Different Screen Size Different Design...
What You’ll Learn…

- We’ll be restyling an entire page layout to work with different screen sizes and devices using **Media queries** to apply styles selectively based on the visitor’s device properties.
The Base Page

- We will look at a layout for a fictional bakery.

- The layout is fluid so that it adjusts to the width of the browser window, making it work at a variety of screen sizes without generating horizontal scrollbars or causing elements to overlap.

- However it looks better at some screen sizes than at others. On very wide or very narrow windows, the design is still usable and looks OK, but it’s not as attractive as it is within the 800- to 1200-pixel range.
Recap - What Are Media Queries?

- Media queries let you customize styles based on the characteristics of the user’s device or display.

- This could be the viewport width, whether it’s in portrait or landscape mode, or whether it shows colour.

- This is different from the media types, such as `screen` and `print`, that you can specify for your style sheets in CSS 2.1.

- With media queries, you specify not only the media type to which you want to apply a set of styles, but also one or more characteristics of the user’s display.
Recap - What Are Media Queries?

- Here’s an example:

```css
@media screen and (max-width: 600px) {
  body {
    font-size: 88%;
  }
  #content-main {
    float: none;
    width: 100%;
  }
}
```
Recap - What Are Media Queries?

- This media query starts with the `@media` rule, and then specifies a media type (in this case, `screen`).

- Next there’s the word `and`, followed by the characteristic we want to match against, called the `media feature`.

- This particular media feature, `max-width: 600px`, tells the browser that the styles for this media query, which are contained within a set of curly brackets for the media query as a whole, should apply only up to a maximum width of 600 pixels.
Recap - What Are Media Queries?

- If the viewport width exceeds 600 pixels, the browser will ignore the styles inside the media query.

- This media query can be dropped right into your main style sheet.
Recap - What Are Media Queries?

- If you want, however, you can apply media queries to separate style sheets on the link element or @import rule:

  @import url(narrow.css) only screen and (max-width:600px);

  <link rel="stylesheet" media="only screen and (max-width:600px)" href="narrow.css">
Recap - What Are Media Queries?

- The keyword `only` in front of the media type screen keeps some older browsers that don’t understand media queries from downloading and applying the style sheets universally.

- Most non-supporting browsers will not use the sheet anyway, but this is extra insurance. The `only` keyword isn’t needed when you place the `@media` rule directly in your main style sheet.
Recap - What Are Media Queries?

- Media Queries can be used then to customise and fine-tune our styles to devices and settings with more precision than we’ve ever been able to before.

- This can improve not only the attractiveness of our web pages, but also their usability.

- We can change text line lengths, leading, and font sizes to make sure the text remains readable at different widths.
Recap - What Are Media Queries?

- We can rearrange columns and resize or remove images on small screens to make better use of the space and let users get right to the content they want.

- We can make links larger on touch-screen mobile devices to make them easier for people to activate with their fingers.

- And we can do all this without having to involve complicated scripting for browser sniffing, feature detection, or style-sheet switching.

- You just continue to use the CSS that you already know to write different styles for different scenarios.
Changing the Layout for Large Screens

- The design of the bakery page starts looking a bit stretched out at around 1200 pixels wide, so let’s add a media query that will apply only when the window is 1200 or more pixels wide.

- Add the following CSS after all the existing styles in the style sheet:

```css
@media screen and (min-width: 1200px) { }
```
Changing the Layout for Large Screens

- *This media query has to be at the end of the styles so that it will over-ride the earlier styles.*

- It tells the browser that we want the styles within this media query to apply to screen media types, but only if the user’s viewport width is 1200 pixels at a minimum.
Changing the Layout for Large Screens

- Of course, right now there are no styles in the media query, just empty brackets waiting to be filled.

- Since we have so much extra space in viewports over 1200 pixels wide, how about we fill those brackets with styles to change the layout from two columns to three?

- To do this, we’ll change the positioning of the navigation div, as well as the widths and margins of the two content divs.
Changing the Layout for Large Screens

- Here are the current styles of these three divs, outside the media query:
  ```css
  #nav-main {
    float: right; margin: 40px 0 0 0;
  }
  #content-main {
    overflow: hidden;
    float: left;
    width: 70%;
    margin-bottom: 40px;
  }
  #content-secondary {
    float: right;
    width: 25%;
    margin-bottom: 40px;
  }
  ```
Changing the Layout for Large Screens

- Modify these styles for viewports over 1200 pixels wide by adding new rules within the media query you just created:

```css
@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%;
  }
}
```
Changing the Layout for Large Screens

- This positions the navigation div under the logo, creating a third column.

- To make room for it, it was necessary to
  - decrease the width of the content-secondary div from 25% to 20%,
  - decrease the width of the content-main div from 70% to 58%, and
  - add a left margin to content-main.
Changing the Layout for Large Screens

- Let’s also change the widths of the about and credits divs in the footer to match the widths of the columns above them.

- Add their IDs onto the `#content-main` and `#content-secondary` rules in the media query:

```css
#content-main, #about {
    width: 58%;
    margin-left: 18%;
}
#content-secondary, #credits {
    width: 20%;
}
```
Changing the Layout for Large Screens

- Now all the page elements are better positioned to work well in the width available.

- Resize your window to see how the layout automatically changes when you get past 1200 pixels wide.
More about Media Queries…

- Media queries are described in a module of the same name, found at www.w3.org/TR/css3-mediaqueries.

- Media features, are listed at www.w3.org/TR/css3-mediaqueries/#media1; not all browsers that support media queries support all of them.
More about Media Queries…

- A media query can be written within a style sheet, using the `@media` rule, followed by the media type and one or more media features.

- Media queries can also be written onto `link` elements and `@import` rules, omitting the `@media` rule.
More about Media Queries…

- You can include more than one *media feature* in a single media query:
  ```
  @media screen and (min-width:320px) and (max-width:480px).
  ```

- You can also include more than one *media query* in the same `@media` rule, separated by commas (like a grouped selector):
  ```
  @media screen and (color), projection and (color)
  ```

- You can write the word *not* at the start of a media query to apply its styles only when the media query is not true:
  ```
  @media not print and (max-width:600px).
  ```
More about Media Queries...

- You could use media queries for:
  - Changing layout at different screen sizes.
  - Adjusting text size and leading to keep text more readable at different line lengths; see [http://forabeautifulweb.com/blog/about/proportional_leading_with_css3_media_queries](http://forabeautifulweb.com/blog/about/proportional_leading_with_css3_media_queries)
  - Increasing text size of buttons, tabs, and links on mobile devices to make these elements easier to activate with your finger on touch screens
More about Media Queries…

- Decreasing body-text size on small mobile screens since the user is effectively zoomed in, making the text seem larger than on desktop screens.

- Revealing in-page links to jump to content down the page on small mobile screens.

- Swapping in higher resolution images on high-resolution devices, see [http://dryan.com/articles/hi-res-mobile-css/](http://dryan.com/articles/hi-res-mobile-css/)
More about Media Queries...

- Swapping in differently sized images for different viewport sizes
- Applying different print styles for different sizes of paper
Although everything is now in the place we want it, some of the page elements could use further cosmetic updates.

E.g., the li elements in the nav-main div are floated and have left margins in order to align them all horizontally and space them out from each other, but this keeps them from stacking on top of each other, only one to a line, as we want in a vertical menu.

They also have slightly rounded top corners, which looks good when they’re horizontal, but not when they’re sitting right on top of each other.
We no longer need these styles now that we’re styling the links as a vertical menu, so we’ll over-ride them with new styles within the media query:

```css
#nav-main li {
  float: none;
  margin: 0;
}
#nav-main a {
  -moz-border-radius: 0;
  -webkit-border-radius: 0;
  border-radius: 0;
}
```

Now each link is on its own line and takes up the full width of the menu.
From Horizontal Nav Bar to Vertical Menu

- Next, we’ll apply some styling to the menu as a whole to make it look more similar to the email newsletter box on the other side of the page.

- This has a semi-transparent background, slightly rounded corners, and a soft drop shadow:
From Horizontal Nav Bar to Vertical Menu

#nav-main {
    position: fixed;
    top: 136px;
    width: 13%;
    margin: 0;
    -moz-box-shadow: 0 0 8px hsla(0,0%,0%,.1);
    -webkit-box-shadow: 0 0 8px hsla(0,0%,0%,.1);
    box-shadow: 0 0 8px hsla(0,0%,0%,.1);
    -moz-border-radius: 3px;
    -webkit-border-radius: 3px;
    border-radius: 3px;
    background: hsla(0,0%,100%,.3);
    text-align: right;
}
Since the menu has its own background colour now, tone down the gradients on the links within it, so that the two colours layered over each other don’t get too opaque:

```css
#nav-main a {
  -moz-border-radius: 0;
  -webkit-border-radius: 0;
  border-radius: 0;

  background: -moz-linear-gradient(hsla(0,0%,100%,.3), hsla(0,0%,100%,0) 15px);
  background: -webkit-gradient(linear, 0 0, 0 15, from(hsla(0,0%,100%,.3)), to(hsla(0,0%,100%,0)));
}
#nav-main a:hover {
  background: -moz-linear-gradient(hsla(0,0%,100%,.6), hsla(0,0%,100%,.2) 15px);
  background: -webkit-gradient(linear, 0 0, 0 15, from(hsla(0,0%,100%,.6)), to(hsla(0,0%,100%,.2)));
}
These changes complete the navigation’s transformation from horizontal bar to vertical menu
One of the main complaints people have with layouts that adjust to viewport width is that the length of lines of text can become either too short or too long to be read comfortably or look attractive.

In reality, there is no magic line length that is ideal for everyone.

A person’s age, reading level, native language, disability, and other factors all influence which line length s/he finds easiest to read.
Multiple Column Text

- However, it’s true that line lengths on the extreme ends of the range don’t work well for the majority of readers and don’t always look very attractive.

- We can use the multiple column properties to control line lengths.

- These allow you to flow the content of a single HTML element into multiple columns.
Multiple Column Text

- You create the columns using either the `column-count` or `column-width` properties.

- In the latter case, the browser will decide how many columns to make based on the available space.

- You can also use both properties together, though you may get unexpected results...
Let’s break the introductory paragraph into two columns in both the regular layout and the wide layout.

Find the existing `h1 + p` rule in the styles outside of the media query.

Add the `column-count` property, plus the three browser-specific versions, to the rule:
Multiple Column Text

h1 + p {
  -moz-column-count: 2;
  -o-column-count: 2;
  -webkit-column-count: 2;
  column-count: 2;
  color: #7F4627;
  text-shadow: -1px -1px 0 hsla(0,0%,100%,.6);
  font-size: 120%;
}
These column boxes are not actual elements in the document tree of the HTML, rather just virtual boxes that the browser creates to flow the content of the paragraph into.

The paragraph is now what the W3C calls a **multicol element** - it’s a container for a multiple-column layout.
You can control the space between the columns using the `column-gap` property. Set it to 1.5 ems in the `h1 + p` rule:

```css
h1 + p {
    -moz-column-count: 2;
    -moz-column-gap: 1.5em;
    -o-column-count: 2;
    -o-column-gap: 1.5em;
    -webkit-column-count: 2;
    -webkit-column-gap: 1.5em;
    column-count: 2;
    column-gap: 1.5em;
    color: #7F4627;
    text-shadow: -1px -1px 0 hsla(0,0%,100%,.6);
    font-size: 120%;
}
```
Multiple Column Text

- If you don’t set a column-gap value, each individual browser decides how much space to add by default.

- So it’s best to standardise it by explicitly setting the value you want.

- Here, we’ve used a value in ems so that the gap will grow larger as the text grows larger, keeping the text more readable.
Problems With Multiple Columns

- **Balancing column heights:**
  - If there’s not enough content to fill each column equally, the browser has to decide which column gets the extra height.
  - Different browsers choose differently, with sometimes unexpected results.

- **Flowing margin, padding, and borders across columns:**
  - Webkit-based browsers allow margin, padding, and borders to be split across columns, creating a very strange appearance.
Problems With Multiple Columns

- **Breaking content across columns:**
  - Being able to control where content breaks across columns is important, as you want to be able to ensure that a heading stays with its associated text, for instance.
  - The `column-break` properties control this, but support is patchy.
Problems With Multiple Columns

- **Overflowing columns or content:**
  - Browsers are currently inconsistent about how to handle overflow when not all of the content or columns can fit in the container (the multicol element).
  - It may overflow to the right or below, or just be truncated.
  - An individual piece of content that is too large to fit in a column box, such as an image that is wider than the column width, is supposed to be cut off in the middle of the column gap, but Firefox lets it overflow and Webkit cuts it off at the edge of the column, not within the gutter as the spec dictates.
Problems With Multiple Columns

- *Floating content within columns:*
  - Floats within a multicol element are supposed to be positioned relative to the column box in which they appear.
  - Firefox does this; Webkit, strangely, puts the float outside of the multicol element entirely.
Problems With Multiple Columns

- **Pagination when printed:**
  - When a multicol element has to break across two or more pages when printed, the columns are not supposed to break across the pages.
  - The content should run through the columns on the first page, then run through the columns on the second page, and so on.
  - Older versions of Webkit-based browsers didn’t follow this; current versions simply make the content go back to a single column when printed, avoiding the issue entirely.
Problems With Multiple Columns

- But some problems with Multiple Columns are more inherent to the idea of columns on the web to begin with.

- Having to scroll down to read a column and then back up to read the next column, over and over again, is just plain annoying and tiresome.

- This isn’t a technical problem - it’s a usability problem with breaking up content that’s taller than a constrained screen.

- Treating the web like print often doesn’t work well.
Problems With Multiple Columns

- For more on the usability and design problems inherent to CSS3 Multiple Columns, see
  - “Multicolumn layout considered harmful” by Roger Johanssen [http://www.456bereastreet.com/archive/200509/css3_multicolumn_layout_considered_harmful/](http://www.456bereastreet.com/archive/200509/css3_multicolumn_layout_considered_harmful/)
  - “More on Multiplecolumn layouts” by Richard Rutter [www.clagnut.com/blog/1590](http://www.clagnut.com/blog/1590), and
  - “CSS3 MultipleColumn Thriller” by Andy Clarke [http://www.stuffandnonsense.co.uk/blog/about/css3_multicolumn_thriller](http://www.stuffandnonsense.co.uk/blog/about/css3_multicolumn_thriller).
Problems With Multiple Columns

- Because of all of these problems, it is recommended that you only use multiple columns in a limited manner.

- They’re fine for a couple of paragraphs or a list, for instance, but don’t work very well for long blocks of body copy or content that is complex, with several paragraphs, types of elements, or images within it.

- Just keep this in mind, and use Multiple Columns wisely.
Changing the Layout for Small Screens

- We’ll add a second media query right below the first one you added, targeting viewports that are narrower than 760 pixels wide:

  ```css
  @media screen and (max-width: 760px) { } 
  ```

- This tells the browser that we want the styles that we’ll add within this media query to apply to screen media types in viewports up to a maximum width of 760 pixels.
Changing the Layout for Small Screens

- Why 760 pixels?

- Under 760, the layout starts looking squished, with an increasing possibility of content overflowing its containers.
Changing the Layout for Small Screens

- Let’s start by changing the styles on the nav bar to better fit the available space.

- When the window is narrowed, the entire nav bar drops onto a line below the logo, which is fine, but it stays right-aligned, which doesn’t look as good when it doesn’t have the logo to its left. So let’s change the styles on the nav bar to left-align it when it’s on a line below the logo:

```css
@media screen and (max-width: 760px) {
  #nav-main { clear: left; float: left; }
  #nav-main li { margin: 0 .5em 0 0; }
}
```
Changing the Layout for Small Screens

- Next, let’s get rid of the two columns in the introductory paragraph - they’re awkwardly narrow when the window is under 760 pixels.

- Change the column count to 1 in a new `h1 + p` rule in the second media query:

```css
h1 + p { -moz-column-count: 1; -o-column-count: 1; -webkit-column-count: 1; column-count: 1; }
```
Changing the Layout for Small Screens

- Now the line lengths are more reasonable in the introductory paragraph, but the three side-by-side columns underneath that paragraph are still extremely narrow.

- Right now, each featured product box is a div that’s floated to the left. Removing the floats will make them stack on top of each other instead, filling the whole width of the main content div.

- But when they’re stacked on top of each other, the illustration that goes with each feature box doesn’t look as nice positioned at the top of the box - it makes more sense to put the illustration on the left side of the box.
Changing the Layout for Small Screens

- So add this new rule to the media query:

```css
.feature {
    float: none;
    width: auto;
    margin: 0 0 1.6em 0;
    padding: 0 0 0 140px;
    background-position: top left;
}
```
Changing the Layout for Small Screens

- This rule stops the feature boxes from floating and removes their percentage widths.

- It also removes the top padding from each box and replaces it with left padding, providing room for each illustration - a background image - to sit in on the left side of the box.
Changing the Layout for Small Screens

- The right column is now fairly thin, increasing the chance that long words will overflow it.

- The headings in the column are in the greatest danger, since their all-caps style makes them take up so much room. We can lessen their chance of overflowing by decreasing their text size and letter spacing:

```css
h3 {
  font-size: 100%;
  letter-spacing: 0;
}
```
Changing the Layout for Small Screens

- This completes the changes we’re going to make for the narrow version of the bakery page.

- Save your page and view it in an up-to-date browser.

- Resize the window to see the design change at very narrow and very wide widths.
Changing the Layout for Mobile Devices

- Media queries are a great way to customize the styles on mobile devices quickly and easily.

- However, be aware that they’re not the only way you should deal with mobile sites; you may need to add server-side scripting or other techniques to change the content and functionality on the mobile version of your site.

- While media queries may be enough customization for the mobile version of a small business’s brochure site (such as our example bakery site), a big, complicated news site probably needs to use additional techniques to significantly change the content, navigation, and other functionality on their mobile site.
Changing the Layout for Mobile Devices

- Plus, hiding or swapping in different content extensively using media queries is not efficient - the browser may still download the content it doesn’t need (see www.quirksmode.org/blog/archives/2010/08/combining_media.html for more on this).

- So don’t think media queries are necessarily going to solve all your mobile web design problems - use media queries as one of your mobile optimisation tools.
Changing the Layout for Mobile Devices

- When adding a mobile media query, what size should you target?


- Mobile phone screen sizes vary so dramatically that there is an argument to be made that your breakpoints should be based on your design not on devices.
Changing the Layout for Mobile Devices

- The design of our bakery page starts to break down around 550 pixels.

- So let’s use 550 as the width to target with our third media query, which will work in 320 by 480 mobile phones as well as mobile phones with slightly larger screens.

  @media screen and (max-width: 550px) { }
Changing the Layout for Mobile Devices

- Make sure you add this beneath the second media query (the one targeting a maximum width of 760 pixels).

- That’s because the second media query applies to mobile devices as well - a mobile device with a 480-pixel-wide screen is under the maximum width of 760 pixels.

- If you put the 550-pixel media query before the 760-pixel media query, the 760 one would override the styles in the 550 one.

- This is just how the CSS cascade works - rules that come later override rules of the same specificity that were declared earlier.
Changing the Layout for Mobile Devices

- If you didn’t want the two media queries to overlap, you could add a minimum width onto the 760-pixel media query, such as:
  ```
  @media screen and (min-width: 551px) and (max-width: 760px)
  ```

- This media query would apply only to windows between 551–760 pixels, not to mobile devices under 551 pixels wide.

- This might be good or bad, depending on your particular project.
Changing the Layout for Mobile Devices

- In our case, it would mean repeating a lot of the rules from the 760-pixel media query in the 550-pixel one, since we want a lot of the styles to be the same in both.

- For instance, we want the intro paragraph to have only one column of text in both the 550-pixel layout and the 760-pixel layout.

- When these two media queries overlap, we only have to declare the one column in the 760-pixel media query, and then it will also apply to windows under 550 pixels.
Changing the Layout for Mobile Devices

- In our example page, overlapping the media queries lets us reuse several styles and keep our CSS more streamlined.

- On other sites, however, you may want very different styles at each width, so it may make more sense to not let your media queries overlap.

- Keeping them separate may also be less confusing for you, as you don’t have to keep track of the cascade.
Changing the Layout for Mobile Devices

- Again, there’s no right or wrong answer here - it all depends on what you’re trying to accomplish.

- In this case, we’re going to leave the 760-pixel media query as it is, and make sure the 550-pixel media query comes below it so that both apply to windows under 551 pixels wide.
Removing Floats

- The primary change we need to make to the mobile design of the site is getting rid of the floats so that the entire page is one column.

- Most mobile web pages are a single column - there’s simply not enough room for columns to sit side by side on those little screens.
Removing Floats

- Add the following rules to the third media query:

```css
@media screen and (max-width: 550px) {
    #content-main, #content-secondary {
        float: none;
        width: 100%;
    }
    #about, #credits {
        float: none;
        width: 100%;
    }
    #credits {
        margin-top: 1.6em;
    }
}
```
Removing Floats

- Now the sidebar column displays under the main content column, and the “Credits” block in the footer displays under the “About” block.

- The top margin added to the credits div keeps the blocks in the footer spaced out from each other.
Reducing Heights

- Another useful change to make to many mobile pages is to reduce the vertical space that elements take up, reducing the amount that users have to scroll down the long single column.

- The text in the tagline and introductory paragraph doesn’t need to be quite so large when viewed up close on a mobile device, so you can reduce both font sizes by creating new `h1` and `h1 + p` rules:

```css
h1 { font-size: 225%; }
h1 + p { font-size: 100%; }
```
Reducing Heights

- Working our way further down the page, you’ll see that the product icons look rather large in the context of such a narrow window, and the text beside them could use more room.

- Luckily, the icon set I’ve used for the illustrations came in three sizes: 128 pixels, 64 pixels, and 48 pixels.

- We can switch the background images to the 64-pixel size in our mobile media query:
Reducing Heights

.feature { padding-left: 70px; }
#feature-candy { background-image:
    url(images/icon_candy_64-trans.png); }
#feature-pastry { background-image:
    url(images/icon_pastry_64-trans.png); }
#feature-dessert { background-image:
    url(images/icon_dessert_64-trans.png); }
Reducing Heights

- Next, check out the email newsletter subscription block. The text field within it takes up its full width, but there’s now room to display the label text and button on the same line as the text field, at least on larger mobile screens.

- Add these rules to the media query:

```css
#form-newsletter * { display: inline; }
#form-newsletter input[type=text] { width: auto; }
```
Reducing Heights

- These changes tighten up the newsletter block’s appearance.

- In portrait-oriented mobile screens, the subscribe button will drop down to a second line, but even then the form still makes better use of the space overall.
Reducing Heights

- Finally, we can make a small change in the footer to slightly reduce its height.

- Float the `dt` elements within the credits div:

  ```css
  #credits dt {
  clear: left;
  float: left;
  margin: -.05em .2em 0 0;
  }
  ```
Preventing Overlapping Header Elements

- In small mobile screens, the possibility of page elements overlapping each other is of course increased.

- You can see this problem in the header of our example page.

- With the viewport at 550 pixels wide, the search form fits fine beside the logo, but at around 400 pixels they start to overlap.

- If the user has a larger text size, the overlap will happen even sooner.
Preventing Overlapping Header Elements

- To reduce the chance of overlap, reduce the width of the text field in the search form by adding this rule to the third media query:
  
  ```
  #form-search input[type=text]{width:100px; }
  ```

- Next, add a fourth media query below the 550-pixel one. This media query will target windows less than 401 pixels wide:
  
  ```
  @media screen and (max-width: 400px) { }
  ```
Preventing Overlapping Header Elements

- Add a rule within this media query to make the label in the search form display as a block-level element so it will sit on a line above the text field:

```css
@media screen and (max-width: 400px) {
    #form-search label { display: block; }
}
```

- Now the search form takes up less width at both 550 pixels wide and 400 pixels wide, and it’s not likely to overlap the logo even in 320-pixel wide mobile phone screens.