

CSS3, Media Queries, & Responsive Design

May 23, 2012

STC Summit

Zoe Mickley Gillenwater | @zomigi

What I do

Books



Stunning CSS3:
A Project-based Guide to
the Latest in CSS

www.stunningcss3.com



Flexible Web Design:
Creating Liquid and Elastic
Layouts with CSS

www.flexiblewebbook.com

Web

Accessibility
specialist at AT&T

Visual designer

CSS developer
and consultant

My home's web-enabled devices



more mobile devices

&

more diversity within devices

EVERY DAY

every day

1.45 MILLION DEVICES

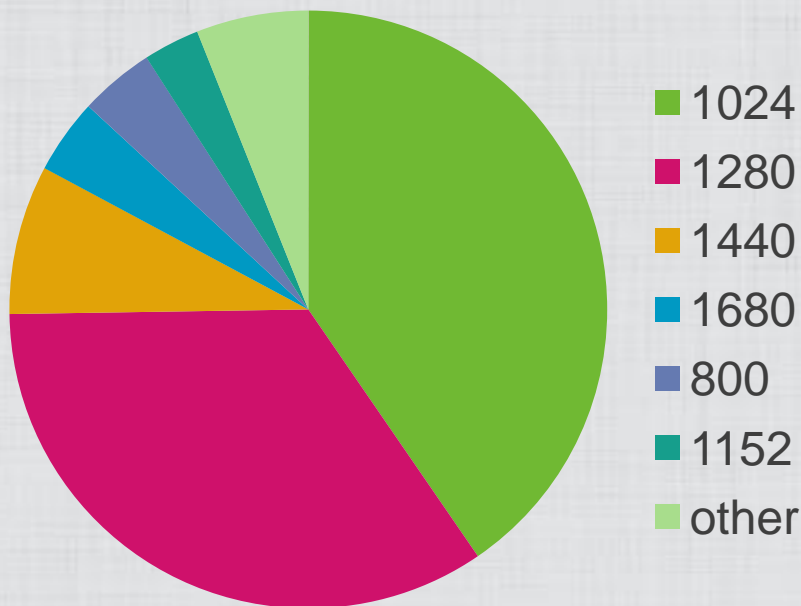
&

317,124 BABIES

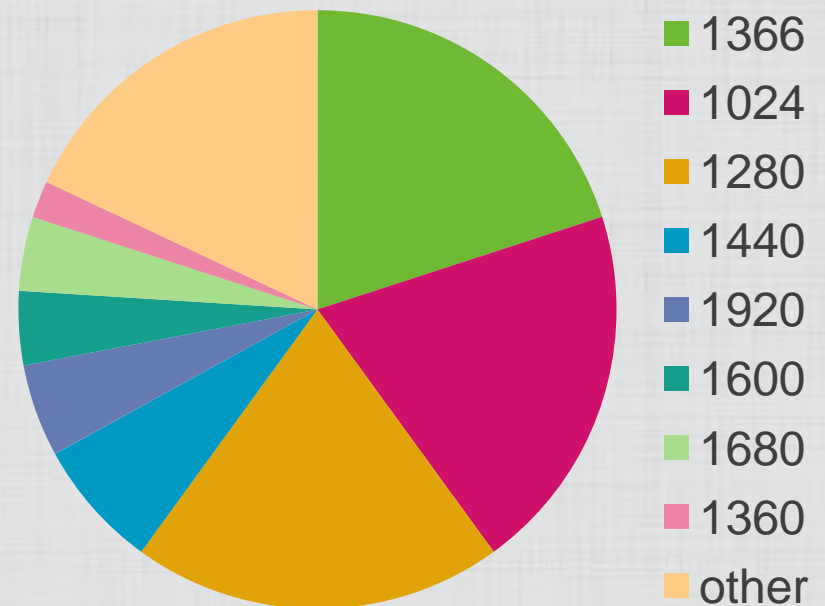
enter the world

Growing screen resolution diversity on desktop

May 2009 widths



May 2012 widths



25%

of U.S. smartphone users do

MOST OR ALL

of their web browsing on mobile

*how can our sites
accommodate all this*
DIVERSITY

?

Introducing media queries

- Awesome new part of CSS3
- Simple way to **feed different CSS** based on characteristics of user's device
- Used to build **responsive/adaptive** designs
- Not:
 - for feeding styles based on browser
 - just for feeding styles based on viewport size

Media query syntax: internal

```
body {  
    background: gray;  
}  
  
@media screen and (max-width:500px) {  
    body {  
        background: blue;  
    }  
}
```

English translation:

Make the background gray. But up to a maximum width of 500 pixels, make the background blue.

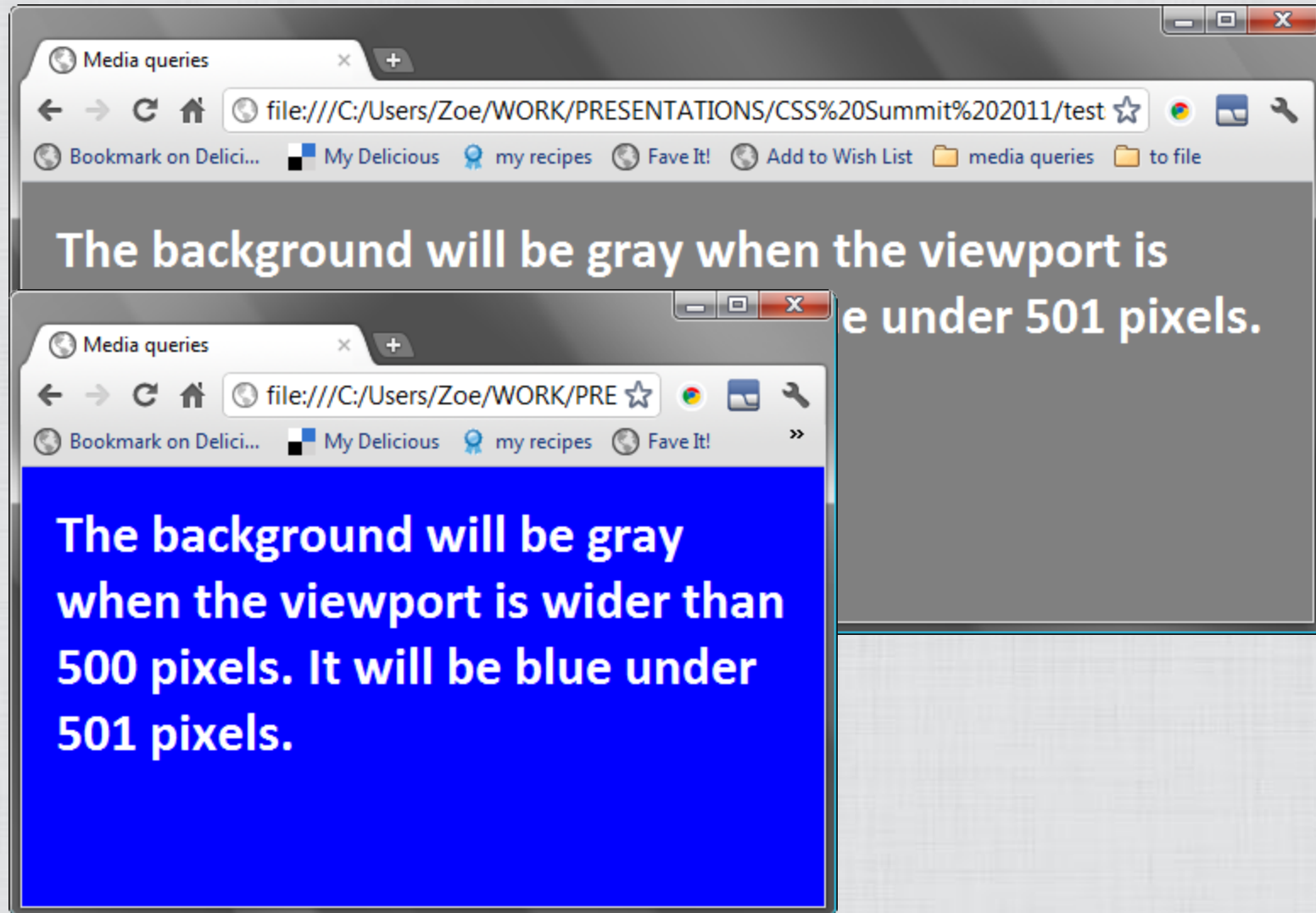
Flip flop it

```
body {  
    background: blue;  
}  
  
@media screen and (min-width:501px) {  
    body {  
        background: gray;  
    }  
}
```

English translation:

Make the background blue. But at and past the minimum width of 501 pixels, make the background gray.

How it looks



Media query syntax: external

Extend the existing media part of the **link** element or **@import** rule:

```
<link href="narrow.css" rel="stylesheet"  
media="only screen and (max-width:500px)">
```

```
@import url(narrow.css) only screen and  
(max-width:500px);
```

Recommendation: internal

- Main advantages:
 - No extra HTTP request(s)
 - Not out of sight and forgotten
- Learn full pros/cons: www.zomigi.com/blog/essential-considerations-crafting-quality-media-queries

you now know media query syntax

YAY

!

but media queries don't actually
DO
anything

it's the CSS
INSIDE
that changes the appearance

Width-dependent layout changes

- **Responsive web design:**
 - Media queries + fluid layouts + fluid media
 - See www.alistapart.com/articles/responsive-web-design/
- **Adaptive layouts:**
 - Media queries + fixed-width layouts
 - See www.netmagazine.com/tutorials/adaptive-layouts-media-queries

Retrofitting responsiveness

- Typical to add on media queries for **both smaller and wider styles**
- CSS before media queries is default
- Can take different approach when starting from scratch
 - Start with "**mobile**," layer on wider styles?
 - Start with "**desktop**," layer on narrower styles?
 - Start with **something in between** for majority?

Starting with desktop styles

Pros:

- No extra work to make majority width appear correctly on IE 6-8
- Easiest way to retrofit existing site

Cons:

- Mobile devices may have to download unneeded desktop assets
- Need separate style sheets or JavaScript to make mobile design appear in IE Mobile 7 and other older mobile browsers

Starting with mobile styles

Pros:

- Mobile devices won't download unneeded desktop assets
- Older, non-media-query-supporting mobile browsers still get the mobile styles without any extra work

Cons:

- Desktop devices may have to download unneeded mobile assets
- Need separate style sheets or JavaScript to make majority desktop design appear in IE 6-8

Our starting point

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ullamcorper pharetra. Vestibulum erat wisi, condimentum sed, commodo vitae, ornare sit amet, wisi. Aenean fermentum, elit eget tincidunt condimentum, eros ipsum rutrum orci, sagittis tempus lacus enim ac dui. Donec non enim in turpis pulvinar facilisis. Ut felis.

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Credits

WEB FONTS:
Nadia Serif from [Kernest](#)
ILLUSTRATIONS:
Yummy by [Icon Eden](#)

Very wide: awkward



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CAKES, PIES, TARTS, COOKIES, AND MORE

Donec eu libero sit amet quam egestas semper. Aenean ultricies mi vitae est. Mauris placerat

Wide-screen media query

```
/*all the other styles up here*/
```

```
@media screen and (min-width: 1200px) {  
    /*styles for larger screens in here*/  
}
```

Add third column

```
@media screen and (min-width: 1200px) {  
    #nav-main {  
        position: fixed;  
        top: 136px;  
        width: 13%;  
        margin: 0;  
    }  
    #content-main {  
        width: 58%;  
        margin-left: 18%;  
    }  
    #content-secondary { width: 20%; }  
}
```


Style nav as vertical menu

```
@media screen and (min-width: 1200px) {  
    ...  
    #nav-main li {  
        float: none;  
        margin: 0;  
    }  
    #nav-main a {  
        -moz-border-radius: 0;  
        -webkit-border-radius: 0;  
        border-radius: 0;  
    }  
}
```

Wide-screen design



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Small-screen media query

```
/*all the other styles up here*/
```

```
@media screen and (max-width: 760px) {  
    /*styles for smaller screens in here*/  
}
```



Remove columns from text

```
@media screen and (max-width: 760px) {  
    h1 + p {  
        -moz-column-count: 1;  
        -o-column-count: 1;  
        -webkit-column-count: 1;  
        column-count: 1;  
    }  
}
```

Stack feature boxes

```
@media screen and (max-width: 760px) {  
  ...  
  .feature {  
    float: none;  
    width: auto;  
    margin: 0 0 1.6em 0;  
    padding: 0 0 0 140px;  
    background-position: top left;  
  }  
}
```

Narrow-screen design




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Desserts

CAKES, PIES, TARTS, COOKIES, AND MORE

Donec eu libero sit amet quam egestas

pause for
CAVEATS
&
CLARIFICATIONS

Some sites would be better served with a **separate site** for mobile devices **instead** of using media queries.

Even if a separate mobile site would be best, using media queries is a **good first step** if a separate site isn't currently feasible.

“The choice is not between using media queries and creating a dedicated mobile site; the choice is between using media queries and doing nothing at all.”

—Jeremy Keith
<http://adactio.com/journal/1696/>

You can add media queries to a dedicated mobile site in order to cater to the wide range of mobile viewport sizes.

If you do use media queries on a single site, they're not the only tool you can use—you can **add scripting as well** to further customize the content, markup, functionality, etc.

Media queries are only meant to solve the problem of mobile's **small viewports**, not all the other things that can make mobile browsing different (such as context, bandwidth, etc.).

*“It's making sure your layout doesn't look crap
on diff. sized screens.”*

—Mark Boulton

<http://twitter.com/#!/markboulton/status/50237480368214016>

back to
CSS

Mobile media query

```
/*all the other styles up here*/
```

```
@media screen and (max-width: 550px) {  
    /*styles for tiny screens in here*/  
}
```

Non-overlapping version

```
@media screen and (min-width: 551px) and  
(max-width: 760px) {  
    /*styles for small screens in here*/  
}  
  
@media screen and (max-width: 550px) {  
    /*styles for tiny screens in here*/  
}
```

Media features for mobile

`min-width`

`max-width`

`device-width`

`min-device-width`

`max-device-width`

`orientation`

`min-device-pixel-ratio`

`-webkit-min-device-pixel-ratio`

`min--moz-device-pixel-ratio`

`-o-min-device-pixel-ratio`

Useful media features for mobile

`min-width`

`max-width`

`device-width`

`min-device-width`

`max-device-width`

`orientation`

`min-device-pixel-ratio`

`-webkit-min-device-pixel-ratio`

`min--moz-device-pixel-ratio`

`-o-min-device-pixel-ratio`

Changing to single column

```
@media screen and (max-width: 550px) {  
    #content-main, #content-secondary,  
    #about, #credits {  
        float: none;  
        width: 100%;  
    }  
}
```

Changing feature images

```
@media screen and (max-width: 550px) {  
    ...  
    .feature { padding-left: 70px; }  
    #feature-candy {  
        background-image: url(icon_candy_64.png);  
    }  
    #feature-pastry {  
        background-image: url(icon_pastry_64.png);  
    }  
    #feature-dessert {  
        background-image: url(icon_dessert_64.png);  
    }  
}
```

Mobile design



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Viewport meta tag

Forces mobile devices to scale viewport to actual device width

```
<meta name="viewport"  
      content="width=device-width" >
```


Zoom problem in iOS

- Remember: **device-width** on iOS devices always matches **portrait width**
- This means design **doesn't reflow** when you switch to landscape, but instead just **zooms**

Fixing (and adding) zoom issues

- Option 1: add **maximum-scale=1**

- But disables user scaling

```
<meta name="viewport"  
      content="width=device-width, maximum-scale=1">
```

- Option 2: add **initial-scale=1**

- Allows user scaling
- But triggers over-zoom/crop bug when changing from portrait to landscape

```
<meta name="viewport"  
      content="width=device-width, initial-scale=1">
```

The best way to fix zoom issues

- Option 3: add `initial-scale=1` plus script to fix over-zoom bug
 - See http://filamentgroup.com/lab/a_fix_for_the_ios_orientationchange_zoom_bug/

```
<head>
  ...
  <meta name="viewport"
        content="width=device-width, initial-scale=1">
  <script src="ios-orientationchange-fix.js">
  ...
</head>
```

View it live

<http://stunningcss3.com/code/bakery/>



More responsive examples

- **Design patterns:**
 - "Multi-Device Layout Patterns" by Luke Wroblewski: www.lukew.com/ff/entry.asp?1514
 - "Responsive Navigation Patterns" by Brad Frost: <http://bradfrostweb.com/blog/web/responsive-nav-patterns/>
- **Inspiration:**
 - Gallery: <http://mediaqueri.es/>
 - My own bookmarks: <https://gimmebar.com/loves/zomigi/tag/mediaqueries>

Dealing with IE 8 and earlier

- Conditional comments
- JavaScript

Conditional comments

- Split styles into **separate sheets** and feed applicable sheet to IE based on whether it's IE on desktop or mobile
- Approach varies based on which set of styles are your default

Conditional comment when desktop styles are default

Feed IE Mobile 7 media query sheet:

```
<link rel="stylesheet" href="global.css" media="all">
```

```
<link rel="stylesheet" href="mobile.css" media="all  
and (max-width: 700px)">
```

```
<!--[if IEMobile 7]>
```

```
<link rel="stylesheet" href="mobile.css" media="all">
```

```
<![endif]-->
```

Source: <http://blogs.msdn.com/b/iemobile/archive/2010/12/08/targeting-mobile-optimized-css-at-windows-phone-7.aspx>

Conditional comment when mobile styles are default

Feed older IE media query sheet, hide from IE Mobile 7:

```
<link rel="stylesheet" href="global.css" media="all">
```

```
<link rel="stylesheet" href="desktop.css" media="all  
and (min-width: 700px)">
```

```
<!--[if (lt IE 9)&(!IEMobile 7)]>
```

```
<link rel="stylesheet" href="desktop.css" media="all">
```

```
<![endif]-->
```

Source: <http://adactio.com/journal/4494/>

Pre-fab JavaScript for non-supporting browsers

- Simply add one of these scripts:
 - Respond: <https://github.com/scottjehl/Respond>
 - css3-mediaqueries.js:
<http://code.google.com/p/css3-mediaqueries-js/>
- Avoid extra HTTP request for non-old-IE browsers using conditional comments:

```
<!--[if (lt IE 9)&(!IEMobile 7)]>  
<script src="respond.min.js"></script>  
<![endif]-->
```


WHAT ELSE
can media queries do
?

Swapping images on high-res displays

```
@media  
screen and (moz--min-device-pixel-ratio : 1.5),  
screen and (-o-min-device-pixel-ratio : 3/2),  
screen and (-webkit-min-device-pixel-ratio : 1.5),  
screen and (min-device-pixel-ratio : 1.5) {  
  
}
```

Swapping images on high-res displays

```
@media ... screen and (min-device-pixel-ratio : 1.5) {  
  .feature {  
    -moz-background-size: 64px 64px;  
    -webkit-background-size: 64px 64px;  
    background-size: 64px 64px;  
  }  
  #feature-candy {  
    background-image: url(icon_candy_128.png); }  
  #feature-pastry {  
    background-image: url(icon_pastry_128.png); }  
  #feature-dessert {  
    background-image: url(icon_dessert_128.png); }  
}
```

Learn more

Download slides and get links at
<http://zomigi.com/blog/responsive-web-design-presentation>

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