6

How to use CSS for page layout

In this chapter, you'll learn how to use CSS to control the layout of a page. That means that you can control where each of the HTML elements appear on the page. When you finish this chapter, you should be able to implement sophisticated 2- and 3-column page layouts by floating elements.

How to float elements in 2- and 3-column layouts

To create a page layout with two or three columns, you can float the elements that make up the columns of the page. You'll learn how to do that in the topics that follow.

How to float and clear elements

By default, the block elements defined in an HTML document flow from the top of the page to the bottom of the page, and inline elements flow from the left side of the block elements that contain them to the right side. When you *float* an element, though, it's taken out of the flow of the document. Because of that, any elements that follow the floated element flow into the space that's left by the floated element.

Figure 6-1 presents the basic skills for floating an element on a web page. To do that, you use the float property to specify whether you want the element floated to the left or to the right. You also have to set the width of the floated element. In the example, the aside is 150 pixels wide, and it is floated to the right. As a result, the main element that follows flows into the space to the left of the aside.

Although you can use the float property with any block element, you can also use it with some inline elements. In chapter 4, for example, you learned how to float an image in the header of a document. When you float an img element, you don't have to set the width property because an image always has a default size.

By default, any content that follows a floated element in an HTML document will fill in the space to the side of the floated element. That includes block elements as well as inline elements.

However, if you want to stop the flow of elements into the space beside a floated element, you can use the clear property. In this example, this property is used to stop the footer from flowing into the space next to the aside. The value for this property can be left, right, or both, and either right or both will work if the element ahead of it is floated to the right. Similarly, left or both will work if the element ahead of it is floated to the left.

The properties for floating and clearing elements

Property	Description
float	A keyword that determines how an element is floated. Possible values are left, right, and none. None is the default.
clear	Determines whether an element is cleared from flowing into the space left by a floated element. Possible values are left, right, both, and none (the default).

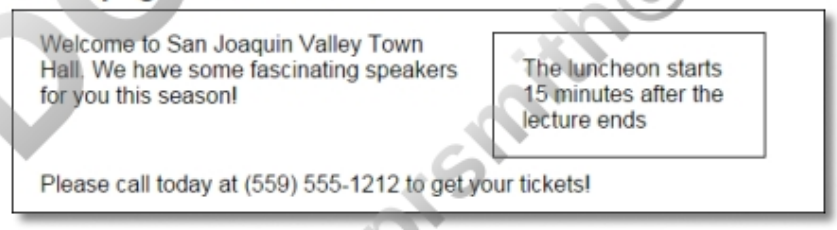
The HTML for a web page with a sidebar

```
<body>
    <aside>
        <p>The luncheon starts 15 minutes after the lecture ends</p>
    </aside>
    <main>
        <p>Welcome to San Joaquin Valley Town Hall. We have some fascinating
           speakers for you this season!</p>
    </main>
    <footer>
        <p>Please call today at (559) 555-1212 to get your tickets!</p>
    </footer>
</body>
```

The CSS for the web page for floating the sidebar

```
body { width: 500px; }
main, aside, footer {
    margin: 0;
    padding: 0px 20px; }
aside {
    margin: 0 20px 10px;
    width: 150px;
    float: right;
    border: 1px solid black; }
footer { clear: both; }
```

The web page in a browser



Description

- When you *float* an element to the right or left, the content that follows flows around it.
- When you use the float property for an element, you also need to set its width.
- To stop the floating before an element, use the clear property.
- In the example above, if the clear property for the footer isn't set, its content will flow into the space beside the floated element.

Figure 6-1 How to float and clear elements

How to use floating in a 2-column, fixed-width layout

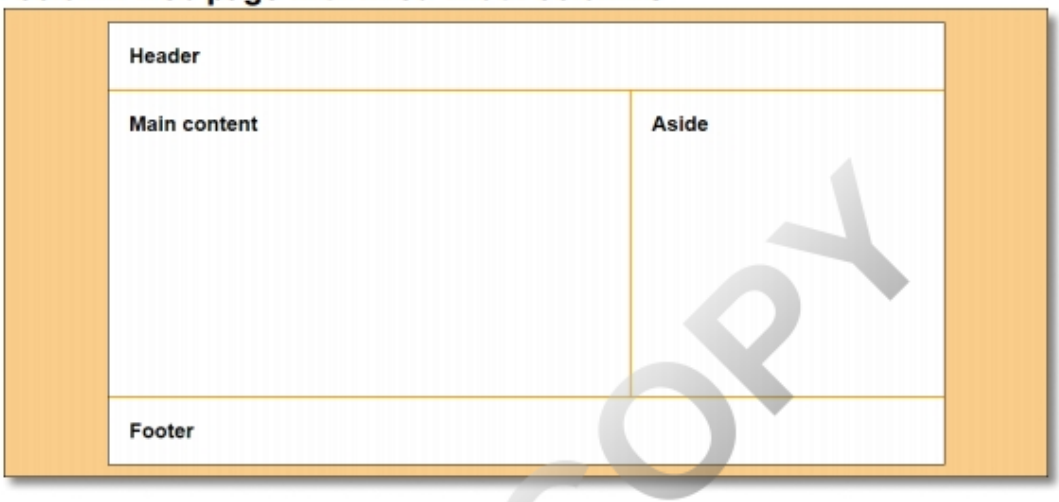
Figure 6-2 shows how floating can be used to create a 2-column, fixed-width page layout. Here, the HTML consists of four elements: header, main, aside, and footer.

In the CSS, you can see that the width is set for the body, main, and aside elements. Here, the width of the body must be the sum of the widths of the main and aside elements, plus the widths of any margins, padding, or borders for the main and aside elements. Since the right border for the main element is 2 pixels and neither the main nor aside elements have margins or padding, the width of the body is 962 pixels (360 + 600 + 2).

After you set up the widths for the body and columns, you create the columns by floating the main element to the left and the aside element to the right. This will work whether the main or aside element is coded first in the HTML.

Another alternative is to float both the main and aside elements to the left. But then, the main element must come first in the HTML. In that case, though, the aside doesn't need to be floated at all. That's because the natural behavior of the aside is to flow into the space left by the floated main element that's ahead of it in the HTML.

A 2-column web page with fixed-width columns



The HTML for the page

```
<body>
    <header><h2>Header</h2></header>
    <main><h2>Main content</h2></main>
    <aside><h2>Aside</h2></aside>
    <footer><h2>Footer</h2></footer>
</body>
```

The CSS for the page

```
* { margin: 0; padding: 0; }
body {
    width: 962px;
    background-color: white;
    margin: 15px auto;
    border: 1px solid black; }
h2 { padding: 1em; }

header { border-bottom: 2px solid #ef9c00; }
main {
    height: 350px;      /* to give the sidebar some height for its border */
    width: 600px;
    float: left;
    border-right: 2px solid #ef9c00; }
aside {
    width: 360px;
    float: right; }
footer {
    clear: both;
    border-top: 2px solid #ef9c00; }
```

Description

- The main element is floated to the left and the aside is floated to the right. Then, it doesn't matter whether the aside comes before or after the main element in the HTML.
- Another alternative is to float both the main element and the aside to the left, but then the main element has to be coded before the aside in the HTML.

Figure 6-2 How to use floating in a 2-column, fixed-width layout

How to use floating in a 2-column, fluid layout

Instead of creating a *fixed layout* like the one in figure 6-2, you can create a *fluid layout*. With a fluid layout, the width of the page changes as the user changes the width of the browser window. Also, the width of one or more columns within the page changes.

The key to creating a fluid layout is using percents to specify the widths. This is illustrated by figure 6-3. In both of these examples, the width of the page is set to 90%. That means that the page will always occupy 90% of the browser window, no matter how wide the window is. Of course, you can omit the width property entirely if you want the page to occupy 100% of the browser window.

In the first example, the widths of the main and aside elements are set to percents. This means that the widths of both columns will change if the user changes the width of the browser window. In this case, since the main element has a 2-pixel right border, the sum of the widths of the main and aside elements is 99%, not 100%. However, if there wasn't a border, the sum could be 100%.

In the second example, the width of the aside element is set to 360 pixels and no width is specified for the main element. This means that only the width of the main element will change if the user changes the width of the browser window. In this case, the border is applied to the left of the aside element rather than to the right of the main element because it's the width of the aside element that's fixed.

As you decide whether to use a fixed or a fluid layout, your main consideration should be the content of the page. If the page consists of a lot of text, you probably won't want to use a fluid layout. That's because a page becomes more difficult to read as the length of a line of text gets longer. On the other hand, if you want the users to be able to use their browsers to increase the size of the text on a page, you might want to use a fluid layout. Then, the users can adjust the size of their browser windows to get the optimal line length for reading.

You may also want to use a fluid layout if you're designing a website for use on mobile devices. That way, the width of the page will change automatically depending on the screen width of the device. Keep in mind, though, that this is just one part of developing pages for mobile sites. In chapters 8, 9, and 10, you'll learn all the skills you need to develop responsive sites using a technique called Responsive Web Design.

A 2-column web page with fluid widths for both columns

The CSS for the page when both columns are fluid

```
body {
    width: 90%;
    background-color: white;
    margin: 15px auto;
    border: 1px solid black; }
main {
    width: 66%;
    height: 350px;          /* to give the main content some height */
    border-right: 2px solid #ef9c00;
    float: left; }
aside {
    width: 33%;
    float: right; }
```

The CSS for the page when the aside is fixed and the section is fluid

```
body {
    width: 90%;
    background-color: white;
    margin: 15px auto;
    border: 1px solid black; }
main {
    float: left; }
aside {
    height: 350px;          /* to give the aside some height */
    width: 360px;
    border-left: 2px solid #ef9c00;
    float: right; }
```

Description

- The benefit of using fluid column sizes is that the size of the page is adjusted based on the size of the browser.
- The disadvantage is that changing the size of the columns may affect the typography or the appearance of the page.

Figure 6-3 How to use floating in a 2-column fluid layout

How to use floating in a 3-column, fixed-width layout

Figure 6-4 shows how to take floating to one more level and thus create a 3-column, fixed-width page layout. Here, the width of the body is 964 pixels, which is the sum of the two sidebars, the main content, and the two sidebar borders. Once those widths are set up, the first sidebar is floated to the left. The main content is floated to the left. And the second sidebar is floated to the right.

One of the keys here is getting the widths right. If, for example, you set the body width to 960 pixels instead of 964 pixels, the two sidebars and the main content won't fit into the width of the body. In that case, the main content will flow beneath the left sidebar.

A 3-column web page with fixed-width columns

The HTML for the page

```
<body>
    <header><h2>Header</h2></header>
    <aside id="sidebarA"><h2>Sidebar A</h2></aside>
    <main><h2>Main content</h2></main>
    <aside id="sidebarB"><h2>Sidebar B</h2></aside>
    <footer><h2>Footer</h2></footer>
</body>
```

The critical CSS for the page

```
body {
    width: 964px;
    background-color: white;
    margin: 15px auto;
    border: 1px solid black; }
#sidebarA {
    width: 180px;
    height: 350px;      /* to give the sidebar some height for its border */
    float: left;
    border-right: 2px solid #ef9c00; }
main {
    width: 600px;
    float: left; }
#sidebarB {
    width: 180px;
    height: 350px;      /* to give the sidebar some height for its border */
    float: right;
    border-left: 2px solid #ef9c00; }
```

Description

- The first aside is floated to the left; the main content is floated to the left; and the second aside is floated to the right.
- You could get the same result by floating both asides and the main content to the left.

Figure 6-4 How to use floating in a 3-column, fixed-width layout

Two web pages that use a 2-column, fixed-width layout

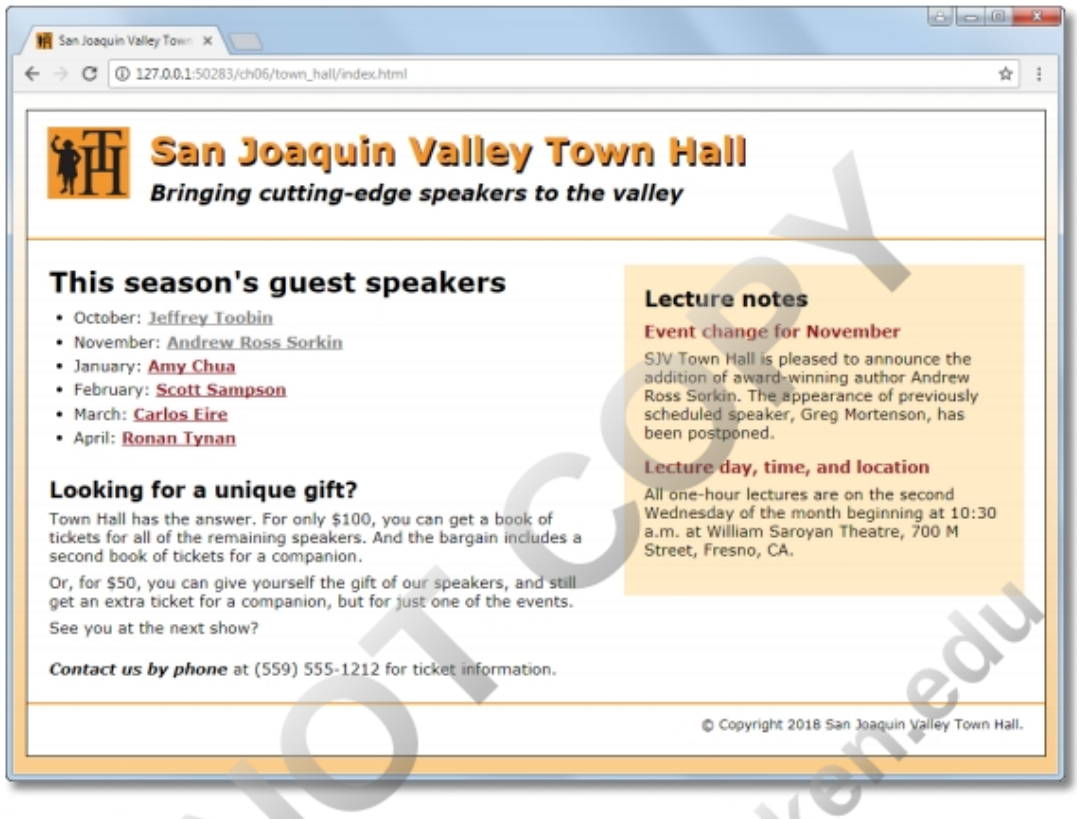
To show how floating works in a more realistic application, the next topics present two pages of a website along with their HTML and CSS.

The home page

Figure 6-5 shows the home page for the Town Hall website. It uses a 2-column, fixed-width layout. Except for the aside, this is the same content that you saw in the page at the end of the last chapter. It's just formatted a little differently.

Note here that instead of using a border to separate the two columns on this page, a background color is applied to the aside. This adds some visual interest to the page, and it saves you from having to set the height of either of the columns.

A home page with a sidebar floated to the right of a section



Description

- This web page illustrates a common page layout that includes a header, two columns, and a footer.
- The columns for this page are coded as a section element and an aside element within a main element.
- The columns are created by floating the aside element to the right so the section element that follows it in the HTML flows to its left.
- The image in the heading is floated to the left so it appears to the left of the h2 and h3 elements that follow it.
- A bottom border is applied to the header, and a top border is applied to the footer. The page is formatted so these borders extend to the left and right borders for the body of the page.
- Instead of using a border to separate the two columns, this page uses a background color for the portion of the aside with content. That way, you don't have to worry about which column is longer like you do if you use a border.

Figure 6-5 A 2-column, fixed-width home page

The HTML for the home page

Figure 6-6 presents the HTML for this web page. Here, the only new content is in the aside. Note that the aside is coded before the section. Then, if the aside is floated to the right, the section will flow beside it.

Before looking at the CSS, take a minute to note the use of the HTML5 semantic elements. The header and footer start and end the HTML and the remaining content of the page is coded within a main element. The aside and section provide the content for the two columns. And the nav element within the section marks the navigation list. That helps make this code easy to understand.

The HTML for the home page (index.html)

```
<head>
    .
    <link rel="stylesheet" href="styles/normalize.css">
    <link rel="stylesheet" href="styles/main.css">
</head>
<body>
    <header>
        <img src="images/logo.jpg" alt="Town Hall Logo" width="80">
        <h2>San Joaquin Valley Town Hall</h2>
        <h3>Bringing cutting-edge speakers to the valley</h3>
    </header>
    <main>
        <aside>
            <h2>Lecture notes</h2>
            <h3>Event change for November</h3>
            <p>SJV Town Hall is pleased to announce the addition of award-
               winning author Andrew Ross Sorkin. The appearance of previously
               scheduled speaker, Greg Mortenson, has been postponed.</p>
            <h3>Lecture day, time, and location</h3>
            <p class="news_item">All one-hour lectures are on the second
               Wednesday of the month beginning at 10:30 a.m. at William
               Saroyan Theatre, 700 M Street, Fresno, CA.</p>
        </aside>
        <section>
            <h1>This season's guest speakers</h1>
            <nav>
                <ul>
                    <li>October: <a class="date_passed"
                        href="speakers/toobin.html">Jeffrey Toobin</a></li>
                    .
                    .
                    <li>March: <a href="speakers/eire.html">
                        Carlos Eire</a></li>
                    <li>April: <a href="speakers/tynan.html">
                        Ronan Tynan</a></li>
                </ul>
            </nav>
            <h2>Looking for a unique gift?</h2>
            <p>Town Hall has the answer. For only $100, you can get
               a book of tickets for all of the remaining speakers. And the
               bargain includes a second book of tickets for a companion.</p>
            <p>Or, for $50, you can give yourself the gift of our speakers,
               and still get an extra ticket for a companion, but for just one
               of the events.</p>
            <p>See you at the next show?</p>
            <p id="contact_us"><em>Contact us by phone</em> at (559) 555-1212
               for ticket information.</p>
        </section>
    </main>
    <footer>
        <p>&copy; Copyright 2018 San Joaquin Valley Town Hall.</p>
    </footer>
</body>
</html>
```

Figure 6-6 The HTML for the home page

The CSS for the home page

Figure 6-7 presents the CSS for this web page. Since you've already seen code like this in the earlier figures, you shouldn't have much trouble following it. But here are a few highlights.

First, the width of the body is set to 992 pixels, but the width of the section is set to 535 pixels and the width of the aside is set to 350 pixels, or a total of 885 pixels. The other 107 pixels come from the left and right borders for the body (2 pixels), the left margin for the section (20 pixels), the right padding for the section (25 pixels), the left and right padding for the aside (40 pixels), and the right margin for the aside (20 pixels).

Second, the left margins of the h2 and h3 elements in the header are set to 120 pixels instead of being centered as they were in previous examples. This sets them to the right of the image in the header, which has been floated to the left.

The CSS for the home page (main.css) **Page 1**

```
/* type selectors */
html {
    background-image: -moz-linear-gradient(to bottom, white 0%, #facd8a 100%);
    background-image: -webkit-linear-gradient(
        to bottom, white 0%, #facd8a 100%);
    background-image: -o-linear-gradient(to bottom, white 0%, #facd8a 100%);
    background-image: linear-gradient(to bottom, white 0%, #facd8a 100%);    }
body {
    font-family: Verdana, Arial, Helvetica, sans-serif;
    font-size: 100%;
    width: 992px;
    background-color: white;
    margin: 15px auto;
    padding: 15px 0;
    border: 1px solid black; } /* no border radius or box shadow */
section, aside, h1, h2, h3, p {
    margin: 0;
    padding: 0; }
section, aside {
    margin-top: 1.5em;
    margin-bottom: 1em; }

a { font-weight: bold; }
a:link { color: #931420; }
a:visited { color: #f2972e; }
a:hover, a:focus { color: blue; }

ul {
    margin-top: 0;
    margin-bottom: 1.5em; }
li {
    font-size: 95%;
    padding-bottom: .35em; }
p {
    font-size: 95%;
    padding-bottom: .5em; }
em { font-weight: bold; }

/* the styles for the header */
header {
    padding-bottom: 2em;
    border-bottom: 2px solid #f2972e; }
header img {
    float: left;
    margin-left: 20px; }
header h2 {
    font-size: 220%;
    color: #f2972e;
    text-shadow: 2px 3px 0 black;
    margin-left: 120px;
    margin-bottom:.25em; }
header h3 {
    font-size: 130%;
    font-style: italic;
    margin-left: 120px; }
```


Figure 6-7 The CSS for the home page (part 1 of 2)

Third, both the aside and section are floated to the right, but you could float the section to the left. This would also work if you didn't float the section at all since the aside comes first in the HTML.

Finally, because both the aside and the section are floated, the footer is cleared so it will appear below both columns. Because both the aside and section are floated to the right, I could have coded the clear property with a value of right. In most cases, though, you'll code this property with a value of both so it doesn't matter how the columns are floated.

At this point, you may be wondering why the left margins of the image in the header and the section and the right margins of the aside and the footer paragraph are set to 20 pixels instead of setting the padding for the body as in chapter 5. The answer is that this allows the borders below the header and above the footer to extend to the left and right edges of the border around the body of the page. This is just another visual element of this page.

The CSS for the home page (main.css) **Page 2**

```
/* the styles for the section */
section {
    width: 535px;
    margin-left: 20px;
    padding-right: 25px;
    float: right; }
section h1 {
    font-size: 170%;
    margin-bottom: .35em; }
section h2 {
    font-size: 130%;
    margin-bottom: .35em; }

#contact_us { margin-top: 1em; }
a.date_passed  { color: gray; }

/* the styles for the sidebar */
aside {
    width: 350px;
    float: right;
    padding: 20px;
    background-color: #ffebc6;
    margin-right: 20px; }
aside h2 {
    font-size: 130%;
    padding-bottom: .5em; }
aside h3 {
    font-size: 100%;
    color: #931420;
    padding-bottom: .5em; }
aside p { margin-bottom: .5em; }

/* the styles for the footer */
footer {
    clear: both;
    border-top: 2px solid #f2972e;
    padding-top: .7em; }
footer p {
    font-size: 80%;
    text-align: right;
    margin-right: 20px; }
```


Figure 6-7 The CSS for the home page (part 2 of 2)

The speaker page

Figure 6-8 shows the page that's displayed if you click on the fourth link of the home page. This page has the same header and footer as the home page, and it has a 2-column, fixed-width page layout like the one for the home page.

Unlike the home page, though, this page uses an article for the left column instead of a section. This is consistent with HTML5 semantics since the content is an article about the speaker. Within the article, an image of the speaker is floated to the left of the text.

A speaker page with a sidebar floated to the right of an article

Description

- The columns for this page are coded as an article element and an aside element.
- The columns are created by floating the aside element to the right so the article element that follows it in the HTML flows to its left.
- The image in the article is floated to the left. In the HTML, the image is coded after the h1 element and before the <p> elements that make up the article.
- A background color is applied to the aside to separate it visually from the article.

Figure 6-8 A 2-column, fixed-width speaker page

The HTML for the speaker page

Figure 6-9 presents just the HTML changes for the speaker page. For instance, it doesn't include the header and footer elements because they are the same for the home page and the speaker page.

To start, the link element refers to a different style sheet named speaker.css. This style sheet can be used for all of the speaker pages.

After that, you can see the contents for the aside, which includes a nav element. You can also see the contents for the article, which includes an h1 element, an img element, and several <p> elements.

The CSS for the speaker page

Figure 6-9 also presents the CSS changes for the speaker page. Otherwise, the CSS is the same as the CSS for the home page.

First, the margins and padding are set up for the article and the aside, just as they were for the section and aside of the home page. Then, the article is formatted just like the section of the home page. In addition, though, the img element within the article is floated to the left.

Like the home page, both the aside and article are floated to the right, but you could float the article to the left. This would also work if you didn't float the article at all.

Because the CSS for the home page (main.css) and the CSS for the speaker pages (speaker.css) are so much alike, you could combine the CSS into a single file. Often, though, it's easier to manage the CSS if you keep it in separate files. Then, if you want to modify the CSS for the speaker pages, you don't have to worry about affecting the home page.

The HTML changes for the speaker page (sampson.html)

```
<head>
    .
    <link rel="stylesheet" href="styles/speaker.css">
</head>
<aside>
    <h2>This season's guest speakers</h2>
    <nav>
        <ul>
            <li>October: <a class="date_passed"
                href="speakers/toobin.html">Jeffrey Toobin</a></li>
            .
            .
            <li>April: <a href="speakers/tynan.html">Ronan Tynan</a></li>
        </ul>
        <p><a href="index.html">Return to Home page</a></p>
    </nav>
</aside>
<article>
    <h1>Fossil Threads in the Web of Life</h1>
    <img src="images/sampson_dinosaur.jpg" alt="Scott Sampson" width="260">
    <p>What's 75 million years old and brand spanking new? A teenage
       ...
       ...</p>
    <p>Scott Sampson is a Canadian-born paleontologist who received his
       ...
       ...</p>
    <p>Following graduation in 1993, Sampson spent a year working at the
       ...
       ...</p>
    <p>In addition to his museum and laboratory-based studies, Sampson has
       ...
       ...</p>
</article>
```

The CSS changes for the speaker page (speaker.css)

```
article, aside, h1, h2, p, ul {
    margin: 0;
    padding: 0; }
article, aside {
    margin-top: 1.5em;
    margin-bottom: 1em; }

/* the styles for the article */
article {
    width: 535px;
    margin-left: 20px;
    padding-right: 25px;
    float: right; }
article h1 {
    font-size: 170%;
    margin-bottom: .35em; }
article img {
    float: left;
    margin: 0 1.5em 1em 0; }
```

Figure 6-9 The HTML and CSS for the speaker page

How to use CSS3 to create text columns

So far, we've been talking about the columns in a page layout. But CSS3 provides a new feature that makes it easy to create text columns. For instance, you can easily format an article into two or more text columns within a 2- or 3-column page layout.

The CSS3 properties for creating text columns

Figure 6-10 summarizes the properties for creating text columns. For instance, the column-count property automatically formats the text within an article into the number of columns specified. You can use the column-gap property to set the width of the gaps between columns. You can use the column-rule property to set borders within the columns. And you can use the column-span property to cause an element like the heading in this example to span the columns. Note, though, that Firefox doesn't currently support the column-span property.

Three of these properties are illustrated by the example in this figure. Here, an article is formatted into 3 columns with 35-pixel gaps and 2-pixel rules between the columns. To fit this into this figure, the bottom of the article is truncated, but the entire article is formatted correctly.

As you can see, this is a powerful feature that can easily improve the readability of an article by shortening the line length. When using this feature, though, you don't want to make the columns too narrow because that can make the text more difficult to read. Also, you don't want to justify the text because that can cause gaps between the words.

The primary CSS3 properties for creating text columns

Property	Description
`column-count`	The number of columns that the text should be divided into.
`column-gap`	The width between the columns. Otherwise, this is set by default.
`column-rule`	Defines a border between columns.
`column-span`	With the value "all", this property can be used to have an element that's a child of an element that's formatted with columns span all of the columns. Not currently supported by Firefox.

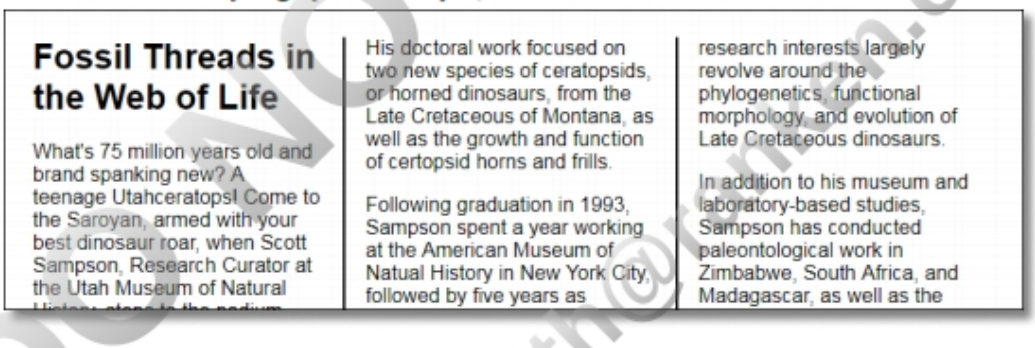
3 columns with default-sized gaps

```
article {
    column-count: 3;
}
```

3 columns with 35px gaps and 2px rules between the columns

```
article {
    column-count: 3;
    column-gap: 35px;
    column-rule: 2px solid black;
}
```

3 columns with 35px gaps and 2px rules in a browser window



Description

- At this writing, Firefox doesn't support the column-span property.
- If you want the heading of an article to span the columns, you can code the HTML for the heading before the article. Then, you don't have to use the column-span property.
- If the columns are too narrow, an article becomes harder to read.

Figure 6-10 The properties for creating text columns

A 2-column web page with a 2-column article

Figure 6-11 shows how easily this feature can add columns to the article in the speaker page of figure 6-8. It just takes one column-count property, plus the two prefixed versions of it. Then, if a browser doesn't support this property, it just ignores it, so there's no harm done.

Although you might think that you could use the CSS3 column-span property to get the heading to span the columns in this example, that doesn't work. That's because the article that contains the columns is floated, and that somehow interferes with the span. In the future, though, this should work correctly, so you can start using this feature right away. Alternatively, you can code the heading before the article in the HTML.

Incidentally, if you want to float the image that's coded at the start of the text to the right when you use two or more columns, it won't work the way you want. Instead of floating the image in the rightmost column, the browser will float the image in the first column. Although there are ways around this, it's usually best to float the image to the left when you use this feature.

A web page with a two-column article

The CSS for creating the columns

```
article {
    column-count: 2;
}
```

Description

- This shows how easy it is to divide an article into columns.
- If you compare this page with the one in figure 6-8, you can see that this page is easier to read because the lines are shorter, but not too short.
- If a browser doesn't support this feature, the page is displayed as in figure 6-8, which is acceptable.
- If you want the heading in the article to span the columns, you have to code the heading before the article in the HTML. In the future, this should work using the CSS3 column-span property.
- In general, it's best to float an image within the columns area to the left so it will be in the leftmost column. If you float it to the right, the browser will float the image to the right, but in the first column, which usually isn't what you want.

Figure 6-11 A 2-column web page with a 2-column article

How to position elements

Although floating provides an easy way to create pages with two or more columns, you may occasionally need to use other positioning techniques. You'll learn about those techniques in the topics that follow.

Four ways to position an element

To position the elements on a page, you use the properties shown in the first table in figure 6-12. The first property, position, determines the type of positioning that will be used. This property can have four different values as shown in the second table.

The first value, static, is the default. This causes elements to be placed in the normal flow.

The second value, absolute, removes the element from the normal flow and positions it based on the top, bottom, right, and left properties you specify. When you use *absolute positioning*, the element is positioned relative to the closest containing block that is positioned. If no containing block is positioned, the element is positioned relative to the browser window.

The third value, fixed, works like absolute in that the position of the element is specified using the top, bottom, left, and right properties. Instead of being positioned relative to a containing block, however, an element that uses *fixed positioning* is positioned relative to the browser window. That means that the element doesn't move when you scroll through the window.

The fourth value, relative, causes an element to be positioned relative to its normal position in the flow. When you use the top, bottom, left, and right properties with *relative positioning*, they specify the element's offset from its normal position.

One more property you can use to position elements is z-index. This property is useful if an element that you position overlaps another positioned element. In that case, you can use the z-index property to determine which element is on top. By default, the elements are stacked in the same order that they're declared in the HTML.

Properties for positioning elements

Property	Description
`position`	A keyword that determines how an element is positioned. See the table below for possible values.
`top, bottom, left, right`	For absolute or fixed positioning, a relative or absolute value that specifies the top, bottom, left, or right position of an element's box. For relative positioning, the top, bottom, left, or right offset of an element's box.
`z-index`	An integer that determines the stack level of an element whose position property is set to absolute, relative, or fixed.

Possible values for the position property

Value	Description
`static`	The element is placed in the normal flow. This is the default.
`absolute`	The element is removed from the flow and is positioned relative to the closest containing block that is also positioned. The position is determined by the top, bottom, left, and right properties.
`fixed`	The element is positioned absolutely relative to the browser window. The position is determined by the top, bottom, left, and right properties.
`relative`	The element is positioned relative to its position in the normal flow. The position is determined by the top, bottom, left, and right properties.

Description

- By default, static positioning is used to position block elements from top to bottom and inline elements from left to right.
- To change the positioning of an element, you can code the position property. In most cases, you also code one or more of the top, bottom, left, and right properties.
- When you use absolute, relative, or fixed positioning for an element, the element can overlap other elements. Then, you can use the z-index property to specify a value that determines the level at which the element is displayed. An element with a higher z-index value is displayed on top of an element with a lower z-index value.

Figure 6-12 Four ways to position an element

How to use absolute positioning

To give you a better idea of how positioning works, figure 6-13 presents an example of absolute positioning. Here, the aside element is positioned absolutely within its containing element, which is the body of the HTML document.

For this to work, the containing element must also be positioned. However, the positioning can be either relative or absolute, and the top, bottom, left, and right properties don't have to be set. Since they aren't set in this example, the body is positioned where it is in the natural flow. In other words, nothing changes. However, because the body is positioned, the elements that it contains can be absolutely positioned within it. In this case, the aside element is positioned 30 pixels from the right side of the body and 50 pixels from the top.

When you use absolute positioning, you typically specify the top or bottom and left or right properties. You also are likely to specify the width or height of the element. However, you can also specify all four of the top, bottom, left, and right properties. Then, the height and width are determined by the difference between the top and bottom and left and right properties.

How to use fixed positioning

Fixed positioning is like absolute positioning except that its positioning is relative to the browser window. So, to change the example in figure 6-13 from absolute positioning to fixed positioning requires just two changes. First, you delete the position property for the body since fixed positioning is relative to the browser window. Second, you change the position property for the aside to fixed.

The benefit of fixed positioning is that the element that's fixed stays there when you scroll down the page. If, for example, the section in this figure was so long that it required scrolling, the aside would stay where it is while the user scrolls.

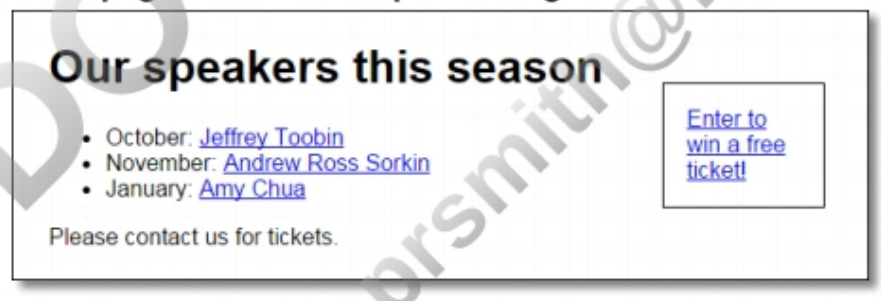
The HTML for a web page

```
<body>
    <main>
        <h1>Our speakers this season</h1>
        <ul>
            <li>October: <a href="speakers/toobin.html">
                Jeffrey Toobin</a></li>
            <li>November: <a href="speakers/sorkin.html">
                Andrew Ross Sorkin</a></li>
            <li>January: <a href="speakers/chua.html">
                Amy Chua</a></li>
          </ul>
        <p>Please contact us for tickets.</p>
      </main>
    <aside>
        <p><a href="raffle.html">Enter to win a free ticket!</a></p>
    </aside>
</body>
```

The CSS for the web page with absolute positioning

```
p { margin: 0;}
body {
    width: 550px;
    margin: 0 25px 20px;
    border: 1px solid black;
    position: relative; }  /* not needed for fixed positioning */
aside {
    width: 80px;
    padding: 1em;
    border: 1px solid black;
    position: absolute;    /* change to fixed for fixed positioning */
    right: 30px;
    top: 50px; }
```

The web page with absolute positioning in a browser



Description

- When you use *absolute positioning*, the remaining elements on the page are positioned as if the element weren't there. As a result, you may need to make room for the positioned element by setting the margins or padding for other elements.
- When you use *fixed positioning* for an element, the positioning applies to the browser window and the element doesn't move even when you scroll.

Figure 6-13 How to use absolute and fixed positioning

A sidebar that uses fixed positioning

Because floating works so well, you won't need to use positioning much. Occasionally, though, it comes in handy.

In figure 6-14, for example, you can see a sidebar that uses fixed positioning. This sidebar is fixed at the right side of the browser window and 170 pixels from the top of the browser window. Then, when the user scrolls through the page, the sidebar remains visible.

Note in this example that the sidebar overlaps some of the content in the article. That's because the browser window is too narrow to accommodate both the sidebar and the article. When that happens, the positioned element is displayed on top of any non-positioned elements by default. If that's not what you want, you can change the z-index property for the positioned element as described in figure 6-12.

To see the structure of the HTML for the page shown here, you can refer back to figure 6-9. Then, this figure shows the CSS for the aside element, which uses fixed positioning. The first thing to notice here is that the float and margin-right properties aren't used for this element because it uses fixed positioning. Although it isn't shown here, the float and padding-right properties have also been removed from the article element so it's displayed at the left side of the page with no right padding.

To position the sidebar, the position property of the aside element is set to fixed so the element is positioned relative to the browser window. Then, the right property is set to 0 so there's no space between the right side of the sidebar and the right side of the browser window. In addition, the top property is set to 170 pixels so the sidebar is displayed 170 pixels from the top of the browser window. That way, when the page is scrolled to the top, the top of the sidebar is even with the top of the article.

A sidebar that uses fixed positioning

The CSS for the positioned elements

```
aside {
    width: 350px;
    padding: 20px;
    background-color: #ffebc6;
    position: fixed;
    right: 0;
    top: 170px;
}
```

Description

- The HTML for this page has the same structure shown in figure 6-9.
- Fixed positioning is used to fix the sidebar at the right side of the browser window so it's always displayed in the window.
- When the browser window is too narrow to display all of the elements on the page, the positioned sidebar will overlap the elements that aren't positioned.
- Because the sidebar on this page uses fixed positioning, it isn't necessary to float the sidebar or the article.

Figure 6-14 A sidebar that uses fixed positioning

Perspective

Now that you've completed this chapter, you should be able to develop web pages that have headers, footers, and 2- or 3-column layouts. Better yet, you'll be using CSS to do these layouts, which makes these pages easier to create and maintain. In contrast, you'll find that some websites are still using HTML tables to implement page layouts.

In addition to creating layouts with two or more columns by floating elements as described in this chapter, you can use two new features of CSS3, called Flexible Box Layout and Grid Layout, to create multi-column layouts. You'll learn how to use these features in chapters 9 and 10.

Terms

float
fixed layout
fluid layout
absolute positioning
relative positioning
fixed positioning

Summary

- When you use the float property to *float* an element, any elements after the floated element will flow into the space left vacant. To make this work, the floated element has to have a width that's either specified or implied.
- To stop an element from flowing into the space left vacant by a floated element, you can use the clear property.
- In a *fixed layout*, the widths of the columns are set. In a *fluid layout*, the width of the page and the width of at least one column change as the user changes the width of the browser window.
- When you use *absolute positioning* for an element, the remaining elements on the page are positioned as if the element weren't there. Because of that, you may need to make room for positioned elements by adjusting other elements.
- When you use *relative positioning* for an element, the remaining elements leave space for the moved element as if it were still there.
- When you use *fixed positioning* for an element, the element doesn't move in the browser window, even when you scroll.

Exercise 6-1 Enhance the Town Hall home page

In this exercise, you'll enhance the formatting of the Town Hall home page that you formatted in exercise 5-1. When you're through, the page should look like this, but without the Speaker of the Month content:

Open the HTML and CSS files

1. Use your text editor to open the HTML and CSS files that you created for exercise 5-1 or 5-2:

```
c:\html5_css3_4\exercises\town_hall_1\index.html
c:\html5_css3_4\exercises\town_hall_1\styles\main.css
```

Enhance the HTML and CSS to provide for the two columns

2. In the main element of the HTML file, enclose the h2 elements and the elements that follow them up to the h1 element in a section element.

3. Enclose the remaining content of the main element in an aside element. Also, shorten the content of the h1 heading to just "Guest speakers" and change the h1 element to an h2 element now that it's in an aside.
4. Still in the HTML file, add the heading and image for the fourth speaker.
5. In the CSS file, enhance the style rule for the body so the width is 800 pixels. Next, set the width of the section to 525 pixels and float it to the right, and set the width of the aside to 215 pixels and float it to the right. Then, use the clear property in the footer to clear the floating. Last, delete the style rule for the h1 heading. Now, test this. The columns should be starting to take shape.
6. To make this look better, delete the left and right padding for the main element, set the left and bottom padding for the aside to 20 pixels, change the right and left padding for the section to 20 pixels, and set the bottom padding for the section to 20 pixels. Now, test again.
7. To make the CSS easier to read, change the selectors for the main elements so they refer to the section or aside element as appropriate and reorganize these style rules. Be sure to include a style rule for the h2 headings in both the section and aside. Then, test again to be sure you have this right.

Get the headings right

8. Add a style rule for the h3 element in the aside that sets the font size to 105% and the bottom padding to .25 ems.
9. Add a style rule for the img elements in the aside so the bottom padding is set to 1em. Then, test this change.
10. At this point, the page should look good, but it won't include the Speaker of the Month content. Now, make any adjustments, test them in both Chrome and IE or Edge, use the developer tools if necessary, and then go on to the next exercise.

Exercise 6-2 Add the Speaker of the Month

In this exercise, you'll add the Speaker of the Month to the home page. Whenever appropriate, test the changes in Chrome.

Enhance the HTML page

1. Copy the content for the speaker of the month from the file named c6_content.txt in the text folder into the HTML file right before the heading for "Our Ticket Packages".
2. Enclose the Speaker of the Month heading in h1 tags, and enclose the rest of the content in an article element.
3. Within the article, enclose the first heading in h2 tags; enclose the second heading (the month and speaker's name) in h3 tags with a
 tag to provide the line break; and enclose the rest of the text in <p> tags.
4. Add an <a> element within the last paragraph that goes to the sampson.html page in the speakers folder when the user clicks on "Read more." Also, add a non-breaking space and <b> tags so the rest of the line looks right.
5. Add an img element between the h2 and h3 elements in the article, and display the image named sampson_dinosaur.jpg from the images folder.

Enhance the CSS for the home page

6. Add a style rule for the h1 element that sets the font size to 150%, sets the top padding to .5 ems and the bottom padding to .25 ems, and sets the margins to 0. (You need to explicitly set the top and bottom margins of this element to 0 because they're set to .67 ems in the normalize.css style sheet.)
7. Add .5 ems of padding above and below the article. Then, add 2-pixel top and bottom borders to the article with #800000 as the color.
8. Float the image in the article to the right, and set its top, bottom, and left margins so there's adequate space around it. Then, add a 1-pixel, black border to the image so the white in the image doesn't fade into the background.
9. Set the top padding of the h2 element in the article to 0.
10. Set the font size of the h3 element in the article to 105% and set the bottom padding to .25 ems.
11. Make any final adjustments to the margins or padding, use the developer tools if necessary, validate the HTML page, and test in both Chrome and IE or Edge.

Exercise 6-3 Add one speaker page

In this exercise, you'll add the page for one speaker. This page will be like the home page, but the speaker information will be in the second column as shown below. As you develop this page, test it in Chrome whenever appropriate.

Create the CSS and HTML files for the speaker

1. Copy the index.html file that you've been working with into the speakers folder and name it sampson.html.
2. Copy the main.css file that you've been working with into the styles folder and name it speaker.css.

3. In the head element of the sampson.html file, change the last link element so it refers to the speaker.css file in the styles folder. To do that, you can code a document-relative path like this:

```
../styles/speaker.css
```

Update the other link elements so they also use relative paths.

Modify the HTML file

4. Update all the image and link references in the header and aside to document-relative paths. Then, at the bottom of the HTML aside element, add a link back to the home page within an h3 element.
5. Delete all of the content from the section in the sampson.html file, but not the section tags. Then, copy the text for the speaker from the c6_sampson.txt file in the text folder into the section of the sampson.html file.
6. Enclose the first heading ("Fossil Threads in the Web of Life") within an h1 element. Then, code an img element after the first heading that displays the sampson_dinosaur.jpg file that's in the images folder.
7. Enclose the rest of the content for the speaker including the image you just added in an article element. Within the article, enclose the first heading (the month and speaker's name) in h2 tags with a
 tag to provide the line break, and enclose the rest of the text in <p> tags.
8. Validate the file, and fix any errors.

Modify the CSS file

9. If you test the page right now, it should look pretty good. Then, you just need to adjust the styles to get the page to look like the one shown above. For instance, you should delete the borders from the style rule for the article, switch the colors of the h1 and h2 headings in the section, adjust the space between those headings, and reduce the size of the h2 heading.
10. Test all the links to make sure they work correctly. Also, make sure the favicon and all images are displayed correctly.
11. Test the page in IE or Edge. Then, if necessary make any corrections, and test again. Now, if you've done everything: "Congratulations!"