn your attention to a color scheme for the photo gallery.



Choosing the Colors

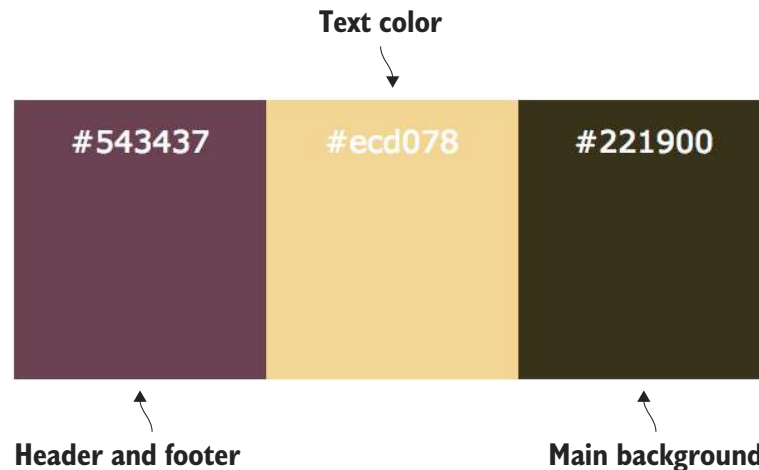
This page is simple, color-wise, so you don't need to build an elaborate color scheme. In fact, in my version of this project, I'm using just three main colors:

- **Header and footer background**—This design looks balanced when the header and the footer have the same color. Because the main background (discussed next) should be relatively plain to show off the thumbnails, the header and footer background gives you a chance to pick something with a bit of pizzazz to liven up the page.
- **Main background**—This area takes up the bulk of the page, and it's used to show both the image thumbnails and the navigation links. A color such as black or dark versions of gray, brown, or blue work best for this purpose.
- **Text**—This color needs to read well in all three sections of the page: header, main, and footer. Assuming these sections are using dark backgrounds, an off-white color such as #eee would work fine, as would something along the lines of a not-too-bright yellow.

Figure 15.2 shows the colors I chose for my project.

► **Figure 15.2**

The color scheme for my project



With the page layout sketched and your typefaces and colors chosen, it's time to make things more concrete (virtually speaking) by translating everything into HTML and CSS code.

Building the Page

To build your photo gallery, start with the skeleton code that I introduced you to in Chapter 1. From there, go section by section, adding text, HTML tags, and CSS rules.



The Initial Structure

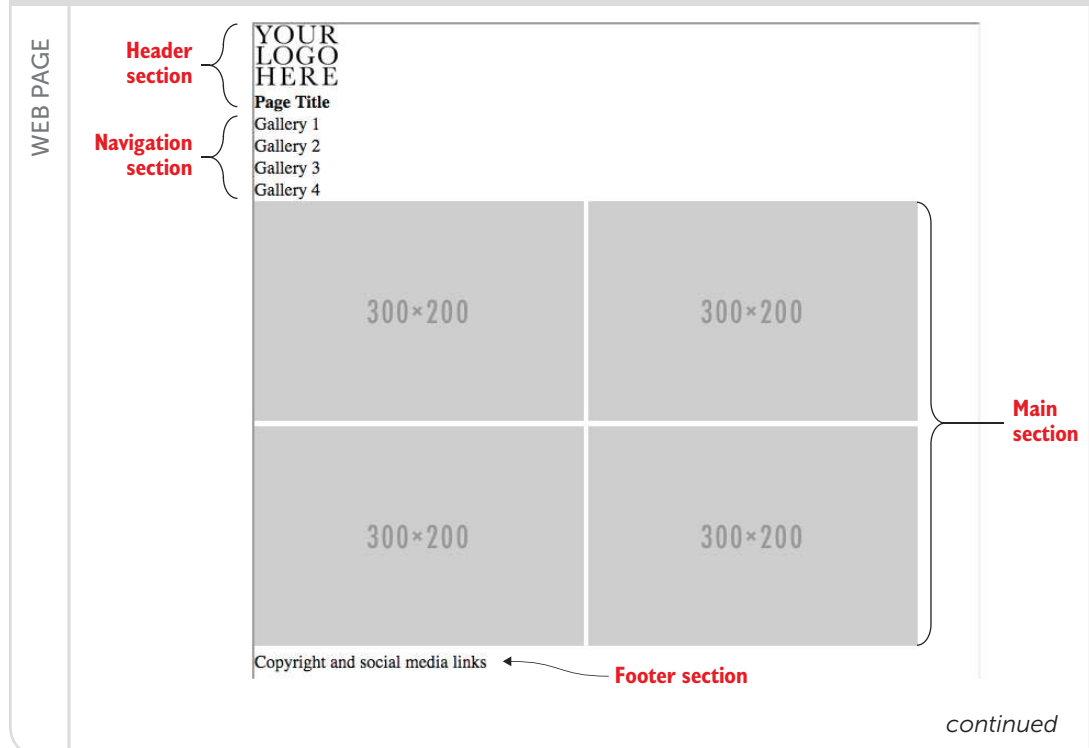
To get things started, take the basic page structure from Chapter 1, and add the gallery layout. I'm going to use the HTML5 semantic elements:

- The page header section uses the `header` element, and it consists of two items: an `img` element for the site logo and an `h1` element for the site title.
- The navigation section uses the `nav` element, and it consists of an unordered list of links to other pages of the gallery.
- The main section uses the `main` element, and it consists of several `img` elements, each of which points to a thumbnail version of a photo.
- The page footer section uses the `footer` element, and it consists of a copyright notice and links to several social media sites.

► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/1

Here are the elements that make up the photo gallery's initial HTML structure.





PROJECT: Creating a Photo Gallery

HTML

```
<header>
  
  <h1>Page Title</h1>
</header>
<nav>
  <ul>
    <li>Gallery 1</li>
    <li>Gallery 2</li>
    <li>Gallery 3</li>
    <li>Gallery 4</li>
  </ul>
</nav>
<main>
  
  
  
  
</main>
<footer>
  <p>Copyright and social media links</p>
</footer>
```

Header
section

Navigation
section

Main
section
(the image
thumbnails)

Footer
section

REMEMBER

The initial page layout also includes a CSS reset that sets the margin and padding to 0 and the box sizing to border-box.

The gallery isn't much to look at right now, but you'll soon fix that problem. You start by setting up the page's overall layout.

The Overall Layout

After spending all that time learning how to use Flexbox in Chapter 12, you'll be pleased to hear that you'll be putting that effort to good use here, because this project uses Flexbox for its entire layout.

Get things rolling by setting up the initial Flexbox container. The `<body>` tag will do nicely for that purpose, and you'll use it as a single-column container, which gives you a vertical main axis. You want the items aligned with the start of that axis (that is, the top of the page). You also want everything to be centered horizontally, and you want the footer to appear at the bottom of the screen, even when there isn't enough content to fill the rest of the page. The following example shows you how to set everything up.



► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/2

This example shows you how to configure the body element as a Flexbox container for the entire page.

CSS

```
body {  
  display: flex;  
  flex-direction: column;  
  justify-content: flex-start;  
  align-items: center;  
  min-height: 100vh;  
  font-family: Optima, Calibri, sans-serif;  
  background-color: #221900;  
  color: #ecd078;  
}
```

Sets a minimum height

Sets up the Flexbox container

Applies a font stack and the background and text colors

The one comment I'll add here concerns the `min-height` property. By declaring this property to be `100vh`, you're telling the browser that the body element is always at least the height of the browser's viewport. Having the body element height greater than or equal to the height of the viewport ensures that the footer section appears at the bottom of the screen, even if there isn't enough content to fill the viewport vertically.

The Header Section

The header section consists of a `header` element that contains two items: an `img` element for the site logo and an `h1` element for the site title. You also want the header to have the following features:

- Because the header background is different from the page background, the header will look best if it extends across the width of the browser window. To do this, declare `width: 100%` on the `header` element.
- The site logo and title should be centered both horizontally and vertically within the header. Configure the `header` element as a Flexbox container with a horizontal main axis and both `justify-content` and `align-items` set to `center`.

The following example shows the HTML and CSS that I used to accomplish these goals and to style the rest of the header section.



PROJECT: Creating a Photo Gallery

► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/3

This example styles the photo-gallery header section as a Flexbox container that centers the site logo and title horizontally and vertically.

WEB PAGE



CSS

```
header {
  display: flex;
  justify-content: center;
  align-items: center;
  padding: 1em 0;
  width: 100%;
  background-color: #543437;
}
h1 {
  padding-left: .5em;
  font-family: cursive;
  font-size: 3em;
}
```

The header is a Flexbox container.

The header uses the full window width.

Styles for the site title

HTML

```
<header>
  
  <h1>Ampersand Photography</h1>
</header>
```

The Navigation Section

The next area of the page is the navigation section, which consists of several links to other gallery pages. This section uses the `nav` element and contains an unordered list of links. Here's a list of the goals you want to accomplish for this section:

- The links should be centered both horizontally and vertically within the navigation section. Set up the `nav` element as a Flexbox container with a horizontal main axis and both `justify-content` and `align-items` set to center.
- The links should appear as a horizontal bulleted list without the bullets. To do this, configure the `ul` element as a Flexbox container, and set the `list-style-type` property to none.

The following example shows the HTML and CSS that I used to accomplish these goals and to style the rest of the navigation section.



► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/4

This example styles the photo gallery's navigation section as a Flexbox container that displays the unordered list items horizontally.

WEB PAGE	
CSS	<pre> nav { display: flex; justify-content: center; align-items: center; width: 100%; background-color: inherit;} nav ul { display: flex; list-style-type: none;} nav li { padding: 1em 2.5em; text-transform: uppercase;} </pre> <p>The nav is a Flexbox container.</p> <p>The ul is a Flexbox container, and its bullets are hidden.</p> <p>Styles for the li elements</p>
HTML	<pre> <nav> Gallery 1 Gallery 2 Gallery 3 Gallery 4 </nav> </pre>

You should see two problems with the navigation links right away:

- The link text is the standard blue that browsers use for links. By default, links don't pick up the parent's text color, so you need to tell the browser to use that color for links. In most cases, the easiest way is to declare `color: inherit` on the `a` element.
- Nothing indicates which gallery page is currently being displayed. To solve this problem, apply a special style to the navigation text for the current page. I created a class named `current-page` and used it to style the current `li` element with the background and text colors switched.

The following example shows the revised navigation links.

MASTER

You could declare the page's text color explicitly, but if you decide to change the text color later, you have to make the change in two places: the body element and the `a` element. When you use `inherit`, the `a` element automatically picks up any change you make in the body element's text color.




PROJECT: Creating a Photo Gallery

► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/5

This example styles the navigation links to use the body element's text color. It also adds a class named `current-page` to the current page item to use reverse text.

WEB PAGE	 <p>Current page</p> <p>Hovered link</p> <p>htmlcssplayground.com/gallery2.html</p>
CSS	<pre>.current-page { padding: .75em; background-color: #ecd078; color: #221900; } a { color: inherit; text-decoration: none; } a:hover { color: #d95b43; text-decoration: underline; }</pre> <p>The <code>current-page</code> class creates a reverse text effect.</p> <p>The <code>a</code> element inherits the body text color.</p> <p>Hover over styles for the links.</p>
HTML	<pre><nav> Gallery 1 Gallery 2 Gallery 3 Gallery 4 </nav></pre> <p>The link is replaced by a span that uses the <code>current-page</code> class.</p>

With your header and navigation elements in place, you're ready to tackle the main part of the project: the photo gallery itself.

The Main Section

The real meat of the photo gallery is, of course, the photos themselves. The basic idea of a gallery is to display a thumbnail of an original photo and enable the visitor to view the original with a click. The simplest way is to set up each thumbnail as a link that points to the original, as I've done in the following example. Note, too, that I set up `main` as a Flexbox container that centers the thumbnails horizontally and allows them to wrap.



► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/6

This example sets up the main element as a Flexbox container. The flex items are the photo thumbnails, each of which links to its original photo.

WEB PAGE	
CSS	<pre>main { display: flex; justify-content: center; flex-wrap: wrap; max-width: 960px; font-family: Optima, Calibri, sans-serif; }</pre> <p>The main element is a Flexbox container</p> <p>Sets the maximum width</p>
HTML	<pre><main> etc. </main></pre> <p>Opens each linked image in a new tab</p>

The Footer Section

The final element of the photo gallery page is the footer section, which you'll use to display a copyright notice and links to social media sites. To align these items horizontally and vertically, configure the footer element as a flex container.

REMEMBER

In this project's main element, the secondary axis runs vertically, so the declaration `align-content: flex-start` tells the browser to keep all the thumbnails aligned with the top of the main element.



PROJECT: Creating a Photo Gallery

Note as well that you want the footer element to appear at the bottom of the page, even when the main element doesn't fill the browser window vertically. You need to set the main element's flex-grow property to 1 to force it to fill in the space. That solution creates weird vertical spacing in the thumbnails, however. To fix that problem, add align-content: flex-start to the main element. The following example shows how.

► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/7

This example configures the footer element as a flex container and adds properties to the main element to force it to fill any empty space between the main and footer elements.

WEB PAGE



CSS

```
main {
  display: flex;
  justify-content: center;
  flex-wrap: wrap;
  align-content: flex-start;
  flex-grow: 1;
  max-width: 960px;
  font-family: Optima, Calibri, sans-serif;
}
footer {
  display: flex;
  justify-content: center;
  align-items: center;
  width: 100%;
  padding: 1em 0;
  text-transform: uppercase;
  background-color: #543437;
}
footer p {
  padding: 0 1.5em;
}
```

The main element now fills the space down to the footer.

The footer element is a Flexbox container.

The footer uses the full window width.

HTML

```
<footer>
  <p>&copy; Ampersand Photography</p>
  <p><a href="#">Facebook</a></p>
  <p><a href="#">Twitter</a></p>
  <p><a href="#">Instagram</a></p>
</footer>
```




Adding a Few Tricks

As it stands, your photo gallery is a decent page that looks good and works well. That may be all you're looking for, and if so, you need read no further. If you've been thinking that the gallery is a bit ho-hum and run-of-the-mill, however, the next few sections show you how to add some dynamic and useful features to the gallery.

Making the Footer Fixed

Earlier, you set things up so that your footer section displays at the bottom of the screen even if there isn't enough content in the main section to fill the browser window. When the main element has more content than will fit in the browser window, it pushes the footer down, and the user must scroll to see it. What if you prefer to have your footer always visible?

You can implement the following:

- Set the footer element's position property to fixed.
- Set the footer element's bottom property to 0, which tells the browser to fix the footer to the bottom of the viewport.
- Add some padding to the bottom of the main element to ensure that the last of its content isn't obscured by the fixed footer. Set the padding-bottom value to the same value as the height of the footer element (3.5em, in this case).

The following example shows the added code that accomplishes all these tasks.

BEWARE

When adding a copyright notice, you may be tempted to include the word Copyright and the copyright symbol (©), but using both is redundant. Use one or the other, but not both.

► Try This

➡ Online: wdpg.io/2/projects/photo-gallery/8

This example fixes the footer element to the bottom of the viewport.



continued



PROJECT: Creating a Photo Gallery

CSS

```
main {
  display: flex;
  justify-content: center;
  flex-wrap: wrap;
  align-content: flex-start;
  flex-grow: 1;
  max-width: 960px;
  padding-bottom: 3.5em;
}
footer {
  display: flex;
  justify-content: center;
  align-items: center;
  position: fixed;
  bottom: 0;
  width: 100%;
  text-transform: uppercase;
  background-color: #543437;
}
```

The bottom padding on main equals the height of the footer.

The footer is fixed.

The footer is positioned at the bottom of the viewport.

PLAY

The full code for the fixed nav element is available on the Playground.

➡ Online: wdpg.io/2/projects/photo-gallery/9

Making the Nav Bar Sticky

You may not be interested in having a fixed footer, but it's a common layout request to have the navigation bar onscreen full time, no matter how far down the user scrolls. In this case, however, you can't use the same technique that you used for the footer in the preceding section. If you fix the nav bar in place, you also have to fix the header; otherwise, you end up with some ugly scrolling. But fixing the header is a waste of screen real estate, so you need a different solution.

One possibility is to switch the positions of the header and nav elements. With the latter now at the top of the screen, you could declare `position: fixed` and `top: 0` on the nav element and add `padding-top: 3.5em` to the body element.

That solution is a nice one, but what if (like me) you prefer the nav element to appear below the header? In that case, you can turn to the CSS position value called `sticky`. Combined with a specific top or bottom value, `sticky` tells the browser to scroll the element normally until it hits the specified position and then sticks in place. To set this feature up for your navigation bar, you need to do the following:

- Set the nav element's `position` property to `sticky`.
- Set the nav element's `top` property to `0`, which tells the browser to stick the nav bar when it's scrolled to the top of the viewport.
- Set the nav element's `z-index` property to a positive number (such as `10`) to ensure the nav bar always appears on top of the rest of the page elements as they scroll by.




The following example shows the code you need to add to make this happen.

► Try This

➞ Online: wdpg.io/2/projects/photo-gallery/10

This example makes the navigation bar sticky.

<p>WEB PAGE</p>	<p>Sticky nav</p> 
<p>CSS</p>	<pre>nav { display: flex; justify-content: center; align-items: center; position: sticky; top: 0; z-index: 10; height: 3.5em; width: 100%; background-color: inherit; }</pre> <p>Makes the nav sticky</p> <p>Sticks when it's scrolled to the top</p> <p>Ensures that it's always visible</p>

Adding Dynamic Captions

One thing your photo gallery lacks is captions for the thumbnails. One straightforward way to add captions is to wrap each thumbnail in a div and configure that div as a flex container with `flex-direction` set to `column`. Then you could add the caption as, say, a `figcaption` element, and it will appear below the thumbnail. The following example demonstrates this technique.




PROJECT: Creating a Photo Gallery

► Try This

🔗 Online: wdpg.io/2/projects/photo-gallery/11

This example shows one method for adding captions below each thumbnail.

WEB PAGE	
CSS	<pre>.image-thumbnail { display: flex; flex-direction: column; align-items: center; }</pre> <p>The image and caption wrapper is a flex container.</p>
HTML	<pre><div class="image-thumbnail"> <figure> <figcaption>Ladies gossiping in Montreal</figcaption> </figure> </div> <div class="image-thumbnail"> <figure> <figcaption>To an ant, a flower is a world</figcaption> </figure> </div></pre> <p>The captions</p> <p>A div wrapper surrounds each image and caption.</p>

That solution works fine, but I'd like to show you a more advanced technique that comes with a considerable "wow" factor. In this technique, you keep the `figcaption` wrapper but add the `image-caption` class and expand it with `p` elements that you can use for both a caption title and the caption itself:

```
<div class="image-thumbnail">
  
  <figcaption class="image-caption">
    <p class="caption-title">Les Chuchoteuses</p>
    <p class="caption-text">Sculpture of ladies gossiping in
Montreal</p>
  </figcaption>
</div>
```

The caption title and text are enclosed in this `figcaption`.



Your goal is to hide the caption and display it only when the user hovers the mouse over the thumbnail. In your CSS, you set up the `image-thumbnail` class with relative positioning and a width and height equal to the actual width and height of the thumbnail image:

```
.image-thumbnail {
  position: relative;
  width: 300px;
  height: 200px;
}
```

Set these to the same dimensions as the thumbnail.

Now that `image-thumbnail` is positioned, you're free to use absolute positioning on the `image-caption` class. That's important, because you want to style this class with the same width and height as the thumbnail and then position it in the top-left corner (that is, at `top: 0` and `left: 0`) so that when you display it, it covers the thumbnail. Here's the full CSS for this class:

```
.image-caption {
  display: flex;
  flex-direction: column;
  justify-content: flex-end;
  position: absolute;
  left: 0;
  top: 0;
  width: 300px;
  height: 200px;
  background-color: rgba(32, 32, 32, 0.75);
  color: #ecd078;
  opacity: 0;
}
```

The caption is a flex container.

Positioned absolutely at top left

Same dimensions as the thumbnail

Dark-gray, slightly transparent background

Hidden by default

Notice that you've set up a flex container with a vertical main axis and the items aligned with `flex-end` so that they appear at the bottom of the container. The background color is set to a dark gray that's slightly transparent, so you'll still be able to see the thumbnail. Finally, the caption has opacity set to 0, which means that it's hidden by default. To show it, add the `hover` pseudo-class to the `image-caption` class, and use it to set the opacity to 1 (Figure 15.3 shows an example):

```
.image-caption:hover {
  opacity: 1;
}
```



► **Figure 15.3**

Hover the mouse over a thumbnail to see the caption.

PLAY

The full code for this example is available on the Playground.

➡ Online: wdpg.io/2/projects/photo-gallery/12



PROJECT: Creating a Photo Gallery

From Here

The final version of the photo gallery (mine is shown in Figure 15.4) is a great showcase for your photos. (If you want to get your code on the web sooner rather than later, check out the appendix for the details.)

► **Figure 15.4**

A full-featured photo gallery



Even though you've built a full-featured photo gallery (especially if you added the extra features from the last section), you still have many ways to add to or modify the gallery. You can always add more images, of course, and if you have a ton of photos to show off, you can add more gallery pages. You can also change the colors, try different typefaces and type sizes, and so on.

Summary

- Prepare thumbnail and full-size versions of the photos you want to display.
- Sketch out the photo gallery you want to build.
- Choose the typefaces for the page title and text.
- Choose colors for your background and your text.
- Build the initial page structure: the barebones HTML tags and the global CSS properties applied to the `body` element.
- Add the Flexbox layout by setting up the `body` element as a flex container.
- Fill in and style each section one by one: header, navigation, main, and footer.
- Optionally, add a few tricks such as a fixed footer, a sticky nav bar, and dynamic captions.

Part 4

.....

Making Your Web Pages Shine

It has been roughly 30 years since most of us started to take notice of the World Wide Web (as we would have long-windedly called it back then). That's not long in the timeline of human history, but it's long enough for us to have mostly forgotten what the web was like back in, say, 1995. If you're old enough to have used the web back then, let me refresh your memory: it was drab. That dreariness was caused by several things, including a universal lack of color, no style sheets, and only a few rudimentary HTML tags. Back then, it didn't even occur to most web surfers that pages could look decent. Ah, now we know better. Now we know that pages can not only look good but also positively *shine*.

Your own web designs will shine as well when you get through the chapters in part 4, where you learn how to use a few sophisticated HTML tags (Chapter 16), understand

how to apply colors and gradients (Chapter 17), gain some advanced web typography skills (Chapter 18), and pick up some professional-level CSS techniques (Chapter 19). Chapter 20 brings everything together by showing you how to build a shiny personal portfolio page.



More HTML Elements for Web Designers



This chapter covers

- Checking out some underused but important HTML elements
- Linking to files on your site
- Linking to a specific element on a page
- Adding special characters and comments

You may have noticed that after a flurry of HTML-related activity in the early chapters of the book, subsequent chapters had a decidedly CSS flavor. That's not too much of a surprise, because after you know a few basic tags such as `<div>`, `<p>`, and ``, you can hang a lot of CSS baggage on them and create some fine-looking web pages. But there's more to HTML than these basic elements. You saw a few useful page structure elements in Chapter 11, but in this chapter, you'll extend your HTML know-how even further with elements for everything from abbreviations to variables, advanced uses of the `<a>` tag, adding nonkeyboard characters to your pages, and even adding comments to make your code more readable. It's a regular HTML extravaganza!



Lesson 16.1: Other Text-Level Elements You Should Know

Covers: Text-level elements

➡ Online: wdpg.io/2/16-1-0


I've mentioned a few times in this book that it's important to construct the HTML portion of your web page code semantically. That is, you should use elements that tell the web browser—not to mention other web designers and developers reading your code—what meaning each element has in the context of the page. This is particularly true when it comes to the overall layout of the page; as you saw in Chapter 11, tags such as `<header>`, `<nav>`, and `<article>` make your code much easier to understand. These elements are block-level elements, but you can also use inline elements and mark them up semantically. HTML5 defines quite a few such text-level elements, and although you may use them only rarely, you should know what they are and what semantic freight they're meant to pull.

`<abbr>`

This element identifies text as an abbreviation or an acronym. Add the `title` attribute to tell the browser the full version of the abbreviation or the full expansion of the acronym. Most browsers display the `title` value in a tooltip when you hover the mouse pointer over the element. Some browsers (particularly Google Chrome and Mozilla Firefox) add a dotted underline to the text.

▶ Example

➡ Online: wdpg.io/2/16-1-1

WEB PAGE	
HTML	<pre><abbr title="fear of missing out">FOMO</abbr></pre>



<cite>

Use the `cite` element to mark text that's a reference to a creative work, such as a book, article, essay, poem, blog post, tweet, movie, TV show, play, or work of art. Most browsers display the cited text in italics.

► **Example** ➞ Online: wdpg.io/2/16-1-2

WEB PAGE	<p>“A fine quotation is a diamond on the finger of a man of wit, and a pebble in the hand of a fool.”</p> <p>—<i>Joseph Roux, Meditations of a Parish Priest</i></p>
HTML	<pre><q>A fine quotation is a diamond on the finger of a man of wit, and a pebble in the hand of a fool.</q> -<cite>Joseph Roux, Meditations of a Parish Priest</cite></pre>

<code>

This element identifies text as programming code. Most browsers display the marked-up text in a monospace font.

► **Example** ➞ Online: wdpg.io/2/16-1-3

WEB PAGE	<p>Use the CSS <code>rgb()</code> function.</p>
HTML	<pre>Use the CSS <code>rgb()</code> function.</pre>



More HTML Elements for Web Designers

<dfn>

You use this element to mark the initial or defining instance of a term. Most browsers display the text in italics.

► **Example** ➞ Online: wdpg.io/2/16-1-4

WEB PAGE

A *header* is an element that appears at the top of the page.

HTML

A `<dfn>header</dfn>` is an element that appears at the top of the page.

<kbd>

You use the `kbd` element to indicate text that's entered via the keyboard (such as typed characters or a pressed key, such as Enter or Return) or, more generally, to indicate any type of user input (such as a voice command). Most browsers display the text in a monospace font.

► **Example** ➞ Online: wdpg.io/2/16-1-5

WEB PAGE

For example, type `Helvetica` and then press Enter.

HTML

For example, type `<kbd>Helvetica</kbd>` and then press `<kbd>Enter</kbd>`.

<mark>

Use the `mark` element to highlight page text that has some significance for the reader, similar to the way you'd use a highlighter to mark a passage of text in a book. Most browsers display the text with a yellow background.



► **Example** ➞ Online: wdpg.io/2/16-1-6

WEB PAGE	Futura is a geometric sans-serif typeface that was designed by Paul Renner in 1927.
HTML	Futura is a geometric sans-serif typeface that was <mark>designed by Paul Renner in 1927</mark>.

<pre>

The `pre` element doesn't have a semantic purpose in HTML5, but it's used quite often with other semantic elements, such as `code`. One of the problems with displaying programming code and similar text is that it's difficult to show structuring elements such as indents because the web browser ignores such whitespace. When you mark up the code with the `pre` (short for *preformatted text*) element, however, the web browser preserves all whitespace characters, including multiple spaces and new lines. The browser also displays the text in a monospace font.

► **Example** ➞ Online: wdpg.io/2/16-1-7

WEB PAGE	<pre>function helloWorld() { //Greet the reader alert('Hello World!'); }</pre>
HTML	<pre><pre><code> function helloWorld() { //Greet the reader alert('Hello World!'); }</code></pre></pre>



More HTML Elements for Web Designers

<s>

Use the `s` element to mark text that's inaccurate, outdated, or in some other way incorrect. Why not delete the text instead? Sometimes, you want to leave the inaccurate text in place for comparison purposes, such as to show a correction, updated information, or a revised price. The web browser marks up this text by using a strikethrough effect.

► **Example**

⇒ Online: wdpg.io/2/16-1-8

WEB PAGE

On sale now for ~~\$12.99~~ \$9.99.

HTML

```
On sale now for <s>$12.99</s> $9.99.
```

<samp>

The `samp` element enables you to mark up a passage of text as the sample output from a computer program or similar system. The web browser displays this text using a monospace font.

► **Example**

⇒ Online: wdpg.io/2/16-1-9

WEB PAGE

The error message said Comic Sans?
Are you kidding me!?.

HTML

```
The error message said <samp>Comic Sans!? Are you kidding me!?!</samp>.
```

<small>

You use the `small` element to mark text as an aside from the regular text, particularly one that has to do with what people often refer to as *fine print*: copyright or trademark notices, disclaimers or disclosures, legal rights or restrictions, warnings or caveats, or source attributions. The web browser displays this text using a type size that's slightly smaller than the regular text.



► **Example** ➞ Online: wdpg.io/2/16-1-10

WEB PAGE	Thank you for reading this essay. TypeNerdNews is © 2023 Aldus Manutius. All rights reserved.
HTML	Thank you for reading this essay. <small>TypeNerdNews is © 2023 Aldus Manutius. All rights reserved.</small>

<sub>

The sub element marks text as a subscript, which is handy if your web page requires chemical or mathematical formulas. The web browser displays this text using a small type size that's set partially below the regular text baseline.

► **Example** ➞ Online: wdpg.io/2/16-1-11

WEB PAGE	Many illuminated manuscripts are written using iron gall ink, which is iron sulfate (FeSO ₄) added to gallic acid (C ₇ H ₆ O ₅).
HTML	Many illuminated manuscripts are written using iron gall ink, which is iron sulfate (FeSO₄) added to gallic acid (C₇H₆O₅).

<sup>

The sup element marks text as a superscript, so it's often used for mathematical formulas, but many web authors also use it to specify footnote markers. The web browser displays this text using a small type size that's set partially above the regular text baseline.



► **Example** ➔ Online: wdpg.io/2/16-1-12

WEB PAGE	The W3C standard cautions us not to use subscripts and superscripts "for typographical presentation for presentation's sake." ^[1]
HTML	The W3C standard cautions us not to use subscripts and superscripts "for typographical presentation for presentation's sake." ^[1]

<time>

You use the time element to indicate that a particular bit of text is a date, a time, or a combination of the two:

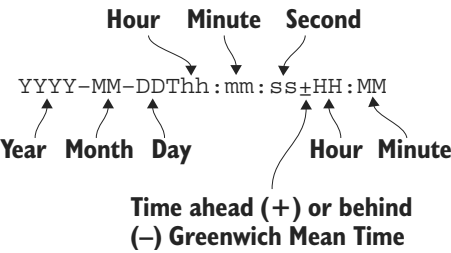
```
<time datetime="machine-value">human text</time>
```

The idea is to represent the date and/or time in two ways:

- The text between the <time> and </time> tags is a human-friendly way of showing the date or time, such as 1 p.m. on August 23, 2023.
- The value of the datetime attribute is a machine-friendly version of the date and/or time, such as 2023-08-23T16:00:00-05:00. The general syntax to use is shown in Figure 16.1.

► **Figure 16.1**

The syntax to use for the <time> tag's datetime attribute



The web browser doesn't format the date/time in a special way. Instead, you use the time element to give the browser and other software-based visitors to your page a meaningful, readable date and/or time. It's often useful to include the date and time when a page was created or last edited, for example.



► **Example** ➞ Online: wdpg.io/2/16-1-13

WEB PAGE	This web page was last modified on August 23rd, 2023, at 9:25AM.
HTML	This web page was last modified on <code><time datetime="2023-08-23T09:25:00-05:00">August 23rd, 2023 at 9:25AM</time></code> .

<u>

The `u` element has no semantic use that I can discern. The HTML standard says that it “represents a span of text with an unarticulated, though explicitly rendered, non-textual annotation.” I have no idea what that means. The standard unhelpfully suggests that a possible use may be “labeling the text as being misspelt,” but that seems dubious.

The real problem with the `u` element is that all web browsers render the text as underlined, which means that every person who visits your page will think that the text is a link, and a large subset of those visitors will try to click it (and grow frustrated when nothing happens). You may think that underlining is useful for emphasizing text, but that’s what the `` tag is for. In short, you have no good reason to use the `<u>` tag and plenty of good reasons *not* to use it. I include it here because you may come across it when looking at the source code of some (no doubt poorly designed) web pages.

► **Example** ➞ Online: wdpg.io/2/16-1-14

WEB PAGE	It's a really bad idea to use the <code>u</code> element because its text <u>looks just like a link</u> .
HTML	It's a really bad idea to use the <code><code>u</code></code> element because its text <code><u></code> looks just like a link <code></u></code> .



<var>

The var element enables you to mark up a word or phrase as a placeholder. This placeholder could be a programming variable, a function parameter, or a word or phrase used to represent a general class of things. The web browser displays this text by using italics.

► Example

⇒ Online: wdpg.io/2/16-1-15

WEB PAGE

Here's the syntax to use for the time element:

```
<time datetime="machine-value">human text</time>.
```

HTML

```
Here's the syntax to use for the <code>time</code> element:<br>  
<code>&lt;time datetime="<var>machine-value</var>"&gt;<var>human  
text</var>&lt;/time&gt;.</code>
```

Now it's time to take a closer look at a familiar web page object: the <a> tag.

More about Links

When I showed you how to wield the <a> tag way back in Chapter 2, you learned that creating a link is a straightforward matter of setting the link address as the value of the <a> tag's href attribute. That's all true as far as it goes, but there's more to the <a> tag because your web page links can come in any of the following three varieties:

- Remote links to web pages outside your site
- Local links to other web pages on your site
- In-page links to other sections of the current web page

You learned about remote links in Chapter 2, and you'll learn about in-page links in the next section. But now, I'm going to talk about local links to your other web pages.

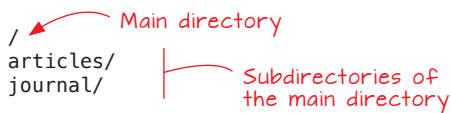
Linking to Local Files

The first thing to note is that for local links, the URL doesn't require either the protocol or the domain name. With an internal link, the browser assumes that the protocol is HTTPS and that the domain name is the name of your host server. That's straightforward enough, but before continuing with the linking lesson, I want to take a short side trip to help you understand how directories work in the web world.



When you sign up with a company that will host your web pages, that company gives you your own directory on its server. If you're putting together only a few pages, that directory should be more than adequate. If you're constructing a larger site, however, you should give some thought to how you organize your files. Why? Well, think of your own computer. It's unlikely that you have everything crammed into a single directory. Instead, you probably have separate directories for the different programs you use and other directories for your data files.

There's no reason why you can't cook up a similar scheme in your web home. With this type of multidirectory setup, however, how you link to files in other directories can be a bit tricky. As an example, consider a website that has three directories:



There are three scenarios to watch out for:

- **Referencing a file in the same directory**—This scenario is easiest because you don't have to include any directory information. Suppose that the HTML file you're working on is in the `journal` directory and that you want to reference a page named `rant.html` that's also in that directory. In this case, you use only the name of the file, like this:

```
<a href="rant.html">
```

- **Referencing a file in a subdirectory from the main directory**—This scenario is common because your home page (which is almost certainly in the main directory) is likely to have links to files in subdirectories. Suppose that you want to link to a page named `design.html` in the `articles` subdirectory of your home page. Your `<a>` tag takes the following form:

```
<a href="articles/design.html">
```

- **Referencing a file in a subdirectory from a different subdirectory**—This scenario is the trickiest one. Suppose that you have a page in the `articles` subdirectory, and you want to link to a page named `poem.html` in the `journal` subdirectory. Here's the `<a>` tag:

```
<a href="/journal/poem.html">
```

In the last example, the leading slash (`/`) tells the browser to first go up to the main directory and then go into the `journal` directory to find the `poem.html` file.



Lesson 16.2: Linking to the Same Page

Covers: In-page links

➡ Online: wdpg.io/2/16-2-0

When a surfer clicks a standard link, the page loads, and the browser displays the top part of the page in the window. It's possible, however, to set up a special kind of link that forces the browser to display some other part of the page, such as a section in the middle.

When would you ever use such a link? Most of your HTML pages probably will be short and sweet, and the web surfers who drop by will have no trouble finding their way around. But for longer pages, you can set up links to various sections of the page that enable a reader to jump directly to a section rather than scroll through the page to get there.

To create this kind of link, you must set up a special identifier that marks the spot to which you want to link. To understand how in-page links work, think of how you might mark a spot in a book you're reading. You might dog-ear the page, attach a sticky note, or place something (such as a bookmark) between the pages. An in-page link identifier performs the same function: it marks a particular spot in a web page, and you can use an `a` element to link directly to that spot.

To set up an identifier for an in-page link, you add an `id` attribute to a tag and supply it a value:

```
<h2 id="best-practices">Best Practices</h2>
```

The value you assign to the `id` attribute must meet the following criteria:

- It must be unique on the web page.
- It must start with a letter.
- The rest of the characters can be any combination of letters, digits (0–9), hyphens (-), underscores (_), colons (:), or periods (.).

How you set up your in-page link depends on whether it resides in the same page as the link or in a different page. If the identifier and the link are in the same page, you link to it by using the `id` value, preceded by the hash symbol (#):

```
<a href="#best-practices">Go to the Best Practices section</a>
```

If the identifier is defined in a separate web page, your link's `href` value is the URL of that page, followed by the hash symbol (#) and the `id` value:

```
See my <a href="organization.html#best-practices">primer on best practices</a>
```

The following example shows a few in-page links in action.



► Example Online: wdpg.io/2/16-2-1

This example shows a page that uses some in-page links.

WEB PAGE	<div data-bbox="371 458 499 485">In-page links</div> <div data-bbox="271 564 471 590">In-page link address</div> <div data-bbox="535 335 1092 599"> <h3>Organizing Your Web Page Text</h3> <p>Contents:</p> <ul style="list-style-type: none"> Benefits Workflow Best Practices <p>All great documents have something in common: excellent organization. Content and formatting are important, but their effectiveness is diminished or even nullified if the document has a slipshod organization. However, even a page with only so-so content and negligible formatting can get its point across if it's organized coherently and sensibly.</p> <p>htmlcssplayground.com/results.html#best-practices</p> </div>
HTML	<div data-bbox="271 784 378 890">Link for Best Practices heading</div> <div data-bbox="942 643 1156 696">Link for Benefits heading</div> <div data-bbox="978 714 1199 767">Link for Workflow heading</div> <div data-bbox="921 943 1192 996">Identifier for Benefits heading</div> <div data-bbox="278 1543 621 1596">Identifier for Best Practices heading</div> <div data-bbox="992 1525 1206 1578">Identifier for Workflow heading</div> <pre> <h1>Organizing Your Web Page Text</h1> <h4>Contents:</h4> Benefits
 Workflow
 Best Practices <p> All great documents have something in common: excellent organization. Content and formatting are important, but their effectiveness is diminished or even nullified if the document has a slipshod organization. However, even a page with only so-so content and negligible formatting can get its point across if it's organized coherently and sensibly. <h2 id="benefits">Benefits</h2> There are many reasons to organize your web page text, but three are the most important: narrative flow, accessibility, and search engine optimization. Narrative Flow</h3> Research has shown &mdash; and poets and storytellers have known for thousands of years &mdash; that humans have an innate hunger for story. We learn better and take in data more effectively when it's organized as a narrative. <h3>Accessibility</h3> Visually impaired visitors to your web page will often use special screen readers to read aloud the page contents. These tools are designed to look for and read web page headings so the user can quickly get an overall sense of the page structure. <h3>Search Engine Optimization</h3> Most search engines include page headings as part of their algorithms for determining where a page should rank in the results. In general, text that resides higher up in the page hierarchy is given more importance in the search results. <h2 id="workflow">Workflow</h2> <h2 id="best-practices">Best Practices</h2> </pre>



You won't use in-page links all that often, but keep them in mind the next time you build a long page with lots of sections.

PLAY

Set up an external link to the following address: www.w3.org/TR/html5/text-level-semantic.html. Set up an external in-page link to the identifier named the-a-element on the same page. ➡ Online: wdpg.io/2/16-2-3

REMEMBER

If you include the tag `<meta charset="utf-8">` in your page's header section, you can type characters such as the em dash (—) and copyright symbol (©) directly in your code. You type an em dash by pressing `Alt-0151` in Windows or `Option-Shift+-` (hyphen) in macOS, for example.

Inserting Special Characters

Your HTML and CSS files consist only of text, but that doesn't mean that they consist only of the letters, numbers, and other symbols that you can type with your keyboard. If your web text needs an em dash (—), a copyright symbol (©), or an e with an acute accent (é), you can add those elements to your page by using special codes called *character entities*. These entities are available in three flavors: hexadecimal code, decimal code, and entity name. The hex and decimal codes are numbers, and the entity names are friendlier symbols that describe (although often cryptically) the character you're trying to display. You can display the registered trademark symbol (™), for example, by using the hex code `™`, the decimal code `™`, or the entity name `™`.

Note that all three references begin with an ampersand (&) and end with a semicolon (;). Don't forget either symbol when you use character entities on your own pages. Figure 16.2 shows a few common character entities.

Character	Hex Code	Decimal Code	Entity Name
"	<code>&#x0022;</code>	<code>&#34;</code>	<code>&quot;</code>
&	<code>&#x0026;</code>	<code>&#38;</code>	<code>&amp;</code>
<	<code>&#x003c;</code>	<code>&#60;</code>	<code>&lt;</code>
>	<code>&#x003e;</code>	<code>&#62;</code>	<code>&gt;</code>
¢	<code>&#x00a2;</code>	<code>&#162;</code>	<code>&cent;</code>
£	<code>&#x00a3;</code>	<code>&#163;</code>	<code>&pound;</code>
©	<code>&#x00a9;</code>	<code>&#169;</code>	<code>&copy;</code>
®	<code>&#x00ae;</code>	<code>&#174;</code>	<code>&reg;</code>
½	<code>&#x00bd;</code>	<code>&#189;</code>	<code>&frac12;</code>
é	<code>&#x00e9;</code>	<code>&#233;</code>	<code>&eacute;</code>
—	<code>&#x2014;</code>	<code>&#8212;</code>	<code>&mdash;</code>

► **Figure 16.2** Some HTML5 character entities and their codes

To help you work with HTML entities, I built a tool that enables you to browse and find what you need. Read on to learn how to access and use this tool.



Using the HTML5 Entity Browser

HTML5 has nearly 1,500 defined character entities, so it's not surprising that two of the biggest frustrations associated with using character entities are knowing what characters are available and finding the character you want. Having been through this frustration many times myself, I decided to do something about it. To that end, I built the HTML5 Entity Browser, which organizes character entities by category (so you can easily see what's available) and offers a search feature (so you can find any character quickly). Here's how it works:

- 1 In the Web Design Playground (<https://webdesignplayground.io/2>), choose Menu > HTML5 Entity Browser (under Tools).
- 2 Use the Category list to select the type of entity you're looking for.
The app filters the list of entities to show only those in the category you selected, as shown in Figure 16.3.

HTML5 Entity Browser

Use this tool to browse the full set of HTML5 entities. Either select the category you want to browse, or enter a search string. The resulting entities appear on the right along with their descriptions, entity names, and hex and decimal codes.

Select a Category

Choose the entity category you want to browse:

Arrows

Search the Entities

Type your entity search text¹:

¹You can enter all or part of the entity name or description. You can also locate specific entities by entering a hex or decimal code.

<p>← LEFTWARDS ARROW</p> <p>Name: &larr; Hex: &#x02190; Decimal: &#8592;</p>	<p>↑ UPWARDS ARROW</p> <p>Name: &uarr; Hex: &#x02191; Decimal: &#8593;</p>
<p>→ RIGHTWARDS ARROW</p> <p>Name: &rarr; Hex: &#x02192; Decimal: &#8594;</p>	<p>↓ DOWNWARDS ARROW</p> <p>Name: &darr; Hex: &#x02193; Decimal: &#8595;</p>
<p>↔ LEFT RIGHT ARROW</p> <p>Name: &harr; Hex: &#x02194; Decimal: &#8596;</p>	<p>↕ UP DOWN ARROW</p> <p>Name: &varr; Hex: &#x02195; Decimal: &#8597;</p>
<p>↖ NORTH WEST ARROW</p> <p>Name: &nwarr; Hex: &#x02196; Decimal: &#8598;</p>	<p>↗ NORTH EAST ARROW</p> <p>Name: &nearr; Hex: &#x02197; Decimal: &#8599;</p>
<p>↘ SOUTH EAST ARROW</p> <p>Name: &searr; Hex: &#x02198; Decimal: &#8600;</p>	<p>↙ SOUTH WEST ARROW</p> <p>Name: &swarr; Hex: &#x02199; Decimal: &#8601;</p>
<p>↔ LEFTWARDS ARROW WITH STROKE</p> <p>Name: &nlarr; Hex: &#x0219a; Decimal: &#8602;</p>	<p>↔ RIGHTWARDS ARROW WITH STROKE</p> <p>Name: &nrarr; Hex: &#x0219b; Decimal: &#8603;</p>
<p>↞ RIGHTWARDS WAVE ARROW</p> <p>Name: &rrarrw; Hex: &#x0219c; Decimal: &#8604;</p>	<p>↞ LEFTWARDS TWO HEADED ARROW</p> <p>Name: &Larr; Hex: &#x0219d; Decimal: &#8605;</p>

► **Figure 16.3**

With the HTML5 Entity Browser, choose a category to filter the list of entities, as shown here, or search the entities.

- 3 To search the list of entities, use the Search the Entities text box to enter all or part of the entity name or description.
If you want to see a specific entity, you can enter that entity's hex or decimal code.



Adding Comments

A comment is a chunk of text that, although it resides in your HTML file, is skipped by the web browser, so it doesn't appear when your page is rendered. That behavior may strike you as odd, but comments have quite a few good uses:

- You can add notes to yourself in specific places of the page code. You can add a comment such as `Here's where the logo goes when it's finished.`
- You can add explanatory text that describes parts of the page. If you have a section that comprises the header of your page, you can add a comment before the section such as `This is the start of the header.`
- You can skip problematic sections of your page. If you have a section that isn't working properly or a link that isn't set up yet, you can convert the text and tags to a comment so as not to cause problems for the browser or the user.
- You can add a copyright notice or other info for people who view your HTML source code.

To turn any bit of text into a comment, surround it with the HTML comment tags. Specifically, you precede the comment with `<!--` and follow it with `-->`, like this:

```
<!--This text is a comment-->
```

Summary

- If you're linking to a local file in the same directory, set the `<a>` tag's `href` attribute to the name of the file; otherwise, you need to precede the filename with the directory name.
- To create an in-page link, add the `id` attribute to the link location; then set your `<a>` tag's `href` attribute to the `id` value, preceded by a hash tag (`#`).
- To specify a special character, enter the character directly, if possible, or use the decimal code, hexadecimal code, or entity name, each of which begins with an ampersand (`&`) and ends with a semicolon (`;`).
- To add a comment to your code, surround the comment text with `<!--` and `-->`.

BEWARE

Although comment text isn't displayed in the browser, it's easy for another person to see it by viewing the page source code. Therefore, don't put sensitive information inside a comment tag.



Adding a Splash of Color to Your Web Designs



This chapter covers

- Learning some color basics
 - Understanding how CSS uses color
 - Applying a color to an element
 - Adding background colors
 - Creating color gradients
-

CSS offers all the tools you need to add a dash of color to your headings, text, links, and backgrounds. You learn how to use those tools in this chapter, as well as how to wield a few special CSS tools for building color gradients that will raise the “wow” factor on your pages.



Understanding Colors

The good news about understanding colors for use in your web designs is that you don't need to understand much. Yes, entire books have been written on color theory, but you don't need to be versed in the physics of optics to create beautiful, eye-catching web pages. You need to know only two things: how to combine colors harmoniously and how colors are created. For the former, see "Choosing Harmonious Colors" later in this chapter; for the latter, read on.

Color is free on the web. While there's nothing wrong with black text on white, using different colors not only adds a bit of drama to the page, but also creates hierarchies for the content. —Erik Spiekermann

MASTER

With 256 available values for each of the three colors, you have a palette of more than 16 million colors to choose from.

You can use two methods to create any color. The first method uses the fact that you can create any color in the spectrum by mixing the three main colors, which are red, green, and blue, so this method is sometimes called the *RGB method*. Painters do this mixing on a palette, but you're in the digital realm, so you mix your colors using numeric values, supplying a number between 0 and 255 (or a percentage between 0 and 100) for each of the three colors. A lower number means that the color is less intense, and a higher number means that the color is more intense.

Table 17.1 lists nine common colors and their respective red, green, and blue values.

► **Table 17.1** The red, green, and blue values for nine common colors

MASTER

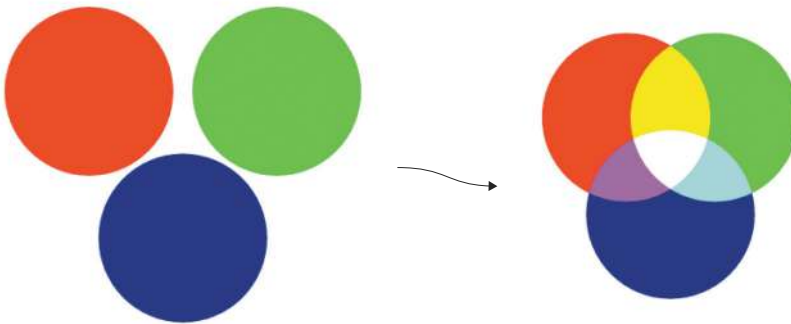
Whenever the red, green, and blue values are equal, you get a grayscale color. Lower numbers produce darker grays, and higher numbers produce lighter grays.

Name	Red	Green	Blue	Color
Red	255	0	0	<div></div>
Green	0	255	0	<div></div>
Blue	0	0	255	<div></div>
Yellow	255	255	0	<div></div>
Magenta	255	0	255	<div></div>
Cyan	0	255	255	<div></div>
Black	0	0	0	<div></div>
Gray	128	128	128	<div></div>
White	255	255	255	<div></div>



As you can see in table 17.1, when only one color is specified (that is, has a value greater than 0), you get the pure color, but when two or more values are specified, you get a blend of those colors. To help you visualize this blending process, I've put together a short animation on the Web Design Playground. Choose Menu > RGB Visualizer (or surf directly to wdpg.io/2/rgbvis), and you'll see three circles—one red, one green, and one blue—slowly approach one another and then overlap. When the overlap occurs, as shown in Figure 17.1, notice four things:

- The overlap of red and blue produces magenta.
- The overlap of red and green produces yellow.
- The overlap of green and blue produces cyan.
- The overlap of all three colors produces white.



► **Figure 17.1**

On the Web Design Playground, choose Menu > RGB Visualizer to see an animation in which the three circles come together and the overlaps produce the blended colors shown here.

The second method of creating a color involves supplying numeric values for three attributes called hue, saturation, and lightness, so this technique is sometimes called the *HSL method*:

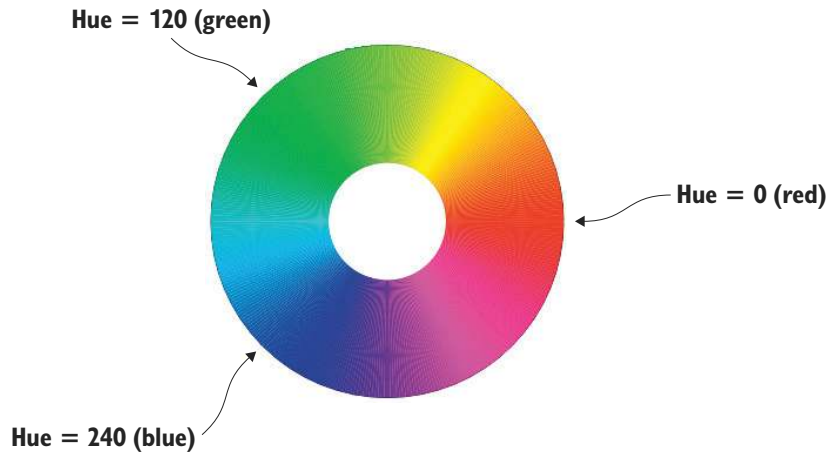
- **Hue**—This value (which is more or less equivalent to the term *color*) measures the position (in degrees) on the color wheel with values between 0 and 359, as shown in Figure 17.2. Lower numbers indicate a position near the red end (with red equal to 0 degrees), and higher numbers move through the yellow, green, blue, and violet parts of the spectrum.



Adding a Splash of Color to Your Web Designs

► **Figure 17.2**

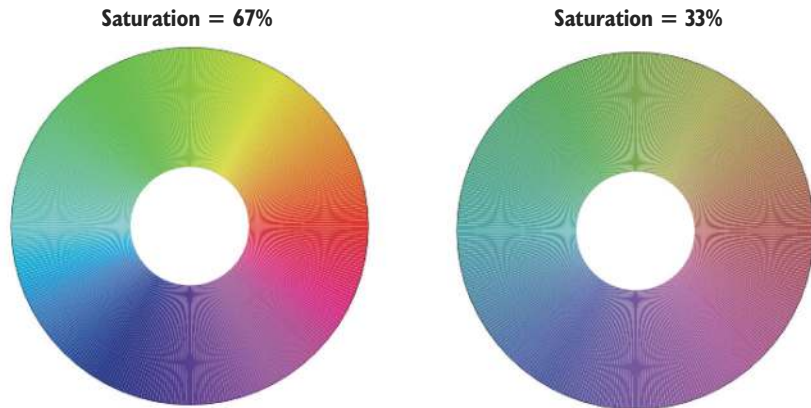
Hue refers to the position on the color wheel, starting at 0 (red) and passing through 120 (green) and 240 (blue).



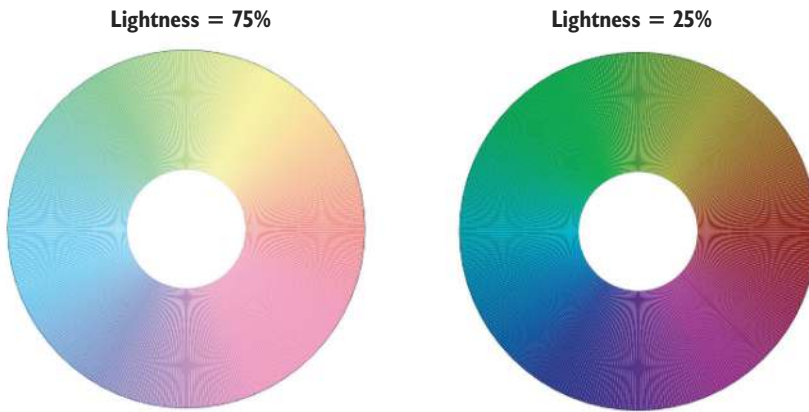
- **Saturation**—This value is a percentage and a measure of a given hue's purity. A saturation value of 100% means that the hue is a pure color. As shown in Figure 17.3, lower numbers indicate that more gray is mixed with the hue; at 0%, the color becomes part of the grayscale.

► **Figure 17.3**

Saturation is a measure of a color's purity or how much gray is mixed in. The color wheel in Figure 17.2 is set to 100% saturation. The lower the saturation percentage, the grayer the color appears.



- **Lightness**—This value is also a percentage and is a measure of how light or dark the color is. As you can see in Figure 17.4, lower percentages are darker (with 0% producing black), and higher percentages are lighter (with 100% creating white).



► **Figure 17.4**

Lightness measures how dark or light a color appears. The color wheel shown previously in Figure 17.3 is set to 50% lightness. Higher percentages produce lighter colors, and lower percentages produce darker colors.

Which method should you use? The answer depends on various factors. If you want to specify a single color, the RGB method is a bit more straightforward, but if you want to choose harmonious colors—such as colors that are complementary or analogous—the HSL method is best. Before you decide, you need to know the specifics of how you apply colors in CSS.

Adding Colors with CSS

As a measure of the importance of color not only in the style sheet world but also in web design, CSS offers at least a half-dozen ways to define something as apparently simple as a color. Each method has its uses, so you're going to learn them all over the next few sections.

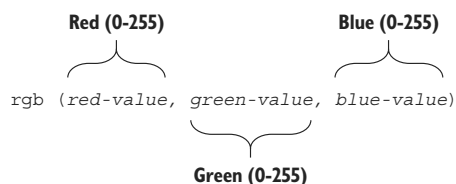
Lesson 17.1: Specifying Red, Green, and Blue with the `rgb()` Function

Covers: The `rgb()` function

➡ Online: wdpg.io/2/17-1-0

Earlier, you learned that you can define any of more than 16 million colors by specifying a value between 0 and 255 for each of the color's red, green, and blue components. One way to do this in CSS is to use the `rgb()` function, shown in Figure 17.5.

To use this function, replace *red-value* with a number between 0 and 255 to specify the red component; replace *green-value* with a number between 0 and 255 to specify the green component;



► **Figure 17.5**

To specify a color's red, green, and blue components, you can use the `rgb()` function.



Adding a Splash of Color to Your Web Designs

and replace *blue-value* with a number between 0 and 255 to specify the blue component. (Note that the commas are optional, so feel free to leave them out.) You can generate purple, for example, by using 128 for red, 0 for green, and 128 for blue. The following example shows how you'd use CSS to display all your h1 headings with purple text.

Example [Online: wdpg.io/2/17-1-1](https://wdpg.io/2/17-1-1)
This example uses the `rgb()` function to assign the color purple to the `h1` element.

WEB PAGE	Royalty: A History ← <code><h1></code>
CSS	<pre>h1 { color: rgb(128, 0, 128); }</pre> <p>Specifies the <code>h1</code> element to style</p> <p>Uses the <code>rgb()</code> function to set the color property value</p>
HTML	<code><h1>Royalty: A History</h1></code>

PLAY

How would you use the `rgb()` function to apply the color red to an element? [Online: wdpg.io/2/17-1-2](https://wdpg.io/2/17-1-2)

You can also specify the `rgb()` function's *red-value*, *green-value*, and *blue-value* parameters by using percentages, with 100% specifying the full intensity of the color (equivalent to the 255 decimal value) and 0% specifying the lowest intensity of the color (so it's the same as 0 in the decimal notation). Table 17.2 is a repeat of table 17.1 with the decimal values replaced by their percentage equivalents.

► **Table 17.2** The red, green, and blue percentages for nine common colors

Name	Red (%)	Green (%)	Blue (%)	Color
Red	100	0	0	
Green	0	100	0	
Blue	0	0	100	
Yellow	100	100	0	



Name	Red (%)	Green (%)	Blue (%)	Color
Magenta	100	0	100	<div></div>
Cyan	0	100	100	<div></div>
Black	0	0	0	<div></div>
Gray	50	50	50	<div></div>
White	100	100	100	<div></div>

Here's the `color` declaration for purple converted to percentages:

```
color: rgb(50%, 0, 50%)
```

The `rgb()` function is straightforward, but it's not particularly intuitive, which is the main reason why most web designers eschew the `rgb()` function in favor of the more intuitive `hsl()` function, discussed next.

PLAY

How would you use the `rgb()` function to apply a light-gray color to an element? ➡ Online: wdpg.io/2/17-1-3

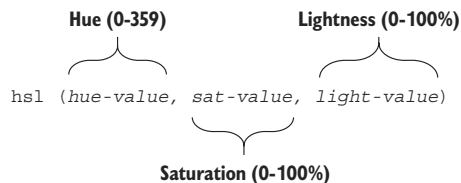
Lesson 17.2: Specifying Hue, Saturation, and Lightness with the `hsl()` Function

Covers: The `hsl()` function

➡ Online: wdpg.io/2/17-2-0

If you have a specific hue in mind, you may prefer to define your CSS color by specifying the color's hue, saturation, and lightness components. To do this in CSS, use the `hsl()` function, shown in Figure 17.6.

To use this function, replace *hue-value* with a number between 0 and 359 to specify the hue component; replace *sat-value* with a percentage between 0 and 100 to specify the saturation component; and replace *light-value* with a percentage between 0 and 100 to specify the lightness component. Sticking with the purple `h1` text example, the following shows how you'd use CSS to display all your `h1` headings with purple text by using the `hsl()` function.



► **Figure 17.6**

To specify a color's hue, saturation, and lightness components, use the `hsl()` function.



Adding a Splash of Color to Your Web Designs

► Example

⇒ Online: wdpg.io/2/17-2-1

This example uses the `hsl()` function to assign the color purple to the `h1` element.

WEB PAGE	<h1>Royalty: A History</h1> ← <code><h1></code>
CSS	<pre>h1 { color: hsl(300, 100%, 25%); }</pre> <p>Specifies the <code>h1</code> element to style</p> <p>Sets the color property value via the <code>hsl()</code> function</p>
HTML	<code><h1>Royalty: A History</h1></code>

PLAY

How would you use the `hsl()` function to apply the color blue to an element? ⇒ Online: wdpg.io/2/17-2-2

PLAY

How would you use the `hsl()` function to apply the color white to an element? ⇒ Online: wdpg.io/2/17-2-3

LEARN

To learn how to modify your colors with transparency, see the “Changing the Transparency” lesson on the Playground. ⇒ Online: wdpg.io/2/17-6-0

Before learning the next method for specifying colors, this is as good a time as any to learn how to control transparency in CSS

A Quick Note About Transparency

For the most part, you want your web page text to appear solid and readable. However, there will be times when, for the sake of adding visual interest to your page, you consciously decide to sacrifice a tiny bit of readability by making your text slightly transparent. This means that whatever is behind the text—it could be a solid color, an image, or even other text—shows through.

You control the transparency (also called the *opacity*) of your text by using variants of the `rgb()` and `hsl()` functions: `rgba()` and `hsla()`. You use these functions like `rgb()` and `hsl()`, respectively, except that you also specify a fourth parameter called the *alpha channel*. The *alpha channel* is a numeric value between 0.0 and 1.0, where 1.0 means that the text is completely opaque and 0.0 means that the text is completely transparent. (Alternatively, you can stick with the `rgb()` and `hsl()` functions and just add the alpha channel value as a fourth parameter.)

A Brief Detour into Hexadecimal Numbers

The next CSS color tool I’m going to tell you about uses *hexadecimal* numbers, which use base 16 instead of the base 10 used by regular decimal



numbers. If you know about hexadecimal numbers, feel free to skip this section; otherwise, before moving on with CSS colors, you need to make a short but necessary detour into the hexadecimal realm.

Hexadecimal values are efficient because they use single-character symbols for everything from 0 to 15. Specifically, they use 0 through 9 for the first 10 values, just as in decimal numbers, but they use letters A through F to represent the quantities 10 through 15. Figure 17.7 shows the decimal and hexadecimal equivalents for the quantities 0 through 15.

Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

► **Figure 17.7**

Hexadecimal uses 0 through 9 the same as decimal, but it represents the quantities 10 through 15 with the letters A through F.

For two-digit values, a decimal number has two parts: a tens part on the left and a ones part on the right. The number 10 can be read as “one ten and zero ones,” and 36 can be read as “three tens and six ones.” A two-digit hex number also has two parts: a sixteens part on the left and a ones part on the right. The hex number 10 can be read as “one sixteen and zero ones” (making it the equivalent of 16 decimal), and 5C hex can be read as “five sixteens and C (twelve) ones,” making it the equivalent of 92 decimal. Figure 17.8 shows a few examples.

One ten	Six ones	Three tens	Six ones	Nine tens	Two ones	
↙	↘	↙	↘	↙	↘	
16		36		92		Decimal
↑		↑		↑		
10		24		5C		Hexadecimal
↙	↘	↙	↘	↙	↘	
One sixteen	Zero ones	Two sixteens	Four ones	Five sixteens	Twelve ones	

► **Figure 17.8**

In the same way that a two-digit decimal number consists of a tens place on the left and a ones place on the right, a two-digit hexadecimal number consists of a sixteens place on the left and a ones place on the right.

Okay, now that you know all about hexadecimal numbers (right?), it's time to put that knowledge to good use by learning how to use hex numbers to specify colors in CSS.

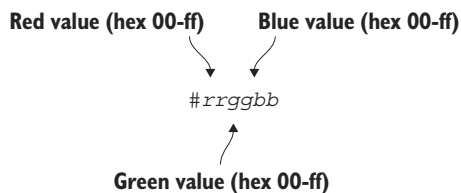


Lesson 17.3: Using RGB Hex Codes

Covers: RGB hexadecimal codes

➡ Online: wdpg.io/2/17-3-0

Rather than using the `rgb()` function to specify a color's red, green, and blue components, you can use the CSS hexadecimal-based method, shown in Figure 17.9.



These RGB hex codes always begin with the hash symbol (`#`), followed by the two-digit hex value for the red component, the two-digit hex value for the green component, and the two-digit hex value for the blue component. (If you want to include an alpha

channel to control transparency, use the format `#rrggbbaa`, where `aa` is a two-digit hex value.) In each case, the allowed hex values range from `00` to `ff`. (If you're using the format `#rrggbbaa`, then when `aa` is `00`, the color is completely transparent, and when `aa` is `ff`, the color is completely opaque.) Because these codes consist of three hex values, they're often called *hex triplets*. Table 17.3 lists the RGB hex codes used for the nine common colors shown earlier in tables 17.1 and 17.2.

► **Table 17.3** The RGB hex codes for nine common colors

Name	Hex	Color
Red	#ff0000	<div></div>
Green	#00ff00	<div></div>
Blue	#0000ff	<div></div>
Yellow	#ffff00	<div></div>
Magenta	#ff00ff	<div></div>
Cyan	#00ffff	<div></div>
Black	#000000	<div></div>
Gray	#808080	<div></div>
White	#ffffff	<div></div>

► Figure 17.9

You can specify a color by using the code `#rrggbb`, where `rr` is the hex value for the red component, `gg` is the hex value for the green component, and `bb` is the hex value for the blue component.



The following example shows how you'd use this method to apply purple to h1 text. The hex equivalent of decimal 128 is 80, so for the color value, the red component is hex 80, the green component is hex 00, and the blue component is hex 80.

► Example

➡ Online: wdpg.io/2/17-3-1

This example uses #rrggbb to assign the color purple to the h1 element.

WEB PAGE	Royalty: A History ← <code><h1></code>
CSS	<pre>h1 { color: #800080; }</pre> <p>Specifies the h1 element to style</p> <p>Uses #rrggbb to set the color property value</p>
HTML	<code><h1>Royalty: A History</h1></code>

You can use an even shorter code in certain circumstances. If each of the rr, gg, and bb values use repeated characters—such as 00, 66, or ff—you can use one of the repeated characters for each color. The following two codes are equivalent:

```
#3366cc
#36c
```

If you're finding any of this confusing, not to worry: I've added a tool to the Web Design Playground that makes it easy to choose the color you want and get the correct CSS code for that color.

Working with the Color Chooser

Dealing in RGB codes, HSL values, and hexadecimals may be convenient for a computer, but the connection between those numbers and a particular color isn't intuitive for humans. Color keywords are more comprehensible, but they represent far too few of the available colors. To make it easier for you to view and ultimately choose a color to use on a web page, the Web Design Playground offers a tool called the Color Chooser. This tool provides a color palette control that lets you select a preset color or any combination of hue, saturation, luminosity, and transparency. The tool shows not only the

PLAY

What RGB code would you use to apply the color blue to an element?

➡ Online: wdpg.io/2/17-3-2

PLAY

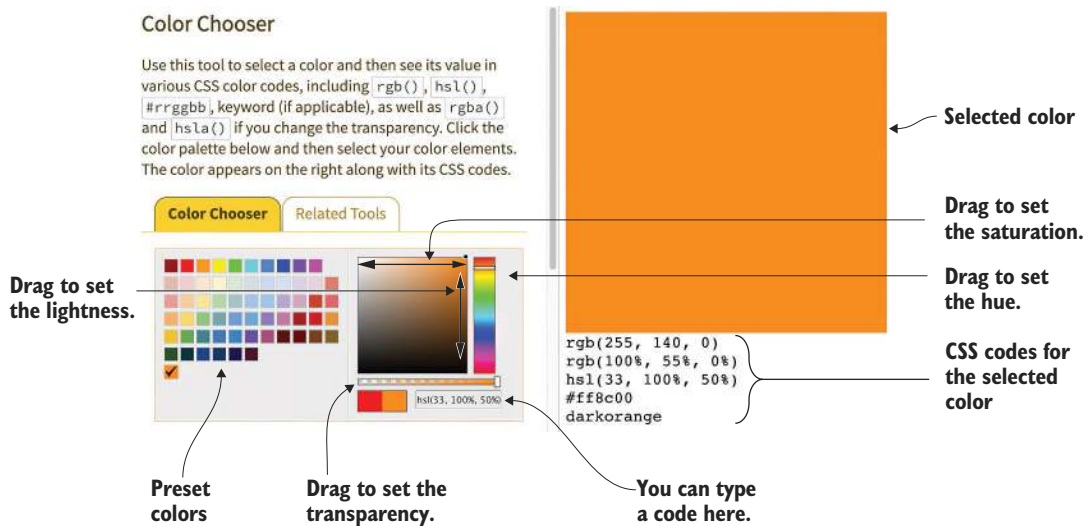
What RGB code would you use to apply the lightest possible gray to an element? ➡ Online: wdpg.io/2/17-3-3



Adding a Splash of Color to Your Web Designs

resulting color but also the `rgb()` function (both decimal and percentage), the `hsl()` function, the RGB hex triplet, the color keyword (if applicable), and the `r()` and `hsla()` functions if you set the transparency. Here's how you use the Color Chooser tool:

- 1 In the Web Design Playground, choose Menu > Color Chooser (or go directly to wdpg.io/2/colorchooser) to display the tool, as shown in Figure 17.10.
- 2 To choose a preset color, click one of the swatches.
- 3 To specify a color, use the text box to enter an `rgb()` function, `hsl()` function, RGB hex triplet, color keyword, `rgba()` function, or `hsla()` function.
- 4 In the large color box, drag horizontally to set the saturation, or drag vertically to set the lightness.
- 5 Use the vertical box to set the hue and the horizontal box to set the transparency.



► **Figure 17.10** Use the Web Design Playground's Color Chooser tool to select a color and see its various CSS codes.



Now you know how to apply colors to your page elements, but that's only half the battle. Colors that are poorly matched or improperly applied can make a page look worse, not better. The next section examines a few basics for effectively using colors in your page designs.

Choosing Harmonious Colors

With so many colors available, the temptation is to go overboard and use a dozen hues on each page. Using too many colors, however, can confuse your users and even cause eye fatigue. Try to stick to two or three colors at most. If you must use more, use different shades of two or three hues.

When selecting colors, think about the psychological effect of your scheme on your users. Studies have shown that "cool" colors such as blue and gray evoke a sense of dependability and trust. Use these colors for a businesslike appearance. For pages that require a little more excitement, "warm" colors such as red, yellow, and orange can evoke a festive, fun atmosphere. For a safe, comfortable ambiance, try using brown and yellow. For an environmental touch, use green and brown.

Finally, you need to give some thought to how your colors work together. Some colors naturally clash and, when used together, will make your page look terrible. Fortunately, every hue has one or more colors that blend well with it, resulting in harmonious designs that are pleasing to your visitors' eyes. Note that harmonious doesn't mean boring! Depending on the colors you choose, the result can be anything from soothing to vibrant, so the color scheme you go with is a reflection of what you want your site to say.

Happily, you don't have to guess which colors will do the job. You can use the tricks described in the following list:

- **Choose complementary colors.** Complementary colors lie opposite each other on the color wheel. In terms of the `hsl()` function, complementary colors are those with hue values that are 180 degrees apart. For example, red—`hsl(0, 100%, 50%)`—is the complement of `hsl(180, 100%, 50%)`. As a rule, with any complementary color scheme, it's often best to use one color as the main hue on the page and the other color as an accent, particularly for elements you want the user to notice, such as Subscribe or Buy buttons and similar call-to-action objects.



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- *Choose analogous colors.* *Analogous colors* lie adjacent to each other on the color wheel. In terms of the `hsl()` function, analogous colors are those with hue values that are plus or minus 30 degrees from the main color. Red—`hsl(0, 100%, 50%)`—is analogous to both `hsl(30, 100%, 50%)` and `hsl(330, 100%, 50%)`. If you prefer even less contrast (you want colors that are closer to each other), you can create an analogous scheme by using colors that are 15 degrees apart. If you go with a scheme that has more contrast, it's usually best to pick one color as the main hue for your page and to use the other two colors for buttons, borders, and other accents.
- *Choose triadic colors.* *Triadic colors* are three colors that lie an equal distance from one another on the color wheel. In terms of the `hsl()` function, triadic colors are those with hue values that are 120 degrees apart. Red—`hsl(0, 100%, 50%)`—is triadic to both `hsl(120, 100%, 50%)` and `hsl(240, 100%, 50%)`. Triadic colors tend to have a similar level of vibrancy, so they feel balanced and in harmony. Many sites that use a triadic scheme pick one color for the page background, another color for the page content and navigation, and the third color for borders and other accents.
- *Choose split complementary colors.* A *split complementary* color scheme is similar to a complementary color scheme except that instead of using the opposite hue on the color wheel, you use the two colors that lie 30 degrees to either side of that opposite color. Red—`hsl(0, 100%, 50%)`—is split complementary with both `hsl(150, 100%, 50%)` and `hsl(210, 100%, 50%)`. A good rule of thumb for implementing a split complementary color scheme is to use the original color as the page's main hue and use the other two colors for content, navigation, and accents.

To help you work with these color schemes, the Web Design Playground includes a tool called the Color Scheme Calculator that does all the required math for you. I discuss this tool in the next section.

Using the Color Scheme Calculator

If you know the color you want to use as the main hue on your page, calculating the rest of your color scheme is straightforward:

- *Complementary*—Add or subtract 180 degrees.
- *Analogous*—Add 30 degrees for one color, and subtract 30 degrees for the other.

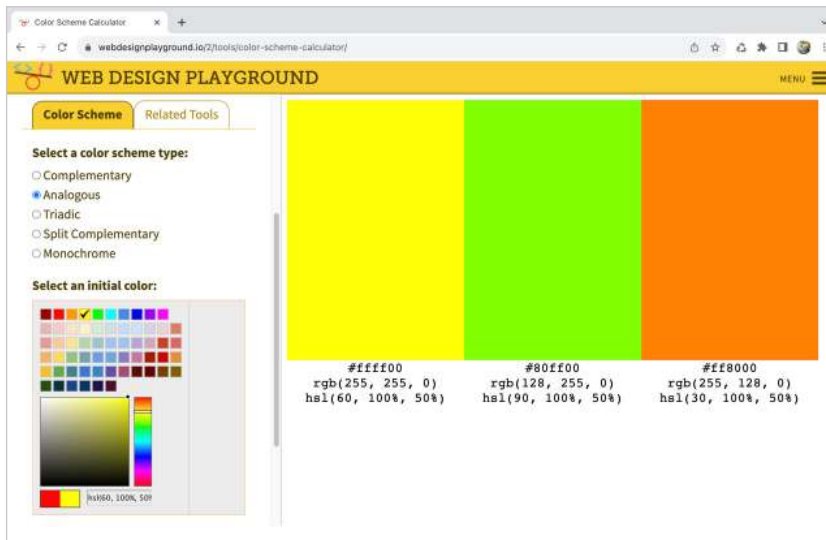


- *Triadic*—Add 120 degrees for one color, and subtract 120 degrees for the other.
- *Split complementary*—Add 180 degrees to the hue, subtract 30 degrees for one color, and add 30 degrees for the other color.

The math is quite daunting if you know only the RGB code, however. Not to worry: I've put a Color Scheme Calculator on the Web Design Playground. Here's how you use it:

- 1 Choose Menu > Color Scheme Calculator (or navigate to wdpg.io/2/colorcalc).
- 2 On the Color Scheme tab, select the option for the color scheme type you want: Complementary, Analogous, Triadic, or Split Complementary. There's also a Monochrome scheme, which generates five colors with the same hue, but varying saturation and lightness values.
- 3 Use the color picker to select your initial color.

You can click the color you want or use the text box to enter an RGB hex triplet or `rgb()` function. (You can also type a color keyword or `hsl()` function.) The calculator displays the color scheme and shows the RGB code, `rgb()` function, and `hsl()` function for each color, as shown in Figure 17.11.



► Figure 17.11

Use the Web Design Playground's Color Scheme Calculator to generate a color scheme for a given RGB code.

CSS colors are awesome, but you can take your web designs to a higher level by using a special color technique called a *gradient*, which is the subject of the next section.



Applying a Color Gradient

So far, all the colors you've worked with have been a single hue—sometimes lighter or darker or more transparent, true, but one hue nonetheless. It's possible, however, to style a single page element with multiple colors by using the concept of the gradient. A *gradient* is a combination of two or more colors in which one color gradually (or sometimes quickly) transitions into the next. When used sparingly, gradients can be effective ways to add visual interest and pizzazz to a web page. Before you get started on the CSS, you need to know a few things:

- Gradients are images that the web browser creates automatically.
- Gradients can be applied only as backgrounds, although a wide range of elements supports background images.
- You can use two types of gradients:
 - A *linear gradient* transitions from one color to the next along a straight line.
 - A *radial gradient* transitions from one color to the next from a single point outward in the shape of an ellipse or circle.

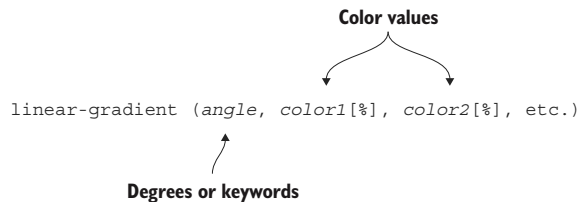
In the next couple of lessons, you'll see the CSS behind linear and radial gradients.

Lesson 17.4: Creating a Linear Gradient

Covers: The linear-gradient function

➡ Online: wdpg.io/2/17-4-0

To specify a linear gradient, you apply the `linear-gradient()` function to the `background-image` property of whatever element you're styling. Figure 17.12 shows the general syntax to use.



► Figure 17.12

To define a linear gradient, use the `linear-gradient()` function to specify the angle and the color stops.



The *angle* value can be a number between 0 and 359 followed by the deg unit or the keyword to followed by the keyword for a horizontal direction (left or right), a vertical direction (top or bottom), or a diagonal direction (top left, top right, bottom left, or bottom right). The color values (*color1*, *color2*, and so on) can be any of the color values that you learned earlier in the chapter. The percentages specify the *color stops*, which are the transition positions where the previous color ends and the next color begins. The first default color stop is 0% (that is, starts at the beginning) and the last default color stop is 100% (that is, stops at the end), so you don't need to enter these values.

The following example shows an empty div element styled with a linear gradient.


PLAY

Create a linear gradient that runs at a 60-degree angle. For the first color, use hue 191 with full saturation and half lightness; for the second color, keep the same hue, but use one-quarter saturation and 15% lightness. ➡ Online: wdpg.io/2/17-4-3

► Example

➡ Online: wdpg.io/2/17-4-1

This example shows a div element styled with a linear gradient that transitions from yellow to blue.

WEB PAGE	
CSS	<pre>div { background-color: blue; background-image: linear-gradient(to bottom, yellow, blue); height: 175px; width: 100%; }</pre> <p>A fallback style for the (rare) browser that doesn't support gradients</p> <p>Various styles applied to the div element</p> <p>The linear gradient defined to run from the top to the bottom, transitioning from yellow to blue</p>
HTML	<pre><div></div></pre> <p>The div element</p>

PLAY

Create a linear gradient that runs from the top-left corner to the bottom-right corner. Use #76a5af as the starting color and #073763 as the finishing color. ➡ Online: wdpg.io/2/17-4-2



Adding a Splash of Color to Your Web Designs

PLAY

Determine the two colors that go with the color #674ea7 in an analogous color scheme. Create a linear gradient that uses all three colors and runs from bottom right to top left. ➡ Online: wdpg.io/2/17-4-8


Notice in the example that I set the background color first and then applied the gradient. Adding a background-color declaration is a fallback for browsers that don't support gradients—mostly Internet Explorer 9 and earlier. Such browsers render the background color but ignore the gradient style. Fortunately, all modern browsers support gradients, so only the increasingly rare older versions of Internet Explorer require this fallback.

If you use three or more colors in your gradient, you need to give some thought as to where you want each color to stop and the next to begin. If you don't specify any stop locations, the browser does the work for you and assumes that the transition occurs halfway between the colors on either side. If you specify three colors, the middle color's transition position is at 50%, halfway between the first (0%) and third (100%) colors. The following example shows a linear gradient in which the second color kicks in a bit earlier.

► Example

➡ Online: wdpg.io/2/17-4-5

This example shows a `div` element styled with a three-color linear gradient in which the middle color (white) begins its transition earlier than normal (at the 25% mark).

WEB PAGE	
CSS	<pre>div { background-color: blue; background-image: linear-gradient(to top right, red, white 25%, blue); height: 175px; width: 100%; }</pre> <p>A fallback style for the (rare) browser that doesn't support gradients</p> <p>Various styles applied to the div element</p> <p>The linear gradient defined to run from the bottom left to the top right, transitioning from red to white at 25% and then to blue</p>
HTML	<pre><div></div></pre> <p>The div element</p>

Linear gradients are awesome, but CSS lets you take things up another notch by creating stunning radial gradients. The next section tells you everything you need to know.



Lesson 17.5: Creating a Radial Gradient

Covers: The radial-gradient function

➡ Online: wdpg.io/2/17-5-0

To specify a radial gradient, you apply the `radial-gradient()` function to the `background-image` property of an element. Figure 17.13 shows the general syntax.

Circle or ellipse
Starting position of the shape

`radial-gradient (shape, extent at position, color-stops)`

Where the last color ends

► **Figure 17.13** Defining a radial gradient, using the `radial-gradient()` function to specify shape, extent, and color stops

The *shape* value can be `circle` (the default, so you can omit it) or `ellipse`. The *extent* value is a keyword pair that tells the browser the side or corner of the element where you want the last color to stop. The possible values are `closest-side`, `farthest-side`, `closest-corner`, and `farthest-corner`. The *position* value specifies the starting point for the shape; it can be a set of x-y points (e.g., `45px 100px`) or a keyword pair that combines a horizontal position (`left`, `center`, or `right`) with a vertical position (`top`, `center`, or `bottom`). The color values and stops are the same as for a linear gradient.

The default value for *extent* is `farthest-corner`, and the default value for *position* is `center center` (which can be shortened to `center`). The simplest possible rule for a radial gradient is `radial-gradient (color1, color2)`, which creates a centered circular gradient that transitions from *color1* to *color2* out to the farthest corner of the element. The following example shows an empty `div` element styled with a radial gradient.

PLAY

Make attractive repeating background patterns using linear gradients and the CSS background-size property. ➡ Online: wdpg.io/2/17-4-7

PLAY

Create a five-color linear gradient that runs from left to right. The five colors (and their stops) are #ffff00 (0%), #05c1ff (20%), #274e13 (50%), #05c1ff (80%), #ffff00 (100%).

➡ Online: wdpg.io/2/17-4-6




Adding a Splash of Color to Your Web Designs

► Example

⇒ Online: wdpg.io/2/17-5-1

This example shows a `<div>` tag styled with a radial gradient that transitions from yellow to blue.

WEB PAGE	
CSS	<pre>div { background-color: yellow; background-image: radial-gradient(ellipse farthest-corner at left top, yellow, blue); height: 200px; width: 100%; }</pre> <p>Various styles applied to the <code>div</code> element</p> <p>A fallback style for the (rare) browser that doesn't support gradients</p> <p>The radial gradient defined to run from the top left to the bottom right, transitioning from yellow to blue</p>
HTML	<pre><div></div></pre> <p>The <code>div</code> element</p>

Using the Gradient Construction Kit

Gradients are among the most eye-catching CSS effects, but they're also some of the most laborious because of all the keywords, colors, and stops. To make implementing this important feature on your own pages easier for you, the Web Design Playground includes a Gradient Construction Kit that enables you to use a form to select all the elements of your gradient. As you build your gradient, you see exactly what the result looks like, and the CSS editor shows the cross-browser code that you can copy and paste into your project.

Here's how you use the Gradient Construction Kit:

- 1 In the Web Design Playground, choose Menu > Gradient Construction Kit (or navigate directly to wdpg.io/2/kits/gradient).
- 2 Select the radio button for the type of gradient you want to create: Linear or Radial.

The controls in the Options tab change to reflect your choice. For example, Figure 17.14 shows the controls for a linear gradient.

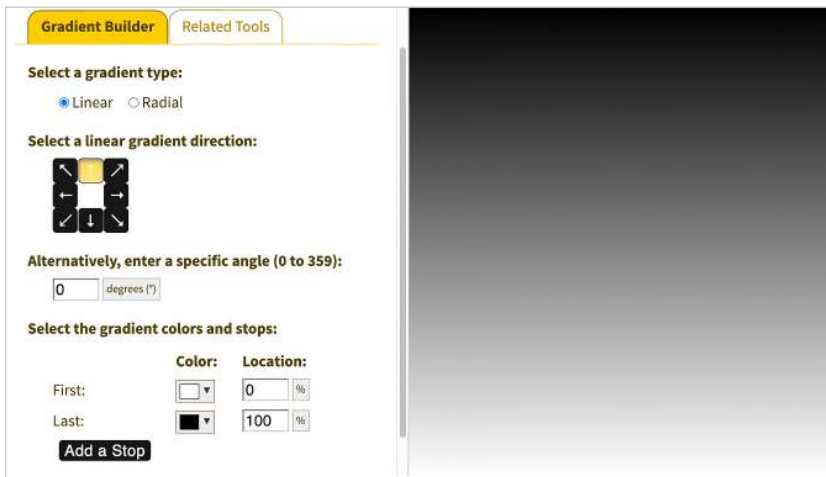


- 3 Select the options for your linear or radial gradient. For example, for a linear gradient, you select the gradient direction by clicking an arrow or entering a specific angle.
- 4 For each stop, select the color button and then, using the control that appears, specify the color you want using the following techniques:
 - To choose a preset color, click one of the swatches on the left side of the control.
 - To specify a color, use the text box to enter an `rgb()` function, `hsl()` function, RGB hex triplet, color keyword, `rgba()` function, or `hsla()` function.
 - In the large color box, drag horizontally to set the saturation, or drag vertically to set the lightness.
 - Use the vertical box to set the hue and the horizontal box to set the transparency.

When you're done, click Choose.

- 5 To choose a preset color, click one of the swatches on the left side of the control.
- 6 To specify a color, use the text box to enter an `rgb()` function, `hsl()` function, RGB hex triplet, color keyword, `rgba()` function, or `hsla()` function.
- 7 In the large color box, drag horizontally to set the saturation, or drag vertically to set the lightness.
- 8 Use the vertical box to set the hue and the horizontal box to set the transparency.
- 9 When you're done, click Close.

The Gradient Construction Kit displays the gradient and shows the corresponding CSS code in the CSS editor.



► **Figure 17.14**

Use the Web Design Playground's Gradient Construction Kit to build a linear or radial gradient with a few mouse clicks.



Adding a Splash of Color to Your Web Designs

Whether you use single colors or gradients, your web designs are always improved by eschewing the browsers' humdrum black and white defaults in favor of something more colorful that suits your personality or the overall aesthetic you're trying to achieve.

Summary

- Besides the color keywords you learned about in Chapter 4, you have five ways to specify a CSS color: the `rgb()` function, the `hsl()` function, an RGB hexadecimal code, the `rgba()` function, and the `hsla()` function.
- To color an element's text, use the `color` property.
- To color an element's background, use the `background-color` property.
- To apply a linear gradient to an element's background, use the `linear-gradient()` function; if you prefer a radial gradient background, use the `radial-gradient()` function.



Enhancing Page Text with Typography



This chapter covers

- Setting the typeface
 - Working with Google fonts
 - Styling your web page words and paragraphs
-

Do you want to know the secret of great web design? Specifically, do you want to know the one design element common to almost all the best websites? The hidden-in-plain-sight design secret shared by nearly every outstanding website can be summed up in just two words: *typography matters*.

Typography—styles applied to enhance the legibility, readability, and appearance of text—is the web’s secret sauce, its magic dust. When you come across a site that has aesthetic appeal, chances are that a big chunk of that appeal comes from the site’s use of fonts, text sizes and styles, spacing, and other matters typographical. The site has text appeal.



If you want the same appeal on your own web pages, you need only remember those two all-important words: *typography matters*. Typefaces matter. Type sizes and styles matter. Spacing, alignment, and indents matter. Fortunately, as you see in this chapter, CSS comes with a large set of typographical tools that you can wield to spruce up your text. No, you don't have the level of control that you get in a desktop page layout program, but there are enough CSS properties and values to show the world that you care about your web page text.

Specifying the Typeface

To shift your typography into high gear, you need to go beyond the generic and system fonts that I talked about in Chapter 4 and embrace the powerful concepts of the font stack and web fonts.

Lesson 18.1: Working with Font Stacks

Covers: The `font-family` property

⇒ Online: wdpg.io/2/18-1-0

You may recall from Chapter 4 that when you use the `font-family` property, you can use multiple font families as long as you separate them with commas in what is known as a *font stack*. Why would you specify more than one font family? With few exceptions, you can't be certain that a system font is installed on the user's device. Although the sans-serif font Helvetica is installed on 100% of Macs, for example, it's installed on a mere 7% of Windows PCs. Similarly, the serif font Cambria is installed on more than 83% of Windows PCs but is available on only about 35% of Macs. When you specify a font stack, the browser checks the first family to see whether it's installed. If not, the browser tries the next font family in the list, and the process continues until the browser finds an installed system font. If none is found, it's always good practice to include a similar generic font family at the end of the font stack. If your system fonts are serifs, for example, include the serif generic font at the end of the stack.

Besides the generic font, are there any other sure bets that you can include in your font stack? Alas, not really, although some fonts are installed on at least 90% of both Macs and Windows PCs. The sans-serif fonts are Arial, Arial Black, Tahoma, Trebuchet MS, and Verdana. The serif fonts are Georgia and Times New Roman. The monospace font is Courier New.

LEARN

To get the installation percentages for many popular system fonts, as well as suggested stacks for each font, see the *CSS Font Stack* at www.cssfontstack.com.



Another font stack strategy is to include the font families in the following order:

- Your preferred font
- A close facsimile of the preferred font
- A similar font that's nearly universal in both Mac and Windows
- The generic font from the same style

Here's an example:

font-family: "League Spartan", Futura, Tahoma, sans-serif;

The following example creates two font stacks: one for the h3 element and one for the p and li elements.

► Example

➡ Online: wdpg.io/2/18-1-1

This example shows a serif-based font stack applied to the h3 element, as well as a sans-serif-based font stack applied to the p and li elements.

WEB PAGE	<div data-bbox="464 846 1178 908"> <p>People of Collar ← The h3 element</p> <p>The p element →</p> </div> <p>The adjectives <i>white-collar</i> and <i>blue-collar</i> are familiar to most of us, but there are a few more whimsical variants that you might not have heard of:</p> <div data-bbox="278 996 1149 1120"> <p>The li elements {</p> <ul style="list-style-type: none"> • Black-and-blue-collar: Football players • Grey-collar: Employees who perform both white- and blue-collar tasks • Green-collar: Environmentalists • Open-collar: People who work at home • Steel-collar: Robots </div>
CSS	<div data-bbox="278 1199 1085 1508"> <p>The h3 element gets a serif-based font stack.</p> <pre>h3 { font-family: "Lucida Bright", Georgia, serif; }</pre> <p>The p and li elements get a sans-serif-based font stack.</p> <pre>p, li { font-family: Tahoma, Helvetica, Arial, sans-serif; }</pre> </div> <p><i>continued</i></p>



```
<h3>People of Collar</h3>
<p>The adjectives <i>white-collar</i> and <i>blue-collar</i> are
familiar to most of us, but here are a few more whimsical variants
that you might not have heard of:</p>
<ul>
  <li>Black-and-blue-collar: Football players</li>
  <li>Green-collar: Environmentalists</li>
  <li>Grey-collar: Employees who perform both white- and blue-
collar tasks</li>
  <li>Open-collar: People who work at home</li>
  <li>Steel-collar: Robots</li>
</ul>
```

Here are a few pointers to bear in mind when you build a font stack for your web design:

- If you have a less popular system font you want to try, put it at the beginning of the stack. If you put it after a font that's installed on, say, 99% of devices, the less-popular font will rarely be used.
- If possible, try to match font characteristics within the stack. Don't include in the same stack both a narrow font such as Arial and a relatively thick font such as Verdana, for example.
- Always end the font stack with a generic font from the same style.

Specifying Web Fonts

Relying on system fonts is a straightforward way to bump up your typography a notch from the browser's default fonts. But system fonts suffer from two glaring problems: a limited number of system fonts is available, and you can't be sure that a given system font is installed on the user's computer. The latter is a big problem because it means that you can't know with any certainty how your web page will appear to every user. If you believe that typography matters (and you should), this uncertainty is a major design hurdle.

Fortunately, you can leap gazelle-like over that hurdle by implementing web fonts on your pages. *Web fonts* are font files that are hosted on the web and referenced by a special CSS rule named `@font-face`. The web browser uses that rule to load the font files, thus ensuring that every user sees the same fonts.

You have two ways to host web fonts:

- Use a third-party host.
- Host the font files on your own site.

The next two lessons provide the details as well as the pros and cons associated with each method.



Lesson 18.2: Using Third-Party Hosted Fonts

Covers: The `link` element

➡ Online: wdpg.io/2/18-2-0

By far, the easiest way to implement web fonts is to link to the fonts hosted on a third-party site. Many font-hosting services are available, including Fonts .com (www.fonts.com) and Adobe Fonts (<https://fonts.adobe.com>). In most cases, you can purchase a font outright or pay a monthly fee, which gives you access to a wide variety of fonts. Most new web designers, however, use Google Fonts (<https://fonts.google.com>), which offers hundreds of free web fonts.

The main advantage of using a third party is that all rights to use the web fonts have been cleared. Fonts are intellectual property, so you need permission from the creator to use them, particularly on a website. Font hosts have already obtained the necessary licenses, so their fonts are hassle- and guilt-free.

“Web font services . . . handle the bulk of the licensing and hosting work, leaving you to do what you do best—build amazing and beautiful websites. —Dan Eden

The main disadvantage of using a third party is that the font files reside on a remote server, so it can sometimes take a bit of extra time for your fonts to load. The more fonts you link to, the slower the load time. Most big-time font-hosting services have optimized delivery mechanisms, however, so this font lag usually isn't a problem.

The method by which you specify which fonts you want to use varies depending on the service, but the general procedure usually goes something like this:

- 1 On the font host's website, locate and select the typeface you want to use.
- 2 Customize the typeface by adding extra fonts such as italic, bold, and possibly bold italic.
- 3 Copy the `<link>` tag (or tags) generated by the font host, and paste the code into the head section of your web page (that is, between the `<head>` and `</head>` tags) before the `<link>` tag for your own CSS file (or before the `<style>` tag if that's where your CSS code is located).

The copied code loads from the host a CSS file that includes the required font code. Here are the `<link>` tags generated by Google Fonts for the Lato typeface (where 400 refers to the regular font and 700 refers to bold):

BEWARE

Remember that the more fonts you add, the slower your web pages will load. Link only to fonts you absolutely need. Besides the regular font, most web pages need only italics and bold.



Enhancing Page Text with Typography

FAQ

Why does Google provide three `<link>` tags? The first two `<link>` tags set up Google server connections in advance. That way, when the browser comes to the third `<link>` tag, which specifies the fonts required, those fonts will arrive much faster.

```
<link rel="preconnect" href="https://fonts.googleapis.com">
<link rel="preconnect" href="https://fonts.gstatic.com"
crossorigin>
<link href="https://fonts.googleapis.com/
css2?family=Lato:ital,wght@0,400;1,400;1,700&display=swap"
rel="stylesheet">
```

4 Add the font to your styles.

The following property tells the web browser to use the Lato font family for all paragraph text (with the addition of a generic font name to display in case the third-party font file can't be loaded):

```
p {
    font-family: Lato, sans-serif;
}
```

► Example

➡ Online: wdpg.io/2/18-2-1

This example shows two snippets of text. The first doesn't appear within a `<p>` tag, so it uses the browser's default font, and the second appears within a `<p>` tag, so it uses the font family specified by the property shown in the CSS section.

WEB PAGE	<p>This text just uses the browser's default font.</p> <p>This text resides within an HTML paragraph, so it uses the font specified in the style definition for the p tag.</p>
CSS	<pre>p { font-family: Lato, sans-serif; }</pre> <p>The p element uses the Lato font family.</p>
HTML	<p>Tells the browser to download the font from Google</p> <pre><link rel="preconnect" href="https://fonts.googleapis.com"> <link rel="preconnect" href="https://fonts.gstatic.com" crossorigin> <link href="https://fonts.googleapis.com/ css2?family=Lato:ital,wght@0,400;1,400;1,700&display=swap" rel="stylesheet"></pre> <p>This text just uses the browser's default font.</p> <p>No p element is specified, so the default font is used.</p> <pre><p> This text resides within an HTML paragraph, so it uses the font specified in the style definition for the p tag. </p></pre> <p>This text is within a p element, so it's formatted with the Lato font.</p>



The alternative to using either default fonts or web fonts is to host your own fonts, which is the topic of the next lesson.

Lesson 18.3: **Hosting Your Own Fonts**

Covers: The `@font-face` at-rule

➡ Online: wdpg.io/2/18-3-0

Using a third-party font host is the easiest way to get out of the default-font rut and make your pages shine with an interesting typeface or two. Some web designers, however, dislike having the look of their pages at the mercy of some remote server, which might work slowly or not at all. In such cases, designers go the host-it-yourself route, in which the actual font files reside on the same server as the web page.

Unfortunately, you have a price to pay for the inherent speed and reliability of hosting your own fonts: complexity. Whereas using third-party-hosted fonts is a straightforward matter of generating and using a `<link>` tag for a remote stylesheet, hosting your own fonts raises the complexity level.

One complicating factor is font licensing. Most commercial fonts come with a license that prevents them from being used on the web. Before you can host a font yourself, you must purchase a license to use the font on the web (assuming such a license is offered), or you can look for an open-source font that allows web use.

For the latter, here are a few font collections to try:

- Befonts (<https://befonts.com>)
- Fontspring (www.fontspring.com)
- Font Squirrel (www.fontsquirrel.com)
- Open Font Library (<https://fontlibrary.org>)

Another complicating factor is the font file format. All modern browsers support a format called Web Open Font Format 2.0—WOFF2, for short—but getting your fonts in that format can be difficult. What usually happens is that you download your licensed font file, but what you get is a file or files in the TrueType Font (TTF) or OpenType Font (OTF) format. These tend to be big files compared to WOFF2 files, so you need to convert them to WOFF2. Practically, that's difficult to do, so most folks use a Font Squirrel service called

PLAY

Use Google Fonts to generate `<link>` tags for a stylesheet that defines just the regular font of the Merriweather typeface. Set up a style that applies the regular font to all page text and includes a generic font name as a fallback.

➡ Online: wdpg.io/2/18-2-2

FAQ

Is a local font file always faster than a remote font file? Not necessarily. Many font providers use content delivery networks (CDNs) that are very fast, so the lag can often be less than with a local file.

BEWARE

Fonts are intellectual property and should be treated as such. Before hosting any font on your site, make sure that you have a license to use the font for personal and/or commercial use (depending on the nature of your site).



Enhancing Page Text with Typography

the Webfont Generator (<https://www.fontsquirrel.com/tools/webfont-generator>), which takes your downloaded font file and automatically creates a package that includes the other file formats.

An alternative is to use the google-webfonts-helper (<https://gwfh.mranftl.com/fonts>), which enables you to select the Google fonts you want to use and then download the WOFF2 files (and also the earlier WOFF versions, which are compatible with Internet Explorer 9 and later). Before downloading fonts, be sure to click the Modern Browsers button on the Download page to simplify the provided CSS code.

With your WOFF2 (and also WOFF, if needed) files downloaded, you now add the necessary CSS code to use the fonts on your site. This code uses the `@font-face` at-rule, and the generic syntax looks like this:

```
@font-face {  
  font-family: 'Font Name';  
  src: url('font_filename.woff2') format('woff2'),  
       url('font_filename.woff') format('woff');  
}
```

Font names with spaces must be enclosed in quotation marks.

To apply the `@font-face` rule, use its `font-family` value as the `font-family` property of the element you want to style.

► Example

➡ Online: wdpg.io/2/18-3-1

This example sets up an `@font-face` rule for the Bree Serif font and applies it to the `ul` element.

WEB PAGE

Prefer to get your word origins on the web? Looking to kill some time at work?
Wondering when this incessant questioning will end? Here are some fun websites
that'll give your clicking finger a workout:

 text

- Online Etymology Dictionary (www.etymonline.com)
- Oxford English Dictionary (www.oed.com)
- The Phrase Finder (www.phrases.org.uk)
- The Word Detective (www.word-detective.com)
- Word Spy (www.wordspy.com)
- World Wide Words (www.worldwidewords.org)



CSS	<pre> @font-face { font-family: 'Bree Serif'; src: url('/fonts/breeserif.woff2') format('woff2'), url('/fonts/breeserif.woff') format('woff'); } ul { font-family: 'Bree Serif'; } </pre> <p>The font-family name is used to apply the font to the element.</p>
HTML	<pre> <p> Prefer to get your word origins on the web? Looking to kill some time at work? Wondering when this incessant questioning will end? Here are some fun websites that'll give your clicking finger a workout: <p> Online Etymology Dictionary (https://www.etymonline.com) Oxford English Dictionary (https://www.oed.com) The Phrase Finder (https://www.phrases.org.uk) The Word Detective (http://www.word-detective.com) Word Spy (https://www.wordspy.com) World Wide Words (https://www.worldwidewords.org) </pre>

Here are some notes to bear in mind when using directories with the @font-face rule filenames:

- If the font files reside in the same directory as the CSS file (or the HTML file that contains the CSS code), no directory is required:

```
url('breeserif.woff2')
```

- If the font files reside in a subdirectory of the location where the CSS (or HTML) file is stored, precede the filename with the directory name and a backslash (/):

```
url('fonts/breeserif.woff2')
```

- If the font files reside in a subdirectory of the site's root directory, precede the filename with a backslash (/), the directory name, and then another backslash (/):

```
url('/fonts/breeserif.woff2')
```

REMEMBER

If you're using both WOFF2 and WOFF, then for best cross-browser results, set up the @font-face rule so that the WOFF2 font format appears before the WOFF format.



Enhancing Page Text with Typography

Working with Text Styles

When you have your typeface (or typefaces) picked out and can format them with different type sizes, you're well on your way to making typographically pleasing web pages. But to make your pages stand out from the herd, you need to know a few more CSS properties related to styling text.

Lesson 18.4: Styling Small Caps

Covers: The `font-variant` property

USE IT

Small caps are also often used to make all-uppercase text (such as acronyms) blend in a bit better with the surrounding text.

➡ Online: wdpg.io/2/18-4-0

When you want some page text to be noticed, most of the time, you'll turn to bold or italics to get the job done. For something a bit different, however, try small caps. Small caps are an all-uppercase style of text in which lowercase letters are converted to uppercase equivalents that are slightly smaller than normal uppercase letters. (Original uppercase text is left unchanged.)

You style text as small caps by using the `font-variant` property and setting its value to `small-caps`.

► Example

➡ Online: wdpg.io/2/18-4-1

This example uses the `font-variant` property set to `small-caps` to style the names in the text as small caps.

WEB PAGE	Movable type was invented by JOHANNES GUTENBERG in the mid-fifteenth century. The first printing press in England was set up by WILLIAM CAXTON in 1476.
CSS	<pre>span { font-variant: small-caps; }</pre> <p>Styles the span element to use small caps</p>
HTML	<p>Movable type was invented by <code>Johannes Gutenberg</code> in the mid-fifteenth century. The first printing press in England was set up by <code>William Caxton</code> in 1876.</p> <p>The names within the span elements are rendered using small caps</p>

You probably won't use small caps all that often, but it can be an effective design feature for certain pages. A design feature that you will (or should) use often is line height, which I discuss in the next lesson.



Lesson 18.5: Setting the Line Height

Covers: The line-height property

➞ Online: wdpg.io/2/18-5-0

The last major factor in making your web page text look typographically solid is the *line height*, which is the height of the so-called *line box*, which is the invisible box that the browser uses to contain a line of text. The line box extends just above the tallest character in the font and just below the lowest-hanging character in the font.

You set the line height by using the CSS property named `line-height`. The types of values you can assign to this property are outlined in table 18.1.

► **Table 18.1** Values you can apply to the `line-height` property

Value	Description
number	A numeric value entered without a unit. The computed line height is the current type size multiplied by the number.
length	A numeric value entered with a unit, such as <code>em</code> .
percentage	A percentage value. The computed line height is the current type size multiplied by the percentage.
normal	A keyword that tells the browser to set the line height automatically based on the current type size.

The line height is crucial for readable text, as you can see in Figure 18.1. The text on the left is set with `line-height` equal to `0.75`, which results in the lines being unreadably close together. The text on the right is set with `line-height` equal to `2.25`, which results in the lines being too far apart for comfortable reading. The text in the middle has its `line-height` set to `1.5`, which looks just right.

“*Typography is two-dimensional architecture, based on experience and imagination, and guided by rules and readability.* —Hermann Zapf

MASTER

Another way to manipulate the case of text is with the `text-transform` property. Set this property to `lowercase` to convert the text to lowercase letters or `uppercase` to convert the text to uppercase. You can also use `capitalize` to apply uppercase to only the first letter of each word.



► **Figure 18.1**

When the line height is too small (left) or too large (right), the text is difficult to read.

<p>"Vertical space is metered in a different way [to horizontal space]. You must choose not only the overall measure – the depth of the column or page – but also a basic rhythmical unit. This unit is the leading, which is the distance from one baseline to the next." —Robert Bringhurst</p>	<p>"Vertical space is metered in a different way [to horizontal space]. You must choose not only the overall measure – the depth of the column or page – but also a basic rhythmical unit. This unit is the leading, which is the distance from one baseline to the next." —Robert Bringhurst</p>	<p>"Vertical space is metered in a different way [to horizontal space]. You must choose not only the overall measure – the depth of the column or page – but also a basic rhythmical unit. This unit is the leading, which is the distance from one baseline to the next." —Robert Bringhurst</p>
---	---	---

► **Example** ➡ Online: wdpg.io/2/18-5-2

This example sets the line-height property of the `p` element to 0.9, which results in so-called *tight leading*. Try a *normal leading* value of around 1.4, as well as a *loose leading* value of 1.75 or higher.

WEB PAGE	The name <i>line height</i> is often used synonymously with <i>leading</i> (it's pronounced <i>ledding</i>). This term comes from the movable type profession, where typesetters often use a strip of lead to set the amount of space between two lines of text.	
CSS	<pre>p { font-size: 1.5em; line-height: 0.9; }</pre>	Adjust the <code>p</code> element's line-height value to create tight, normal, and loose leading.
HTML	<pre><p> The name <i>line height</i> is often used synonymously with <i>leading</i> (it's pronounced <i>ledding</i>). This term comes from the movable type profession, where typesetters often use a strip of lead to set the amount of space between two lines of text. </p></pre>	

Now that you're familiar with all the major font-related CSS properties, you're ready to learn the handy shorthand property for styling your fonts with a single declaration. The next lesson tells you everything you need to know.

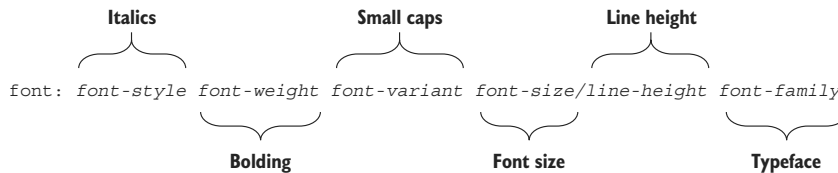


Lesson 18.6: Using the Shorthand font Property

Covers: The font property

➡ Online: wdpg.io/2/18-6-0

As you've seen so far in this book, there are six main font-related components for CSS typography: typeface, type size, bolding, italics, small caps, and line height. These components are represented, respectively, by the CSS properties `font-family`, `font-size`, `font-weight`, `font-style`, `font-variant`, and `line-height`. Handily, you can apply any or all of these properties with a single statement by using the font shorthand property, which takes the syntax shown in Figure 18.2.



► **Figure 18.2**

You can apply up to six font properties at the same time by using the `font` property.

This syntax is a straightforward repetition of everything you've learned so far, although you need to keep the following notes in mind:

- You can use some or all of the values, but at minimum, you must provide the `font-size` and the `font-family` values, in that order.
- If you omit a property, that property gets reset to its initial value.
- You can add the `font-style`, `font-weight`, and `font-variant` values in any order, as long as they all come before the `font-size` value.
- You've no doubt noticed and are more than a little curious about the `font-size/line-height` part of the syntax. That slash is borrowed from traditional print typography, in which as shorthand, one might say that text was "set 12/18," meaning that it uses 12-point type and an 18-point line height.



► Example

➡ Online: wdpg.io/2/18-6-1

This example sets the font property of the `div`, `dt`, and `span` elements.

WEB PAGE	<div><h1>Typography</h1><h2>A Glossary of Terms</h2><ul style="list-style-type: none">ascender The part of a tall lowercase letter such as <i>b</i> or <i>h</i> that extends above lowercase letters such as <i>a</i> and <i>c</i>.baseline The invisible line upon which lowercase characters such as <i>o</i> and <i>w</i> appear to sit.descender The part of a lowercase letter such as <i>g</i> or <i>y</i> that extends below the <small>BASELINE</small>.leading (pronounced <i>led-ding</i>) See <small>LINE HEIGHT</small>.line height The distance between the <small>BASELINES</small> of two adjacent lines of text.x-height The height of a typeface's lowercase <i>x</i>.</div> <p>The <code><div></code> text</p> <p>These are <code><dt></code> text.</p> <p>These are <code></code> text.</p>
CSS	<pre>div { font: bold 1.5em/1.3 Lora; } dt { font: italic 1.1em/1.25 Lora; } span { font: small-caps 1em Lora; }</pre> <p>The <code>div</code> text is bold Lora with type size 1.5 em and line height 1.3.</p> <p>The <code>dt</code> text is italic Lora with type size 1.1 em and line height 1.25.</p> <p>The <code>span</code> text is small caps Lora with type size 1 em.</p>



HTML

The dt text is italic Lora with type size 1.1 em and line height 1.25.

This element embeds the Lora typeface from Google Fonts.

```
<link href="https://fonts.googleapis.com/
css?family=Lora:400,400i,700,700i" rel="stylesheet">

<h1>Typography</h1>
<div>A Glossary of Terms</div>
<dl>
<dt>ascender</dt>
<dd>The part of a tall lowercase letter such as <i>b</i> or <i>h</i>
that extends above lowercase letters such as <i>a</i> and
<i>c</i>.
<dt>baseline</dt>
<dd>The invisible line upon which lowercase characters such as
<i>o</i> and <i>w</i> appear to sit.</dd>
<dt>descender</dt>
<dd>The part of a lowercase letter such as <i>g</i> or <i>y</i>
that extends below the <span>baseline</span>.
<dt>leading</dt>
<dd>(pronounced <i>ledding</i>) See <span>line height</span>.</dd>
<dt>line height</dt>
<dd>The distance between the <span>baselines</span> of two
adjacent lines of text.</dd><dt>x-height</dt>
<dd>The height of a typeface's lowercase <i>x</i>.</dd>
</dl>
```

The div text is bold Lora with type size 1.5 em and line height 1.3.

The span text is small caps Lora with type size 1 em.

From working with font stacks to specifying third-party or hosted web fonts to styling small caps and line height, you now know enough to design all your pages with top-notch typography



Summary

- Use hosted or local font files rather than rely on system fonts.
- Choose a typeface that suits your text and your overall message.
- Use `font-variant: small-caps` as an alternative way to emphasize or highlight text.
- Give your text blocks room (but not too much room) between the lines by setting the `line-height` property.
- Save time by using the `font` property as shorthand.



Learning Advanced CSS Selectors



This chapter covers

- Learning the powerful ID and universal selectors
- Leveling your style game with the descendant, child, and sibling selectors
- Targeting your styles by combining two or more selectors
- Becoming a style master by understanding CSS inheritance, cascading, and specificity

On the surface, CSS seems like a simple topic: you apply values to some properties, combine them into a rule, and then apply that rule to a page element. Repeat a few more times, and voilà: your page is beautiful. But the apparent simplicity of CSS is only skin deep. Underneath the straightforward implementation of declarations and rules are obscure caves of complexity and unfathomed depths of dynamism. This chapter serves as an introduction to this hidden world, which is home to some of the most powerful and practical CSS concepts.



LEARN

My WebDev Workshop includes a complete rundown of all the CSS selectors, with examples. Check it out: <https://webdevworkshop.io/code-selector-reference/>.

Working with ID Selectors

In Chapter 7, I introduced you to CSS selectors, which enable you to specify the page object you want to style:

```
selector {  
  property1: value1;  
  property2: value2;  
  ...  
}
```

So far, you've learned that the *selector* part of this CSS rule can be the name of an HTML tag (a *type selector*) or the name of a CSS class (a *class selector*). A large collection of CSS selectors exists, however. Many of these selectors are rather obscure, but the more common ones are powerful tools indeed. The lessons in this chapter introduce five of these selectors, beginning with the ID selector.

Lesson 19.1: Using ID selectors

Covers: The #id selector

BEWARE

Like class names, id values are case-sensitive.

REMEMBER

As with class names, your id value must begin with a letter—or a hyphen (-) followed by a letter—and can include any combination of letters, numbers, hyphens (-), underscores (_).

➡ Online: wdpg.io/2/19-1-0

Back in Chapter 16, you learned you can link to a specific element in a web page by adding the `id` attribute to that element and then including the `id` value in your link address. You can also use an element's `id` value to apply CSS styling to that element. To do this in an internal or external style sheet, you type the `id` value preceded by a hash symbol (`#`) to create the selector:

```
#id-value {  
  property1: value1;  
  property2: value2;  
  ...  
}
```

The following example shows ID selectors in action.



► **Example** ➞ Online: wdpg.io/2/19-1-1

This example adds an ID to each of two `<div>` tags—`section-quote` and `section-summary`—and then uses the corresponding ID selectors to apply rules to each `div` element.

WEB PAGE	<h2>Metaphors for New Words</h2> <p><i>"Because in our brief lives we catch so little of the vastness of history, we tend too much to think of language as being solid as a dictionary, with a granite-like permanence, rather than as the rampant restless sea of metaphor which it is."</i> —Julian Jaynes</p> <p>We make metaphors for many things, but when we make many metaphors for one thing, it says that thing is important to us. We make metaphors for new words almost as readily as we make new words.</p>
CSS	<pre>#section-quote { color: darkgray; font-size: 1.25rem; font-style: italic; text-align: right; } #section-summary { color: dimgray; font-size: 1.5rem; font-weight: bold; text-align: center; }</pre> <p>Rule for the <code>section-quote</code> id</p> <p>Rule for the <code>section-summary</code> id</p>
HTML	<pre><h1> Metaphors for New Words </h1> <div id="section-quote"> "Because in our brief lives we catch so little of the vastness of history, we tend too much to think of language as being solid as a dictionary, with a granite-like permanence, rather than as the rampant restless sea of metaphor which it is."
—Julian Jaynes </div> <div id="section-summary"> We make metaphors for many things, but when we make many metaphors for one thing, it says that thing is important to us. We make metaphors for new words almost as readily as we make new words. </div></pre> <p>The <code>section-quote</code> id assigned to a <code>div</code> element</p> <p>The <code>section-summary</code> id assigned to a <code>div</code> element</p>

Now that you know about class selectors and ID selectors, you might be wondering which one you should use. That's the subject of the next section.



BEWARE

ID selectors, because they apply to a single element, make your CSS code harder to maintain and troubleshoot. You'll understand why when I talk about specificity later in this chapter. Therefore, the true best practice when it comes to ID selectors is to never use them.

Best Practices: Classes vs. IDs

When should you use an ID selector versus a class selector? Ask yourself the following questions:

- Will the styles I want to use be applied to one and only one element?
If so, use an ID selector on that element.
- Will the styles I want to use be applied to multiple elements?
If so, use a class selector on each of those elements.
- Will the styles I want to use be applied to only one element now but could be applied to other elements in the future?
If so, use a class selector on that one element now. You can always apply the class selector to other elements as needed down the road.

Web Page Genealogy: Parents, Descendants, and Siblings

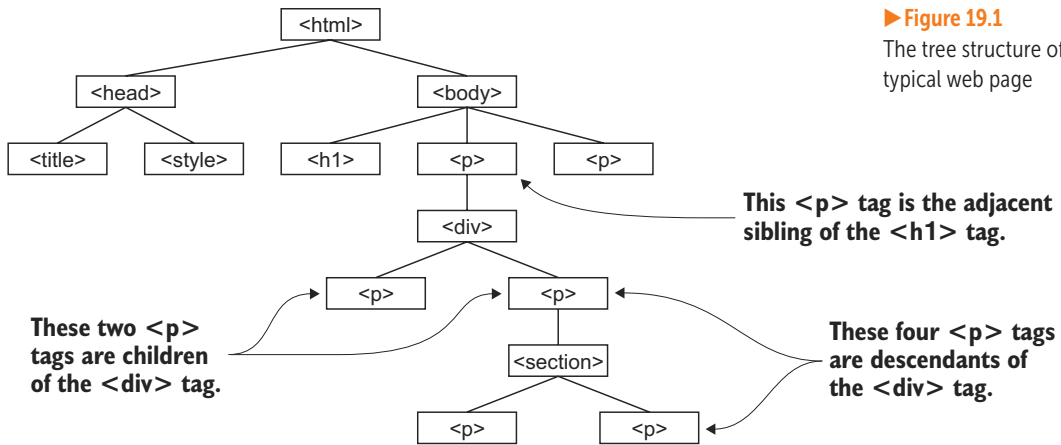
Before continuing with the selectors, you need to take a mercifully brief detour into the hierarchical structure of a web page so that you can learn a few key concepts. Figure 19.1 shows the hierarchy of a typical web page.

Now let's traverse this (upside-down) tree structure:

- The `html` element is the root of the structure.
- The `html` element has two main branches: `head` and `body`.
- The `head` element has two branches: `title` and `style`.
- The `body` element has three branches: an `h1` element and two `p` elements.
- The first of the `p` elements has a `div` branch.
- That `div` branch has two `p` branches.
- The second of those `p` branches has a `section` branch.
- The `section` branch has two `p` branches.

Given this hierarchy, I can define a few useful terms that you'll need to know to understand the CSS selectors that follow:

- **Parent**—An element that contains one or more other elements. In Figure 19.1, `html` is the parent of `head` and `body` elements, and the `div` element is the parent of the two `p` elements.
- **Grandparent**—An element that contains a second level of elements. In Figure 19.1, `html` is the grandparent of (among others) the `title` and `h1` elements, and the `div` element is the grandparent of the `section` element.



- **Ancestor**—An element that contains one or more levels of elements. In Figure 19.1, `html` is an ancestor of every other element, and the `body` element is an ancestor of the `div` element and every element contained within the `div` element.
- **Child**—An element that's contained within an element that lies one level above it in the hierarchy. That is, the element has a parent in the structure. In Figure 19.1, `title` is a child of `head`, and the `div` is a child of its containing `p` element.
- **Descendant**—An element that's contained within an element that lies one or more levels above it in the hierarchy. That is, the element has an ancestor in the structure. In Figure 19.1, `title` is a descendant of `html`, and the four `p` elements are all descendants of their containing `div` element.
- **Sibling**—An element that lies on the same level as another element. In Figure 19.1, the three child elements of the `body` element—that is, the `h1` and the two `p` elements—are all siblings. Note in particular that a sibling that immediately follows another sibling is called an *adjacent sibling*.

All this talk of parents and children, ancestors and descendants might seem like an unnecessary abstraction. What's the point? It's that these concepts are crucial when it comes to understanding the contextual selectors that are the topic of the next few lessons.

Working with Contextual Selectors

With the terms from the preceding section in mind, let's talk about how you can use the web page hierarchy to construct some powerful CSS rules by using three *contextual selectors* (so named because they define an element's context within the web page).



Lesson 19.2: The Descendant Combinator

Covers: The x y combinator

REMEMBER

In CSS lingo, the character that you place between two elements to form a selector (such as the space used in this section's selectors) is called a combinator.

BEWARE

The descendant selector is powerful because it targets every descendant of an ancestor, no matter how far down the hierarchy those descendants reside. To avoid unexpected results, if you want to target a descendant one level below an ancestor, you should use the child selector (discussed in Lesson 19.3).

⇒ Online: wdpg.io/2/19-2-0

One common CSS scenario is applying a style rule to all the elements contained within (that is, are descendants of) some other element (the ancestor). To do that, use the *descendant combinator*, which separates the ancestor and descendant elements with a space, as shown in the following syntax:

```
ancestor descendant {  
  property1: value1;  
  property2: value2;  
  ...  
}
```

The element's parent element

The element you want to style

The styles you want to apply

Your page may have a couple of `p` elements at the beginning that serve as a summary of the page and quite a few more `p` elements that hold the body text. Assuming you want to style the summary text differently from the body text, a generic `p` selector won't work. If, instead, you enclose all the body text `p` elements in a `div` element, you can target all the `p` elements with the following selector:

```
div p
```

The following example uses the descendant combinator to style a page's body text.



► **Example** ➡ Online: wdpg.io/2/19-2-1

This example uses the descendant selector `div p` to target only those `p` elements that are contained within the `div` element.

WEB PAGE	<h2>Weird Word Origins</h2> <p>Welcome to the always wonderful, sometimes weird, and often downright wacky world of word histories</p> <p>Never thought you'd hear adjectives such as <i>wacky</i> and <i>weird</i> associated with the history of words? Think again, oh soon-to-be-even-wiser-than-you-are-now reader! The study of word origins isn't about memorizing technical terms or resurrecting dead languages or puzzling over parts of speech. Instead, it's all about telling stories.</p> <p>The history of a word is a narrative, plain and simple: where the word began, how it changed over time, and how it got where it is today. Delightfully, these narratives are often full of plot twists, turning points, heroes and villains, and surprise endings.</p>
CSS	<pre>body { color: blue; font-family: Verdana, sans-serif; font-size: 1.25rem; } div p { color: #444; font-family: Georgia, serif; font-size: 1rem; }</pre> <p>Styles applied to all text</p> <p>Styles applied only to <code>p</code> elements that are descendants of a <code>div</code> element</p>
HTML	<pre><h2>Weird Word Origins</h2> <p>Welcome to the always wonderful, sometimes weird, and often downright wacky world of word histories</p> <div> <p>Never thought you'd hear adjectives such as <i>wacky</i> <i> and <i>weird</i> associated with the history of words? Think again, oh soon-to-be-even-wiser-than-you-are-now reader! The study of word origins isn't about memorizing technical terms or resurrecting dead languages or puzzling over parts of speech. Instead, it's all about telling stories.</p> <p>The history of a word is a narrative, plain and simple: where the word began, how it changed over time, and how it got where it is today. Delightfully, these narratives are often full of plot twists, turning points, heroes and villains, and surprise endings.</p> </div></pre>



PLAY

Create a rule that applies a green color and a font size of 1.25 rem to any `<code>` tag that is a descendant of a `<div>` tag. ➡ Online: wdpg.io/2/19-2-2

The descendant combinator is powerful because it targets every descendant of an ancestor, no matter how far down the hierarchy those descendants reside. To avoid unexpected results, if you want to target a descendant one level below an ancestor, you should use the child combinator, which I discuss in the next lesson.

Lesson 19.3: The Child Combinator

Covers: The `x > y` combinator

MASTER

To select an element that's the first child of its parent, use the `element:first-child` pseudo-class. Similarly, to select an element that's the last child of its parent, use the `element:last-child` pseudo-class. ➡ Online: wdpg.io/2/19-3-4

➡ Online: wdpg.io/2/19-3-0

Rather than select every descendant of a specified element, you often need to target only its children. To do that, use the *child combinator*, which separates the parent and child elements with a greater-than sign (`>`), as shown in the following syntax:

The diagram illustrates the child combinator syntax. It shows the code `parent > child {` followed by a list of styles: `property1: value1;`, `property2: value2;`, and `...`, ending with a closing curly brace `}`. Red arrows point from text labels to parts of the code: one arrow points from "The element's parent element" to `parent`; another points from "The element you want to style" to `child`; and a third points from "The styles you want to apply" to the opening curly brace `{`.

MASTER

Another powerful child pseudo-class is `:nth-child(n)`, where *n* specifies which child or children you want to select. For example, `:nth-child(3)` selects the third child element. Use `:nth-child(odd)` to select the odd (first, third, and so on) children, or use `:nth-child(even)` to select the even (second, fourth, and so on) elements. ➡ Online: wdpg.io/2/19-3-5

Referring to Figure 19.1, you can style the `div` element's two `p` children with the following selector:

```
div > p
```

The following example uses the child combinator to style those `p` elements that are children of a `div` element.



► Example

➡ Online: wdpg.io/2/19-3-1

This example uses the `div > p` child selector to set a font size of 1.25em and a color of dark green to only those `p` elements that are direct children of a `div` element.

WEB PAGE	<h2>Contextual Selectors</h2> <ul style="list-style-type: none"> The Descendant Combinator The Child Combinator <ul style="list-style-type: none"> The First Child Pseudo-Class The Last Child Pseudo-Class The Nth Child Pseudo-Class The Sibling Combinator <p>These <code><p></code> tags are children of a <code><div></code>.</p> <p>These <code><p></code> tags are not children of a <code><div></code>.</p>
CSS	<pre> p { color: darkblue; font-size: 1rem; font-weight: bold; } div > p { font-size: 1.25rem; color: darkgreen; } </pre> <p>Styles for all <code>p</code> text</p> <p>Styles for <code>p</code> elements that are children of <code>div</code> elements</p>
HTML	<pre> <h1>Contextual Selectors</h1> <div> <p>The Descendant Combinator</p> <p>The Child Combinator</p> <section> <p>The First Pseudo-Class</p> <p>The Last Pseudo-Class</p> <p>The Nth Pseudo-Class</p> </section> <p>The Sibling Combinator</p> </div> </pre> <p>The child <code>p</code> elements</p>

Selecting children and descendants is common in CSS, but you'll also find yourself needing to select siblings, which are elements on the same level of the hierarchy. I discuss sibling selection in the next lesson.



Lesson 19.4: The Sibling Combinator

Covers: The `x ~ y` combinator

PLAY

Given a numbered list that's nested within another numbered list, use the child combinator to create a rule that styles the nested list to use lowercase letters instead of numbers. ➡ Online: wdpg.io/2/19-3-2

➡ Online: wdpg.io/2/19-4-0

Instead of selecting an element's children or descendants, you might need to target the siblings that come after the element. To do that, use the *sibling combinator*, which separates the reference element and the sibling element with a tilde (~), as shown in the following syntax:

```
element ~ sibling {  
  property1: value1;  
  property2: value2;  
  ...  
}
```

The reference element

The element you want to style

The styles you want to apply

In Figure 19.1, you can style the two `p` elements that are the subsequent siblings of the `h1` element with the following selector:

```
h1 ~ p
```

The following example shows the sibling combinator in action.

► Example

➡ Online: wdpg.io/2/19-4-1

This example uses the `h1 ~ div` selector to set a sans-serif font stack and a bold font weight to only those `div` elements that are subsequent siblings of the `h1` element.

WEB PAGE	<p>This <code><div></code> is a sibling of the <code><h1></code>, but comes before it.</p> <p>Here's a quick look at the book's contents:</p> <h2>A Smart Vocabulary—Contents</h2> <p>Chapter 1: Names of Things You Didn't Know Had Names</p> <p>From the indentation on your upper lip to the indentation on the bottom of a wine bottle.</p> <p>Chapter 2: Making Word Whoopee</p> <p>Codswallop, nincompoop, willy-nilly, and other words that will bring a smile to your face.</p> <p>These <code><div></code> tags are not siblings of the <code><h1></code>.</p> <p>These <code><div></code> tags are siblings that come after the <code><h1></code> tag.</p> <p>The <code><h1></code> tag</p>
CSS	<pre>div { font-family: Georgia, serif; font-weight: normal; } h1 ~ div { font-family: Verdana, sans-serif; font-weight: bold; }</pre> <p>Styles for all <code>div</code> text</p> <p>Styles for <code>div</code> elements that are siblings of <code>h1</code></p>



HTML

```
<div>
  Here's a quick look at the book's contents:
</div>
<h1>
  A Smart Vocabulary—Contents
</h1>
<div>
  Chapter 1: Names of Things You Didn't Know Had Names
  <div>From the indentation on your upper lip to the indentation
on the bottom of a wine bottle.</div>
</div>
<div>
  Chapter 2: Making Word Whoopee
  <div>Codswallop, nincompoop, willy-nilly, and other words that
will bring a smile to your face.</div>
</div>
```

This sibling div comes before the h1

The subsequent sibling div elements

CSS selectors such as those that use the descendant, child, and sibling combinators are useful all by themselves, but they become amazingly powerful when you combine them with other selectors. Learning how to combine selectors is the topic of the next section.

Taking Things Up a Notch by Combining Selectors

CSS selectors are useful tools because they enable you to target areas of your web page that you want styled. By specifying a particular class or an element's descendants, you gain much more control of your page presentation. But what if instead of needing to use either the class selector or the descendant selector, you need to use both? That is, what if you want to target not the element that has been assigned a particular class, but its descendants? Table 19.1 demonstrates a few ways to combine CSS selectors.

► Table 19.1 Some ways to combine selectors

Example	Description
<code><div class="sidebar alert"></code>	Applies both the class named <code>sidebar</code> and the class named <code>alert</code> to the <code>div</code> element
<code>p.footnote {styles}</code>	Applies a rule to those <code>p</code> elements that have been assigned the class named <code>footnote</code>
<code>p.footnote > a {styles}</code>	Applies a rule to <code>a</code> elements that are the children of those <code>p</code> elements that have been assigned the class named <code>footnote</code>
<code>p.footnote a.external {styles}</code>	Applies a rule to <code>a</code> elements that have been assigned the class named <code>external</code> and that are the descendants of those <code>p</code> elements that have been assigned the class named <code>footnote</code>
<code>#payables-table li:nth-child(even) {styles}</code>	Applies a rule to the even-numbered <code>li</code> elements in the list that have been assigned the ID <code>payables-table</code>

MASTER

To select only the next sibling of an element, change the tilde to a plus sign: `element + sibling` (as in `h1 + p`). ➡ Online: [wdpg.io/2/19-4-4](#)



While I'm on the topic of combining things, I should mention that it's perfectly valid CSS to apply a single style rule to two or more selectors. You do that by separating the selectors with commas, like so:

```
selectorA,  
selectorB {  
    property1: value1;  
    property2: value2;  
    ...  
}
```

Suppose that you have a class named `pullquote` that you use to style the pull quotes in your website's news articles and a class named `sidebar` that you use for the sidebars in your website's tutorial pages. If these two classes use the same rule, you can combine them:

```
.pullquote,  
.sidebar {  
    color: #444;  
    background-color: #ccc;  
}
```

You'll combine selectors frequently in your CSS code because these combinations enable you to precisely target just the elements you want to style. Another way to zero in on a specific page target is to generate that target with CSS code. That sounds like magic, but as you learn in the next lesson, it's just another useful CSS technique

Lesson 19.5: The `::before` and `::after` Pseudo-Elements

Covers: `::before` and `::after`

⇒ Online: wdpg.io/2/19-5-0

REMEMBER

To insert a special character as the custom content, use the character's hexadecimal code, preceded by a backslash (\). The declaration content: '\0266f';, for example, specifies the musical sharp sign (#) as the custom content. Use the HTML5 Entity Browser (wdpg.io/2/charent/) to look up a character's hex code.

In CSS, you can create web page objects that aren't officially part of the page hierarchy, and these objects are known as *pseudo-elements*. Two common examples are `::before` and `::after`, which you use to insert content before and after, respectively, the content of whatever element you specify. In CSS, this content is called *generated content* because you don't type the content yourself; it's created by the browser automatically. Here's the syntax:

```
element::before|after {  
    content: value;  
    content styles  
}
```

The web page element

Where you want the content added

The content you want to insert

Optional styles applied to the inserted content



You can use the following rule to automatically add a pilcrow (¶), also called a paragraph mark, after each paragraph:

```
p::after {
  content: '¶';
}
```

One of the most common uses for the `::before` pseudo-element is to replace the default bullets in an unordered list with custom bullets. The following example shows how.

► Example

➡ Online: wdpg.io/2/19-5-1

This example uses `list-style-type` to remove the bullets from the `ul` element and then uses `li::before` to add a custom bullet character—a pointing finger (hex code 261e)—and a nonbreaking space (hex 00a0).

WEB PAGE

Here are some interesting characters to use in place of the standard bullets:

- ☞ Circled bullet: ☞
- ☞ Circled white bullet: ☞
- ☞ Rightwards arrow with loop: ☞
- ☞ Black star: ★
- ☞ White star: ☆
- ☞ Triangle bullet: ▶

☞ Pointing finger character as a custom bullet

CSS

```
ul {
  list-style-type: none;
  margin-left: 0;
  padding-left: 1rem;
  text-indent: -1rem;
}

li::before {
  content: '\261e\00a0';
  color: red;
  font-size: 1.1em;
}
```

Removes the default bullet

Ensures that bullet text wraps correctly

Adds a pointing finger and space

Styles the custom bullet

continued



```
<div>
  Here are some interesting characters to use in place of the
  standard bullets:
</div>
<ul>
  <li>Circled bullet: &#x029bf;</li>
  <li>Circled white bullet: &#x029be;</li>
  <li>Rightwards arrow with loop: &#x021ac;</li>
  <li>Black star: &#x02605;</li>
  <li>White star: &#x02606;</li>
  <li>Triangle bullet: &#x2023;</li>
</ul>
```

PLAY

An external link points to a resource on a different site. Create a CSS rule that automatically adds an icon to denote external links, the way that Wikipedia does (see Figure 19.2). ➡ Online: wdpg.io/2/19-5-3

PLAY

CSS offers the counter-increment property that lets you set up a counter for a numbered list. If you set the ol element's list-style-type property to none, you can use ol :before to create custom numbers for a list. ➡ Online: wdpg.io/2/19-5-2

External links

- [Official website](#)
- [CSS](#) at DMOZ

► Figure 19.2

Wikipedia marks external links with an icon.

While I'm talking about pseudo-elements, it's worth mentioning that you can use the `::first-letter` pseudo-element to apply one or more styles to the first letter of a text block. `div::first-letter {font-size: 1.5rem; color: red;}`, for example, styles the first letter of each div element to have size 1.5rem and the color red. To style the entire first line of a text block, use the `::first-line` pseudo-element.

You've seen some truly powerful CSS selectors so far in this chapter, but in the next section, you learn about what is arguably the most powerful selector of them all.

Resetting CSS with the Universal Selector

The *universal selector* (*) applies to every element on the web page, which may seem to be an odd way of approaching styles. After all, how often would a particular set of styles apply to every element on a page? Almost never. The universal selector is useful, however, when it comes to a CSS reset—a way of removing the web browser's default styles so that you can apply your own without having to worry about conflicts with the browser. Here's a basic CSS reset:

```
* {
  box-sizing: border-box;
  margin: 0;
}
```

This reset sets the box-sizing property to border-box and removes the browser's default margins (both of which you learned about in Chapter 9).



Styles: What a Tangled Web Page They Weave

Most of the style declarations and rules you've worked with so far have operated in splendid isolation. You style an `h1` element with a font size and a `p` element with an alignment, and the web browser applies these two rules independently of each other. However, in the real world of web design, such simplicity is rare. I'm talking hen's-teeth rare. For all but the most basic web pages, it's a certainty that your styles are fraternizing and sometimes even fighting with one another. It's mayhem, but you can restore some semblance of order by understanding three key CSS mechanisms: inheritance, cascading, and specificity.

Lesson 19.6: Understanding Inheritance

Covers: CSS inheritance

➡ Online: wdpg.io/2/19-6-0

With all that talk earlier in the chapter about ancestors, parents, children, and descendants, you won't be surprised to learn that CSS comes with a method for passing traits along from one "generation" to the next. This method is called, appropriately enough, *inheritance*, and it means that for certain CSS properties, if a parent element is styled with that property, its child and descendant elements are automatically styled the same way.

What did I mean when I said that only certain properties are inherited? Although many CSS properties are inherited by descendant elements, not all of them are. If you were to apply a border around the parent `div` element in the preceding example, that same border style wouldn't be applied to any of its descendants, because it would look odd to have, say, a border around an `em` or a `sup` element.

In the following example, a `div` element is assigned the class `intro`, which styles the element with `1.1rem` brown text. Notice that the `div` element's children—the `em`, `sup`, and `code` elements, as well as the nested `div` element—are styled the same way because, in each case, they've inherited those styles from the parent `div`.

PLAY

The a element inherits style properties such as color, but you don't see this inheritance; the browser overrides the inheritance so that your links stand out from the regular page text. Can you think of a way to force the text of child a elements to use the same color as their parent?

➡ Online: wdpg.io/2/19-6-2



Learning Advanced CSS Selectors

► Example

➡ Online: wdpg.io/2/19-6-1

This example demonstrates inheritance by showing how the styles of the parent `div` element get passed down to child elements such as `em`, `code`, and the nested `div`.

WEB PAGE	<p>A child <code></code></p> <p>The parent <code><div></code></p> <p>Why don't <i>all</i> CSS properties inherit their parent's styles? * Because in some cases it would lead to weird or nonsensical results. For example, if you apply a border around, say, a <code>div</code> element, it would look odd indeed to apply the same border to a child <code>span</code> or <code>strong</code> element. Similarly, applying, say, a <code>p</code> element's <code>width</code> value to a child <code>em</code> element doesn't make sense.</p> <p>* See www.w3.org/TR/REC-CSS2/propidx.html</p> <p>A child <code><code></code></p> <p>A child <code><div></code></p>
CSS	<pre>.intro { color: saddlebrown; font-size: 1.1rem; line-height: 1.4; }</pre> <p>Styles for the <code>intro</code> class</p>
HTML	<p>The parent <code>div</code> element</p> <p>A child <code>em</code> element</p> <p><code><div class="intro"></code></p> <p>Why don't <code>all</code> CSS properties inherit their parent's styles?<code><sup>*</sup></code> Because in some cases it would lead to weird or nonsensical results. For example, if you apply a border around, say, a <code><code>div</code></code> element, it would look odd indeed to apply the same border to a child <code><code>span</code></code> or <code><code>strong</code></code> element. Similarly, applying, say, a <code><code>p</code></code> element's <code><code>width</code></code> value to a child <code><code>em</code></code> element doesn't make sense.</p> <p>A child <code>code</code> element</p> <p><code><div></code></p> <p><code><sup>*</sup> See www.w3.org/TR/REC-CSS2/propidx.html</code></p> <p><code></div></code></p> <p><code></div></code></p> <p>A child <code>div</code> element</p>

Inheritance is just the beginning of understanding how CSS applies its styles. You also need to know how inheritance works, and that's the topic of the next lesson.



Lesson 19.7: Learning About the Cascade

Covers: CSS cascade

➡ Online: wdpg.io/2/19-7-0

Besides the fact that styles get passed down from parent elements to descendant elements through inheritance, CSS also defines the way that the styles get propagated. This definition is called the *cascade*, and if inheritance is the "what" of style propagation, the cascade is the "how." (Before continuing, let me answer the question that's no doubt on your mind: yes, the cascade is the reason why collections of styles are called *cascading* style sheets.) To see how the cascade works, consider the following code:

```
<style>
  div {
    color: red;
  }
</style>

<div style="color: blue;">
  What is the color of this text?
</div>
```

Internal style sheet

Inline style

Here, an internal style sheet tells the `div` element to use red text, and an inline style colors the `<div>` tag's text blue. What color is the text between the `<div>` and `</div>` tags? That is, how will the browser resolve the conflict between the internal style sheet and the inline style?

To answer both questions, you need to know how the cascade does its job. First, you already know that there are three main ways to specify CSS: inline styles, internal style sheets, and external style sheets. Together, these methods constitute what the W3C calls *author style sheets* (because they're created by the person who wrote the web page—that's you). But two other style sheets get applied when a web page loads: the browser's default styles (called the *user agent style sheet*) and the browser user's custom styles (called the *user style sheet*).

The cascade organizes these five sources of style data into the following hierarchy:

- User agent style sheet
- User style sheet
- External and internal author style sheets
- Inline styles

LEARN

The World Wide Web Consortium (W3C) maintains a slightly out-of-date list of CSS properties. Among other tidbits, that list helpfully specifies whether each property is inherited. See www.w3.org/TR/CSS2/propidx.html.



These sources are listed in *ascending* order of importance (*weight*, in CSS lingo). If the browser sees that a particular style rule is defined in two or more of these sources, it resolves the conflict by applying the style from the source that has the greatest weight. For the code example I showed earlier, you can see that an inline style trumps an internal style sheet, so the text between the `<div>` and `</div>` tags will display as blue, as shown in the following example.

► Example

⇒ Online: wdpg.io/2/19-7-1

This example demonstrates the CSS cascade, where the `div` element's inline style gets rendered because it carries more weight than the `div` type selector from the internal style sheet.

WEB PAGE

What is the color of this text?

The `<div>` tag

HTML

```
<style>
  div {
    color: red;
  }
</style>
```

Internal style sheet

```
<div style="color: blue;">
  What is the color of this text?
</div>
```

Inline style

The cascade is often a kind of competition where different selectors vie to apply their styles to the same element. How CSS determines the "winner" of such competitions is the subject of the next lesson.

Lesson 19.8: Introducing Specificity

Covers: CSS specificity

MASTER

*There's a sixth style source you need to know: adding the **!important** keyword to the end of any style declaration. This keyword carries the greatest possible CSS weight, so it overrides any other source.*

⇒ Online: wdpg.io/2/19-7-2

⇒ Online: wdpg.io/2/19-8-0

You may be wondering what happens to the CSS cascade when two styles that target the same element come from the same source. Consider the following code:

```
<style>
  p.colored-text {
    color: purple;
  }
.colored-text {
```




```

        color: blue;
    }
    div p {
        color: green;
    }
    p {
        color: red;
    }
</style>

<div>
  <p class="colored-text">What is the color of this text?</p>
</div>

```

Diagram annotations:

- A red arrow points from the text "Descendant selector" to the `div p` selector.
- A red arrow points from the text "Type selector" to the `p` selector.

The style sheet contains four rules, all of which target the `p` element. The first rule selects all `p` elements that use the `colored-text` class; the second rule selects all elements that use the `colored-text` class; the third rule selects `p` elements that are descendants of a `div` element; and the fourth rule selects all `p` elements. What color will the browser render the text between the `<p>` and `</p>` tags? The cascade alone doesn't answer this question because all the rules come from an internal style sheet and therefore are given equal weight.

To figure out the winner in this CSS fight, you need to know a bit about a concept called *specificity*. Specificity is one of the most complex ideas in all of CSS, but for purposes of this chapter, I can say this about it: the more specifically a particular selector targets something on a web page, the greater weight it's given when the browser is calculating which rules to apply. You can judge how specifically a selector targets something by applying the following recipe to the selector:

- 1 Count the number of elements (such as `p` or `div`) and pseudo-elements (such as `::before`), and assign 1 point to each.
- 2 Count the number of classes and pseudo-classes (such as `:hover`), and assign 10 points to each.
- 3 Count the number of IDs, and assign 100 points to each.

The points assigned are indicative of the weight each selector carries. Returning to the example, count the points:

- `p.colored-text`—This selector contains one element and one class, for a total of 11 points.
- `.colored-text`—This selector contains one class, for a total of 10 points.
- `div p`—This selector contains two elements, for a total of 2 points.
- `p`—This selector contains one element, for a total of 1 point.

REMEMBER

This recipe is something I made up to make specificity easier to understand. The actual algorithm used by the cascade uses a score of the form I-C-T, where I is the number of IDs in the selector, C is the number of classes or pseudo-classes (also attribute selectors), and T is the number of types (that is, elements and pseudo-elements). Two or more such scores are compared from left to right to determine the winner. For example, 1-0-0 wins over 0-1-1 and 0-2-1 wins over 0-1-4.

BEWARE

Earlier in the chapter, I cautioned you against overusing the ID selector, and here, you see the main reason to approach it with caution. This selector greatly outweighs elements, pseudo-elements, classes, and pseudo-classes.



Learning Advanced CSS Selectors

You can see that the `p.colored-text` selector has the most points, so the text between the `<p>` and `</p>` tags gets rendered as purple, as shown in the following example.

► Example

➡ Online: wdpg.io/2/19-8-1

This example demonstrates CSS specificity, where the selector `p.colored-text` is more specific than the other selectors, so the browser renders the text as purple.

WEB PAGE

What is the color of this text?

The `<p>` tag

HTML

```
<style>
  p.colored-text {
    color: purple;
  }
  .colored-text {
    color: blue;
  }
  div p {
    color: green;
  }
  p {
    color: red;
  }
</style>
<div>
  <p class="colored-text">What is the color of this text?</p>
</div>
```

Specificity = 11 points (or 0-1-1)

Specificity = 10 points (or 0-1-0)

Specificity = 2 points (or 0-0-2)

Specificity = 1 point (or 0-0-1)

If you create a rule that targets a particular element, but the browser doesn't show those styles when it renders the page, it means that a selector with a greater specificity has trumped your selector. You need to dig into your code and find out which selector has more specificity.

Finally, you might be wondering what the cascade does when two (or more) selectors from the same source have the same specificity. In that case, the cascade breaks the tie by looking at the order in which the selectors appear in the CSS code. Whichever selector appears later in the code is declared the winner.



Summary

- An *ID selector* applies CSS rules to any element that uses the specified ID value.
- To target all the elements contained within a parent element, use the *descendant selector*, which is the parent and descendant element names separated by a space.
- To target all the child elements contained within a parent element, use the *child selector*, which is the parent and child element names separated by a greater-than sign (>).
- To target all the elements that are siblings of some other element, use the *sibling selector*, which is the names of the two elements separated by a tilde (~).
- Append `::before` or `::after` to a selector to insert generated content before or after the element's content.
- Many CSS properties are inherited from the element's parent.
- Inheritance occurs via the cascade, which assigns greater importance to declarations whose sources are closer to the element. In ascending order, these sources are browser default styles, user custom styles, external style sheets, internal style sheets, and inline styles.
- For declarations from the same source, specificity tells the browser to render the styles from the more specific of the selectors. In ascending order, these selectors are elements and pseudo-elements, classes and pseudo-classes, IDs, inline styles, and the `!important` keyword.



PROJECT: Creating a Portfolio Page



This chapter covers

- Planning and sketching your portfolio page
- Choosing typefaces and colors for your page
- Adding the page text and images
- Adding contact information

If you do creative work—illustration, writing, music, fine art, or even web design—you owe it to yourself and your career to put yourself out there and tell the world how talented you are. How do you do that? Social media is the standard way of blowing your own horn these days. That's fine, but when you use someone else's platform to talk yourself up, you're giving up lots of control over how you present yourself. It's always better to control your own message, and the best way to do that is to build your own online presence. For creative types, that online stake in the ground should include a portfolio page that showcases your best or your most recent work.



Project: Creating a Portfolio Page

This chapter takes you through the process of putting together a simple portfolio page. I'll be concentrating on many of the techniques you learned here in Part 4 (such as in-page links, typography, and colors), but by the end, you'll see how to build a sophisticated portfolio page that'll put your best creative foot forward.

What You'll Be Building

This project is a basic portfolio page, which refers to a page that's designed to show off some of (or even all of) your creative work. It's the online equivalent of a hard-copy portfolio that starving artists have been lugging around from patron to patron and employer to employer for decades. The main idea of a portfolio page is to show off your creative work to people who may want to buy it or may want to hire you to do your creative thing. If your creative work is a hobby, by all means, use your portfolio page to show off your side projects to anyone you can persuade to stop by.

Sketching the Layout

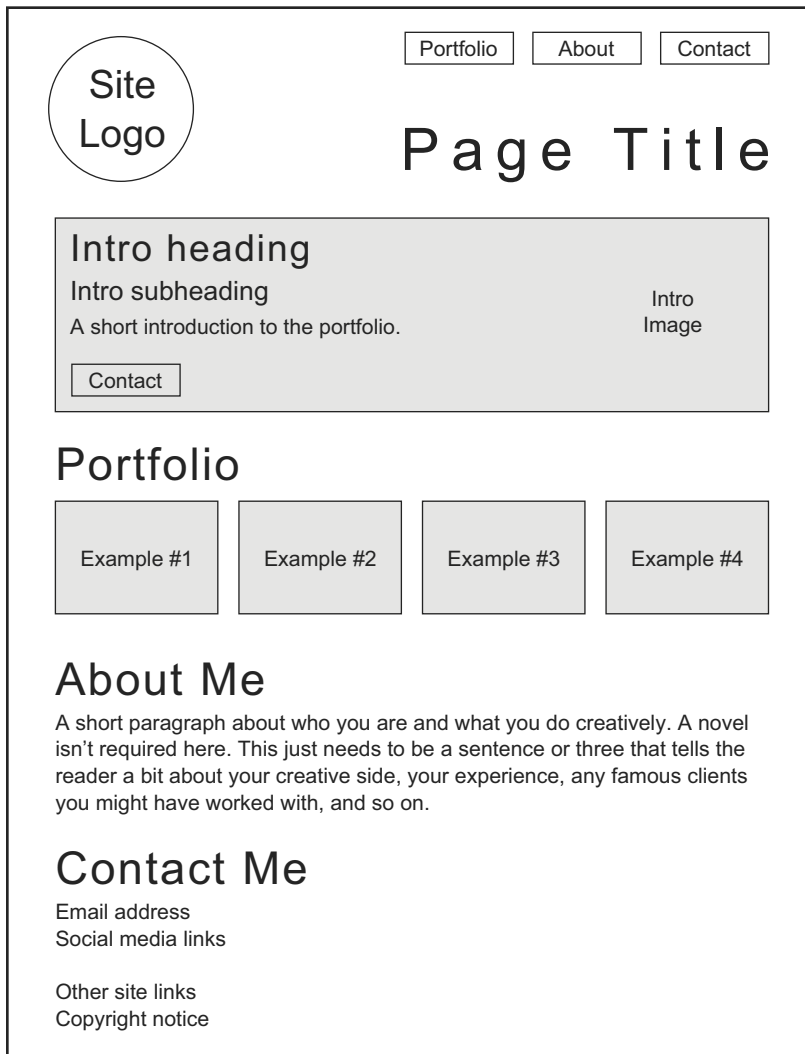
You've been through several of this book's projects by now, so you know the drill: begin by using a pen or pencil to draw the basic layout on a piece of paper. This drawing gives you a kind of blueprint to use when you start throwing around HTML tags and CSS properties.

Figure 20.1 shows the example that I'm going to use for my portfolio page. This page is a variation on a layout that's sometimes called *five boxes*: one large box that serves as your introduction followed by four smaller boxes that you populate with your portfolio images.

Figure 20.1 shows the layout of a page with the following six sections:

- A page header that includes a logo, a page title, and a few links to other page sections
- A short introduction to the portfolio
- The portfolio with four examples of my work
- A section that tells the page visitor about me and my work
- A section that enables the reader to contact me
- A page footer with a copyright notice and links to social media

The first task on your portfolio to-do list is to choose the typeface or typefaces you want to use for your page.



► **Figure 20.1**

Before you start slinging HTML and CSS, draw up a quick sketch of the page layout and content.

Choosing Typefaces

Although the portfolio itself consists of images, your portfolio page contains a decent amount of text, including headings and *body text*—the large blocks of nonheading text that comprises the bulk of your portfolio's words. Because a good chunk of your audience will be reading your page on the screens of laptops, tablets, and smartphones, it's important to take a bit of time up front to choose typefaces that will be legible and readable on these smaller screens.



Project: Creating a Portfolio Page

MASTER

Notice that letters such as a and e have both a counter and an aperture, meaning that a larger counter implies a smaller aperture, and vice versa. To ensure these common characters render well onscreen, look for an x-height that's more than half the font size.

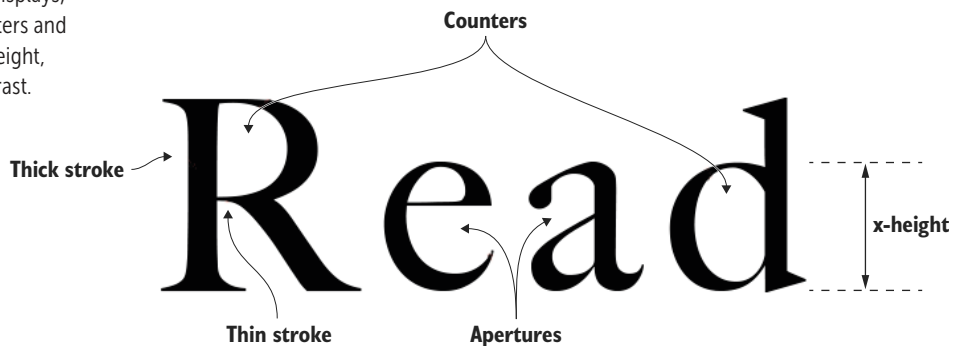
You can visit Google Fonts (<https://fonts.google.com>), view a typeface, type some text, and then eyeball the result to see how good it looks and how easy it is to read. But if you want to be a bit more methodical, certain criteria are common to typefaces that render well on small screens. Here are four things to look for when you're auditioning type on Google Fonts (or whichever font provider you use), each of which is demonstrated in Figure 20.2:

- **Large counters**—A *counter* is the enclosed negative space inside letters such as *A*, *R*, *d*, and *g*. A large counter enhances character legibility.
- **Large apertures**—An *aperture* is the partially enclosed negative space inside letters such as *C*, *S*, *a*, and *e*. A large aperture also enhances legibility.
- **Medium to large x-height**—The *x-height* is the distance from the baseline to the top of lowercase letters such as *x* and *o*, or to the top of the bowl in letters that have ascenders (such as *d* and *h*) or descenders (such as *g* and *y*). A decent x-height (say, half the font size or more) usually leads to large counters and apertures.
- **Low to medium stroke contrast**—Extremely thin strokes can get lost on a small screen, making text difficult to read. Look for typefaces that have a minimal difference between the thinnest and thickest strokes.

You could build your page with a single typeface, but mixing two typefaces—one for headings and the other for body text—adds dynamism and contrast to the page. My preferred use is a sans-serif typeface for headings and a serif typeface for body text, but I'm going to reverse these preferences for my version of the project. For your own portfolio page, feel free to use two serif or two sans-serif fonts. The only criterion to look for is that the two typefaces work in harmony, which means that they have similar legibility characteristics: counters, apertures, x-height, and stroke contrast. Finally, make sure that each typeface you choose comes with the fonts you require, which, at a minimum, usually means regular, italic, and bold fonts.

► **Figure 20.2**

When deciding on a typeface that will render well even on small displays, look for larger counters and apertures, good x-height, and low stroke contrast.





Google Fonts offers hundreds of typefaces and dozens that work well on even the smallest screens. How do you choose? It's certainly fun to play around on the site, but if you prefer a starting point, table 20.1 lists a half-dozen body and heading typeface pairings that work well (and an alternative sans-serif font for body text).

► **Table 20.1** Recommended Google Fonts pairings for headings and body text

Headings	Body	Body (Alternative)
Playfair Display	Open Sans	Raleway
Merriweather	Fira Sans	Merriweather Sans
Source Serif Pro	Source Sans Pro	Lato
Domine	Roboto	Open Sans
Lora	Varela Round	Lato
Roboto Slab	Roboto	Raleway

For this project's headings, I'm going to use one of my favorite text typefaces: Playfair Display. This is a gorgeous font that offers nice, big counters and a generous x-height. It has a high stroke contrast, but that shouldn't be much of a problem for the larger heading sizes I'll be using. Playfair Display comes in six fonts, so it has a style for every occasion. For the body text, I'm going to use Open Sans, one of the most popular sans serifs on the web. It's a sturdy typeface that features large counters and x-height, as well as minimal stroke contrast. A less-popular but still excellent alternative is Merriweather Sans, the sans-serif companion to Merriweather.

To use Google Fonts to link to Playfair Display's bold and bold italic fonts, and to Open Sans's regular, italic, and bold fonts, I'll use the following `<link>` tags:

```
<link rel="preconnect" href="https://fonts.googleapis.com">
<link rel="preconnect" href="https://fonts.gstatic.com"
crossorigin>
<link href="https://fonts.googleapis.com/css2?family=
Open+Sans:ital,wght@0,400;0,700;1,400&family=Playfair+Display:
ital,wght@0,700;1,700&display=swap" rel="stylesheet">
```

In my CSS, I'll use the following declarations to specify these families:

```
font-family: "Playfair Display", Georgia, serif;
font-family: "Open Sans", Verdana, sans-serif;
```

With the page layout in place and your typefaces chosen, your next job is to pick out a color scheme.

Choosing a Color Scheme

The colors you choose depend on the type of portfolio you're highlighting and the overall image you want to project. The example I'm going to use is for a book restoration and repair service (which is, alas, hypothetical). I want to use colors that exude warmth (because people who love old books enough to want them restored tend to be warm, gentle folk) and security (because

REMEMBER

Although it's unlikely that Google would fail to deliver your linked fonts, there could be a lag before the fonts show up. To ensure the browser doesn't display the default serif or sans serif while it waits, add a system font to your stack. Georgia (for serifs) and Verdana (for sans serifs) are installed on almost all new computers.

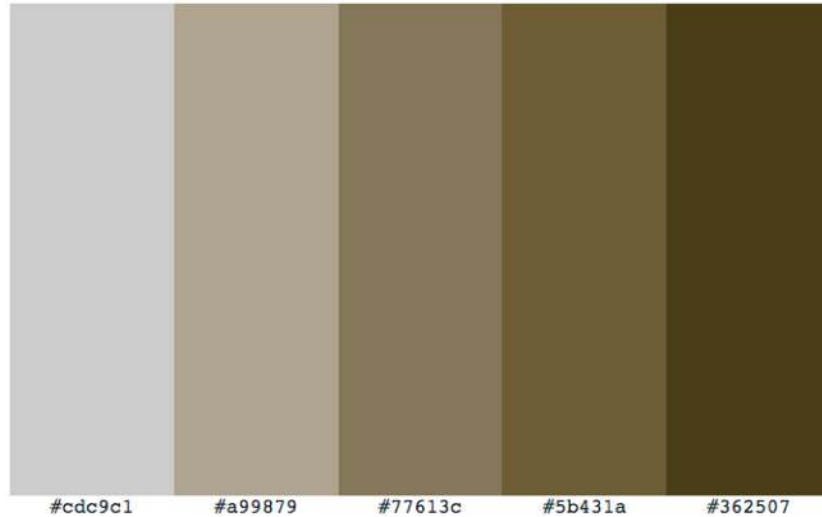


Project: Creating a Portfolio Page

those same people don't want to give their precious books to just anyone). Rich brown colors can set both emotional tones quite effectively. Using the Web Design Playground's Color Scheme Calculator (see wdpg.io/2/colorcalc), I chose a monochrome color scheme based on the color value #77613c, as shown in Figure 20.3.

► **Figure 20.3**

A monochrome color scheme based on the hex color value #77613c



With the page layout in place and your typefaces and colors chosen, it's time to translate this rough sketch into precise HTML and CSS code.

Building the Page

To build out your portfolio page, start with the skeleton code that I introduced you to in Chapter 2. From there, go section by section, adding text, tags, and properties.

The Initial Structure

To start, take the basic page structure from Chapter 2, and add the portfolio layout, using the HTML5 semantic page layout tags:

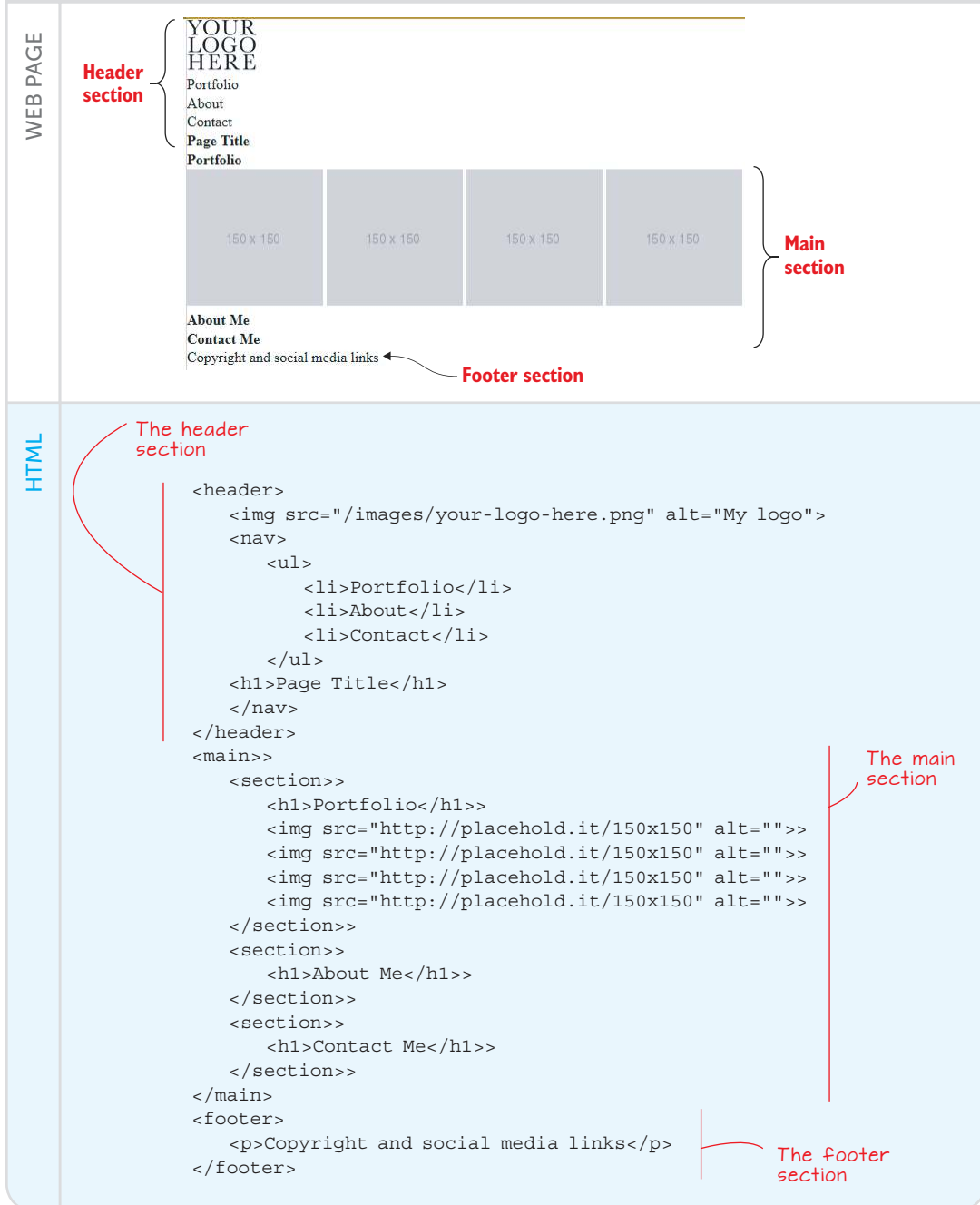
- The page header section uses the `header` element, and it consists of three items: an `img` element for the site logo, a navigation area that uses the `nav` element and consists of an unordered list of links to other items on the page, and an `h1` element for the page title.
- The main section uses the `main` element, and it consists of several `section` elements, each of which is a container for a different section of the page.
- The page footer section uses the `footer` element, and it consists of a copyright notice and links to several social media sites.



► Try This

➡ Online: wdpg.io/projects/portfolio-page/1

Here are the elements that make up the portfolio page's initial HTML structure.





Project: Creating a Portfolio Page

REMEMBER

The initial page layout also includes a CSS reset that, among other tasks, sets the margin and padding to 0 and the font size to 100%.

The portfolio page is about as bare-bones as pages come right now, but it won't stay that way for long. I'll turn now to structuring the page's overall layout.

The Overall Layout

As you might imagine, putting together a layout nicknamed five boxes simply cries out for a Flexbox-based structure, and that's what you'll add here. However, you want the content to be centered in the middle of the browser window, and that's best done using CSS Grid. Here's the overall structure you're shooting for:

- The initial grid container will be the body element. By configuring this element with `grid-template-columns: 1fr auto 1fr`, you create three columns, where the middle column automatically sizes to the content, and the left and right columns take up the remaining space equally, which centers the middle column.
- For the content itself, nest a `div` element inside the `body` element, and set `gridcolumn: 2` to place the `div` in the middle of your grid layout. The `div` is also a Flexbox container with `flex-direction: column` and `justify-content: flex-start`, which gives you a single-column container with the content aligned with the top of the container.

The following example shows you how to set everything up.

► Try This

➡ Online: wdpg.io/2/projects/portfolio-page/2

This example shows you how to configure the `body` element as a grid container and a nested `div` as a Flexbox container for the page content.

CSS

```
body {
  display: grid;
  grid-template-columns: 1fr auto 1fr;
  min-height: 100vh;
  margin-top: 1rem;
  font-family: "Open Sans", Verdana, sans-serif; >
  background-color: #cdc9c1; >
  background-image: radial-gradient(circle farthest-side at
    center top, hsl(0, 0%, 100%) 0%, #cdc9c1 100%); >
  color: #362507;
}
.container {
  grid-column: 2;
  display: flex;
  flex-direction: column;
  justify-content: flex-start;
  max-width: 60rem;
}
```

Sets up the main grid container

Applies a font stack and the background and text colors.

Sets up the nested Flexbox container for the content

Sets a maximum width for the content



HTML

```
<body>
  <div class="container">
    </div>
  </body>
```

With the overall grid layout in place, you're ready to start coding the individual sections of the portfolio page. First up is the header section.

The Header Section

The header section consists of a header element that contains three items: an `img` element for the page logo, a `nav` element for the navigation links, and an `h1` element for the page title. I also want the header to have the following features:

- The page logo should be aligned with the left side of the content container, and the navigation and title should be aligned with the right side of the content container.
- All the header content should be centered vertically within the header.

The easiest method is to use Flexbox, so configure the header element as a Flexbox container with a horizontal main axis and `align-items` set to center. For horizontal alignments, separate the header into left and right sections by using `div` elements. The following example shows the HTML and CSS that I used to accomplish these goals and to style the rest of the header layout.

► Try This

➡ Online: wdpg.io/2/projects/portfolio-page/3

This example adds the HTML code for the header and the CSS for the header structure.

WEB PAGE

*continued*



Project: Creating a Portfolio Page

CSS

```
header {
  display: flex;
  justify-content: center;
  align-items: center;
  padding: .5rem 0;
}
.header-left {
  flex: 1 0 33%;
  text-align: left;
}
.header-right {
  flex: 2 0 67%;
  display: flex;
  flex-wrap: wrap;
  justify-content: flex-end;
}
```

The header is a Flexbox container.

The left header gets one-third of the width, the right gets two-thirds.

The right header is a Flexbox container.

HTML

```
<header>
  <div class="header-left">
    
  </div>
  <div class="header-right">
    <nav>
      <ul>
        <li><a href="#portfolio" class="btn">Portfolio</a></li>
        <li><a href="#about" class="btn">About</a></li>
        <li><a href="#contact" class="btn">Contact</a></li>
      </ul>
    </nav>
    <h1>This Old Book</h1>
  </div>
</header>
```

The left side of the header

The right side of the header

With the header structure set up, you can tend to the styling of the header elements. The logo is fine as is, but you need to turn the navigation links into proper buttons and style the page title. The following example shows the HTML and CSS that I used.



► Try This

➡ Online: wdpg.io/2/projects/portfolio-page/4
This example styles the header elements.

WEB PAGE



PORTFOLIO

ABOUT

CONTACT

This Old Book

CSS

```
h1 {
  padding-top: 1rem;
}
.btn {
  background-color: #362507;
  padding: .25rem .75rem;
  border-radius: .75rem;
  font-size: 1rem;
  color: #cdc9c1;
  text-transform: uppercase;
}
nav ul {
  display: flex;
  list-style-type: none;
}
nav li {
  padding-left: 1rem;
}
a {
  text-decoration: none;
}
a:hover {
  color: #362507;
  background-color: #cdc9c1;
}
h1 {
  font-size: 4rem;
  font-weight: bold;
  font-family: "Playfair Display", Georgia, serif;
}
```

The h1 element is given some padding.

This class turns the navigation items into proper buttons.

This CSS styles the list of navigation items.

This CSS styles the links (regular and hover).

This CSS styles the page title.



Project: Creating a Portfolio Page

MASTER

The `border-radius` property rounds the corners of an element. You can specify a measurement value (the higher the value, the more the corners are rounded), or you can enter a percentage (a value of 50% rounds the borders into a circle, for example).

Of special note here is the `btn` class, which you saw earlier applied to the `<a>` tags in the nav section. Each `a` element is a bulleted-list item, and the purpose of the `btn` class is to turn the content of each `li` element (the link text) into a proper button. The `btn` class does the following:

- Adds a background color
- Adds padding around the text
- Uses the `border-radius` property to round the corners
- Sets the font size and color, and converts the text to uppercase

After the header portion of the page is done, your next task is to add the introduction to the portfolio, which I cover in the next section.

The Portfolio Introduction

The portfolio introduction serves to bring the reader to your page by offering a quick overview of what you do creatively. It should have a title and perhaps a subtitle, a short paragraph, and another link to your Contact section.

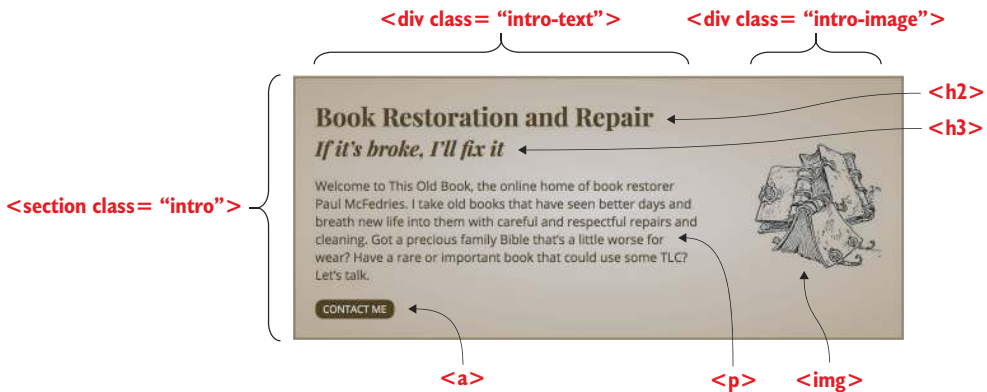
In the following example, I've styled my page introduction with dark brown text (#362507), an `h2` title, an `h3` subtitle, a clickable button, and a related image for visual interest. To keep everything nice and neat, I set up the introduction (using a class named `intro`) as a Flexbox container.

► Try This

➡ Online: wdpg.io/projects/2/portfolio-page/5

This example adds the introduction to the portfolio page.

WEB PAGE





CSS

The CSS for the
intro class

```
.intro {
  display: flex;
  align-items: center;
  margin: 2rem 0;
  border: 3px solid #77613c;
  color: #362507;
  font-size: 1.25rem;
  background-color: #a99879;
  background-image: radial-gradient(ellipse closest-corner at
center, #cdc9c1 0%, #a99879 100%);
}
.intro-text {
  flex: 2 0 67%;
  padding: 2rem 0 2rem 2rem;
}
.intro-text p {
  margin: 1.5rem 0;
}
.intro-image {
  flex: 1 0 33%;
  padding-right: 2rem;
  text-align: right;
}
h2 {
  font-size: 2.5rem;
}
h3 {
  font-size: 2rem;
  font-style: italic;
}
h2, h3 {
  font-family: "Playfair Display", Georgia, serif;
}
```

The CSS for the
intro-text class

The CSS for the
intro-image class

The CSS
for the
headings

continued



Project: Creating a Portfolio Page

HTML

```
<main>
  <section class="intro">
    <div class="intro-text">
      <h2>Book Restoration and Repair</h2>
      <h3>If it's broke, I'll fix it</h3>
      <p>Welcome to This Old Book, the online home of book
restorer Paul McFedries. I take old books that have seen better
days and breath new life into them with careful and respectful
repairs and cleaning. Got a precious family Bible that's a little
worse for wear? Have a rare or important book that could use some
TLC? Let's talk.
      </p>
      <div>
        <a href="#contact" class="btn">Contact Me</a>
      </div>
    </div>
    <div class="intro-image">
      
    </div>
  </section>
</main>
```

The header and introduction serve to invite the reader into the page. With that accomplished, your next task is a crucial one for this project: adding the portfolio itself. I show you how that's done in the next section.

The Portfolio

Next is the real meat of the page, which is the portfolio itself—a series of images that show off your work. When deciding how much to show, you have three choices:

- ***Show all your work.*** This option is the way to go if your portfolio is small. If you have a big portfolio, you can show it, but it may be better to show just a subset and then link to a second page that shows everything.
- ***Show your most recent work.*** This option is a good one if you think that your newest stuff is particularly good, if your style has changed recently, or if you've landed some high-profile clients.
- ***Show your best work.*** This route is the one to take if you want to really show people what you can do.

A typical portfolio has one to three rows, with two to four images per row. You'll want to precede the portfolio with a heading and perhaps a sentence or two as a lead-in. The portfolio itself should be configured as a Flexbox container to make everything look tidy. The following example shows how I did all of this on my portfolio page.



► Try This

➡ Online: wdpg.io/2/projects/portfolio-page/6
This example adds the portfolio to the page.

WEB PAGE



CSS

```
.portfolio {
  margin-bottom: 1rem;
}
.portfolio-text p {
  margin: .5rem 0 1.5rem;
  font-size: 1.25rem;
}
.portfolio-images {
  display: flex;
  justify-content: space-between;
}
.portfolio-image {
  position: relative;
  cursor: pointer;
  margin-bottom: 1rem;
}
```

The portfolio images are housed in a Flexbox container.

continued



Project: Creating a Portfolio Page

HTML

The portfolio text container is a div element with class portfolio-text.

The portfolio container is a section element with class and id portfolio.

```
<section class="portfolio" id="portfolio">
  <div class="portfolio-text">
    <h2>Some Recent Work</h2>
    <p>Here are some of my recent restoration projects. The
    images you see below are the "before" versions of each book. To
    see an "after" version, move your mouse over an image (or tap
    it).</p>
  </div>
  <div class="portfolio-images">
    <div class="portfolio-image">
      
      
    </div>
    <div class="portfolio-image">
      
      
    </div>
    <div class="portfolio-image">
      
      
    </div>
    <div class="portfolio-image">
      
      
    </div>
  </div>
</section>
```

The portfolio images container is a div element with class portfolio-images.

The portfolio content resides in a section tag to which I've assigned the portfolio class. Note, too, that I assigned the ID portfolio, which sets up this section element as a target for the header's Portfolio navigation link you saw earlier.

The portfolio text resides in a div with class portfolio-text. It consists of an h2 heading and a p element for the lead-in sentence.



The portfolio images reside in a div with class `portfolio-images`. It consists of several div elements (with class `portfolio-image`). For most portfolios, you need only include an `img` element within each of these div elements. In my project, however, I wanted to present before and after images, with the latter appearing when the user hovers the mouse over an image (or taps an image on a portable device). To do that, I added a second `img` element with class `image-overlay`. Here's the CSS for that class:

```
.image-overlay {  
  position: absolute;  
  left: 0;  
  top: 0;  
  width: 200px;  
  height: 156px;  
  z-index: 1;  
  opacity: 0;  
  transition: opacity 1.5s ease;  
}  
.image-overlay:hover {  
  opacity: 1;  
}
```

The overlay uses the same dimensions as the before image, and it's positioned absolutely at the top-left corner of the div element with class `portfolio-image` (which uses relative positioning to set a positioning context for the after image). The overlay is given a `z-index` value of 1 to make sure it appears on top of the before image, and it's given an `opacity` value of 0 to prevent it from appearing when the page first loads. Then, the hover event changes the `opacity` value to 1 to make the image appear. The `transition` property in the `image-overlay` class animates the appearance of the overlay.

The About Section

The next element of the portfolio page is the About section, which you can use to toot your own horn in whatever way you feel comfortable. You can talk up your education, your work experience, your appointments, your awards, and so on. Use whatever works to supply your portfolio with the bona fides required to persuade potential clients, employers, or sponsors that you have the creative chops they're looking for.

The About section is simple: a heading followed by a paragraph of self-aggrandizing text. The following shows an example.

USE IT

The idea of having before and after images in your portfolio is useful for many creative pursuits, including furniture repair, art restoration, fitness training, hair styling, and interior decoration.



Project: Creating a Portfolio Page

► Try This

➞ Online: wdpg.io/2/projects/portfolio-page/7

This example adds the About section to the portfolio page.

WEB PAGE	<div><div><div><div><div><h2>About Me</h2><p>Paul McFedries is a book conservator, bookbinder, and an expert in the history and conservation of Gothic and Art Deco bookbindings. He is a graduate of the Canadian Bookbinding and Book Arts Guild, and apprenticed with some of the top North American and European book restorers, including Don Palmer, Rose Eldridge, and Betsy Taylor-Newlove. Paul was formerly president of the Gothic Book Workers Guild and is currently executive director of the Historical Art Deco Bookbinding Society. Working with both institutional and private clients, he has restored hundreds of books over the years.</p></div></div></div></div></div>
CSS	<pre>.about { margin-bottom: 1rem; } .about-text p { margin: .5rem 0 1.5rem; font-size: 1.25rem; }</pre> <p>The CSS for the About section</p>
HTML	<p>The About text container is a div element with class about-text.</p> <p>The About container is a section element with the about class and the about id</p> <pre><section class="about" id="about"> <div class="about-text"> <h2>About Me</h2> <p>Paul McFedries is a book conservator, bookbinder, and an expert in the history and conservation of Gothic and Art Deco bookbindings. He is a graduate of the Canadian Bookbinding and Book Arts Guild, and apprenticed with some of the top North American and European book restorers, including Don Palmer, Rose Eldridge, and Betsy Taylor-Newlove. Paul was formerly president of the Gothic Book Workers Guild and is currently executive director of the Historical Art Deco Bookbinding Society. Working with both institutional and private clients, he has restored hundreds of books over the years. </p> </div> </section></pre>



The About content uses a `section` element with the `about` class. I also assigned the `id` `about`, which sets up this element as a target for the About navigation link in the header. You're almost done! Next up is the crucial Contact section.

The Contact Section

The final element of the main section of the portfolio page is the all-important Contact section, which is where you give interested visitors one or more ways to get in touch with you. At minimum, you should supply an email address, but you'll almost always want to include one or more links to your social networking profiles.

The Contact section is straightforward: a heading, a lead-in paragraph, and your email address and social network links. The following shows an example.

FAQ

Can I have people contact me using a form? A form is a great way to get a message, but it's not ideal for most new web designers because it requires a script to process the form data. However, some services on the web not only enable you to build a form but also process the data for you. Check out TypeForm (www.typeform.com) and Wufoo (www.wufoo.com).

► Try This

➡ Online: wdpg.io/2/projects/portfolio-page/8

This example adds the Contact section to the portfolio page.

WEB PAGE	
CSS	<pre> .contact { margin-bottom: 1rem; } .contact-text p { margin: .5rem 0 1.5rem; font-size: 1.25rem; } .contact-social-links a { margin-right: 1.5em; } </pre> <p>The CSS for the Contact section</p> <p style="text-align: right;">continued</p>



Project: Creating a Portfolio Page

HTML

The Contact text container is a div element with class contact-text.

The Contact container is a section element with class and id contact.

```
<section class="contact" id="contact">
  <div class="contact-text">
    <h2>Contact Me</h2>
    <p>If you want to know more about my work, or if you want to
discuss a project, please get in touch:</p>
    <p><i>paul at thisoldbook dot com</i></p>
    <p>Alternatively, click an icon below to reach out using
your favorite social network:</p>
  </div>
  <div class="contact-social-links">
    <a href="#" class="contact-social-link"></a>
    <a href="#" class="contact-social-link"></a>
    <a href="#" class="contact-social-link"></a>
  </div>
</section>
```

The Contact social media container is a div element with class contact-social-links.

REMEMBER

When you add your email address to the Contact section, make sure that you don't display the address in plain text so that the address isn't harvested by spammers. Instead, obfuscate the address in a way that fools the spammers' bots but is still straightforward for a human to decode.

The Contact content uses a section tag with the contact class and an id value set to contact, which enables this element to act as an anchor for the Contact button in the header and the Contact Me button in the portfolio introduction.

Your portfolio page is so close to being complete! All that remains now is to add the page footer, which I discuss in the next section.

The Page Footer

The final element of the portfolio page is the page footer. As you can see in the following example, I used the footer to display a copyright notice and some links to other sections of the site.



► Try This

➡ Online: wdpg.io/projects/2/portfolio-page/9

This example adds the footer to the portfolio page.

WEB PAGE	
CSS	<pre> footer { display: flex; padding: 1em 0; border-top: 1px solid #a99879; } .footer-copyright { flex: 1 0 50%; text-align: left; font-style: italic; font-size: 1.25em; } .footer-links { flex: 1 0 50%; text-align: right; font-size: 1.25em; } .footer-links a { color: #362507; margin-left: 1em; } </pre> <p>The footer is set up as a Flexbox container.</p>
HTML	<pre> <footer> <div class="footer-copyright"> Copyright 2023 This Old Book </div> <div class="footer-links"> Home FAQ Site Map Privacy </div> </footer> </pre> <p>The footer copyright notice is a div element with class footer-copyright.</p> <p>The footer site links container is a div element with class footer-links.</p>



Project: Creating a Portfolio Page

BEWARE

When adding a copyright notice, don't add both the word Copyright and the copyright symbol (©) because this is redundant. Use one or the other, but not both.

► Figure 20.4

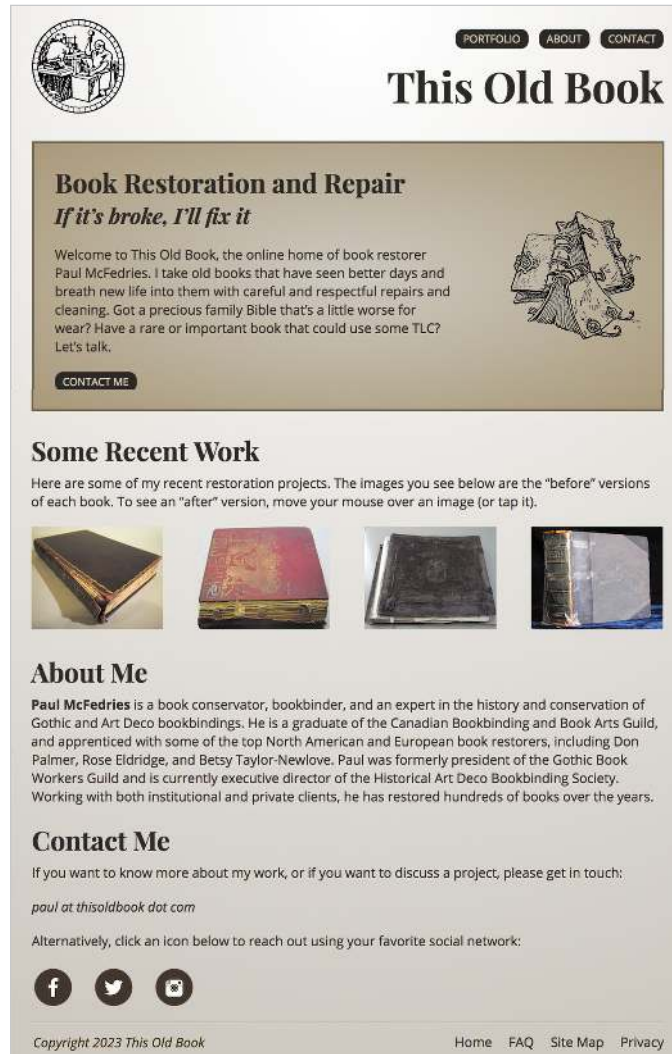
A portfolio page, ready for the web

The footer content uses a footer element that's configured as a Flexbox container. The copyright notice (with class footer-copyright) is a Flexbox item aligned to the left, and the set of site links (with class footer-links) is a Flexbox item aligned to the right.

Congratulations! You've built yourself a fine portfolio page. In the next section, I suggest a few ways you can improve upon the project, if you feel like doing some homework.

From Here

The final version of the portfolio page (mine is shown in Figure 20.4) offers a solid start for getting the word out about your creative work.





The biggest thing missing from the portfolio page is responsiveness. The page looks good in desktop web browsers and even on some tablets in landscape mode, but the design breaks on smaller screens. I'll leave to you the exercise of adding media query breakpoints (see Chapter 14) that help the page look good all the way down to a smartphone.

This is the last chapter of the book, but that doesn't mean it's the last chapter of your web-design education—far from it. Be sure to pay a visit to the Web Design Playground (<https://webdesignplayground.io/2>) for lots of examples, exercises, and tutorials that will help you sharpen your skills and expand your knowledge. See you there!

Summary

- Sketch out the page you want to build.
- Choose the typefaces for the headings and body text.
- Choose a color scheme.
- Build the initial page structure: the bare-bones HTML tags and the global CSS properties applied to the `body` element.
- Set up your main Flexbox containers.
- Fill in and style each section one by one: the header, the portfolio introduction, the portfolio itself, the About section, the Contact section, and the footer.



From Playground to Web: Getting Your Pages Online

You've covered much ground in this book, and no doubt worked your fingers to the bone applying the electronic equivalent of spit and polish to buff your website's pages to an impressive sheen. But you need to perform a couple of related tasks before you can cross "Make website" off your to-do list: find a web home for your site, and move your website files to that new home. This appendix helps take care of both tasks. You first learn how to look for and choose a spot on the web where friends, family, and even total strangers from far-flung corners of the world can eyeball your creation. Then you learn how to emigrate your web pages from their native land (the Web Design Playground or your hard disk) to the New World (the web). You'll learn how to best prepare your pages for the journey, select a mode of transportation, and settle the pages in when they've arrived.



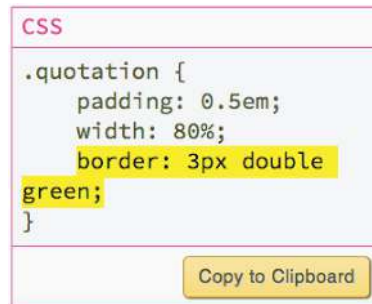
From There to Here: Saving Your Playground Work

If you've been using the Web Design Playground to try some experiments and even build a few sandboxes (the name I use to describe projects on the Playground), the next step is getting your code from the Playground to your computer. You have two ways to go about this: copying code and downloading code. To begin, I'll show you how to copy code from the Playground.

Copying Playground Code

The Web Design Playground is chock full of HTML and CSS code: it's in the lesson pages, it's in the HTML Editor, and it's in the CSS Editor. One way of getting code to your computer is to copy it from one of these Playground locations. When you've done that, you can paste the code into an existing file using your favorite text editor. The Web Design Playground offers three ways to copy code:

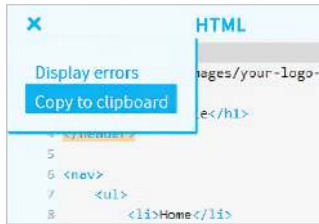
- *In a lesson*—When a lesson page offers an HTML or CSS code snippet, you see a Copy to Clipboard button below the code, as shown in Figure A.1. Click that button to copy the code to your computer's clipboard (the memory area used to store the most recently copied or cut data).



► **Figure A.1**

To copy code from an HTML or CSS snippet in a Playground lesson, click the Copy to Clipboard button.

- *In the HTML Editor*—The HTML Editor contains the current lesson's HTML code, existing HTML code that you've modified, or custom HTML code that you've added to a sandbox. Whatever the source, you can grab the HTML code by clicking the menu icon in the top-left corner of the HTML Editor and then clicking Copy to Clipboard, as shown in Figure A.2. This step copies the full HTML code to your computer's clipboard.



► **Figure A.2**

To copy code from the HTML Editor, click the editor's menu icon, and then click Copy to Clipboard.

- *In the CSS Editor*—The CSS Editor contains the current lesson's CSS code, existing CSS code that you've modified, or custom CSS code that you've added to a sandbox. To place that CSS code in your computer's memory, click the menu icon in the top-left corner of the CSS Editor, and then click Copy to Clipboard, as shown in Figure A.3. This step copies the full CSS code to your computer's clipboard.



► **Figure A.3**

To copy code from the CSS Editor, click the editor's menu icon, and then click Copy to Clipboard.

When you've run the Copy to Clipboard command, open your HTML or CSS file in a text editor, position the insertion point where you want the copied code to appear, and then run the text editor's command for pasting clipboard data. In the vast majority of editors, you do this by choosing Edit > Paste or by pressing Ctrl-V (Windows) or Cmd-V (Mac).

Downloading Playground Code

Rather than copy and paste bits of HTML or CSS code, you may prefer to get the entire contents of both the HTML and CSS Editors. This is the way to go if you want all the code from a particular lesson, or if you've created a sandbox and have been populating it with custom HTML and CSS code.

Here are the steps to follow:

- 1 In the Web Design Playground, open the lesson that has the code you want, or create a sandbox with your custom code.
- 2 Choose Menu > Download Code.

The Playground gathers the code into a zip archive file and tells your web browser to download the file.



- 3 Locate the downloaded file, which is named `webdesign.zip`.
- 4 Double-click the `webdesign.zip` archive to open it.
In the folder that appears, you see two files:
 - `index.html`—This file contains a basic HTML page structure with the contents of the HTML Editor inserted between the `<body>` and `</body>` tags. It also includes a link element in the `<head>` section that references the `styles.css` file.
 - `styles.css`—This file contains the contents of the CSS Editor.
- 5 Copy or move these files to the folder where you store the rest of your web page files (such as the page image files).

Now that you have your Playground code safely stashed on your Mac or PC, you're about ready to get that code onto the web. Before you can do that, however, you need to perform a few more chores to get your files web ready. First on this to-do list is setting up your web page folders on your computer.

Selecting a Text Editor

You can use the Web Design Playground to experiment and play with HTML and CSS, but when it's time to get serious about your code, you'll want to edit it on your computer. To do that, you need a text editor, preferably one that was designed with web coding in mind. A good web code editor comes with features such as syntax highlighting (which color-codes certain syntax elements for easier reading), line numbers, code completion (when you start typing something, the editor displays a list of possible code items that complete your typing), and text processing (such as automatic indentation of code blocks, converting tabs to spaces and vice versa, shifting chunks of code right or left, removing unneeded spaces at the ends of lines, and hiding blocks of code). Here, in alphabetical order, are a few editors that offer all of these features (and usually quite a few more):

- *Notepad++*—Available for Windows only. Free!
<https://notepad-plus-plus.org>
- *Nova*—Available for Mac for \$99, but a free trial is available.
<https://nova.app>
- *Sublime Text*—Available for both Windows and Mac for \$99, but a free trial is available. www.sublimetext.com
- *Visual Studio Code*—Available for Windows and Mac. Yep, this one is free, as well. <https://code.visualstudio.com/>



Setting Up Your Folders

When you sign up for a home to store your web page files (see "Getting a Web Host" later in this appendix), you're given your own folder to store files on the server. That folder is called your website's *root* folder. The question you need to ask yourself now is a simple one: Do I need to create one or more subfolders within the root folder?

I use the word *apparently* here because it's not always clear whether you need subfolders. Examine the possible scenarios:

- *One web project consisting of a single file*—The simplest possible web project consists of a single HTML file. That file contains only text, HTML tags, CSS styles inserted inline or in an internal style sheet (that is, between the `<style>` and `</style>` tags), and media (such as images) that use remote references (that is, references to files that reside on other websites). In this case, you can store that file in the root folder, and you don't need any subfolders.
- *One web project consisting of a small number of files*—Most simple or beginning web projects consist of a few files: an HTML file, a CSS file, and one or more image files. In this case, it's almost certainly overkill to use subfolders, so you should store all the files in the root folder.
- *One web project consisting of many files*—It's not unusual for a large project to have multiple HTML files, several CSS files, and lots of media files, particularly images. In this scenario, it's fine to place all your HTML files in the root folder, but to keep things organized, you should create separate subfolders for each of the other types of files: CSS, images, and so on.
- *Multiple web projects*—If you get into web design even a little, you'll find that you can't create only one project. Multiple projects are the norm, and in this case, you should keep the projects separate by storing each one in its own subfolder. If a particular project is large, you'll want to create sub-subfolders to store the project's various file types (CSS, images, media, and so on).

Why worry about all this now? You'll make your web design life immeasurably easier and more efficient if you set up your computer's local folder structure to mirror what you want to set up remotely after you sign up with a web host:

- 1 Begin by designating a local folder as the main storage area for your web files.

This folder will be the local equivalent of your root folder on the web host.



- 2 If you'll be working on multiple web projects, set up a subfolder for each project.
- 3 If a project is large enough to require subfolders for certain file types, create these subfolders within the project folder.
- 4 When you download files from the Playground (as described in the preceding section), or when you create your own HTML, CSS, or image files and save them for the first time, be sure to store them in the appropriate folder.

With all that done, your next task is making sure that your code passes muster by getting it validated.

Validating Your Code

You've seen in this book that although HTML tags and CSS properties aren't complex, they can be finicky. If you forget a closing tag or brace, leave out a quotation mark or comma, or spell a tag or property name incorrectly, there's a good chance that your web page won't render properly. In some cases, the error is a glaring one (such as the page's failing to show anything), but all too often, the error is subtle and hard to notice.

Either way, you don't want to foist an error-filled page on the web public, so besides going over your HTML and CSS code with a careful eye, you can get some help online by submitting your code to one of the available validation services.

REMEMBER

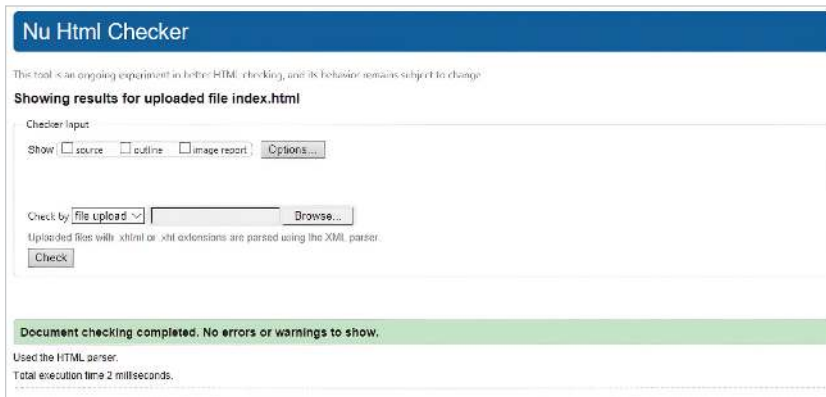
Another way to run the validation is to copy your HTML code from your text editor, select the Validate by Direct Input tab, paste your HTML code into the text box, and then click Check.

Validating HTML

The World Wide Web Consortium (W3C) hosts a Markup Validation Service that can examine your HTML code and let you know whether it contains any errors or warnings. Here's how you use it:

- 1 Use a web browser to surf to <https://validator.w3.org>.
- 2 Click the Validate by File Upload tab.
- 3 Click Browse.
The site prompts you to select the file you want to validate.
- 4 Locate and select the HTML file you want to check, and click Open.
The site uploads the file.
- 5 Click Check.
The Markup Validation Service checks the HTML code and displays the results.

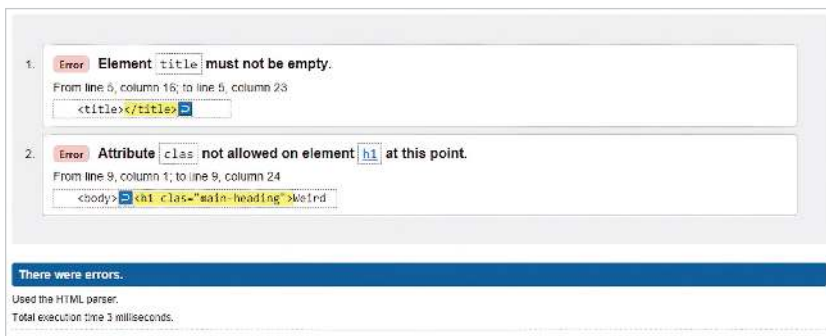
Ideally, you'll see the No errors or warnings to show. message, as shown in Figure A.4.



► Figure A.4

HTML validation bliss: **No errors or warnings to show.**

If your HTML file didn't validate, however, you'll see one or more error or warning messages, as shown in Figure A.5.



► Figure A.5

HTML validation misery: **There were errors.**

Validating CSS

The W3C also offers the CSS Validation Service, which can peruse your CSS code and alert you to any errors or warnings. Here's how to use it:

- 1 Use a web browser to surf to <https://jigsaw.w3.org/css-validator>.
- 2 Click the By File Upload tab.
- 3 Click Browse (Windows) or Choose File (Mac).
The site prompts you to select the file you want to validate.
- 4 Locate and select the CSS file you want to check; then click Open.
The site uploads the file.
- 5 Click Check.
The CSS Validation Service checks the CSS code and displays the results.

Ideally, you'll see the No Error Found message, shown in Figure A.6.

REMEMBER

An alternative CSS validation method is to copy your CSS code from your text editor, select the By Direct Input tab, paste your CSS code into the text box, and then click Check.



► **Figure A.6**

CSS validation joy:
Congratulations!
No Error Found.



If your CSS file contains invalid data, however, the service returns one or more errors or warnings, as shown in Figure A.7.

► **Figure A.7**

CSS validation sorrow:
Sorry! We found
the following
errors.



When you've fixed all the errors in your code, your HTML and CSS files are ready for web prime time. First, though, you need to secure a place to put those files. You need, in short, to find a web host.

Getting a Web Host

Back in Chapter 1, you learned that a web page is stored on a special computer called a *web server*, which accepts and responds to web browser requests for the page and its associated files. Before anyone else can view your web project, you need to get its files on a web server. To do that, you need to sign up with a service that offers space on its server. Because the service in effect plays host to your files, such a service is called a *web hosting provider*, or *web host*.

When you evaluate a web host, what criteria should you use? The answer depends on the type of website you want to set up, but the following criteria are the most common:

- **Maximum bandwidth**—The maximum amount of your data per month that the host will transfer to web browsers. In most cases, you pay extra for data that exceeds your monthly maximum. Some web hosts offer unlimited bandwidth.
- **Total disk space**—The amount of hard disk storage space you get on the web server. At a minimum, total disk space usually is a few hundred megabytes, which is more than enough for a simple site.



- *Number of websites*—The number of root folders you can set up.
- *Number of email addresses*—The number of email addresses that are included with the hosting service.
- *Domain name hosting*—Whether the web host also hosts domain names that you've previously purchased from a domain name registrar. Some hosts sell domain names, and others offer free subdomain names of the form *yourdomain.webhostdomain.com*.
- *FTP support*—Support for the File Transfer Protocol (FTP), which is the internet service you use to transfer your files to the web host. Almost all web hosts support FTP, but some offer only proprietary file transfer services.

As a rule, the cheaper the web host, the fewer of these features you get. Before you start looking for a web host, make a list of these features and decide what you need and what's optional. That might be difficult right now for something like maximum bandwidth because bandwidth is determined in part by how popular your site becomes, but make your best stabs at each one for now. When you're looking for a web host, you have three main choices:

- *Your internet service provider (ISP)*—The company or institution you use to access the internet may also offer a web hosting service. Many ISPs offer free web hosting for simple personal websites, and some organization networks include a web server that you can use. In most cases, the hosting includes features such as bandwidth and disk space at the lower end of the scale.
- *Free web hosting provider*—Many services will host your web pages without charge. The catch is that you usually have fairly severe restrictions on most hosting features, particularly bandwidth and disk space, and you almost always get only a single website. Some free web hosts also display ads, although that's becoming rare these days.
- *Commercial web hosting provider*—If you want to get a reasonable set of features for your web presence, you need to shell out money to rent space with a commercial web hosting provider. Note that I'm not talking about big bucks. Popular providers such as Bluehost (www.bluehost.com), GoDaddy (www.godaddy.com), and HostGator (www.hostgator.com) offer feature-packed hosting usually for less than \$5 per month. If you think you'll be getting into web design beyond the creation of a basic home page, you should consider a commercial web host.



When you've signed up with a web host, it usually takes anywhere from a few minutes to a few hours before everything is ready. When your hosting service is good to go, then it's time to get your stuff online.

Uploading Your Files

With your HTML and CSS files coded and validated, your support files (such as images) in place, your folders set up, and your web host ready to serve your stuff to a waiting world, all that remains is to send your files from your computer to the web host's server—a process known as *uploading*.

How you go about uploading your files depends on the web host, but the following three methods are by far the most common:

- **FTP**—Most hosts offer support for FTP uploads. First, you need to get yourself an *FTP client*, which is a software program that connects to your web host's FTP server and offers an interface for basic file chores, such as navigating and creating folders, and uploading, deleting, and renaming files. Popular Windows clients are CuteFTP (www.globalscape.com/cuteftp) and Cyberduck (<https://cyberduck.io>). For the Mac, try Transmit (<https://panic.com/transmit>) or FileZilla (<https://filezilla-project.org>). When you've downloaded the software, check your web host's support pages for information on how to connect to the host's FTP server.
- **cPanel**—Many web hosts offer an administration tool called cPanel that presents a simple interface for hosting tasks such as email and domain management. cPanel also offers a File Manager component that you can use to upload files and perform other file management chores.
- **Proprietary**—Some web hosts offer their own interface for uploading and working with files. See your host's support page for instructions.

Whatever method is available, upload all your website files and folders to your root folder on your host. Then load your site into your favorite web browser to make sure that everything's working okay. It wouldn't hurt to try your site in a few different browsers and on a few different devices to make sure that it works properly for a wide variety of users. Welcome to the web!

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Adding a hero background image on the Web Design Playground

Lesson 6.2: Working with Background Images

webdesignplayground.io/2/lessons/6-2-5/

WEB DESIGN PLAYGROUND

Run Code

MENU

6.1: Adding an Image to the Page

Previous Page

Next Page

Lesson 6.2

Working with Background Images

Adding a Hero Image

This example shows you how to add a hero image to a page.

HTML

```
1 <div class="hero-image">
2   <h1>Welcome!</h1>
3   <h2>Are you ready to see Toronto in an
4     entirely new way?</h2>
5 </div>
6 <div class="main">
7   The main page content goes here.
8 </div>
```

CSS

```
1 {
2   margin: 0;
3   padding: 0;
4   box-sizing: border-box;
5 }
6 .hero-image {
7   height: 100vh;
8   background-image:
9     url(/images/toronto.jpg);
10    background-position: center center;
11    background-size: cover;
12    color: hsl(58, 71%, 20%);
13 }
```

Welcome!

Are you ready to see Toronto in an entirely new way?

Hide Editors

New Sandbox



WEB DESIGN PLAYGROUND

SECOND EDITION

HTML + CSS THE INTERACTIVE WAY

PAUL MCFEDRIES

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