Chapter 1

Head First
Mobile Web
Build once, run everywhere
Be more supportive (of your users)
Find your way with geolocation
Put your pages on a small-screen diet
Shape-shift your sites with Responsive Web Design

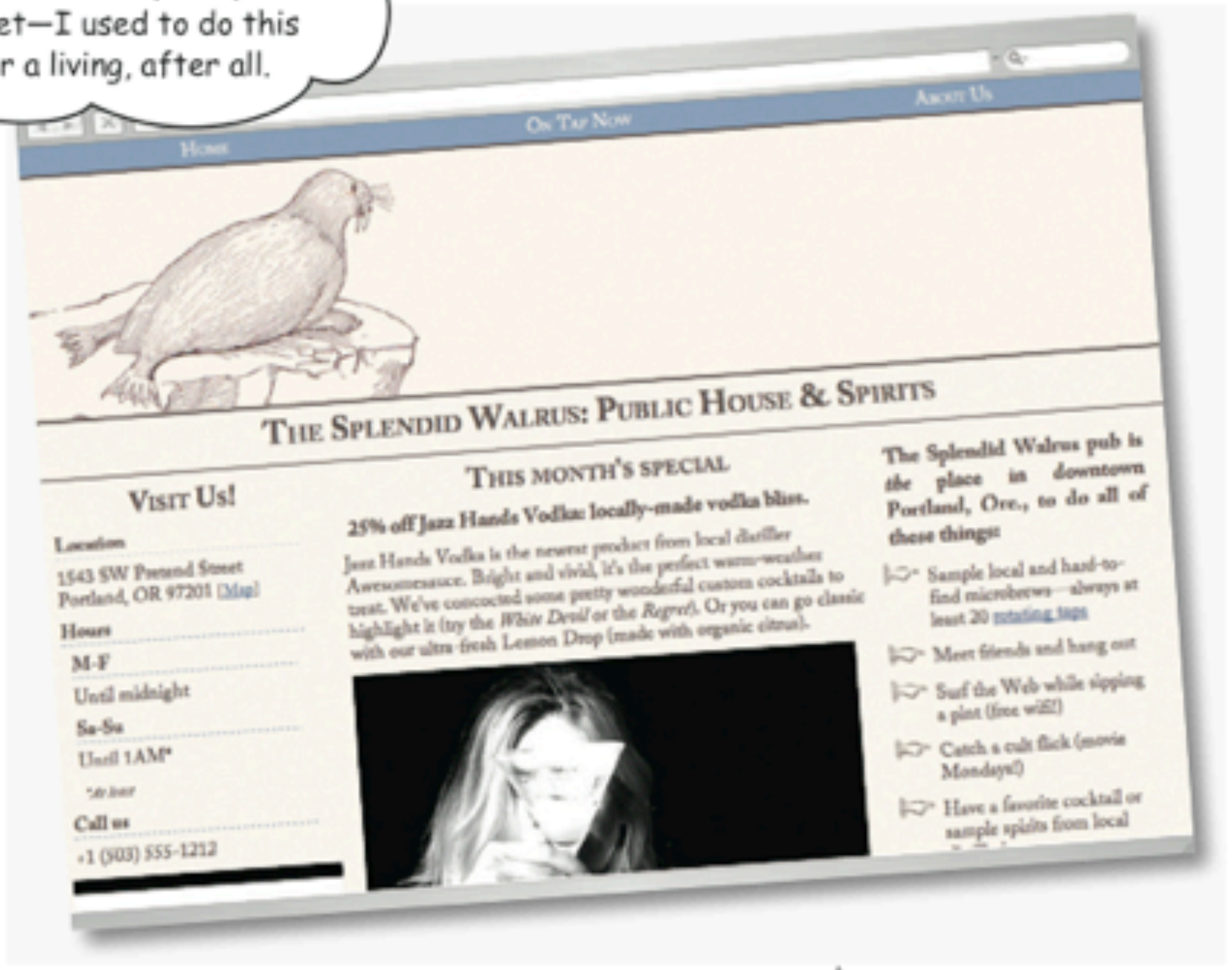
Carlo & Serena

people use a lot of different phones

- Every new phone has a web browser in it.
- Mobile web usage will exceed desktop web usage.
- The Web is the only true cross-platform technology.

Mike was a web developer, so he had no trouble putting together a respectable website

The Splendid Walrus website is pretty sweet—I used to do this for a living, after all.



The Splendid Walrus: Public House & Spirits

Visit Us!

Location

1543 SW Pretend Street
Portland, OR 97201 [Map]

Hours

M-F

Until midnight

Sa-Su

Until 1AM*

*or later

Call us

+1 (503) 555-1212

This month's special

25% off Jazz Hands Vodka: locally-made vodka bliss.

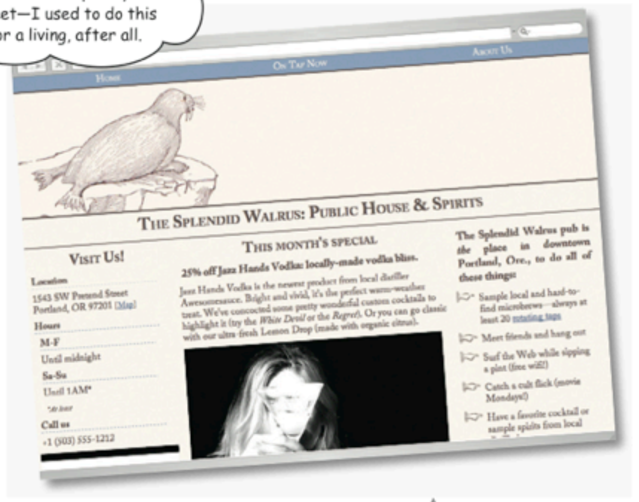
Jazz Hands Vodka is the newest product from local distiller Awesomesauce. Bright and vivid, it's the perfect warm-weather treat. We've concocted some pretty wonderful custom cocktails to highlight it (try the *White Devil* or the *Regret*). Or you can go classic with our ultra-fresh Lemon Drop (made with organic citrus).

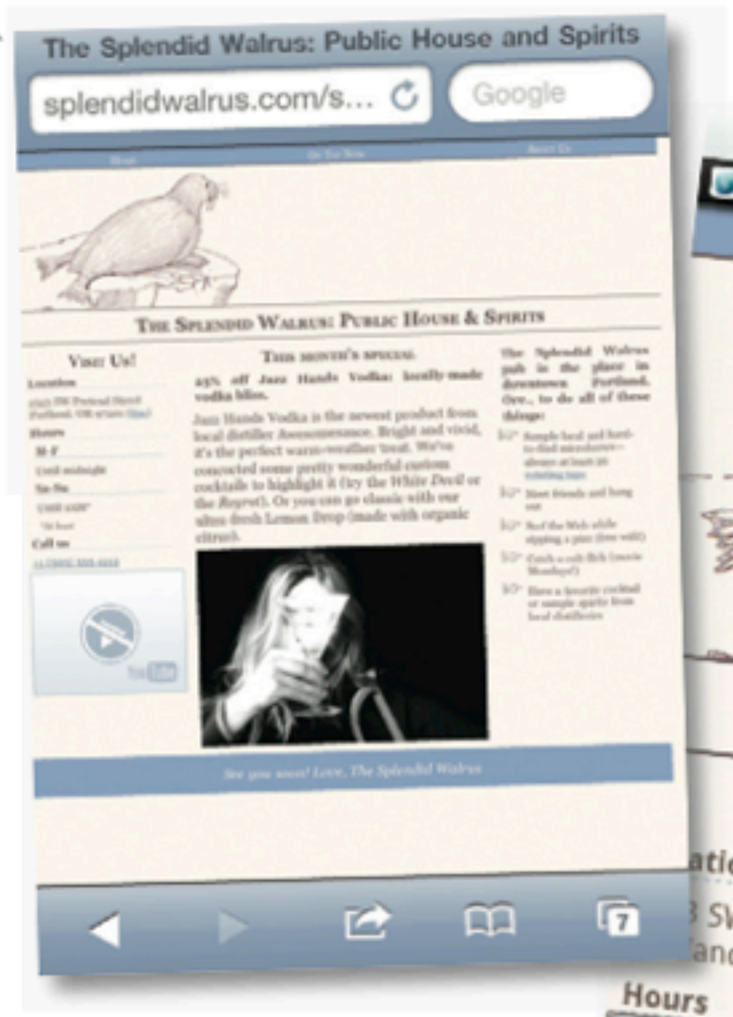
The Splendid Walrus pub is the place in downtown Portland, Ore., to do all of these things:

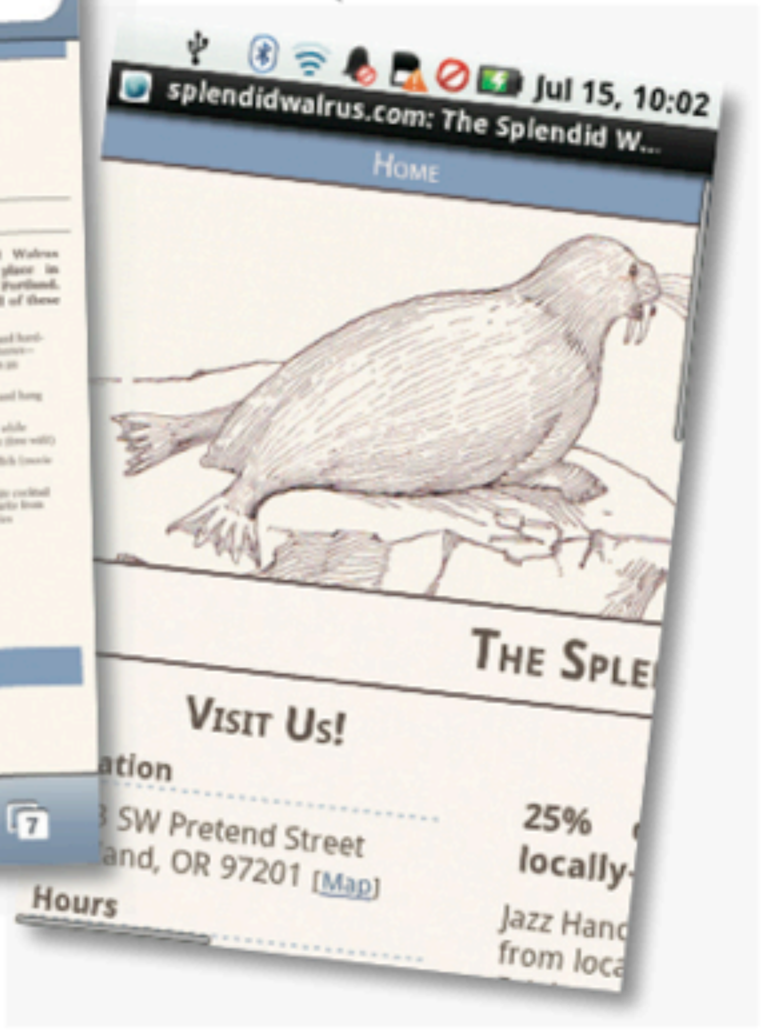
- Sample local and hard-to-find microbrews—always at least 20 rotating taps
- Meet friends and hang out
- Surf the Web while sipping a pint (free wifi!)
- Catch a cult flick (movie Mondays!)
- Have a favorite cocktail or sample spirits from local

If mobile phone web browsers are so great, shouldn't this just work?

The Splendid Walrus website is pretty sweet—I used to do this for a living, after all.


Home
On Tap Now
About Us
The Splendid Walrus: Public House & Spirits
Visit Us!
This month's special
http://www.splendidwalrus.com

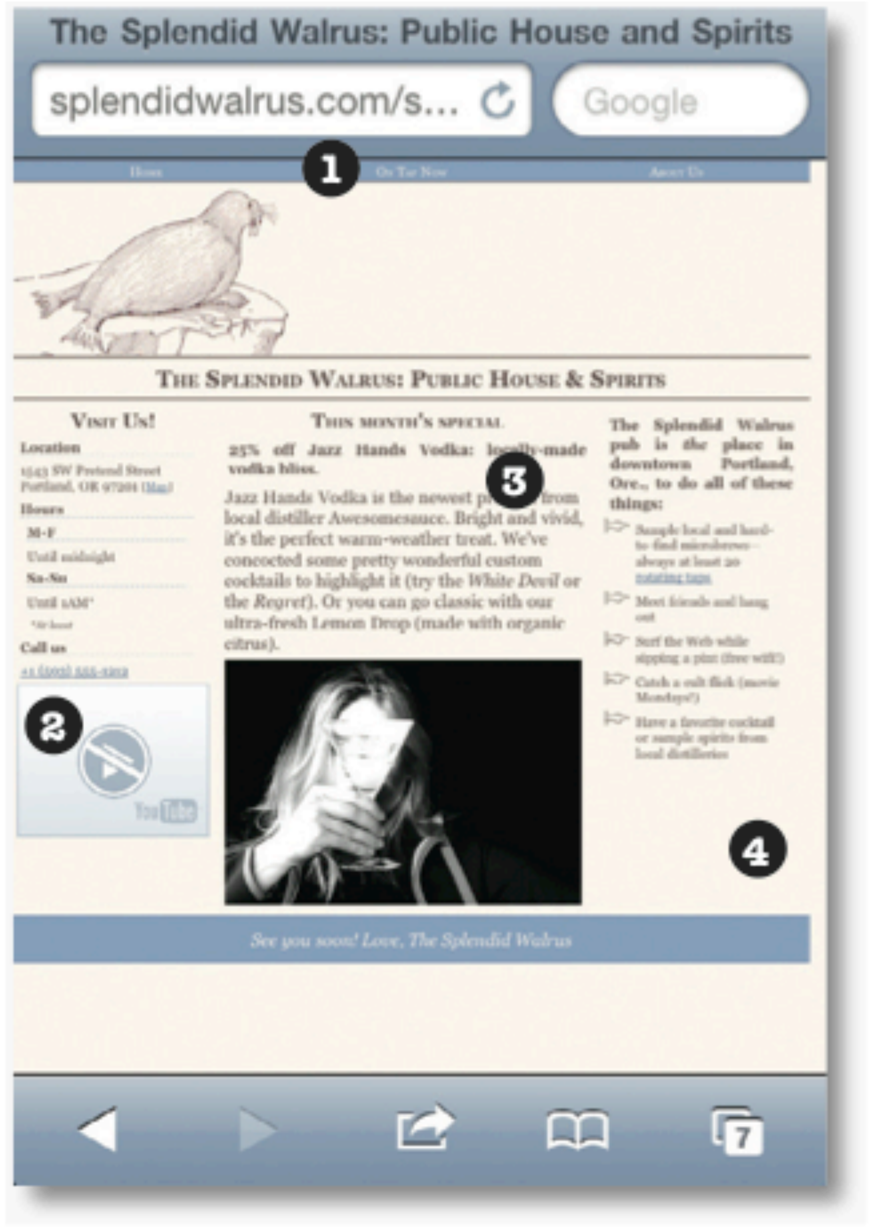

Here's how the Splendid Walrus site looks on an iPhone 4...
The Splendid Walrus: Public House and Spirits
splendidwalrus.com/s...
Google
The Splendid Walrus: Public House & Spirits
Visit Us!
This month's special



Any problem areas

1. The navigation links are all tiny and too small to read or click.

2. The embedded YouTube video doesn't work.



The Splendid Walrus: Public House and Spirits

splendidwalrus.com/s...

Google

Home · On Tap Now · About Us

THE SPLENDID WALRUS: PUBLIC HOUSE & SPIRITS

VISIT US!

Location

1543 SW Pretend Street
Portland, OR 97204 (Map)

Hours

M-F
Until midnight
Sa-Su
Until 1AM*
*At least

Call us

+1 (503) 555-1212

THIS MONTH'S SPECIAL

25% off Jazz Hands Vodka: locally-made vodka bliss.

Jazz Hands Vodka is the newest pr[illegible] from local distiller *Awesomesauce*. Bright and vivid, it's the perfect warm-weather treat. We've concocted some pretty wonderful custom cocktails to highlight it (try the *White Devil* or the *Regret*). Or you can go classic with our ultra-fresh Lemon Drop (made with organic citrus).

The Splendid Walrus pub is the place in downtown Portland, Ore., to do all of these things:

- Sample local and hard-to-find microbrews – always at least 20 rotating taps
- Meet friends and hang out
- Surf the Web while sipping a pint (free wifi!)
- Catch a cult flick (movie Mondays!)
- Have a favorite cocktail or sample spirits from local distilleries

See you soon! Love, The Splendid Walrus

3. The three-column layout feels tight on this screen resolution, and the text is hard to read.

4. There is a weird gap on the right edge of the screen.

what's so different?

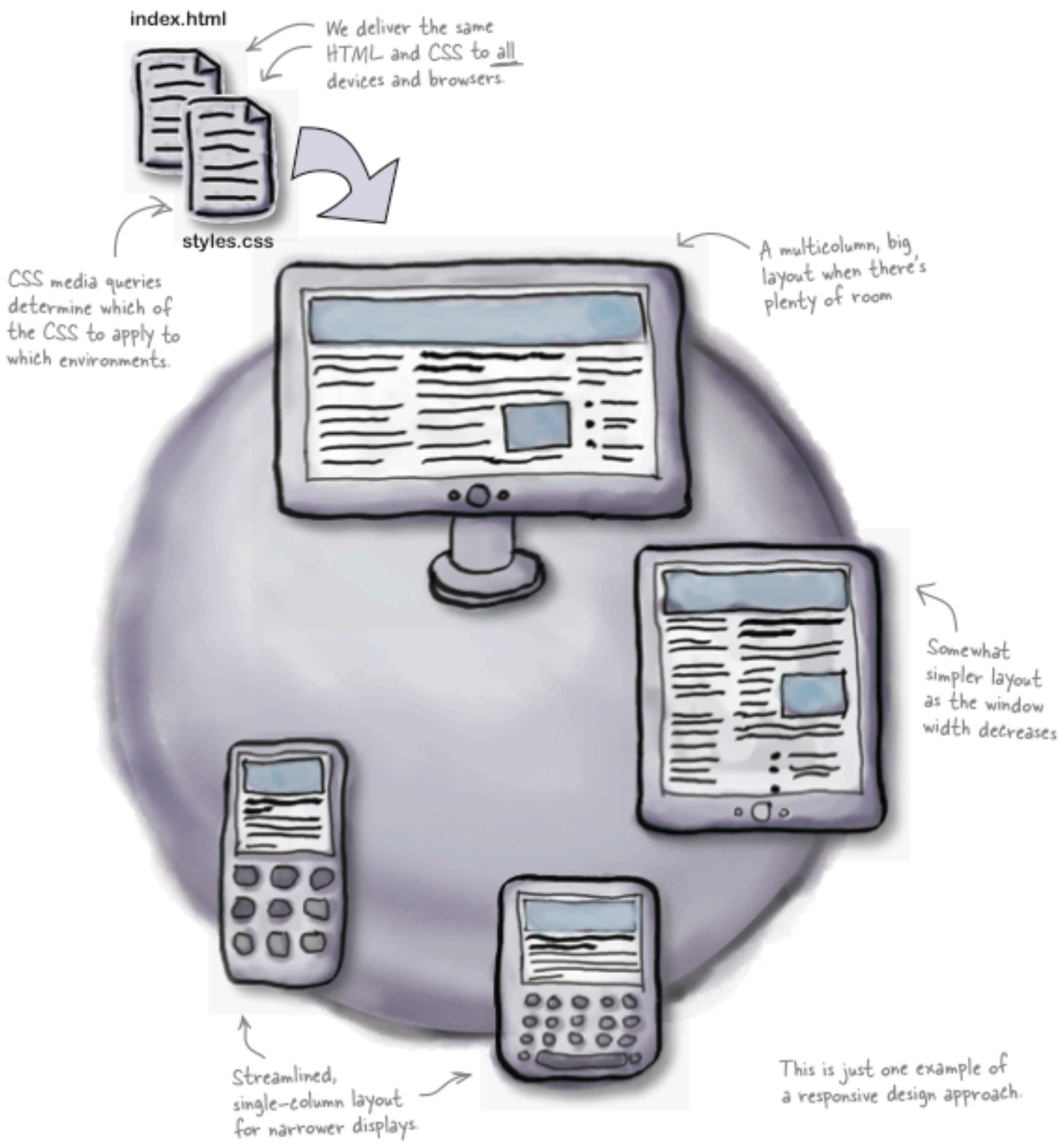
- There are 86 billion different mobile web browsers.
- Support for web technologies varies wildly.
- Mobile devices are smaller and slower.
- Mobile interfaces require us to rethink our sites.

Responsive Web Design

Responsive Web Design (RWD) is a set of techniques championed by web designer Ethan Marcotte. $\longrightarrow$

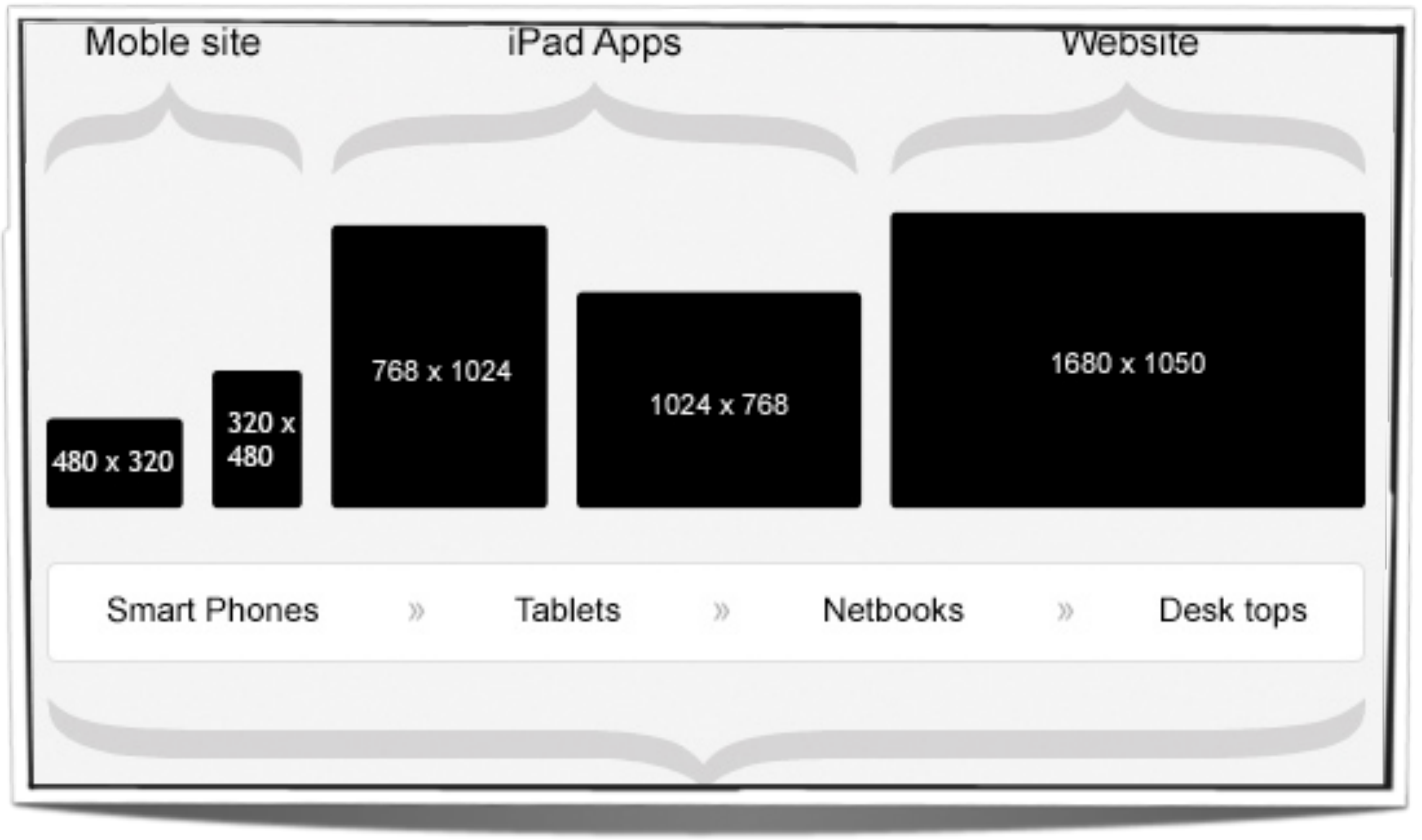
RWD is one of the simplest and quickest ways to make a website work handsomely on a lot of devices, and you can use the web skills you already have.

An example of a responsively designed site


index.html
We deliver the same HTML and CSS to all devices and browsers.
styles.css
CSS media queries determine which of the CSS to apply to which environments.
A multicolumn, big layout when there's plenty of room
Somewhat simpler layout as the window width decreases
Streamlined, single-column layout for narrower displays.
This is just one example of a responsive design approach.

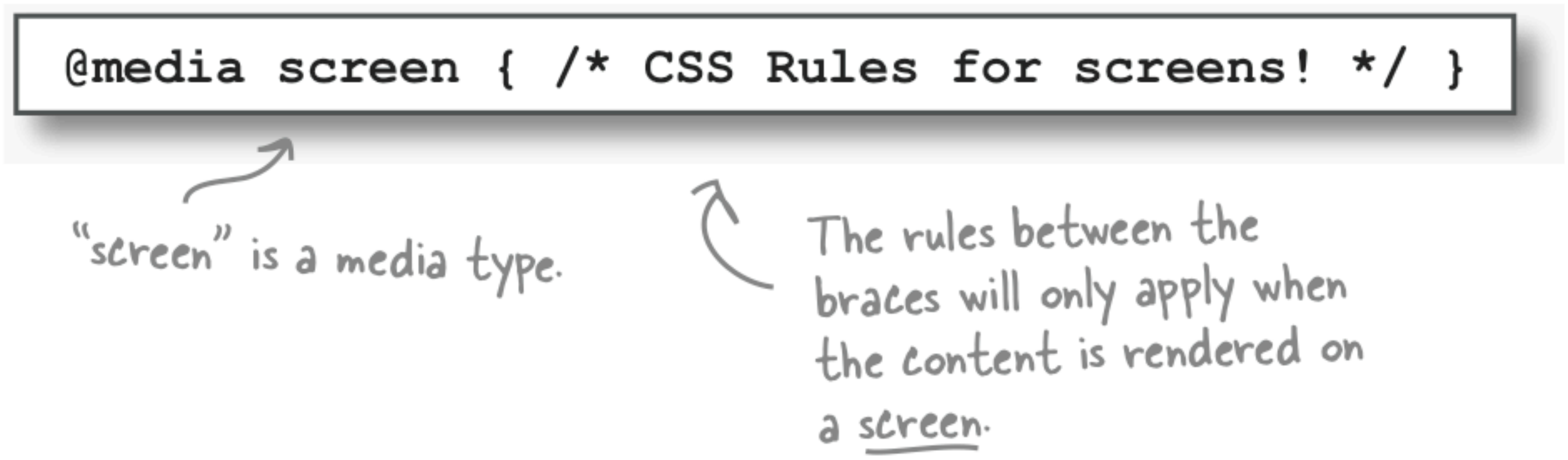
the recipe for Responsive Web Design

- CSS3 media queries
- Fluid-grid layouts
- Fluid images and media



@media rules

We can use @media rules to apply CSS selectively.

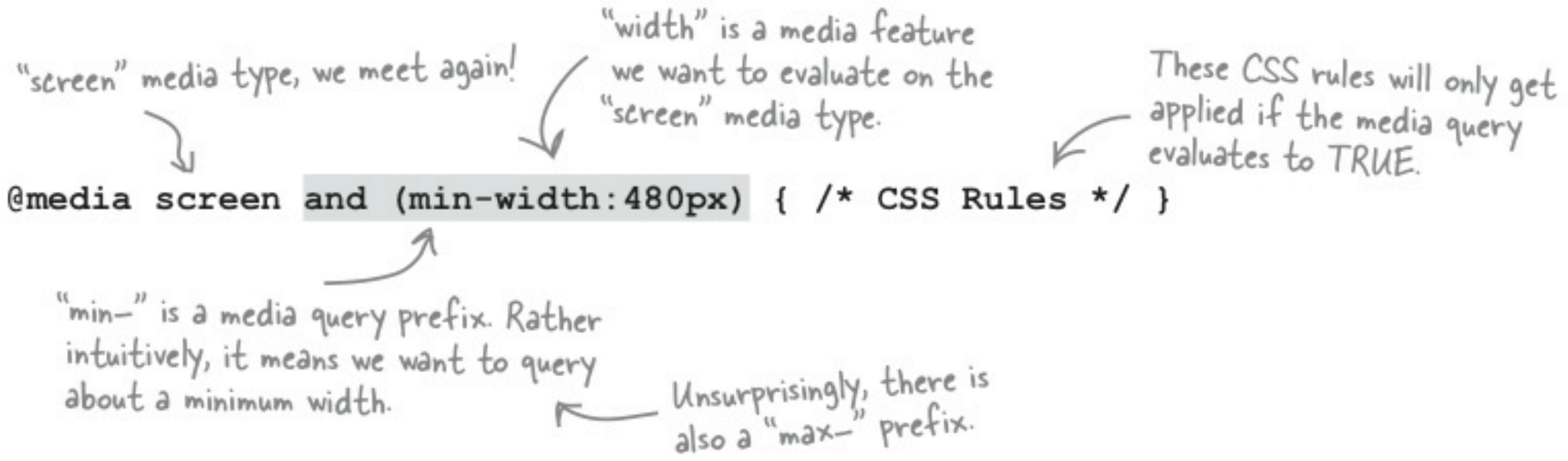


```
@media screen { /* CSS Rules for screens! */ }
```

"screen" is a media type.
The rules between the braces will only apply when the content is rendered on a screen.

CSS media queries

CSS3 media queries are logical expressions that evaluate the current values of media features in the user's browser. If the media query expression evaluates as TRUE, the contained CSS is applied.

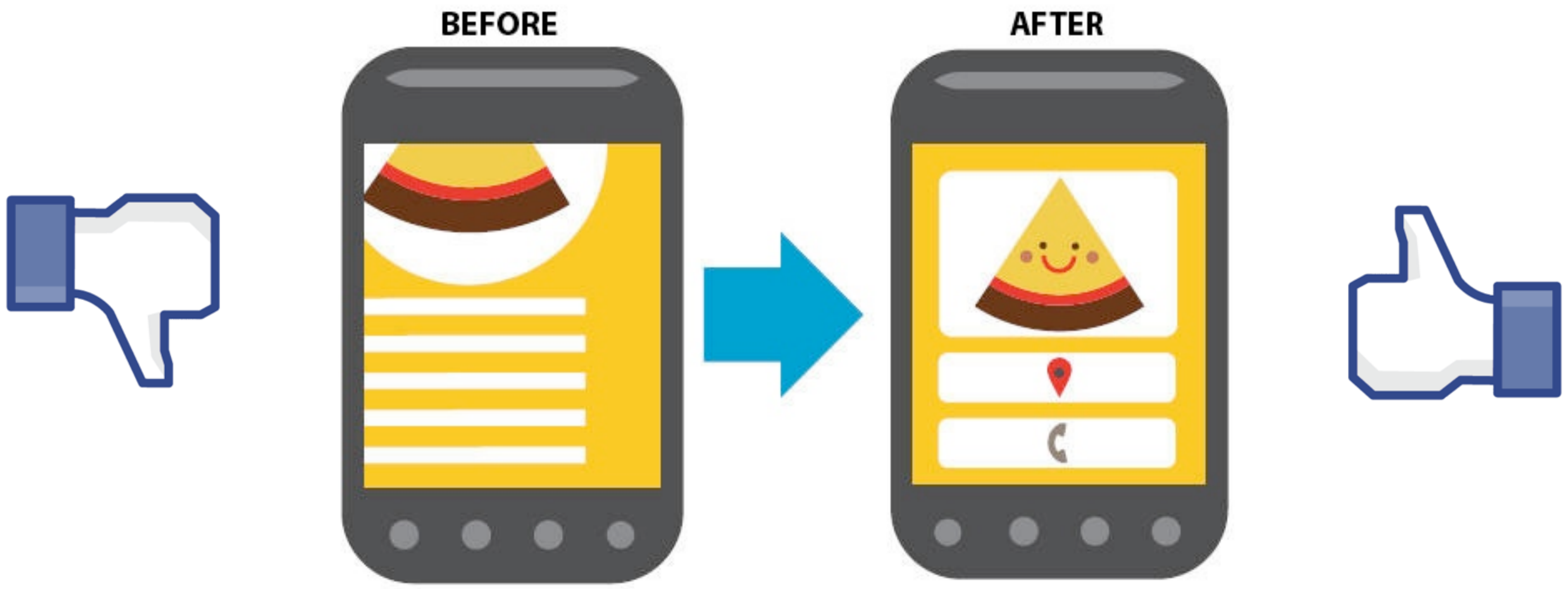


```
@media screen and (min-width:480px) { /* CSS Rules */ }
```

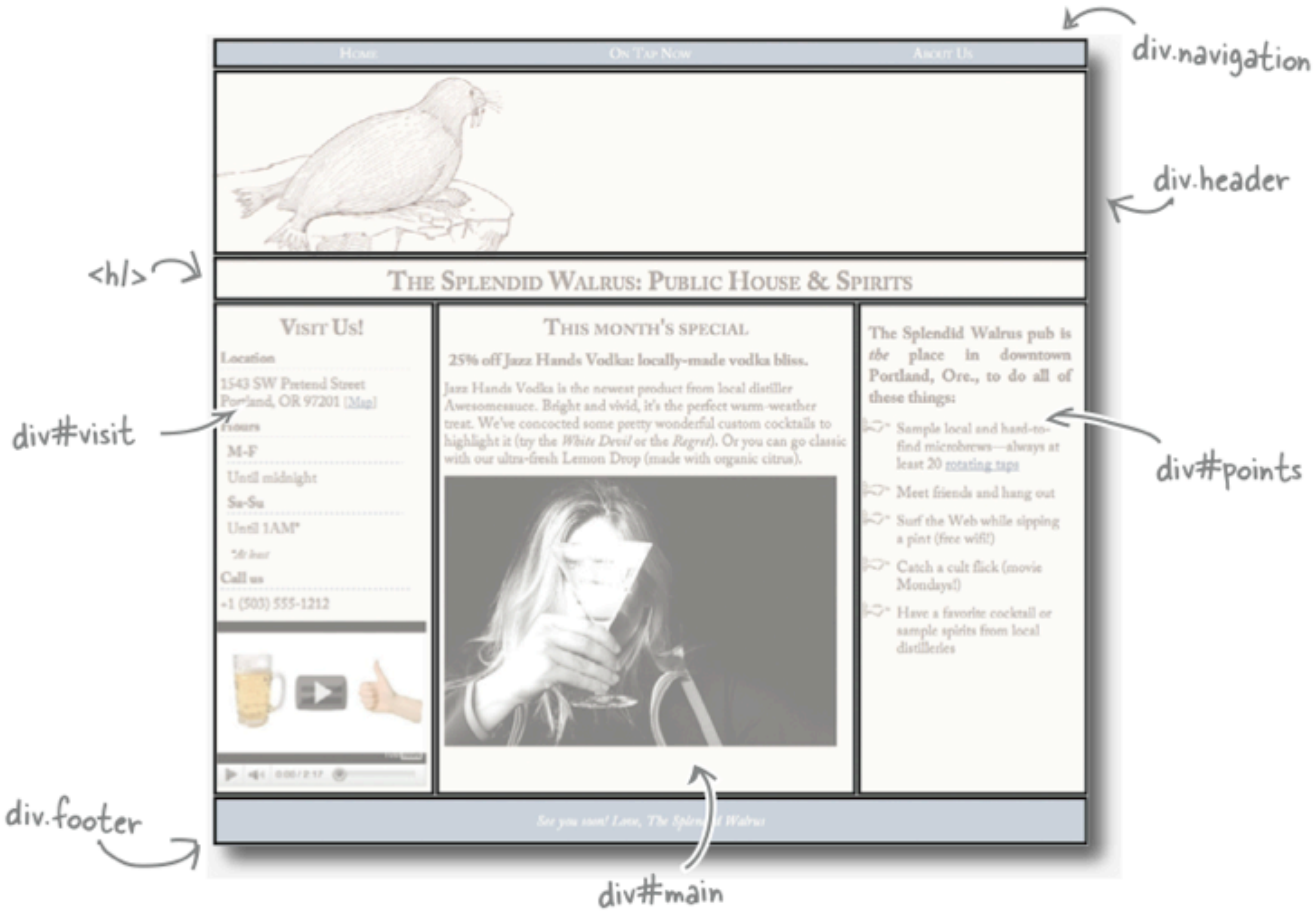
"screen" media type, we meet again!
"width" is a media feature we want to evaluate on the "screen" media type.
These CSS rules will only get applied if the media query evaluates to TRUE.
"min-" is a media query prefix. Rather intuitively, it means we want to query about a minimum width.
Unsurprisingly, there is also a "max-" prefix.

to generate our mobile-friendly layout:

- Check out the current layout and analyze its structure.
- Identify layout pieces that need to change to work better on mobile browsers.
- Generate mobile–adapted CSS for those identified elements.
- Organize our CSS and selectively apply the mobile and desktop CSS using media queries.



1) check out the current layout



Home On Tap Now About Us

The Splendid Walrus: Public House & Spirits

Visit Us!

Location

1543 SW Pretend Street
Portland, OR 97201 [Map]

Hours

M-F

Until midnight

Sa-Su

Until 1AM*

*At least

Call us

+1 (503) 555-1212

This month's special

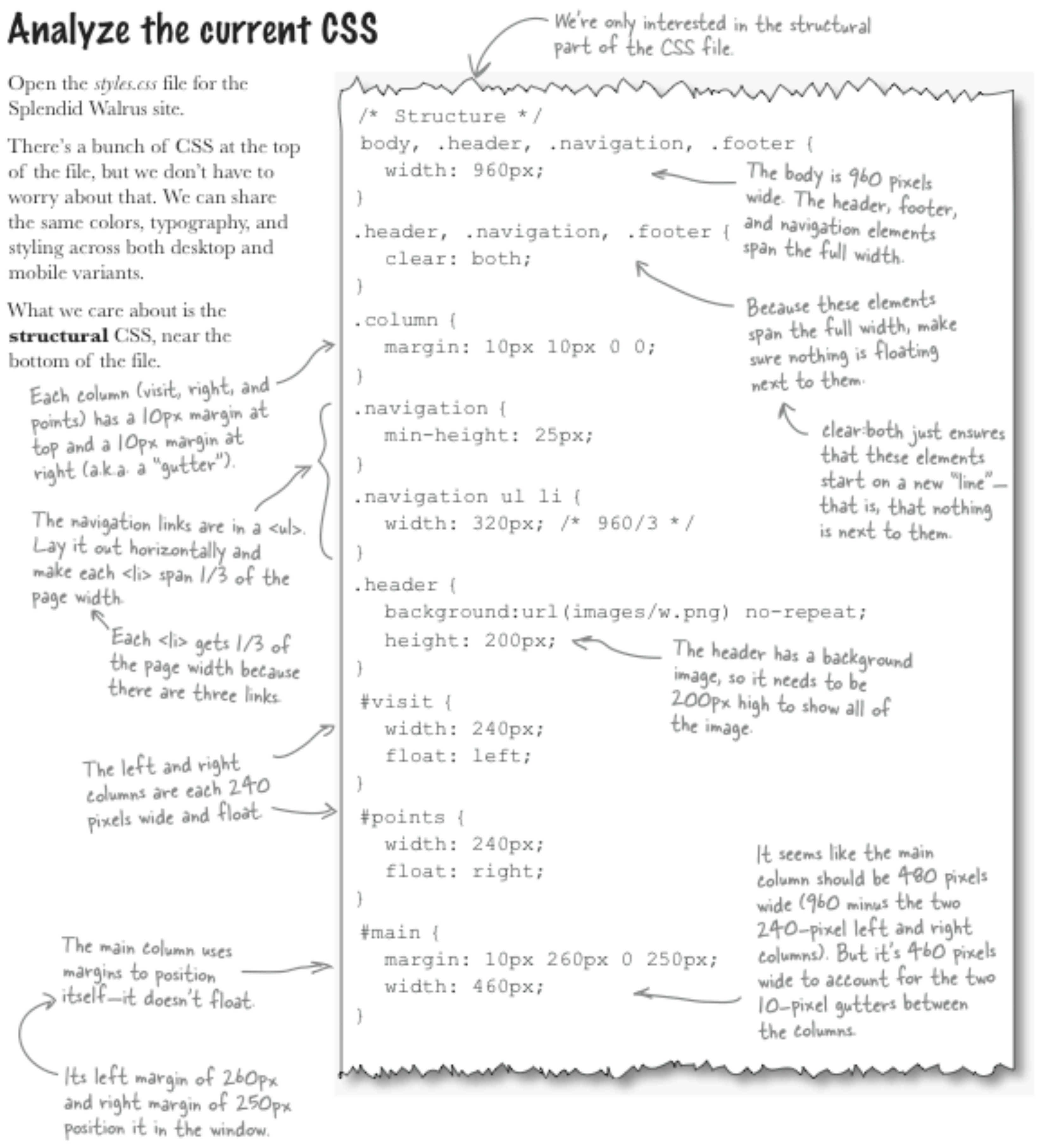
25% off Jazz Hands Vodka: locally-made vodka bliss.

Jazz Hands Vodka is the newest product from local distiller Awesomesauce. Bright and vivid, it's the perfect warm-weather treat. We've concocted some pretty wonderful custom cocktails to highlight it (try the *White Devil* or the *Regret*). Or you can go classic with our ultra-fresh Lemon Drop (made with organic citrus).

The Splendid Walrus pub is *the* place in downtown Portland, Ore., to do all of these things:

- Sample local and hard-to-find microbrews—always at least 20 rotating taps
- Meet friends and hang out
- Surf the Web while sipping a pint (free wifi!)
- Catch a cult flick (movie Mondays!)
- Have a favorite cocktail or sample spirits from local distilleries

See you soon! Love, The Splendid Walrus



Analyze the current CSS

We're only interested in the structural part of the CSS file.

Open the *styles.css* file for the Splendid Walrus site.

There's a bunch of CSS at the top of the file, but we don't have to worry about that. We can share the same colors, typography, and styling across both desktop and mobile variants.

What we care about is the **structural** CSS, near the bottom of the file.

```
/* Structure */
body, .header, .navigation, .footer {
  width: 960px;
}
.header, .navigation, .footer {
  clear: both;
}
.column {
  margin: 10px 10px 0 0;
}
.navigation {
  min-height: 25px;
}
.navigation ul li {
  width: 320px; /* 960/3 */
}
.header {
  background:url(images/w.png) no-repeat;
  height: 200px;
}
#visit {
  width: 240px;
  float: left;
}
#points {
  width: 240px;
  float: right;
}
#main {
  margin: 10px 260px 0 250px;
  width: 460px;
}
```

The body is 960 pixels wide. The header, footer, and navigation elements span the full width.

Because these elements span the full width, make sure nothing is floating next to them.

clear:both just ensures that these elements start on a new "line"—that is, that nothing is next to them.

Each column (visit, right, and points) has a 10px margin at top and a 10px margin at right (a.k.a. a "gutter").

The navigation links are in a <ul>. Lay it out horizontally and make each <li> span 1/3 of the page width.

Each <li> gets 1/3 of the page width because there are three links.

The header has a background image, so it needs to be 200px high to show all of the image.

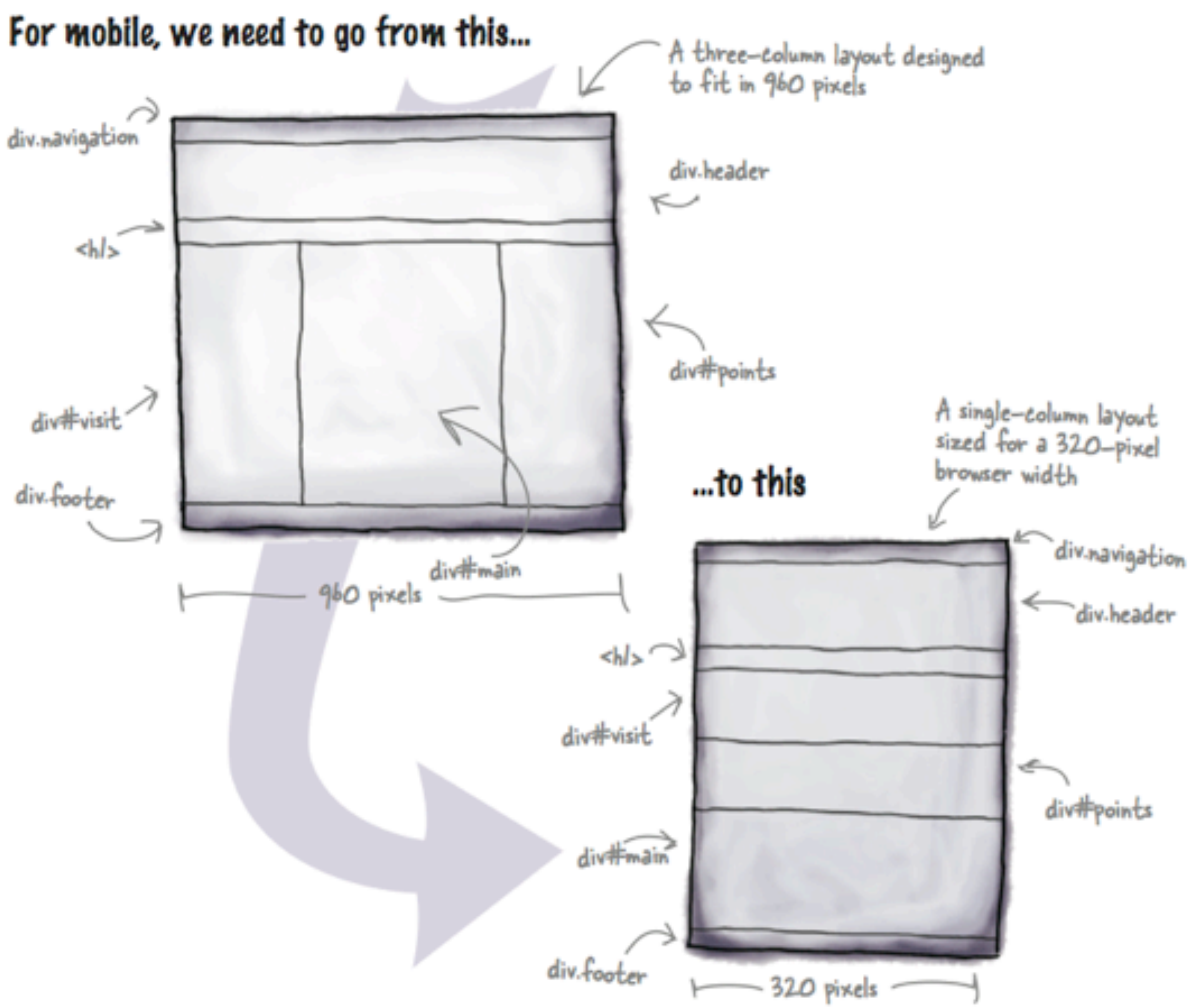
The left and right columns are each 240 pixels wide and float.

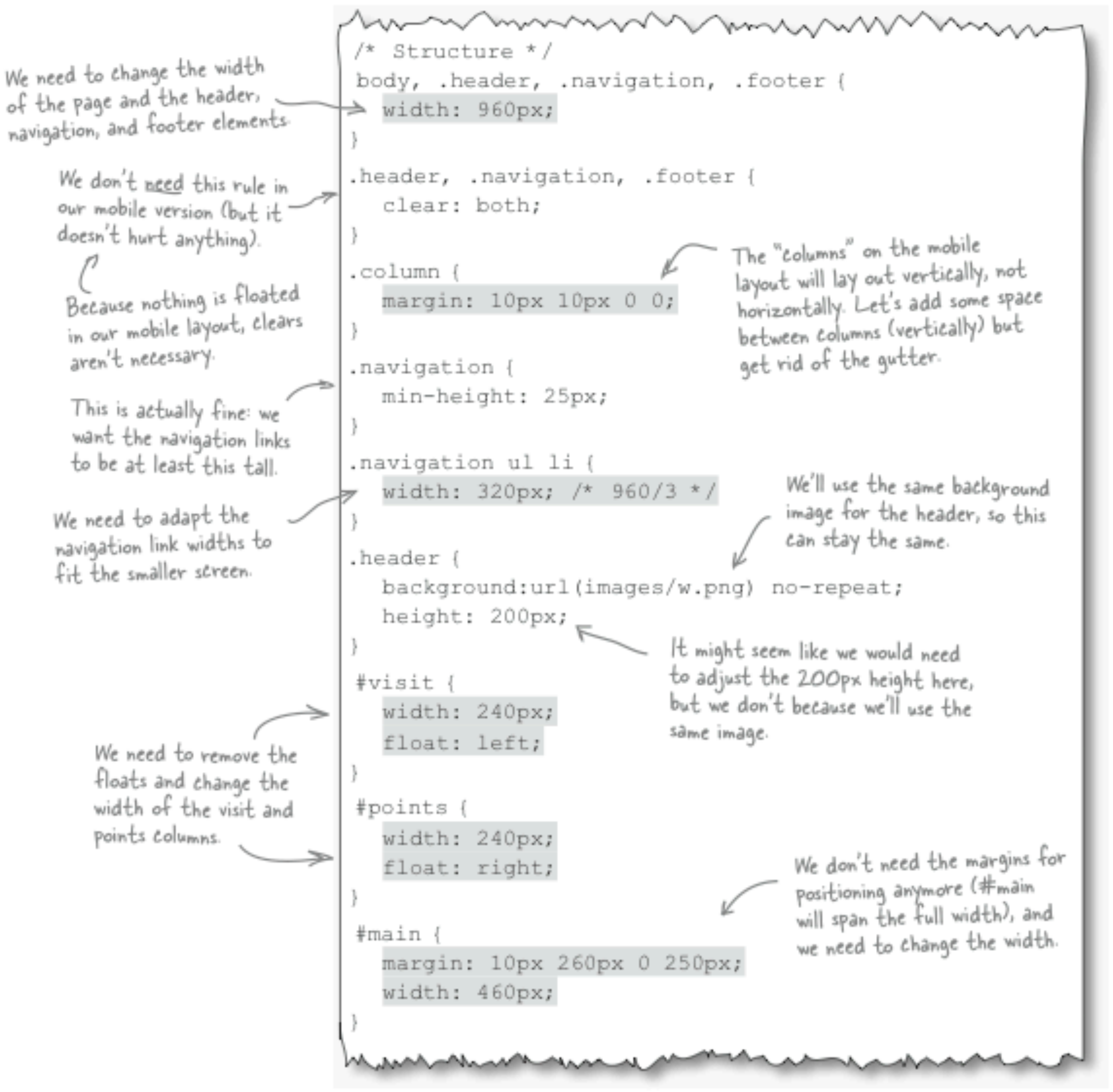
It seems like the main column should be 480 pixels wide (960 minus the two 240-pixel left and right columns). But it's 460 pixels wide to account for the two 10-pixel gutters between the columns.

The main column uses margins to position itself—it doesn't float.

Its left margin of 260px and right margin of 250px position it in the window.

2) what needs to change?





```
/* Structure */
body, .header, .navigation, .footer {
  width: 960px;
}
.header, .navigation, .footer {
  clear: both;
}
.column {
  margin: 10px 10px 0 0;
}
.navigation {
  min-height: 25px;
}
.navigation ul li {
  width: 320px; /* 960/3 */
}
.header {
  background:url(images/w.png) no-repeat;
  height: 200px;
}
#visit {
  width: 240px;
  float: left;
}
#points {
  width: 240px;
  float: right;
}
#main {
  margin: 10px 260px 0 250px;
  width: 460px;
}
```

We need to change the width of the page and the header, navigation, and footer elements.

We don't <u>need</u> this rule in our mobile version (but it doesn't hurt anything).

Because nothing is floated in our mobile layout, clears aren't necessary.

The "columns" on the mobile layout will lay out vertically, not horizontally. Let's add some space between columns (vertically) but get rid of the gutter.

This is actually fine: we want the navigation links to be at least this tall.

We need to adapt the navigation link widths to fit the smaller screen.

We'll use the same background image for the header, so this can stay the same.

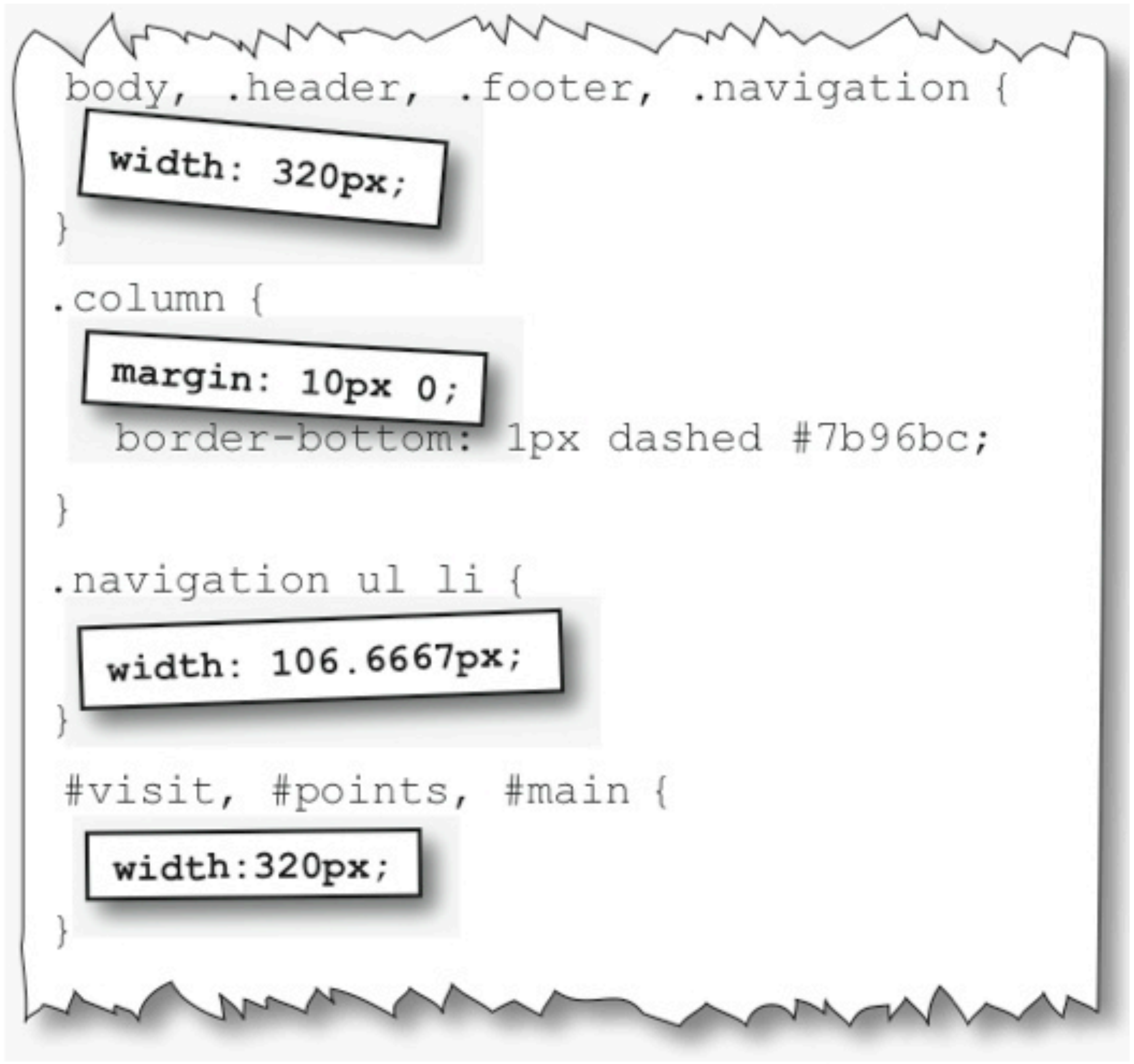
It might seem like we would need to adjust the 200px height here, but we don't because we'll use the same image.

We need to remove the floats and change the width of the visit and points columns.

We don't need the margins for positioning anymore (#main will span the full width), and we need to change the width.

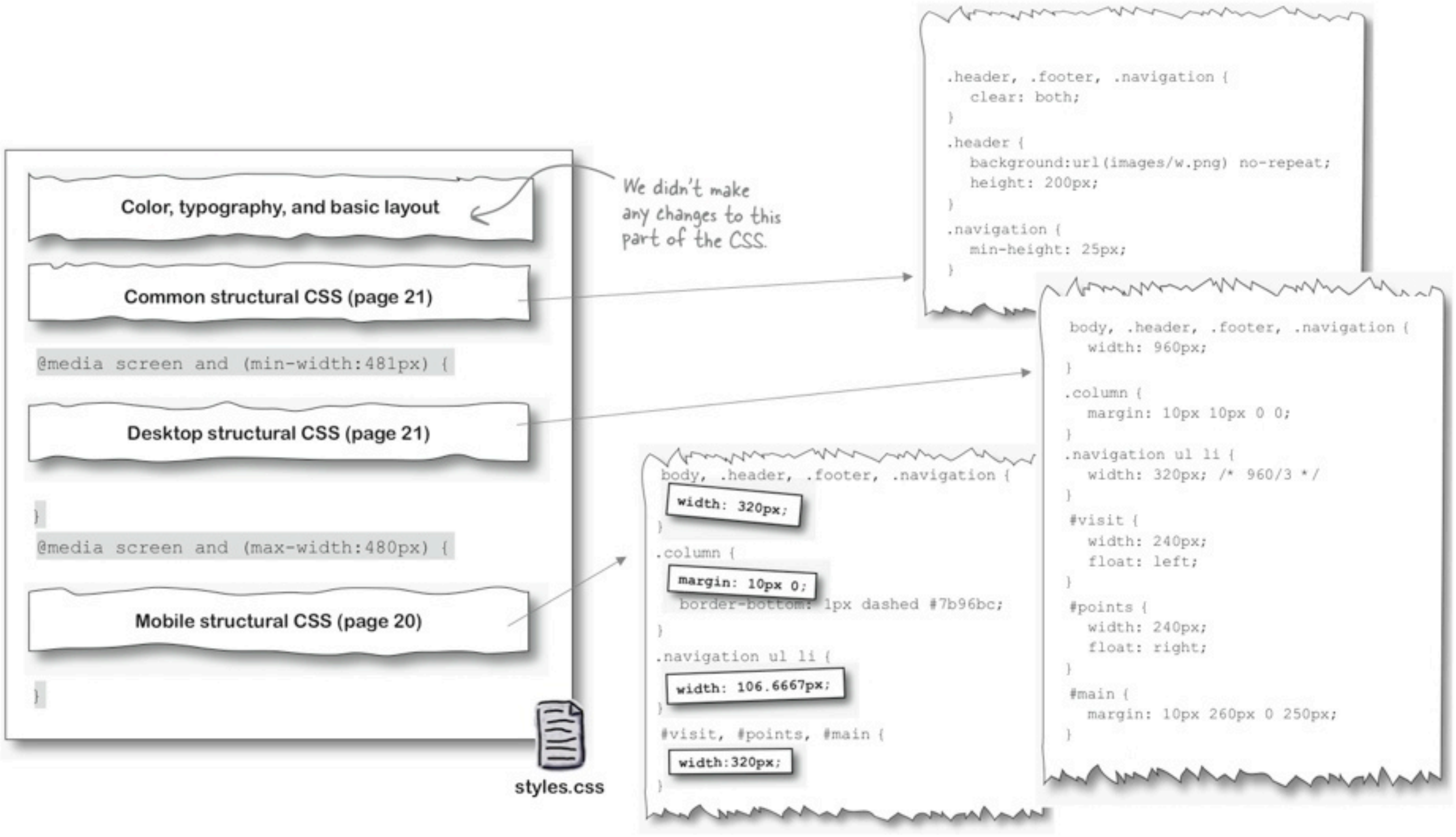
styles.css

3) generate mobile-adapted CSS



```
body, .header, .footer, .navigation {
  width: 320px;
}
.column {
  margin: 10px 0;
  border-bottom: 1px dashed #7b96bc;
}
.navigation ul li {
  width: 106.6667px;
}
#visit, #points, #main {
  width:320px;
}
```

4) organize our CSS



```
Color, typography, and basic layout

Common structural CSS (page 21)

@media screen and (min-width:481px) {

Desktop structural CSS (page 21)

}
@media screen and (max-width:480px) {

Mobile structural CSS (page 20)

}
```

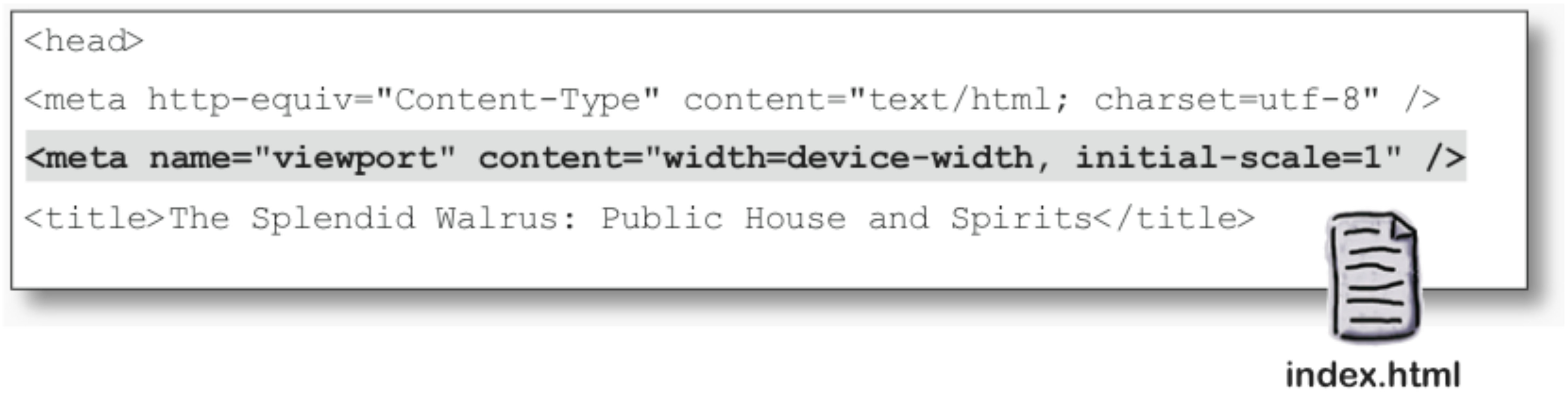
```
.header, .footer, .navigation {
  clear: both;
}
.header {
  background:url(images/w.png) no-repeat;
  height: 200px;
}
.navigation {
  min-height: 25px;
}
```

```
body, .header, .footer, .navigation {
  width: 960px;
}
.column {
  margin: 10px 10px 0 0;
}
.navigation ul li {
  width: 320px; /* 960/3 */
}
#visit {
  width: 240px;
  float: left;
}
#points {
  width: 240px;
  float: right;
}
#main {
  margin: 10px 260px 0 250px;
}
```

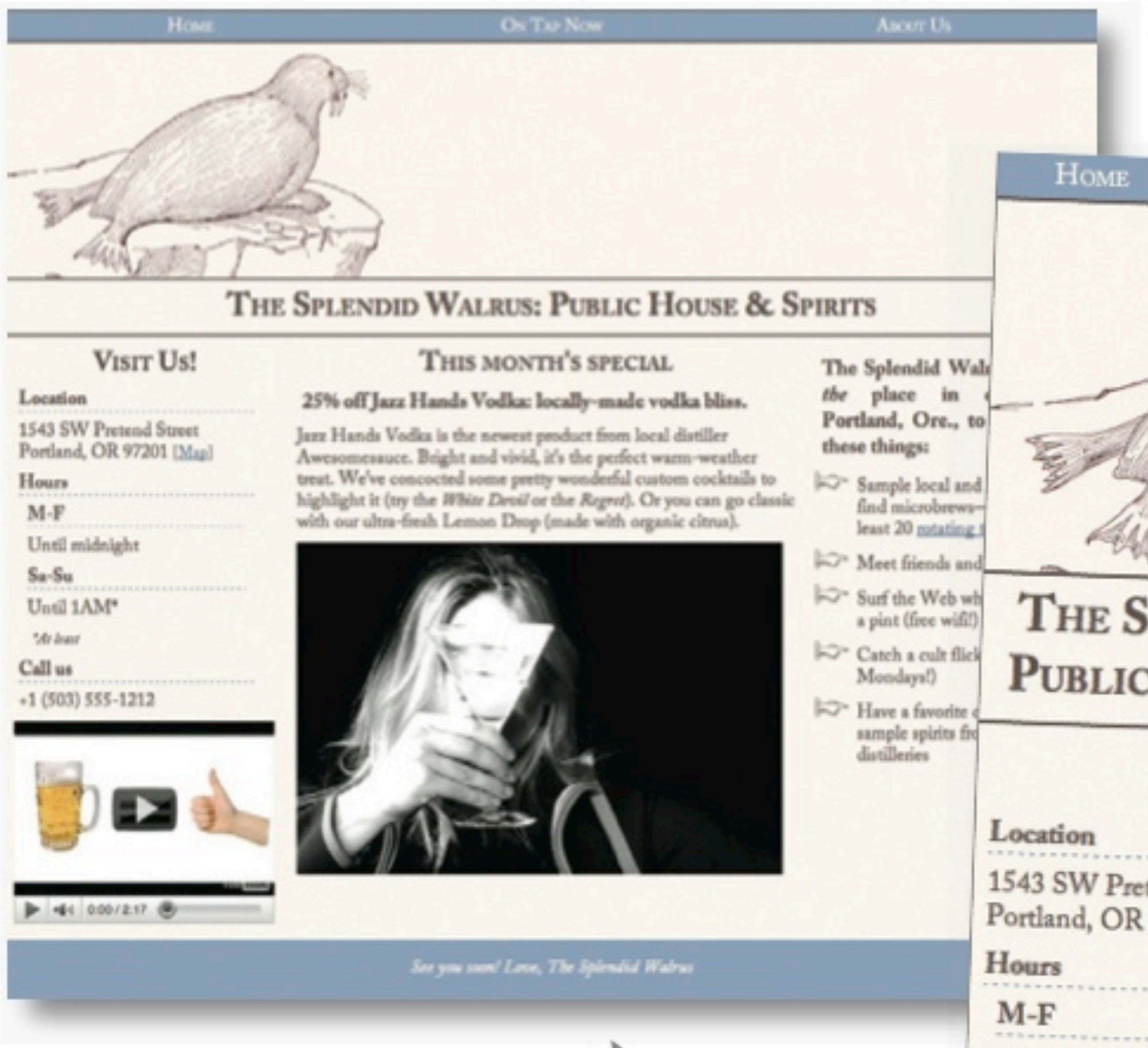
```
body, .header, .footer, .navigation {
  width: 320px;
}
.column {
  margin: 10px 0;
  border-bottom: 1px dashed #7b96bc;
}
.navigation ul li {
  width: 106.6667px;
}
#visit, #points, #main {
  width:320px;
}
```

one last thing...

You're going to need a viewport <meta> tag in the index.html file.
These tags help tell the browser how "zoomed in" to render the content.



```
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta name="viewport" content="width=device-width, initial-scale=1" />
<title>The Splendid Walrus: Public House and Spirits</title>
```



Home On Tap Now About Us

The Splendid Walrus: Public House & Spirits

Visit Us!

Location

1543 SW Pretend Street
Portland, OR 97201 [Map]

Hours

M-F

Until midnight

Sa-Su

Until 1AM*

**At least*

Call us

+1 (503) 555-1212

0:00 / 2:17

This month's special

25% off Jazz Hands Vodka: locally-made vodka bliss.

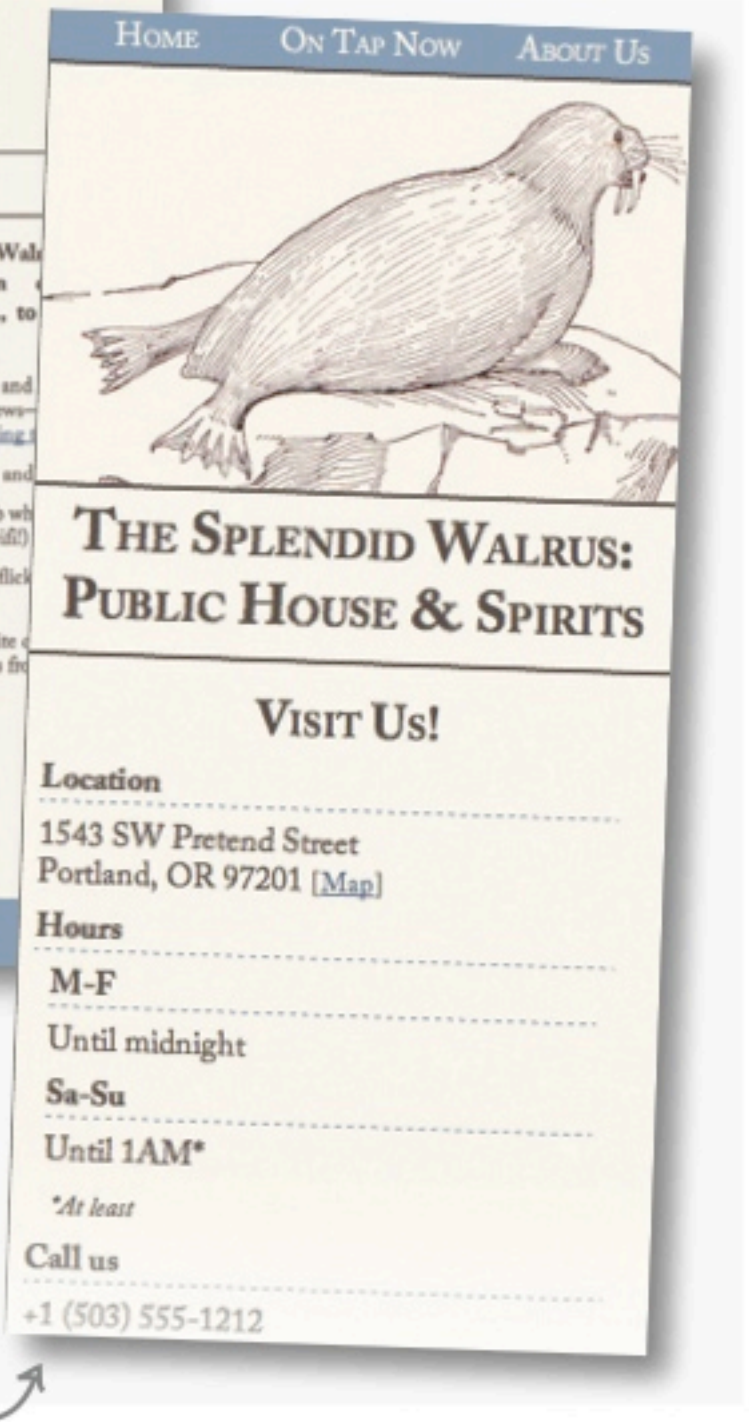
Jazz Hands Vodka is the newest product from local distiller Awesomesauce. Bright and vivid, it's the perfect warm-weather treat. We've concocted some pretty wonderful custom cocktails to highlight it (try the *White Devil* or the *Regret*). Or you can go classic with our ultra-fresh Lemon Drop (made with organic citrus).

The Splendid Wal
***the* place in**
Portland, Ore., to
these things:

- Sample local and
find microbrews—
least 20 rotating
- Meet friends and
- Surf the Web wh
a pint (free wifi!)
- Catch a cult flick
Mondays!)
- Have a favorite
sample spirits fro
distilleries

See you soon! Love, The Splendid Walrus

The page still looks the same in desktop browsers...



Home On Tap Now About Us

The Splendid Walrus: Public House & Spirits

Visit Us!

Location

1543 SW Pretend Street
Portland, OR 97201 [Map]

Hours

M-F

Until midnight

Sa-Su

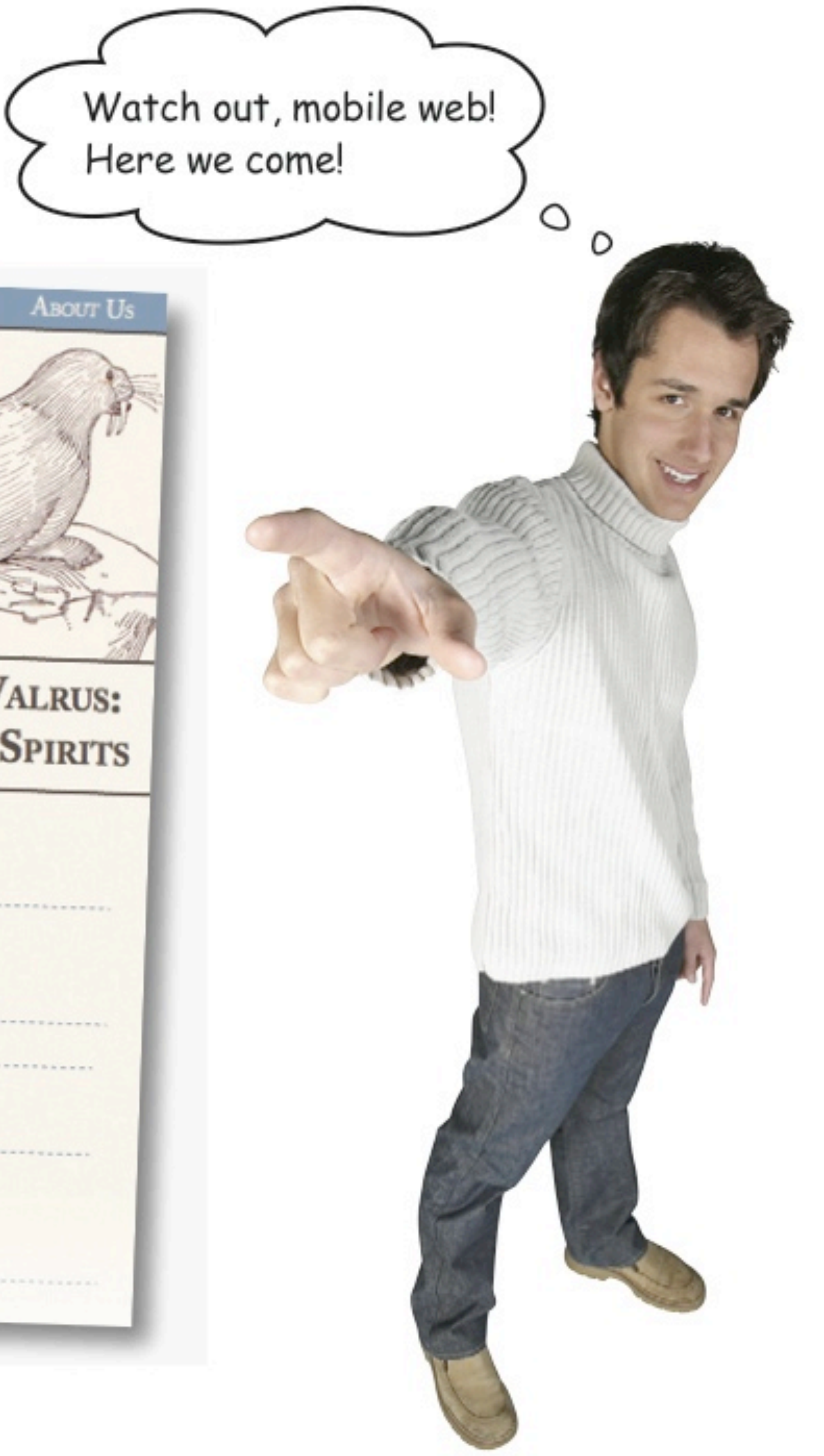
Until 1AM*

**At least*

Call us

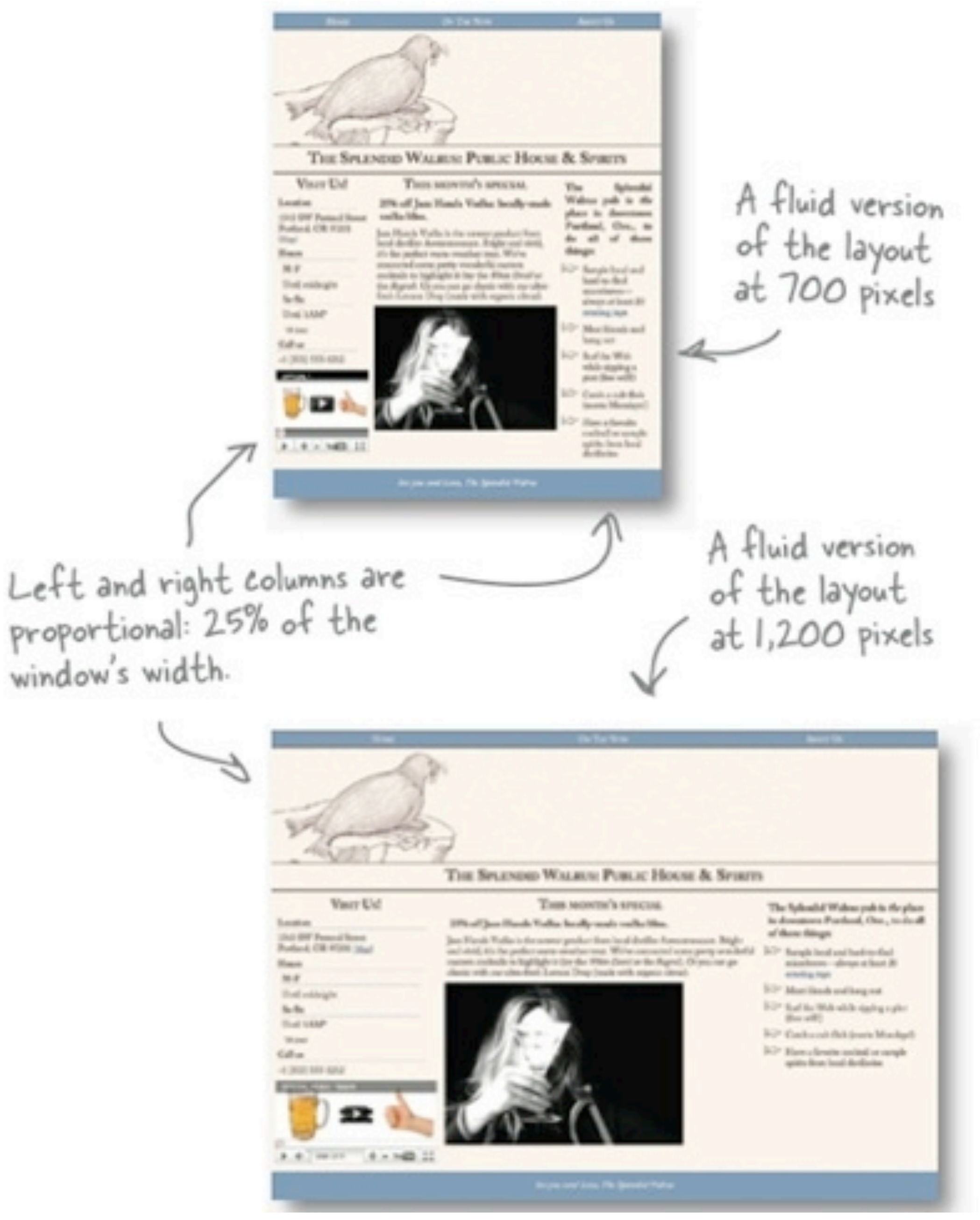
+1 (503) 555-1212

...until the browser window width is less than 481 pixels. Then you can see the mobile-optimized layout!

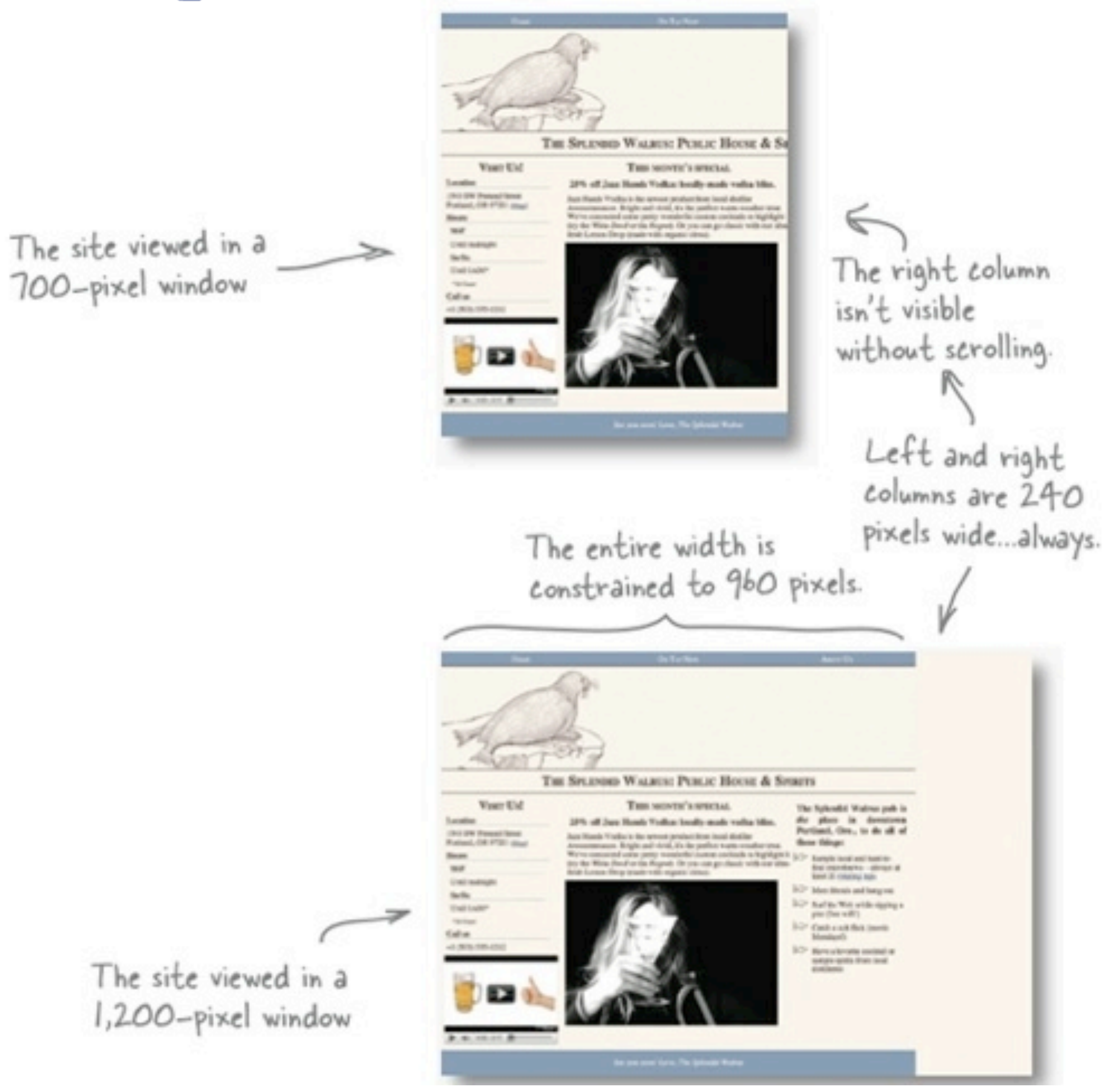


The next step to move toward a responsive design is to convert our fixed, pixel-based layout to a proportional, fluid-grid layout.

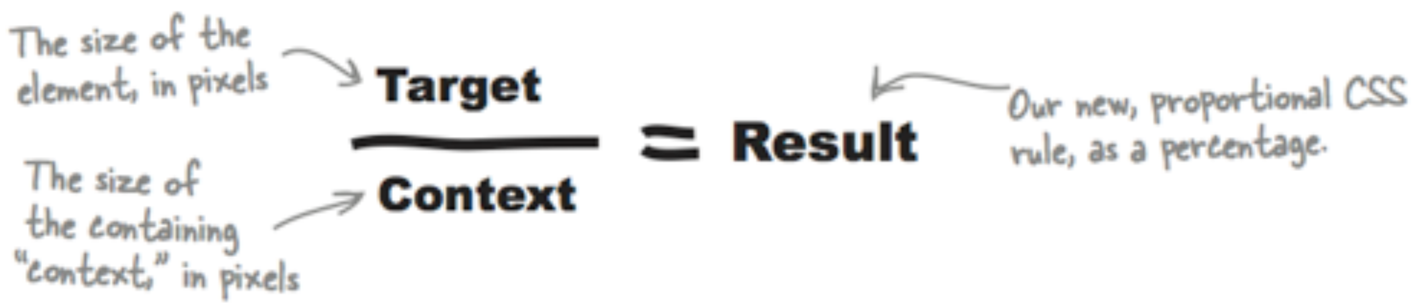
Fluid Grid


A fluid version of the layout at 700 pixels
Left and right columns are proportional: 25% of the window's width.
A fluid version of the layout at 1,200 pixels
The Splendid Walrus Public House & Spirits

Fixed Grid

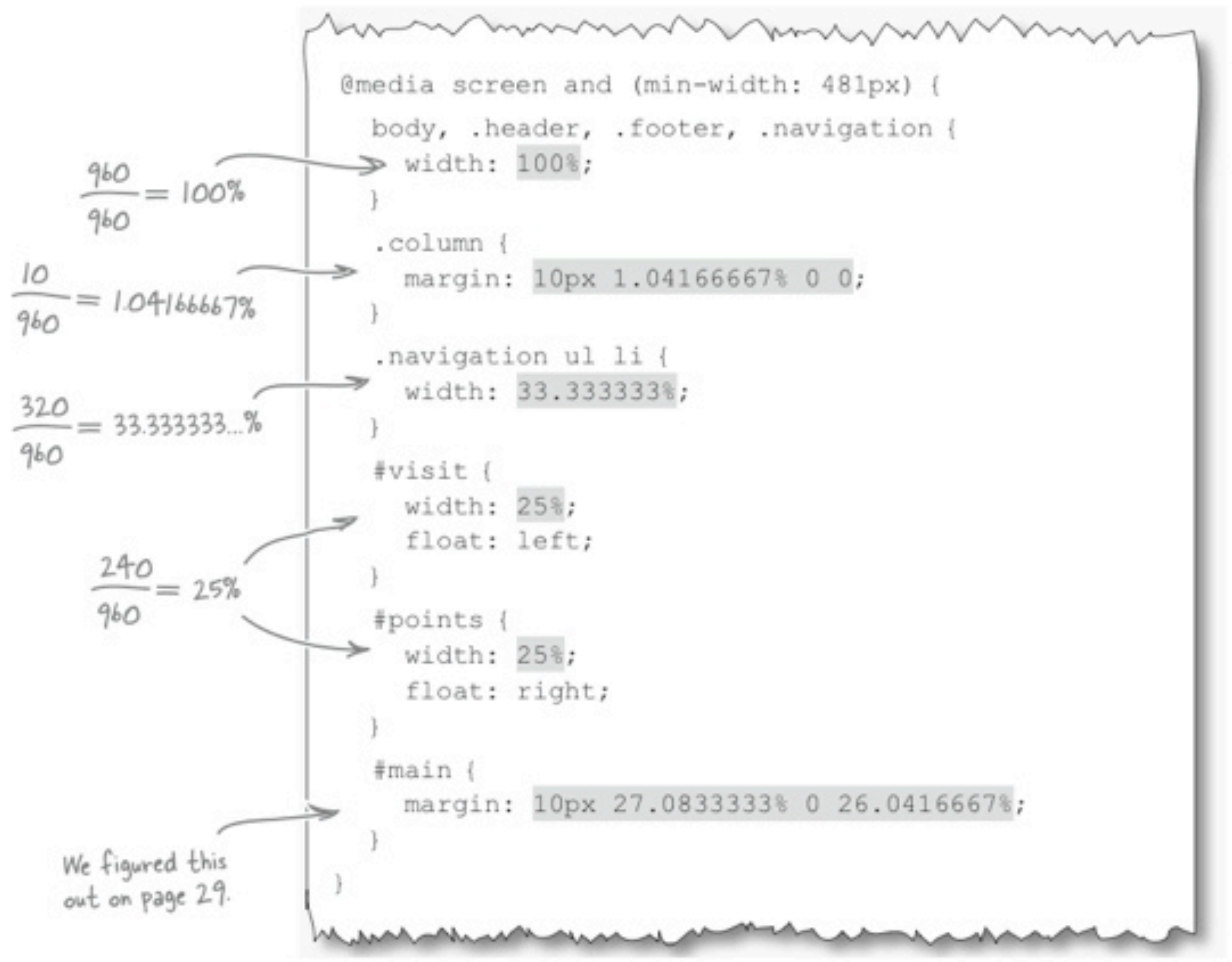

The site viewed in a 700-pixel window
The right column isn't visible without scrolling.
Left and right columns are 240 pixels wide...always.
The entire width is constrained to 960 pixels.
The site viewed in a 1,200-pixel window
The Splendid Walrus Public House & Spirits

fluid conversion



$$\frac{\textbf{Target}}{\textbf{Context}} = \textbf{Result}$$

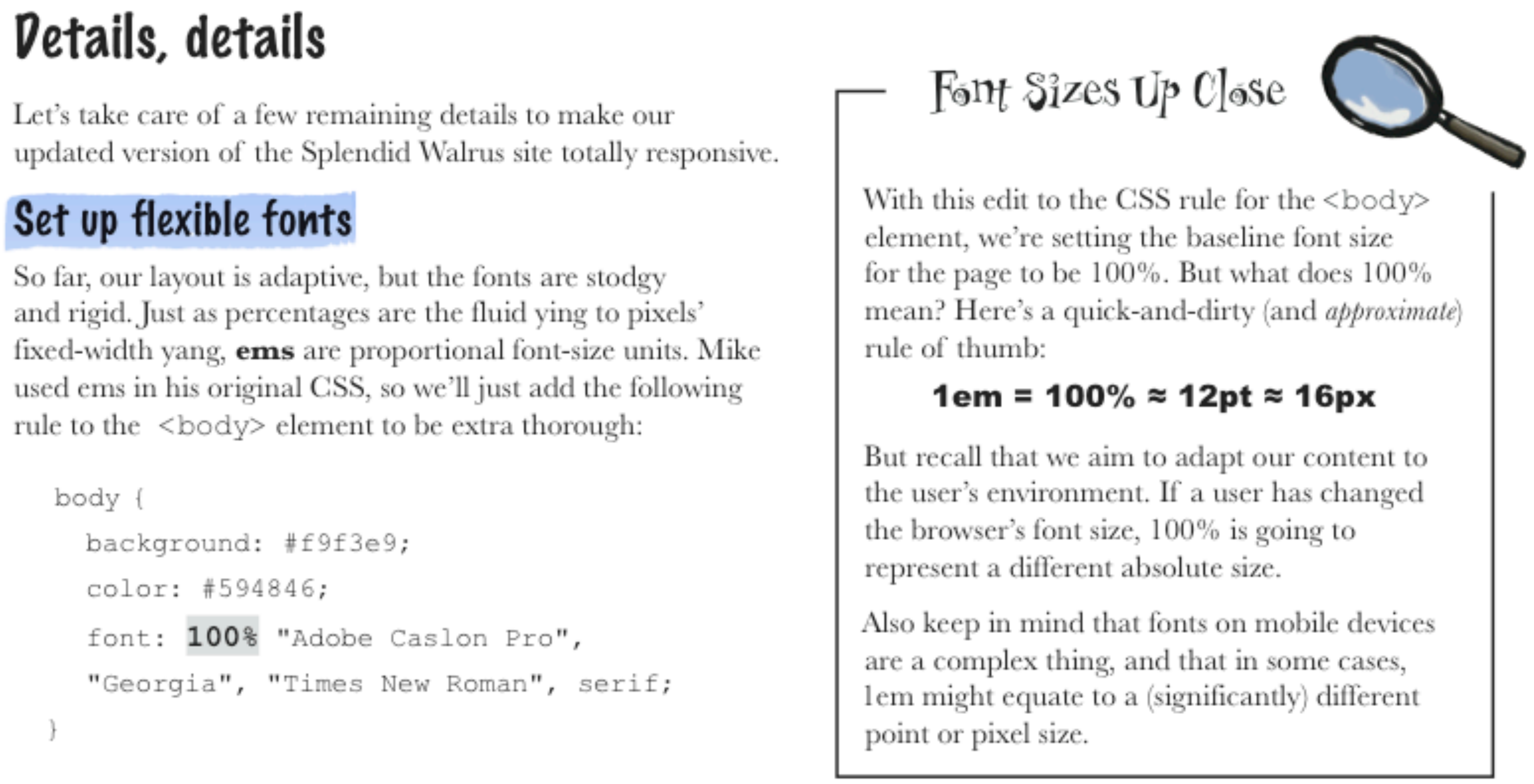
The size of the element, in pixels
The size of the containing "context," in pixels
Our new, proportional CSS rule, as a percentage.



```
@media screen and (min-width: 481px) {
  body, .header, .footer, .navigation {
    width: 100%;
  }
  .column {
    margin: 10px 1.04166667% 0 0;
  }
  .navigation ul li {
    width: 33.333333%;
  }
  #visit {
    width: 25%;
    float: left;
  }
  #points {
    width: 25%;
    float: right;
  }
  #main {
    margin: 10px 27.0833333% 0 26.0416667%;
  }
}
```

$\frac{960}{960} = 100\%$
$\frac{10}{960} = 1.04166667\%$
$\frac{320}{960} = 33.333333...\%$
$\frac{240}{960} = 25\%$
We figured this out on page 29.

flexible fonts



Details, details

Let's take care of a few remaining details to make our updated version of the Splendid Walrus site totally responsive.

Set up flexible fonts

So far, our layout is adaptive, but the fonts are stodgy and rigid. Just as percentages are the fluid ying to pixels' fixed-width yang, **ems** are proportional font-size units. Mike used ems in his original CSS, so we'll just add the following rule to the `<body>` element to be extra thorough:

```
body {
  background: #f9f3e9;
  color: #594846;
  font: 100% "Adobe Caslon Pro",
  "Georgia", "Times New Roman", serif;
}
```

Font Sizes Up Close

With this edit to the CSS rule for the `<body>` element, we're setting the baseline font size for the page to be 100%. But what does 100% mean? Here's a quick-and-dirty (and *approximate*) rule of thumb:

1em = 100% ≈ 12pt ≈ 16px

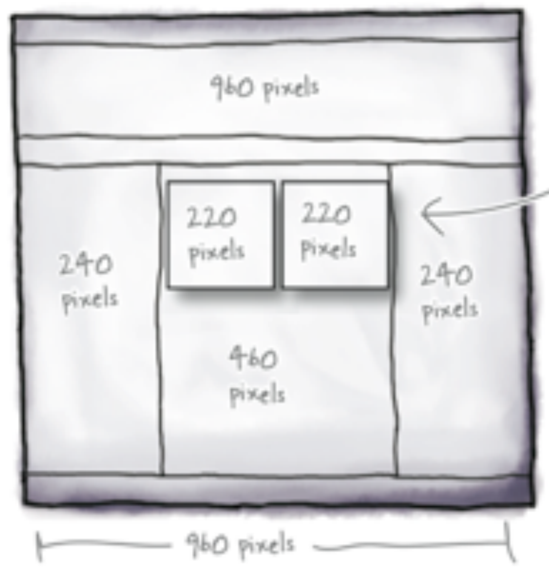
But recall that we aim to adapt our content to the user's environment. If a user has changed the browser's font size, 100% is going to represent a different absolute size.

Also keep in mind that fonts on mobile devices are a complex thing, and that in some cases, 1em might equate to a (significantly) different point or pixel size.

fluid images and media

```
img, object {
  max-width: 100%;
}
```

Ka-pow!



These <img> tags have a class of "label"

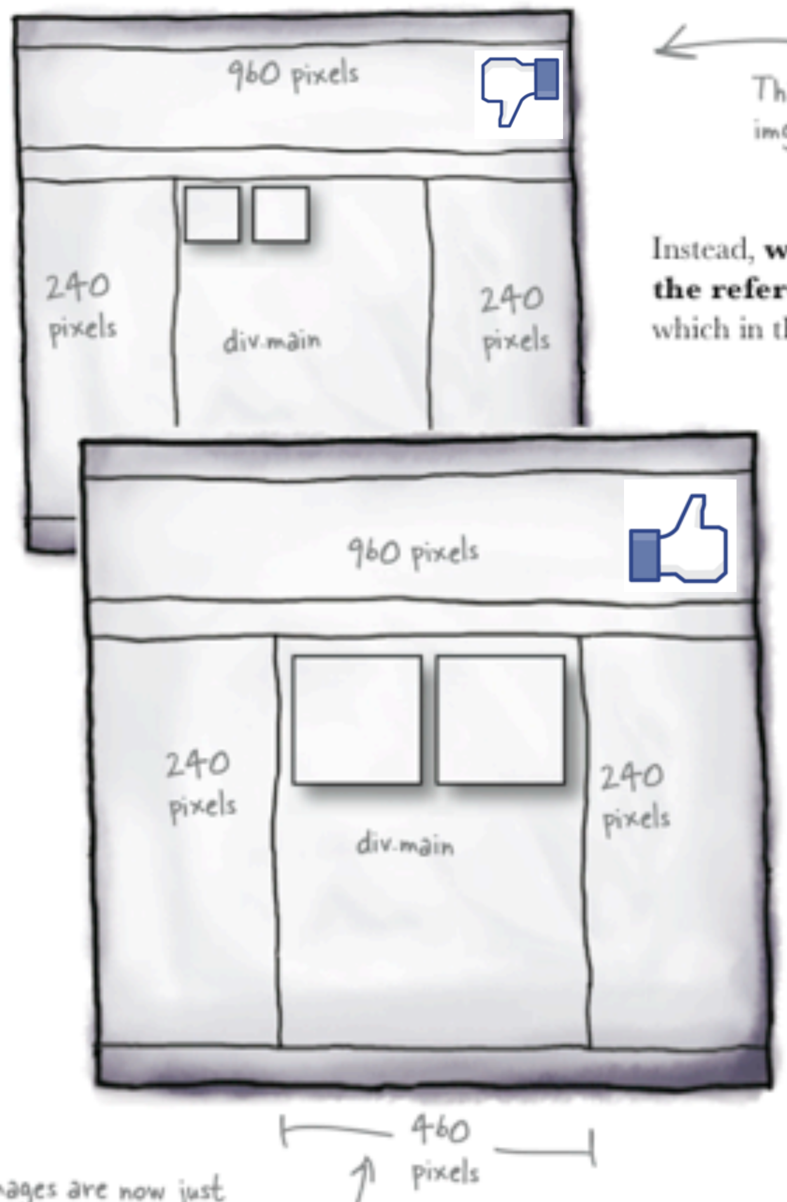
```
#main img.label {
  width: 220px;
  margin: 5px;
  float: left;
}
```

Mike's pixel-based CSS widths

It's tempting to think that the formula for converting these image widths to be fluid would be:

$$\frac{\textbf{220 pixels}}{\textbf{960 pixels}} \approx \textbf{22.916667\%}$$

Does this formula look right to you?



This is what you'll get if you set the width of img.label to be 22.916667%. Uh oh.

Instead, **we set the context in our formula to be the reference width of the containing element**, which in this case is 460 pixels.

Do this!

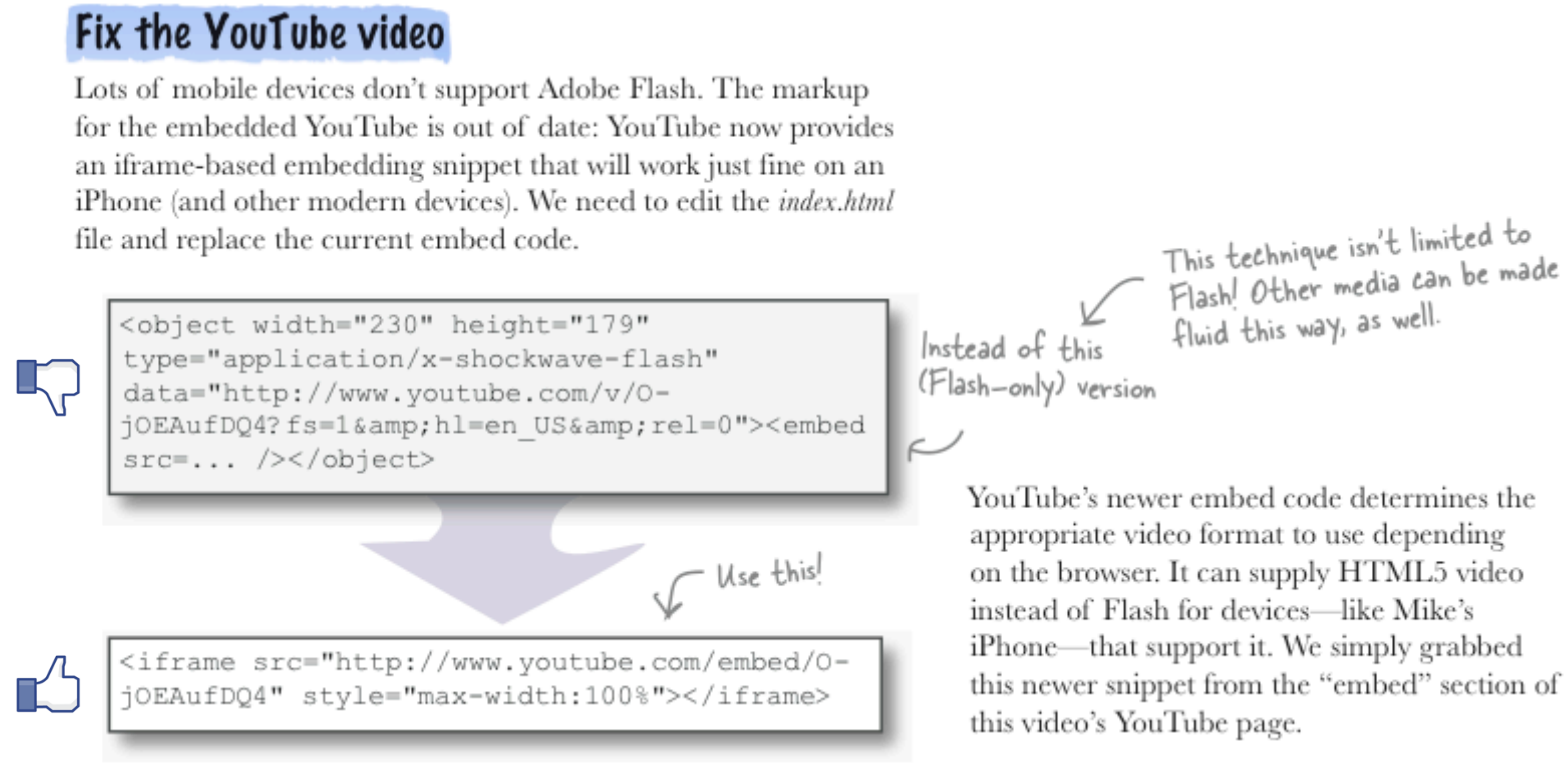
$$\frac{\textbf{220 pixels}}{\textbf{460 pixels}} \approx \textbf{47.826087\%}$$

New context: width of div#main, the containing element

nages are now just under 50% of the width of div#main—that's more like it.

Setting image widths as percentages? Turns out, this is on the right track to fixing one of our other problems with the mobile layout. Remember that photo that is too big and messes up the page width? We can use a variant of what we're doing here to fix that!

HTML5 video



Fix the YouTube video

Lots of mobile devices don't support Adobe Flash. The markup for the embedded YouTube is out of date: YouTube now provides an iframe-based embedding snippet that will work just fine on an iPhone (and other modern devices). We need to edit the *index.html* file and replace the current embed code.

```
<object width="230" height="179"
type="application/x-shockwave-flash"
data="http://www.youtube.com/v/O-
jOEAufDQ4?fs=1&amp;hl=en_US&amp;rel=0"><embed
src=... /></object>
```

Instead of this (Flash-only) version

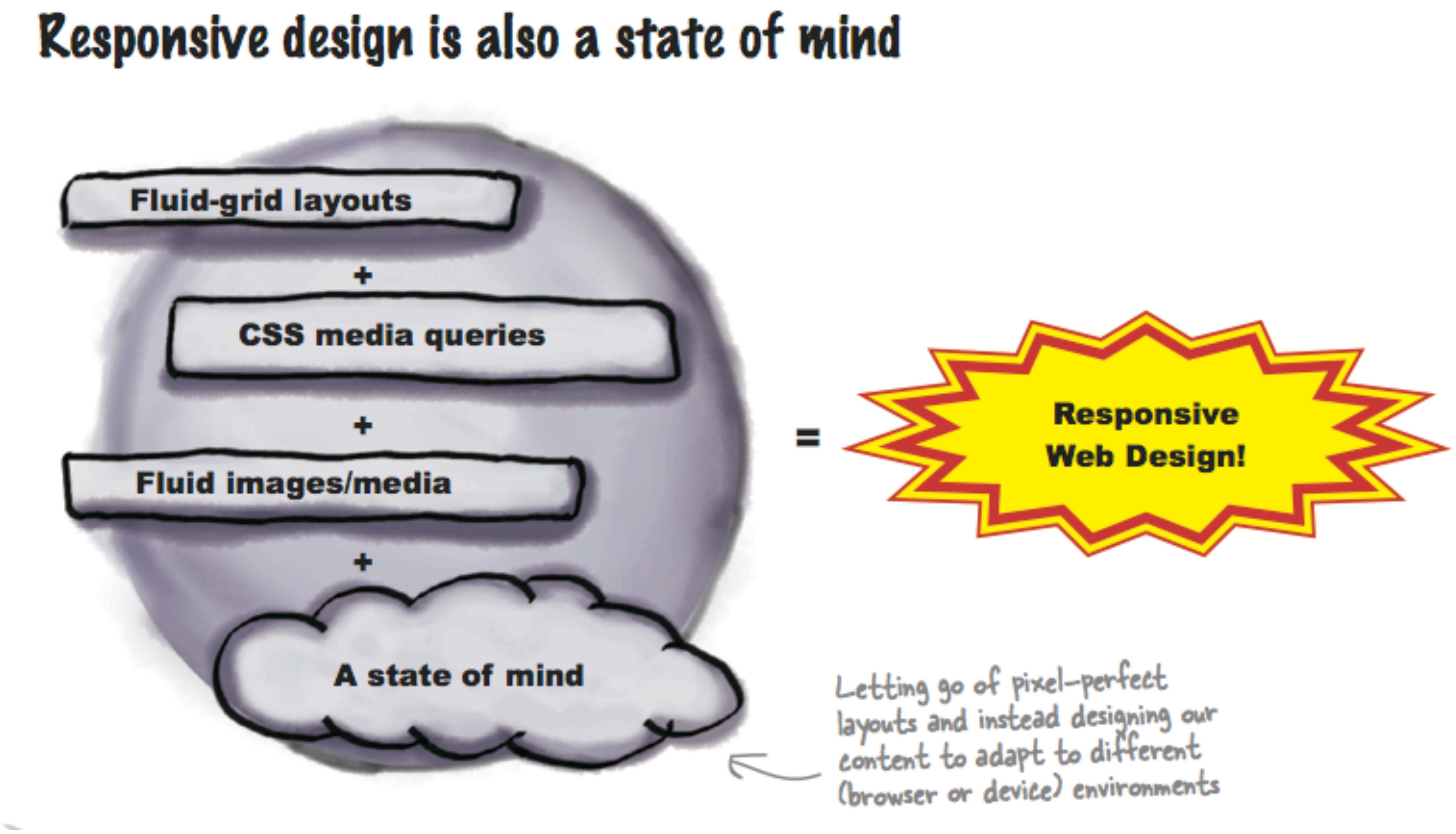
This technique isn't limited to Flash! Other media can be made fluid this way, as well.

Use this!

```
<iframe src="http://www.youtube.com/embed/O-
jOEAufDQ4" style="max-width:100%"></iframe>
```

YouTube's newer embed code determines the appropriate video format to use depending on the browser. It can supply HTML5 video instead of Flash for devices—like Mike's iPhone—that support it. We simply grabbed this newer snippet from the "embed" section of this video's YouTube page.

summing up


Responsive design is also a state of mind
Fluid-grid layouts
+
CSS media queries
+
Fluid images/media
+
A state of mind
=
Responsive Web Design!
Letting go of pixel-perfect layouts and instead designing our content to adapt to different (browser or device) environments