AQUENT

GYMNASIUM

RESPONSIVE WEB DESIGN:

BUILD A PORTFOLIO FOR ALL DEVICES

LESSON 1

ABOUT THIS DOCUMENT

This handout is an edited transcript of the *Responsive Web Design* lecture videos. There's nothing in this handout that isn't also in the videos, and vice versa. Some students work better with written material than by watching videos alone, so we're offering this handout to you as an optional, helpful resource.

Some elements of the instruction, like live coding, can't be recreated in a document like this one. We encourage you to use this handout alongside the videos, rather than as a replacement of them.

INTRODUCTION

1. WHAT IS RESPONSIVE WEB DESIGN?

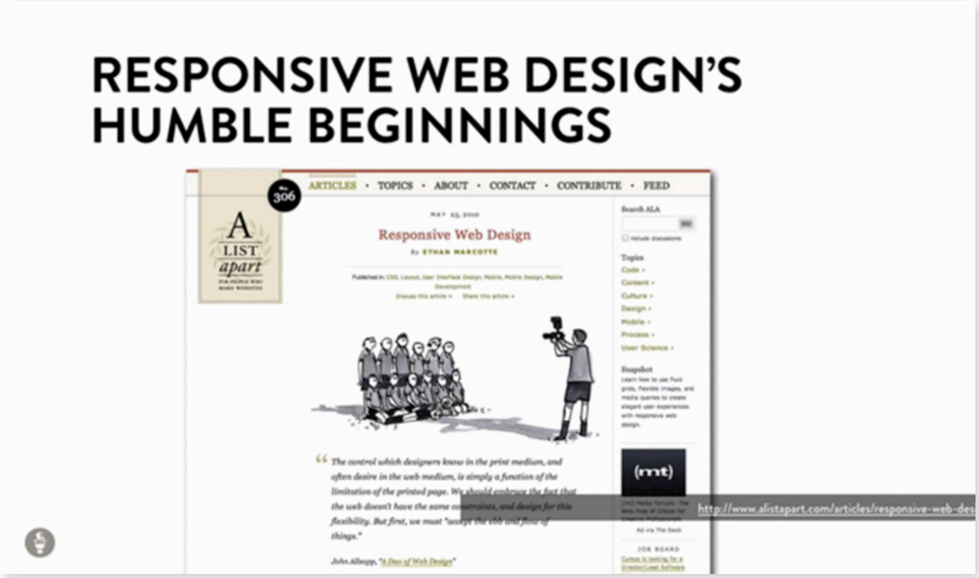
Lesson 1 of Responsive Web Design

Lesson 1 of 12: What is Responsive Design?

This is Responsive Web Design, an online course developed by Aquent. Responsive Web Design, or Promote Yourself Responsively, Build a Portfolio For All Devices. This is Lesson 1, What Is Responsive Web Design. This lesson will promise to be quick, useful. There'll be no coding involved, although don't get used to that, because upcoming lessons will have lots of coding for you.

There will also be homework and a brief quiz at the end of the lesson. My name is Jeremy Osborn. I'm the Academic Director of Aquent Gymnasium. I've also been a designer, educator, and writer for over 20 years. This is Patrick Haney. Patrick helped us out on some of the lesson files for this course, and for that, we thank him. So, let's go ahead and begin.

We'll talk about the structure of the course in just a moment, but let's begin at the beginning with responsive web design and the origins of the term. In 2010, Ethan Marcotte, a web designer, laid out the blueprint for responsive web design in this article on A List Apart. This article is required reading for anyone looking to understand the modern landscape of the web, and you need to read this today if you haven't already, right after this video if possible.



RESPONSIVE WEB DESIGN'S HUMBLE BEGINNINGS

Responsive Web Design

By ETHAN MARCOTTE

"The control which designers know in the print medium, and often desire in the web medium, is simply a function of the limitation of the printed page. We should embrace the fact that the web doesn't have the same constraints, and design for this flexibility. But first, we must "accept the ebb and flow of things."

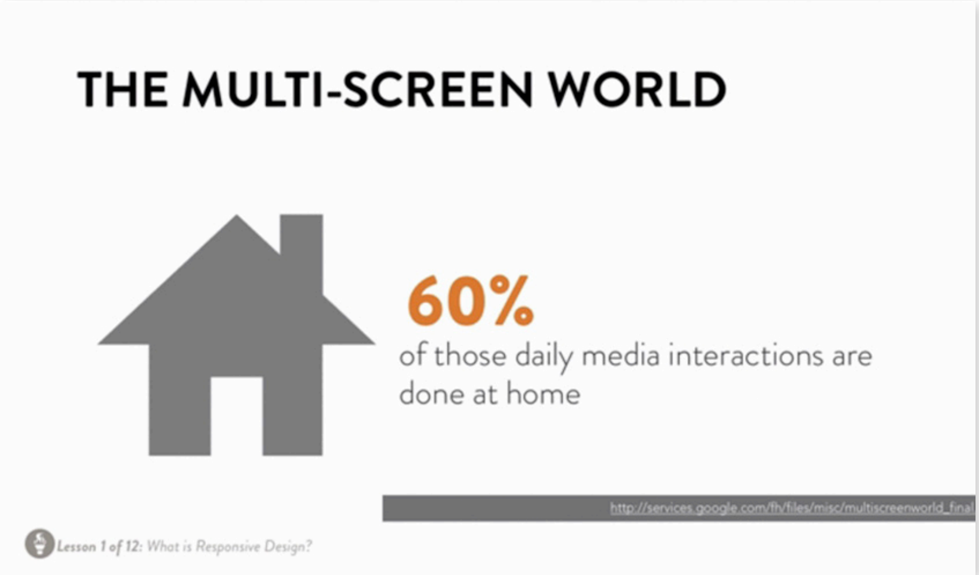
John Allsopp, "A Dao of Web Design"

http://www.alistapart.com/articles/responsive-web-des

Although the landscape of the web has changed slightly since 2010, I'll be using many of the concepts in this article throughout the lesson, and indeed, throughout the course. So, one of the first items to consider is this: The web needs to adapt to its environment. In 2010, when Ethan wrote the article, the world was changing, and specifically the way we access the web was changing.

We were no longer stuck to desktop monitors. We had smartphones, and tablets were beginning to come on the scene. And what this meant is we had to change and adapt to the environment. And when I say we, I mean web designers. Now, of course, I'm recording this in 2014, and a recent survey by Google came out with some findings that said 38% of our daily media interactions are on a smartphone.

That's pretty amazing if you think about it. But what's more interesting is 60% of those daily media interactions were actually done at home, not on the go. And what's the point of this? Well, the point is to consider this term "mobile" that we throw around a lot. And specifically, we want to talk about mobile as it's related to responsive design.



THE MULTI-SCREEN WORLD

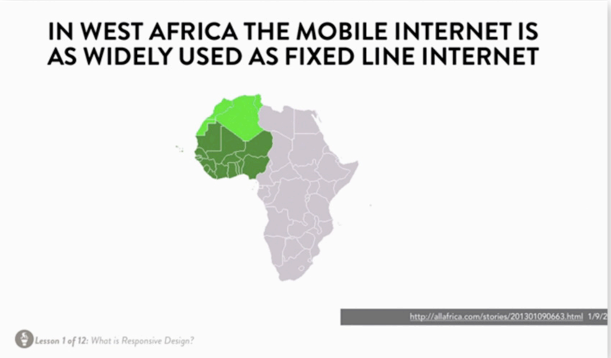
60%
of those daily media interactions are done at home

http://services.google.com/fh/files/misc/multiscreenworld_final

Lesson 1 of 12: What is Responsive Design?

But let's take a step back and imagine this. In West Africa, the mobile Internet is as widely used as fixed line Internet. That's incredible. What that means is, there are more people who access the web on a device, such as a smartphone or a tablet, versus a desktop. So, obviously, this is changing all those people's experience on how to access the web, as well as designers who create the websites for that community.

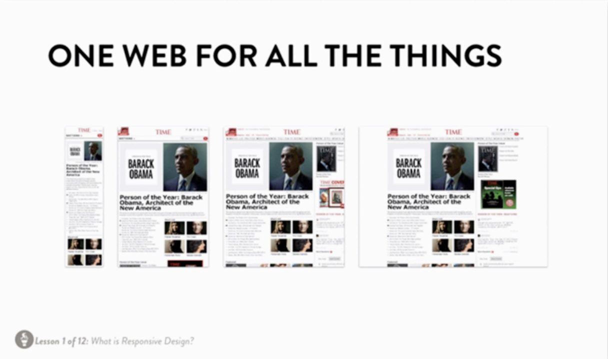
Now, if I was going to break responsive web design down to a single concept, it would be this. One web for all the things. What does this mean? This means we want our websites to work everywhere, to adapt to their environment, and we want to make content easily available to everyone, regardless of how they access it. So, having said that, here is our surprise quiz.



IN WEST AFRICA THE MOBILE INTERNET IS AS WIDELY USED AS FIXED LINE INTERNET

http://allafrica.com/stories/201301090663.html 1/9/2

Lesson 1 of 12: What is Responsive Design?



ONE WEB FOR ALL THE THINGS

BARACK OBAMA
Person of the Year: Barack Obama, Architect of the New America

Lesson 1 of 12: What is Responsive Design?

OK. Are you ready? The title of this quiz is, "What Is a Mobile Device, Anyway?" OK, here we go. Number one, an iPhone, is that a mobile device? OK, yes. easy one, Right? Number two, a Samsung tablet, or any tablet. Is that a mobile device? OK, go ahead and take down your answer. How about this? A laptop. Is a laptop a mobile device?

And would you change your mind if I said that this particular laptop has a 3G connection, which allows it to access a cellular network? OK, how about this? This is the Wii U game console. Is that a mobile device? And if I told you it had a web browser, does that change your mind? OK, take down your answer.

SURPRISE QUIZ!

Lesson 1 of 12: What is Responsive Design?

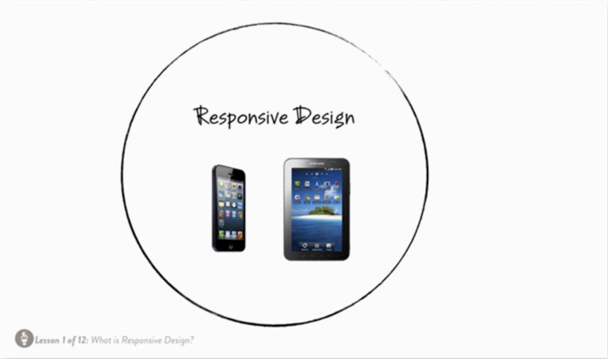
And finally, here's the trick question. A car. Is a car a mobile device? Of course, it has four wheels, but this particular car also has a web browser, which means it's a mobile mobile device. So, actually, what I want you to do is to forget about the term "mobile" for now. It's a bit of a red herring. Thank you! I'll be here all week.

Lesson 1 of 12: What is Responsive Design?

Lesson 1 of 12: What is Responsive Design?

But seriously, what did those devices have in common? Well, they all had screens, they had an Internet connection, they had a web browser, and if we were to take a look at the scope of responsive design, a common mistake is to focus on what we think of as these mobile devices.

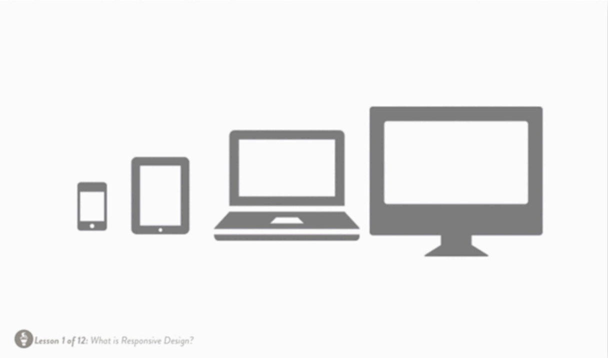
And that's really the main point I want to make here. Responsive design's not just about designing for smartphones and tablets. It's much more than that. What is it exactly? Well, as I mentioned before, we want to provide the best experience to our visitors no matter what their device. Another word for this could be resolution independent, or the flexible web.

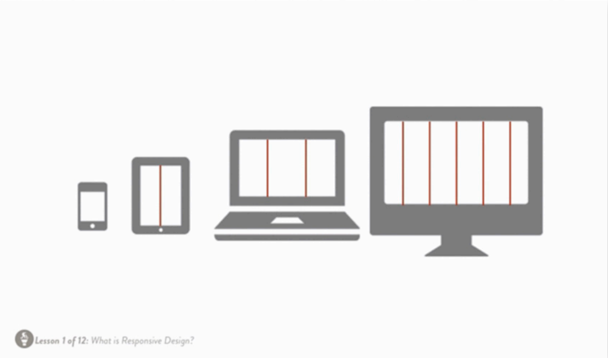


Lesson 1 of 12: What is Responsive Design?

So, let me try to clarify that a little bit more here. In this illustration, we have four examples of screens or devices that we can commonly access the web on. So, we have our smartphone, tablet, laptop, and then a larger desktop system. So, how might the layout work best on all of these devices? Well, for the smartphone, let's keep our layout at a single column.

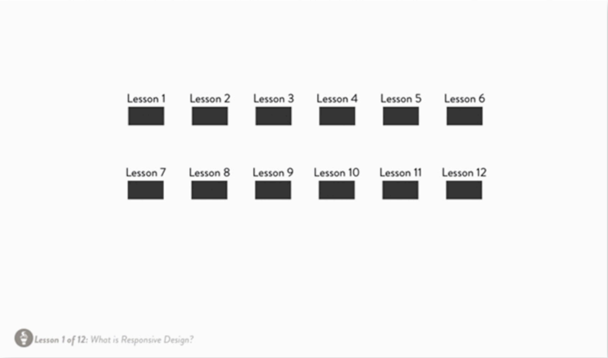
For the tablet, maybe there's enough space for two columns. For this laptop, we can make three column, and for this big, nice, expensive desktop monitor, let's go ahead and give it six columns. Why not? We've got the space. So, this illustrates a little bit about what responsive design is meant to do. Oh, and by the way, responsive web design is for devices and platforms that don't even exist.





That's pretty cool, and I'm very much looking forward to this device. So, as we begin to talk about how we're going to do this practically, I'm going to make some assumptions here. So, I'm assuming that you speak HTML and CSS. So, the following lessons are not for beginners. We're assuming that you've worked on the web before, and you understand that CSS floats are not something you drink.

You probably should have experience working with the JavaScript, although not necessarily coding it from scratch, but using it in your projects. And finally, you have a basic understanding of device differences. So, example, the difference between a smartphone, tablet, desktop, as well as browser compatibility issues. Let's dive a little deeper into what this course offers.

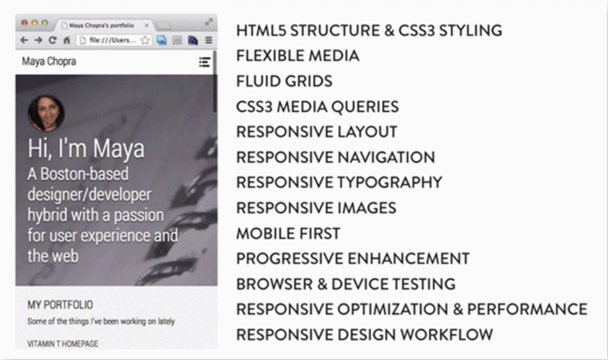

Lesson 1 Lesson 2 Lesson 3 Lesson 4 Lesson 5 Lesson 6

Lesson 7 Lesson 8 Lesson 9 Lesson 10 Lesson 11 Lesson 12

So, this course is going to have 12 different lessons. We're currently, obviously, in lesson 1. Each of these lessons will have useful assignments, readings, and resources for you to explore these concepts further. And you'll be building what we feel is a very important project, which is a portfolio site. So, let's just take a quick look at what you'll be building.

This is a responsive portfolio site using a fictional character here called Maya. And you'll be following along with me using code to create something like this. In fact, you'll be creating exactly this. We have a single column mobile layout out here, and this expands to a three column layout, as you saw at the beginning.

So, specifically the things we need to talk about in order to get you here include HTML5 structure and CSS3 styling, flexible media, fluid grids, media queries, responsive layout, navigation, typography, images, concepts such as mobile first, progressive enhancement, browser and device testing, responsive optimization and performance, and finally responsive design workflow.



Maya Chopra

Hi, I'm Maya

A Boston-based designer/developer hybrid with a passion for user experience and the web

MY PORTFOLIO

Some of the things I've been working on lately

VITAMIN T HOMEPAGE

HTML5 STRUCTURE & CSS3 STYLING
FLEXIBLE MEDIA
FLUID GRIDS
CSS3 MEDIA QUERIES
RESPONSIVE LAYOUT
RESPONSIVE NAVIGATION
RESPONSIVE TYPOGRAPHY
RESPONSIVE IMAGES
MOBILE FIRST
PROGRESSIVE ENHANCEMENT
BROWSER & DEVICE TESTING
RESPONSIVE OPTIMIZATION & PERFORMANCE
RESPONSIVE DESIGN WORKFLOW

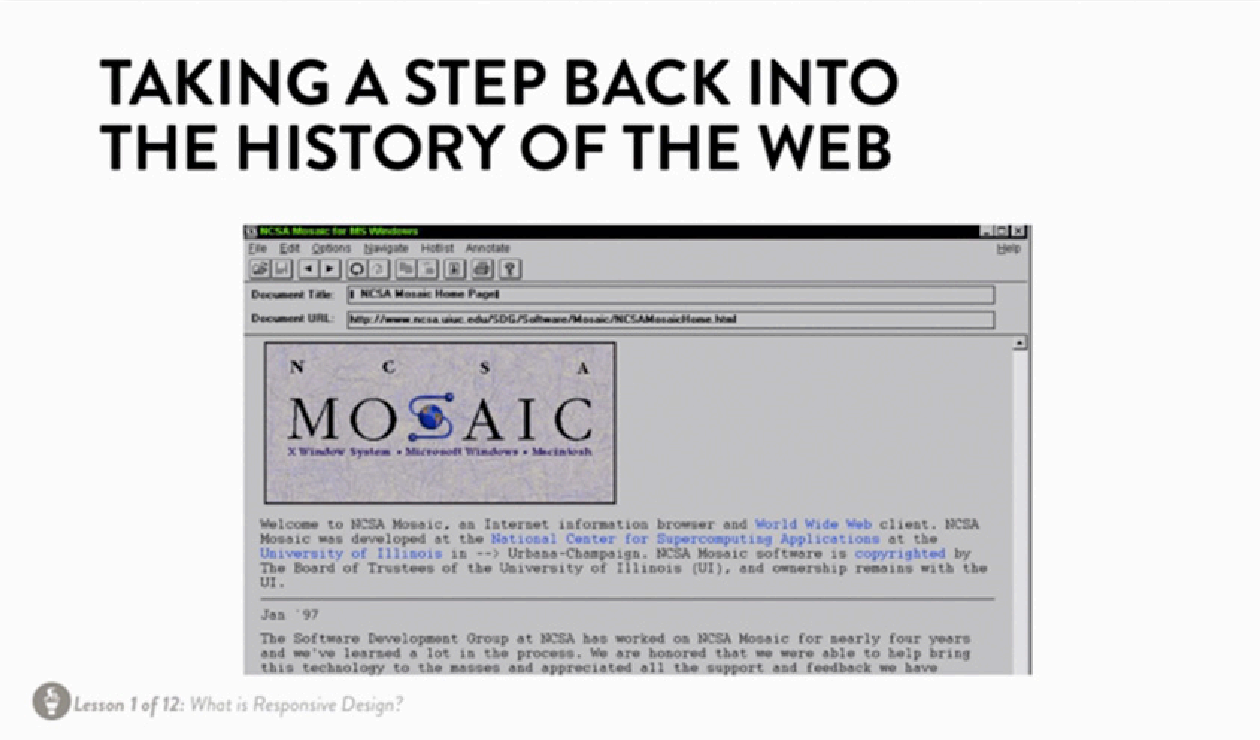
Yes, we have our work cut out for us. I do want to make one thing pretty clear. You are the one who will be creating your portfolio. So, we'll be using these lesson files of our fictional designer in order to get you on the way. In each assignment, I'll also be asking you to work on your own responsive portfolio, your own content, so that by the end of the course, you'll have something awesome to share with the world for all your hard work.

If you have any questions, be sure to hit the forum in our classroom. There, you'll have access to TAs who are paying attention to what's going on in the forum. I'll be checking in from time to time, but your most important resource will be your other classmates. This is Responsive Web Design.

CHAPTER 2: THE HISTORY OF LAYOUT ON THE WEB

In this section, we're going to talk a little bit about the history of the web and more specifically, I suppose, we're going to talk about the history of layout on the web. Why layout? Well, we want to see a little bit where we came from, so we know where to go.

Responsive web design is all about the future and how design is adapting to technology. So if we take a look at this-- this is the first browser for the web. And we can see here that it's pretty basic from a design or a layout sense. We've got some images, some hyperlinks, and then that's about it. Not a whole lot more.



TAKING A STEP BACK INTO THE HISTORY OF THE WEB

NCSA Mosaic for MS Windows
File Edit Options Navigate Hotlist Annotate Help
N C S A
MOSAIC
X Window System • Microsoft Windows • Macintosh

Document Title: NCSA Mosaic Home Page

Document URL: http://www.ncsa.uiuc.edu/SDG/Software/Mosaic/NCSAMosaicHome.html

Welcome to NCSA Mosaic, an Internet information browser and World Wide Web client. NCSA Mosaic was developed at the National Center for Supercomputing Applications at the University of Illinois in --> Urbana-Champaign. NCSA Mosaic software is copyrighted by The Board of Trustees of the University of Illinois (UI), and ownership remains with the UI.

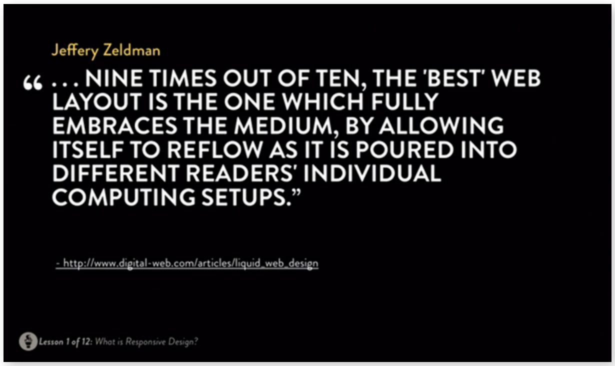
Jan '97

The Software Development Group at NCSA has worked on NCSA Mosaic for nearly four years and we've learned a lot in the process. We are honored that we were able to help bring this techology to the masses and appreciated all the support and feedback we have

Lesson 1 of 12: What is Responsive Design?

But what we did have was the ability to access this document from anywhere in the world that had an Internet connection and a screen, as well as this browser. So to put layout in context, let's take a look at this quote by Jeffrey Zeldman. "Nine times out of ten, the best web layout is the one which fully embraces the medium, by allowing itself to reflow as it's poured into different readers' individual computing setups."

That last layout we looked at largely did that. It reflowed based on the size of your screen. When did Jeffrey say this? Oh, that's right. 1998 is when this was said. So this concept of web design or layout that responds to the user's screen has been around for a while.



Jeffery Zeldman

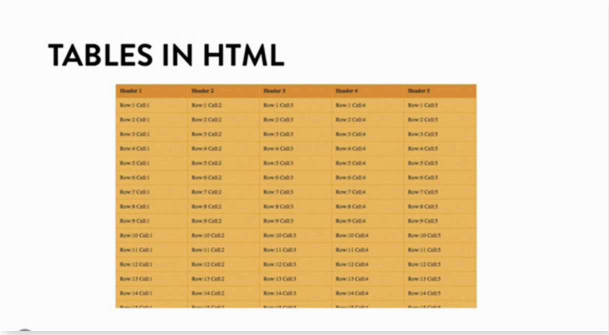
"... NINE TIMES OUT OF TEN, THE 'BEST' WEB LAYOUT IS THE ONE WHICH FULLY EMBRACES THE MEDIUM, BY ALLOWING ITSELF TO REFLOW AS IT IS POURED INTO DIFFERENT READERS' INDIVIDUAL COMPUTING SETUPS."

- http://www.digital-web.com/articles/liquid_web_design

Lesson 1 of 12: What is Responsive Design?

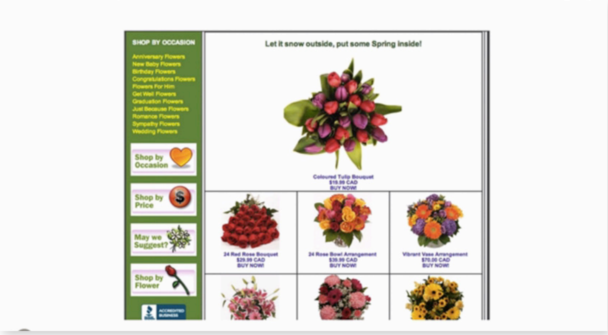
But at the time, all we had to work with were tables. And HTML tables are really designed for data. But we had these layouts, and we could put in some code here to create columns and rows. And they kind of look like this, because, well, this was the beginning of the web and the fact that you got this online was pretty cool to begin with.

Table layouts could be surprisingly complex, capable of both fixed and fluid layouts or even a combination of the two. A fixed width table looks like this-- 800 pixels, no matter how wide your browser window. A fluid or liquid layout, as it was sometimes called, stretched to a certain percentage of your browser window-- 100% in this illustration.



TABLES IN HTML

Header 1	Header 2	Header 3	Header 4	Header 5
Row:1 Cell:1	Row:1 Cell:2	Row:1 Cell:3	Row:1 Cell:4	Row:1 Cell:5
Row:2 Cell:1	Row:2 Cell:2	Row:2 Cell:3	Row:2 Cell:4	Row:2 Cell:5
Row:3 Cell:1	Row:3 Cell:2	Row:3 Cell:3	Row:3 Cell:4	Row:3 Cell:5
Row:4 Cell:1	Row:4 Cell:2	Row:4 Cell:3	Row:4 Cell:4	Row:4 Cell:5
Row:5 Cell:1	Row:5 Cell:2	Row:5 Cell:3	Row:5 Cell:4	Row:5 Cell:5
Row:6 Cell:1	Row:6 Cell:2	Row:6 Cell:3	Row:6 Cell:4	Row:6 Cell:5
Row:7 Cell:1	Row:7 Cell:2	Row:7 Cell:3	Row:7 Cell:4	Row:7 Cell:5
Row:8 Cell:1	Row:8 Cell:2	Row:8 Cell:3	Row:8 Cell:4	Row:8 Cell:5
Row:9 Cell:1	Row:9 Cell:2	Row:9 Cell:3	Row:9 Cell:4	Row:9 Cell:5
Row:10 Cell:1	Row:10 Cell:2	Row:10 Cell:3	Row:10 Cell:4	Row:10 Cell:5
Row:11 Cell:1	Row:11 Cell:2	Row:11 Cell:3	Row:11 Cell:4	Row:11 Cell:5
Row:12 Cell:1	Row:12 Cell:2	Row:12 Cell:3	Row:12 Cell:4	Row:12 Cell:5
Row:13 Cell:1	Row:13 Cell:2	Row:13 Cell:3	Row:13 Cell:4	Row:13 Cell:5
Row:14 Cell:1	Row:14 Cell:2	Row:14 Cell:3	Row:14 Cell:4	Row:14 Cell:5
Row:15 Cell:1	Row:15 Cell:2	Row:15 Cell:3	Row:15 Cell:4	Row:15 Cell:5



SHOP BY OCCASION

Anniversary Flowers
New Baby Flowers
Birthday Flowers
Congratulations Flowers
Flowers For Him
Get Well Flowers
Graduation Flowers
Just Because Flowers
Romance Flowers
Sympathy Flowers
Wedding Flowers

Shop by Occasion

Shop by Price

May we Suggest?

Shop by Flower

ACCREDITED BUSINESS

Let it snow outside, put some Spring inside!

Coloured Tulip Bouquet
$19.99 CAD
BUY NOW!

24 Red Rose Bouquet
$29.99 CAD
BUY NOW!

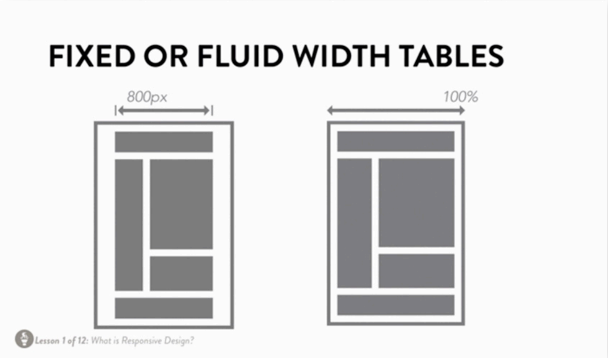
24 Rose Bowl Arrangement
$39.99 CAD
BUY NOW!

Vibrant Vase Arrangement
$70.00 CAD
BUY NOW!

So let's take a look at an example of an old school table layout that's a combination of fixed and fluid. As the browser window contracts, all the content begins to reflow. And laugh, if you will, at the crude design, but these problems of how to deal with shifting content such as line length of text do not magically disappear with modern responsive design.

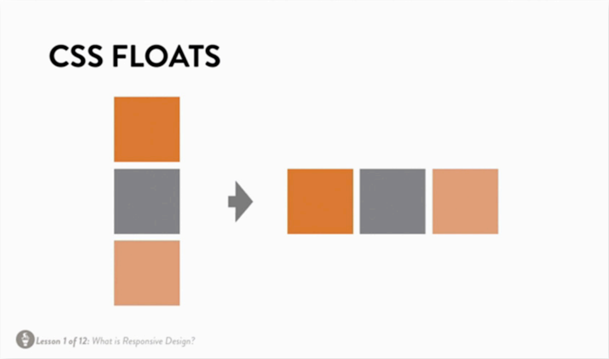
At the time, tables were all developers and designers had to work with. But the code was too complex, making it more difficult to update and modify pages. And in any case, something better was on the way (ECHOING EFFECT) cascading style sheets. Yes, CSS was here to save the day. Far less code was needed to achieve similar layouts.

And it worked in harmony with HTML as a separate presentation layer. You could create a basic layout using a few lines of code and some HTML. Just like tables, you could have a fixed layout of 800 pixels. And you could create a fluid layout that stretched to 100% of the screen.



FIXED OR FLUID WIDTH TABLES

Lesson 1 of 12: What is Responsive Design?



CSS FLOATS

Lesson 1 of 12: What is Responsive Design?

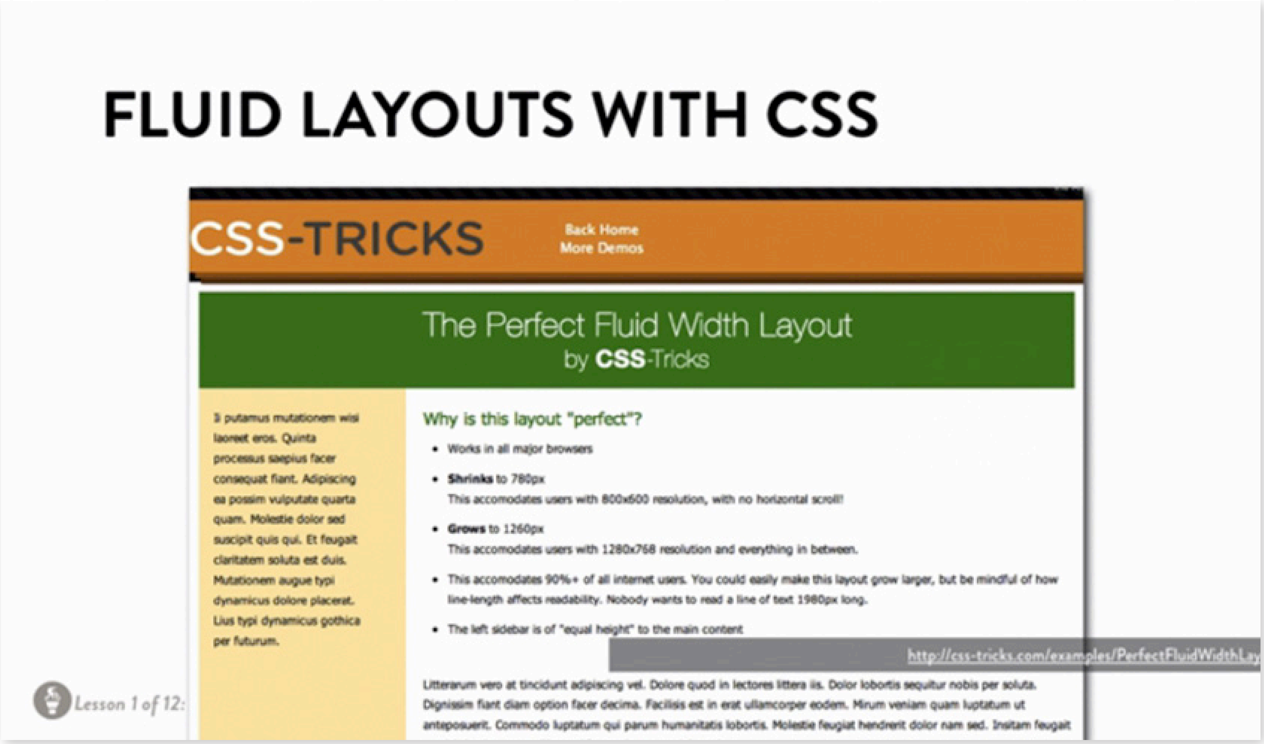
So CSS became the best tool for the job at the time. There were some struggles along the way. We had issues such as browser incompatibilities. And the main problem here is that CSS definitely had some flaws and still has flaws of its own.

For example, the concept of CSS floats. If you've done any CSS layout at all, this is old hat. Here we have three columns stacked on top of each other vertically. We apply some float left code or flow right code to it, and we could stack these horizontally across the screen.

The problem is this behavior was never really intended to give us true layout, such as rows and columns and grids. And so we had to come up with a number of different ways to create fluid width layouts using various hacks. We had browser incompatibilities and all sorts of other issues.

Let's go back to Jeffrey's quote here. And I'm going to highlight this section. "The best web layout is the one which fully embraces the medium by allowing itself to reflow." So let's talk about that reflowing part, and let's do a little detective work.

Let's think about this. If we've been able to do these fixed layouts and fluid layouts, why haven't there been more fluid layouts? Well, the truth is fluid layouts are actually very hard to build. There's all sorts of problems, as I mentioned before, browser incompatibilities. The floating and clearing aspects of web design is really not intuitive or even efficient.



FLUID LAYOUTS WITH CSS

CSS-TRICKS

Back Home
More Demos

The Perfect Fluid Width Layout
by CSS-Tricks

Ii putamus mutationem wisi laoreet eros. Quinta processus saepius facer consequat fiant. Adipiscing ea possim vulputate quarta quam. Molestie dolor sed suscipit quis qui. Et feugait claritatem soluta est duis. Mutationem augue typi dynamicus dolore placerat. Lius typi dynamicus gothica per futurum.

Why is this layout "perfect"?

- Works in all major browsers
- **Shrinks** to 780px
  This accomodates users with 800x600 resolution, with no horizontal scroll!
- **Grows** to 1260px
  This accomodates users with 1280x768 resolution and everything in between.
- This accomodates 90%+ of all internet users. You could easily make this layout grow larger, but be mindful of how line-length affects readability. Nobody wants to read a line of text 1980px long.
- The left sidebar is of "equal height" to the main content

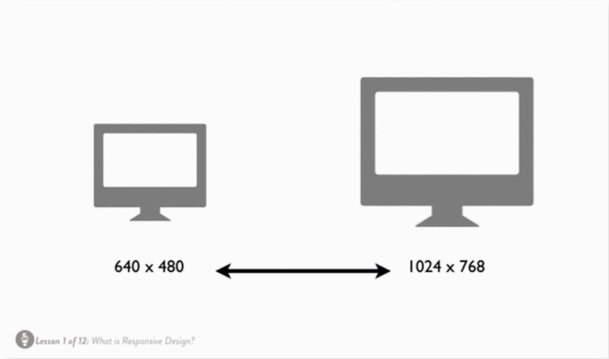
http://css-tricks.com/examples/PerfectFluidWidthLay

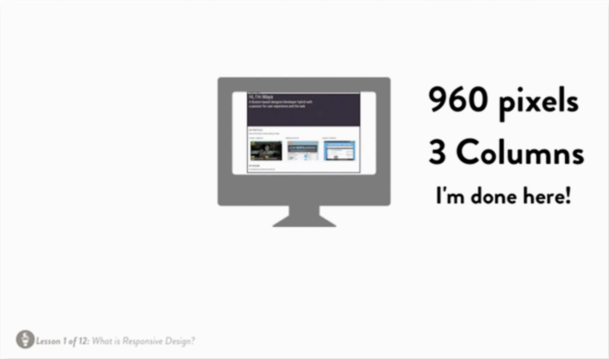
Litterarum vero at tincidunt adipiscing vel. Dolore quod in lectores littera iis. Dolor lobortis sequitur nobis per soluta. Dignissim fiant diam option facer decima. Facilisis est in erat ullamcorper eodem. Mirum veniam quam luptatum ut anteposuerit. Commodo luptatum qui parum humanitatis lobortis. Molestie feugiat hendrerit dolor nam sed. Insitam feugait

Lesson 1 of 12:

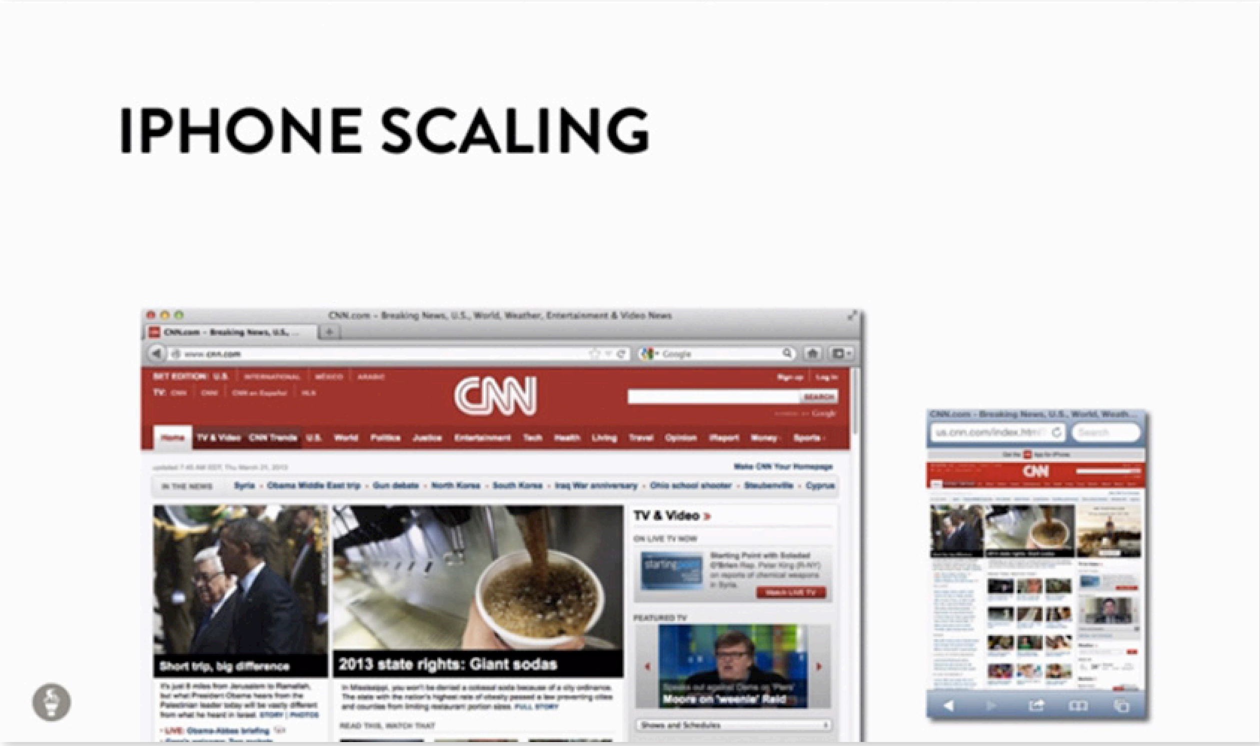
There's other factors as well. Keep in mind that the size of screens largely was the same for many years. So we had this range of about 640 by 480 at the low end to 1024 by 768 at the high end. So the truth is you could get away with fixed layout in this range and not really have to worry about other sized screens.

And finally, if we're also being honest with ourselves, designers liked fixed width and still like fixed width because it gives them control. It gives them control over the placement of rows and columns and the size of images. And visually speaking, it's much more satisfying to work within a fixed width canvas than to try to make it work in fluid.




960 pixels
3 Columns
I'm done here!

But something came along that made all of this a moot point. Yes, our friend the iPhone here, as well as other smartphone devices that were able to browse the web using this very small screen that you could hold in the palm of your hand. So to jump ahead a little bit, how does the iPhone and other smartphones scale a website such as this one when you browse it?

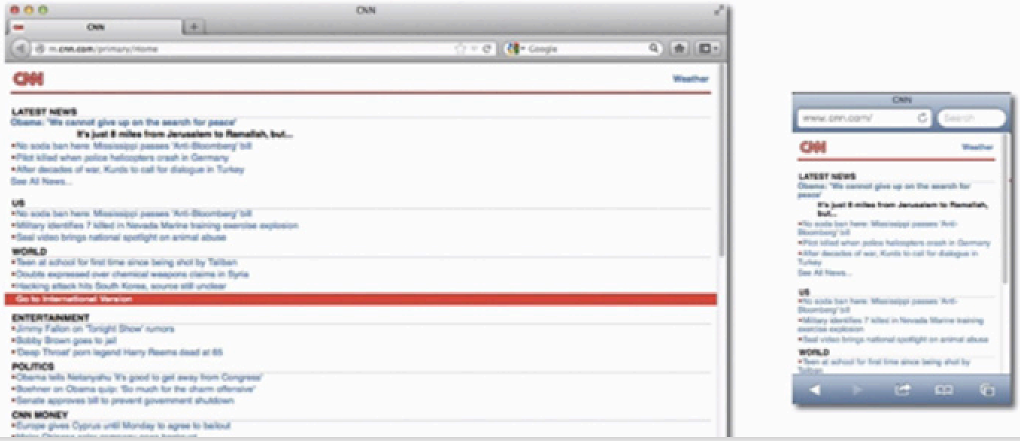

IPHONE SCALING

The default method, which is included in the web browser, is to simply scale the site and allow the user to pinch and zoom if they want to read something in the left column or to look at an image, for example. This creates its own set of problems, something we'll be exploring a little later on.

So if you're not happy with this pinch and zoom behavior, what might you do? You might do something like this, which is to create an entirely different website designed specifically for a smaller screen-- in this case, a single column layout with no images and links. We call these mdot sites because they typically live on their own domains, such as m.cnn.com or m.hbo.com.

So these sites came along, and they did solve somewhat this problem of having the smaller screen. But guess what? They introduced another problem. So think about this scenario. You're on your iPhone, and you want to send a link for someone else to read. And so you send it to them, and they open it up on a desktop. And it looks like this.

THE "MDOT" ON A DESKTOP?



CNN

m.cnn.com/primary/Home

CNN Weather

LATEST NEWS
Obama: 'We cannot give up on the search for peace'
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•Pilot killed when police helicopters crash in Germany
•After decades of war, Kurds to call for dialogue in Turkey
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•No soda ban here: Mississippi passes 'Anti-Bloomberg' bill
•Military identifies 7 killed in Nevada Marine training exercise explosion
•Seal video brings national spotlight on animal abuse

WORLD
•Teen at school for first time since being shot by Taliban
•Doubts expressed over chemical weapons claims in Syria
•Hacking attack hits South Korea, source still unclear

Go to International Version

ENTERTAINMENT
•Jimmy Fallon on 'Tonight Show' rumors
•Bobby Brown goes to jail
•'Deep Throat' porn legend Harry Reems dead at 65

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•Obama tells Netanyahu 'It's good to get away from Congress'
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Obama: 'We cannot give up on the search for peace'
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•No soda ban here: Mississippi passes 'Anti-Bloomberg' bill
•Pilot killed when police helicopters crash in Germany
•After decades of war, Kurds to call for dialogue in Turkey
See All News...

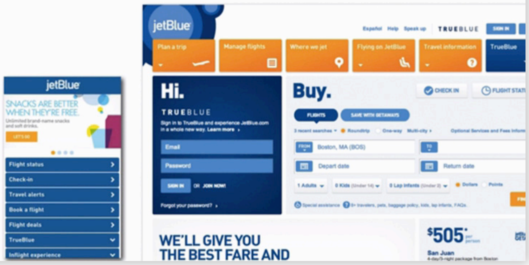
US
•No soda ban here: Mississippi passes 'Anti-Bloomberg' bill
•Military identifies 7 killed in Nevada Marine training exercise explosion
•Seal video brings national spotlight on animal abuse

WORLD
•Teen at school for first time since being shot by Taliban

But they often introduce other problems as well. For example, maybe there's content missing on the mobile site, and this defeats the user's expectations. Also from the back end, they have to be maintained separately from the desktop version. This creates all sorts of versioning issues, where it's quite possible in a new site that you have news that's recent on the desktop but doesn't show up on the mobile.

So what is the answer? Well, that's what we're going to explore in the next lesson as we take a look at the fundamentals of responsive web design.

ONE OF THESE THINGS IS NOT LIKE THE OTHER



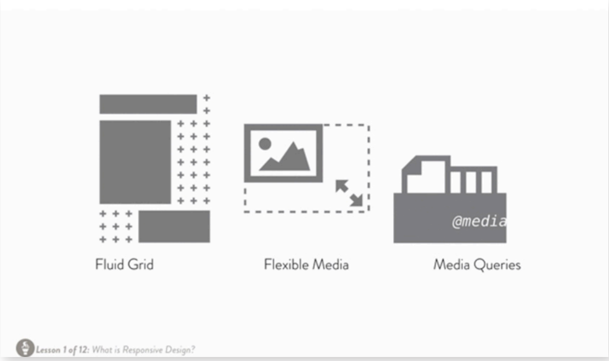
CHAPTER 3: THE COMPONENTS OF RESPONSIVE WEB DESIGN

OK, so up to this point, we've been talking about responsive web design in general terms. So it's time to get specific. We want to discuss the three components of responsive web design here. And we're going to take a look at these in order. And then we'll dive in a little deeper for each one.

So first, the three components are fluid grids, flexible media, and media queries. So we're going to go ahead and start with fluid grids. Grids have been used in graphic and web design for quite a while. They help us keep structure within our layout.

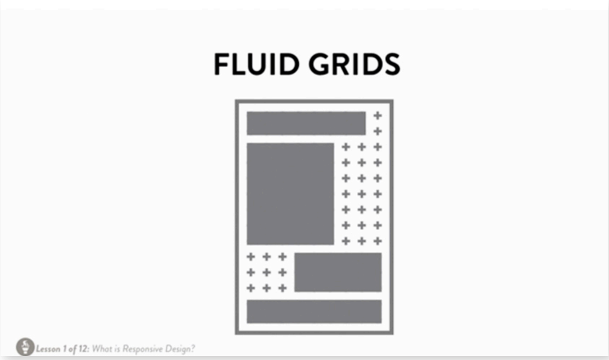
They provide a system, rather than just putting objects on the page randomly. And the point of a grid is to help you line things up and to maintain order. Now the fluid part comes from the fact this grid expands and contracts based on the size of the browser window. And the layout will also change.

So to see this in effect, let's take a look at BostonGlobe.com. This is a responsive website. It's got a fluid grid. You can see here as I begin to change the width of the browser window, you'll see the columns begin to contract. And at some point, they go from three to two to one. The content changes. And if we contrast this with Boston.com, which is a fixed width website, when I change the width of the window here, nothing changes.

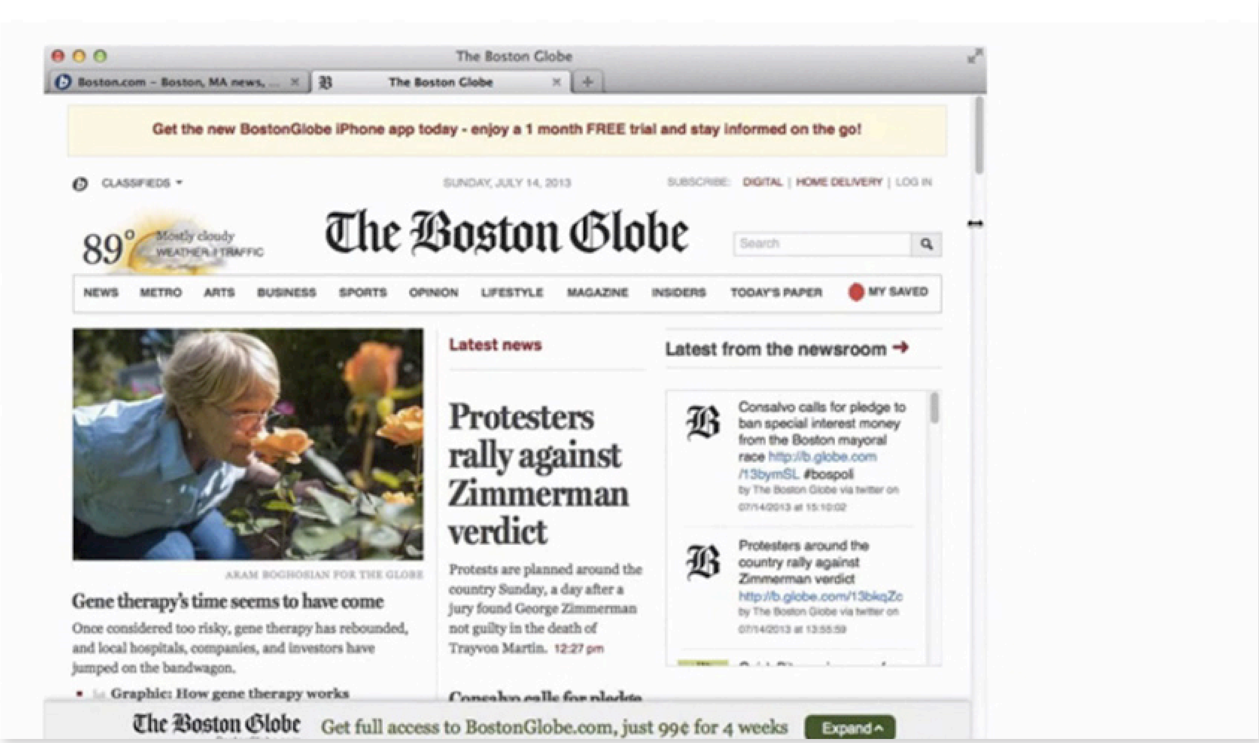


Lesson 1 of 12: What is Responsive Design?

FLUID GRIDS



Lesson 1 of 12: What is Responsive Design?



Get the new BostonGlobe iPhone app today - enjoy a 1 month FREE trial and stay informed on the go!

SUNDAY, JULY 14, 2013

89° Mostly cloudy WEATHER & TRAFFIC

The Boston Globe

ARAM BOGHOSIAN FOR THE GLOBE

Gene therapy's time seems to have come

Once considered too risky, gene therapy has rebounded, and local hospitals, companies, and investors have jumped on the bandwagon.

- Graphic: How gene therapy works

Latest news

Protesters rally against Zimmerman verdict

Protests are planned around the country Sunday, a day after a jury found George Zimmerman not guilty in the death of Trayvon Martin. 12:27 pm

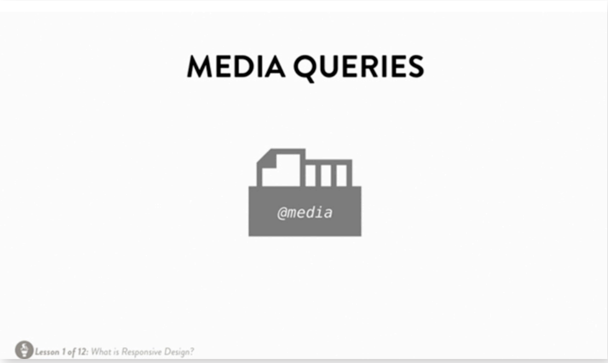
Consalvo calls for pledge

Latest from the newsroom →

Consalvo calls for pledge to ban special interest money from the Boston mayoral race http://b.globe.com/13bymSL #bospoli
by The Boston Globe via twitter on 07/14/2013 at 15:10:02

Protesters around the country rally against Zimmerman verdict http://b.globe.com/13bkqZc
by The Boston Globe via twitter on 07/14/2013 at 13:55:59

The Boston Globe Get full access to BostonGlobe.com, just 99¢ for 4 weeks

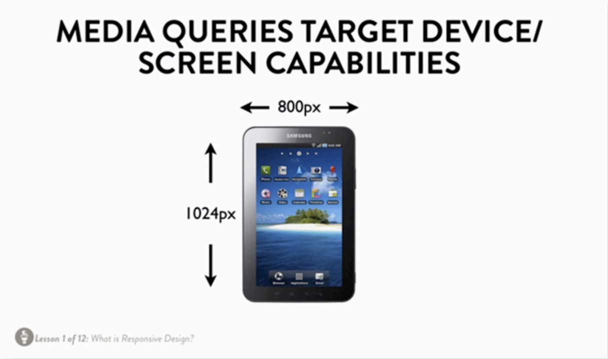


MEDIA QUERIES

Lesson 1 of 12: What is Responsive Design?

The second component is flexible media. So the problem with fluid grids is what to do with that static content, such as the images inside. If you don't do anything else, images will tend to break within a fluid grid, and they don't scale naturally. But with flexible media, we can take content such as images or video, and we can stretch them based on the size of the screen.

The last component to take a look at is media queries. Media queries are a CSS3 component that allows designers and developers to target specific characteristics of different devices or screens. What are some of these characteristics?



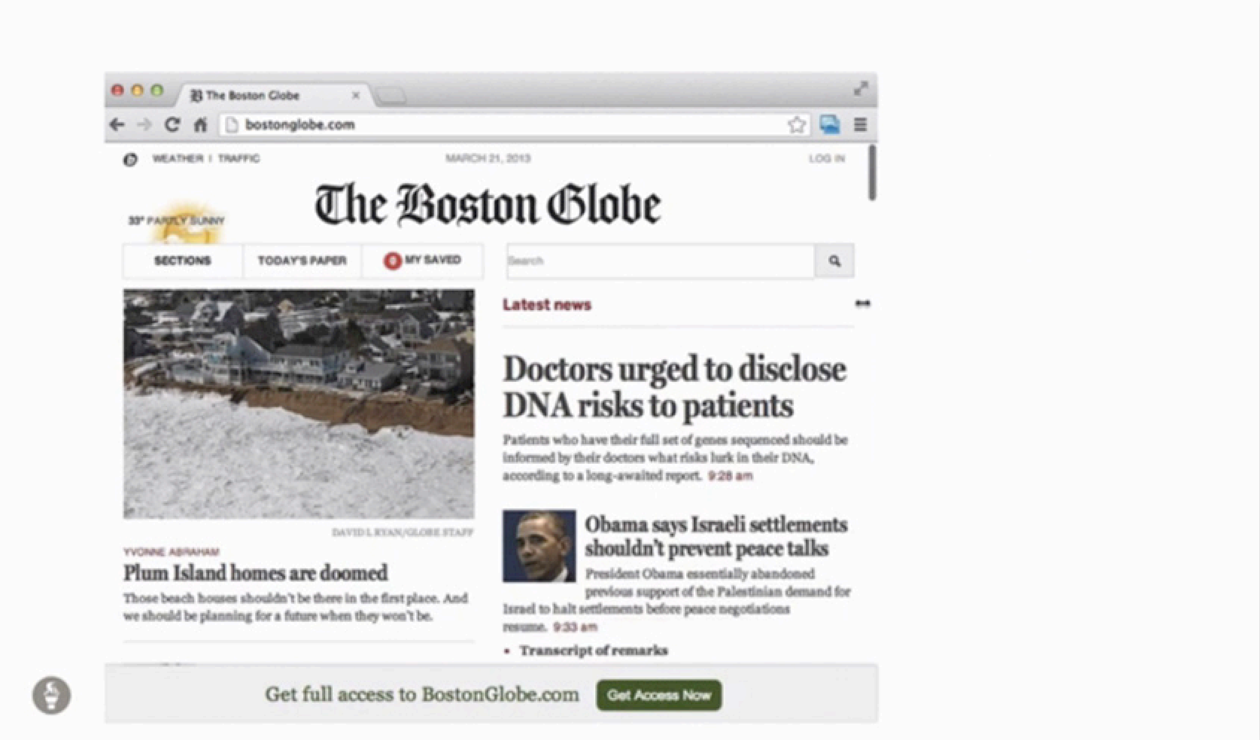
MEDIA QUERIES TARGET DEVICE/ SCREEN CAPABILITIES

Lesson 1 of 12: What is Responsive Design?

Well, we've got screen width and height. We also have things such as pixel density or device orientation, which means we can know whether a tablet or smartphone is in portrait or landscape view. Once these things are targeted, we can provide CSS that applies to our page only under those circumstances.

So to illustrate that in more depth, let's imagine here that these four devices all get some CSS that's the same. So, for example, on the widest desktop, maybe we want four columns or maybe we want three as it gets smaller. If we decide to change the navigation for any of these sizes, we can do that. They all come from one central location, which is an external stylesheet.

So you put all these together, and you get something like this, the Boston Globe website. Now we just took a look at this earlier, but what I want you to do is to pay attention to some of the things we just talked about. I want you to pay attention to how the grid changes and how the media or images change, as well as the navigation.



The Boston Globe

Latest news

Doctors urged to disclose DNA risks to patients

Patients who have their full set of genes sequenced should be informed by their doctors what risks lurk in their DNA, according to a long-awaited report. 9:28 am

Obama says Israeli settlements shouldn't prevent peace talks

President Obama essentially abandoned previous support of the Palestinian demand for Israel to halt settlements before peace negotiations resume. 9:33 am

- **Transcript of remarks**

DAVID L RYAN/GLOBE STAFF

YVONNE ABRAHAM

Plum Island homes are doomed

Those beach houses shouldn't be there in the first place. And we should be planning for a future when they won't be.

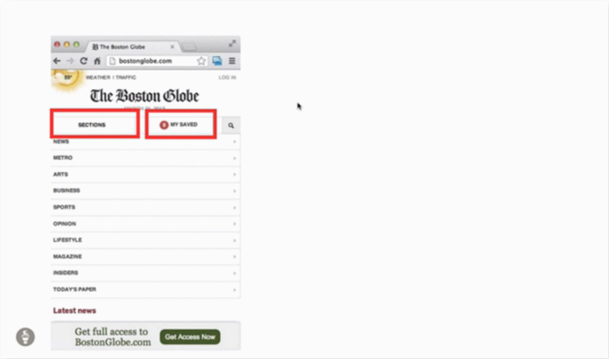
Get full access to BostonGlobe.com

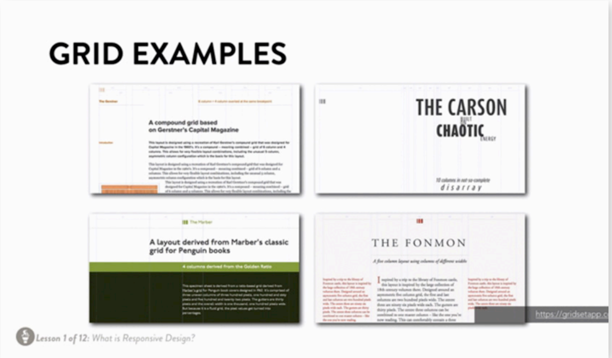
So as we reduce the width-- we go from three columns to two, two to one-- and then that one column goes to a more condensed version of the single column. But also pay attention to the navigation, so that navigation has gone from multiple choices in the menu bar to just two in the single column view. And we have access to these multiple navigation items through these sections.

So this puts it all together. Let's just take a closer look at each of these three elements in turn. And we'll start with fluid grids.

So as we saw there, fluid grids flex and they fit content within the device, but the HTML always remains the same. It's the CSS doing the work. There are numerous examples of how to use grids to your advantage. We're going to take a look at these in an upcoming lesson where we talk about grid layout more specifically.

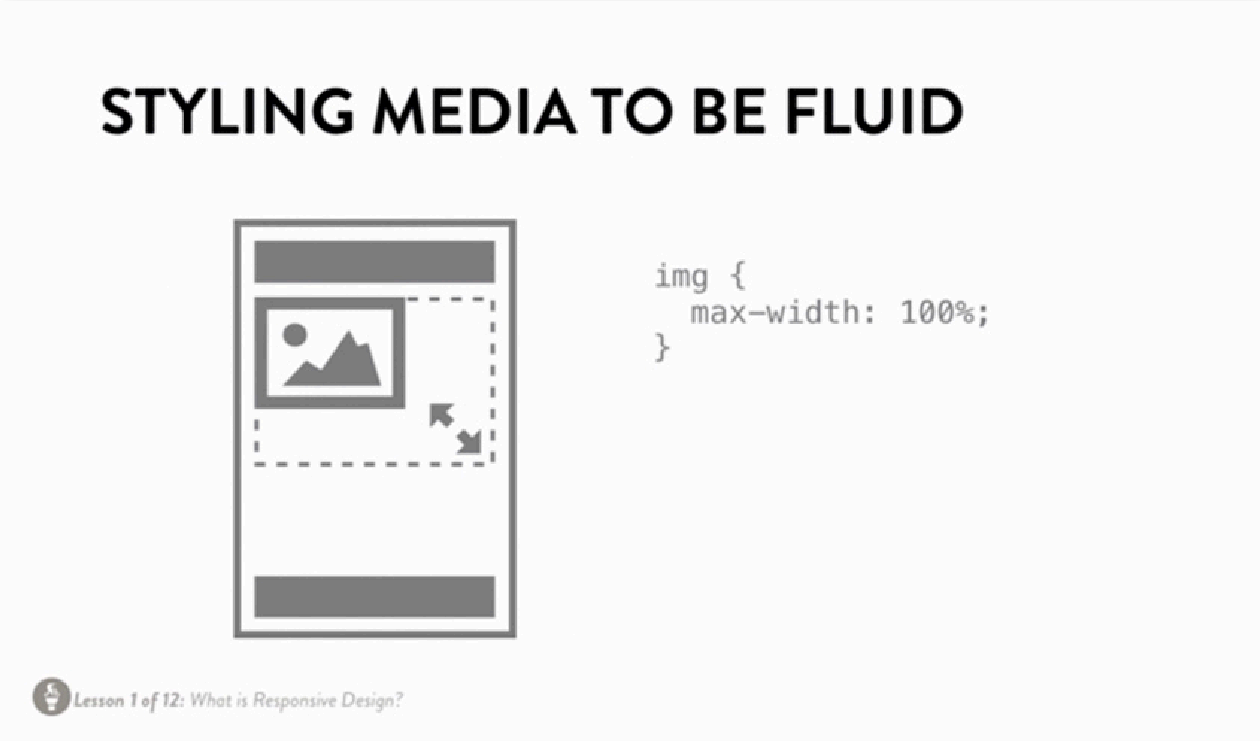
Let's take a quick look at flexible media. The good news is creating flexible images, as we saw in that last example, is relatively easy from a CSS perspective. We can add a simple rule called max-width:100% to our images. And what this will do is allow the image to stretch depending on the size of the container.




GRID EXAMPLES

A compound grid based on Gerstner's Capital Magazine
THE CARSON CHAOTIC
A layout derived from Marber's classic grid for Penguin books
THE FONMON
https://gridsetapp.c

Lesson 1 of 12: What is Responsive Design?


STYLING MEDIA TO BE FLUID

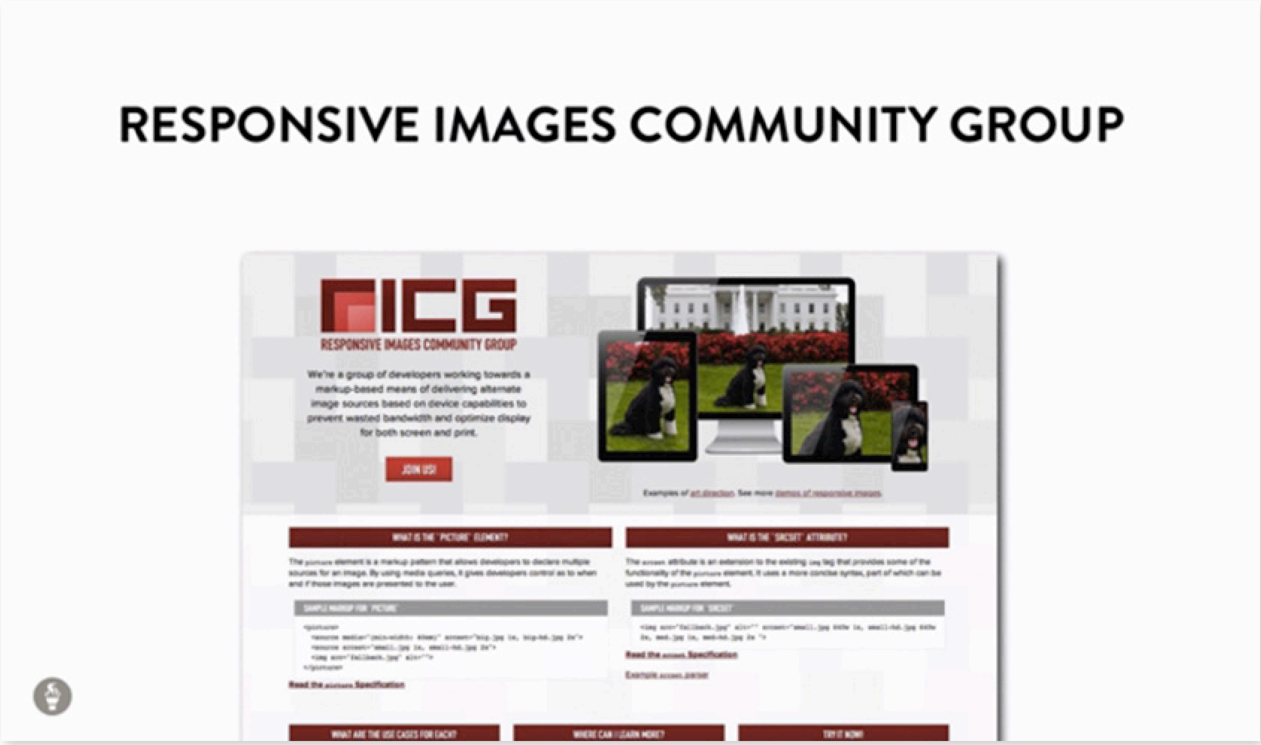
```
img {
  max-width: 100%;
}
```

Lesson 1 of 12: What is Responsive Design?

However, this is a little deceptive. Even though this is relatively easy to do, there's a lot of issues we have to consider when we're using flexible images. One of these has to do with bandwidth, and specifically, how long an image takes to download.

We can create these larger images for websites. And they look great on the desktop. But we're actually penalizing mobile users or those with slower Internet connections. So this is actually one of the major challenges of responsive web design. How do we give users only the images that they need?

In fact, there's an entire group out there called the Responsive Images Community Group. And they're trying to figure some of this out. One of the strategies they're exploring is an entirely new element called the picture element. I'm going to leave you to explore this on your own if you wish. It's worth your time, and we'll be looking at it more in-depth in the responsive images lesson.



RESPONSIVE IMAGES COMMUNITY GROUP

RICG

RESPONSIVE IMAGES COMMUNITY GROUP

We're a group of developers working towards a markup-based means of delivering alternate image sources based on device capabilities to prevent wasted bandwidth and optimize display for both screen and print.

JOIN US!

Examples of art direction. See more demos of responsive images.

WHAT IS THE "PICTURE" ELEMENT?

The picture element is a markup pattern that allows developers to declare multiple sources for an image. By using media queries, it gives developers control as to when and if those images are presented to the user.

SAMPLE MARKUP FOR "PICTURE"

```
<picture>
  <source media="(min-width: 45em)" srcset="big.jpg 1x, big-hd.jpg 2x">
  <source srcset="small.jpg 1x, small-hd.jpg 2x">
  <img src="fallback.jpg" alt="">
</picture>
```

Read the picture Specification

WHAT IS THE "SRCSET" ATTRIBUTE?

The srcset attribute is an extension to the existing img tag that provides some of the functionality of the picture element. It uses a more concise syntax, part of which can be used by the picture element.

SAMPLE MARKUP FOR "SRCSET"

```
<img src="fallback.jpg" alt="" srcset="small.jpg 640w 1x, small-hd.jpg 640w 2x, med.jpg 1x, med-hd.jpg 2x ">
```

Read the srcset Specification

Example srcset parser

WHAT ARE THE USE CASES FOR EACH?

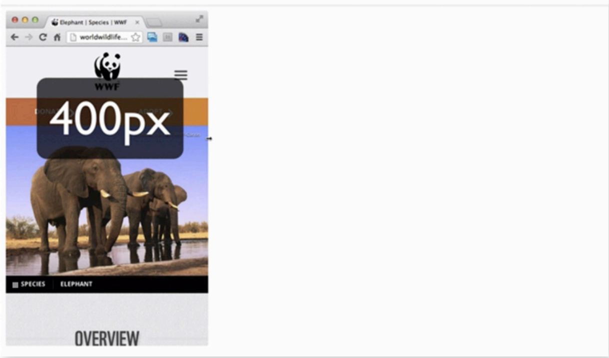
WHERE CAN I LEARN MORE?

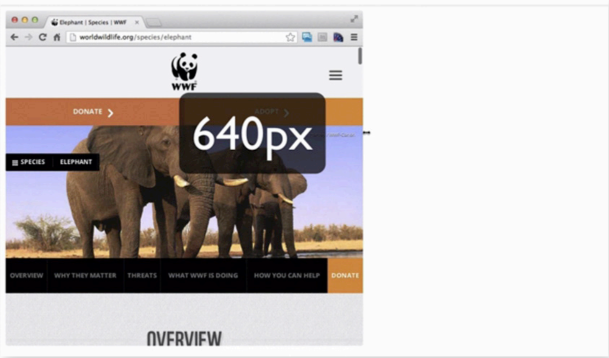
TRY IT NOW!

Now the challenge of working with responsive images isn't just about performance or bandwidth. It's also about content, or more specifically, how you can control the editorial content-- things such as cropping. It'd be really nice on a desktop site to have a big large image that stretches the width of the screen, but then cropped for a smaller mobile phone.

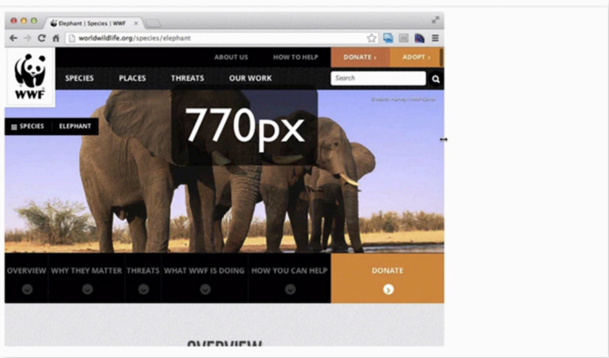
Now last, let's take a look at media queries. One of the terms you're going to be used to working with quite a bit is breakpoints. So here we have an illustration of a single column layout. And the question is what happens when we begin to stretch the width of the browser's screen and that layout begins to break? Well, what we want to do is change it to a two column layout. But at what point do we do that?

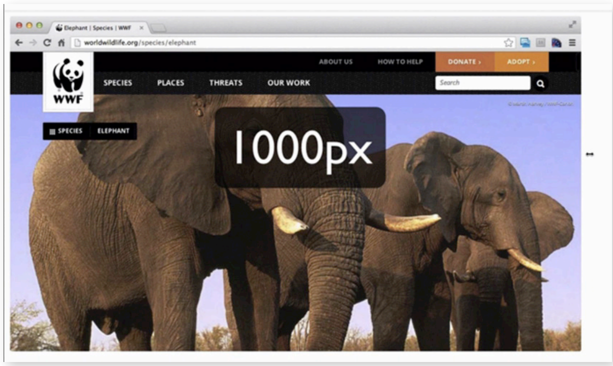
So to illustrate that more clearly, let's go take a look at an example at the WorldWildlife.org site, which is a beautiful responsive site. We'll start out here with the smallest layout, which is 400 pixel wide. Perfect for smartphones. As I began to expand it, we'll see the next breakpoint, right about here. So this is 640 pixels wide.





Now we stretch a little farther, and we hit the next breakpoint here. And this is 770 pixels wide. Notice the completely different layout between this one and the last. And then finally, we'll go to the final layout, which is 1000 pixels wide. And this is essentially the default desktop layout for larger screens.

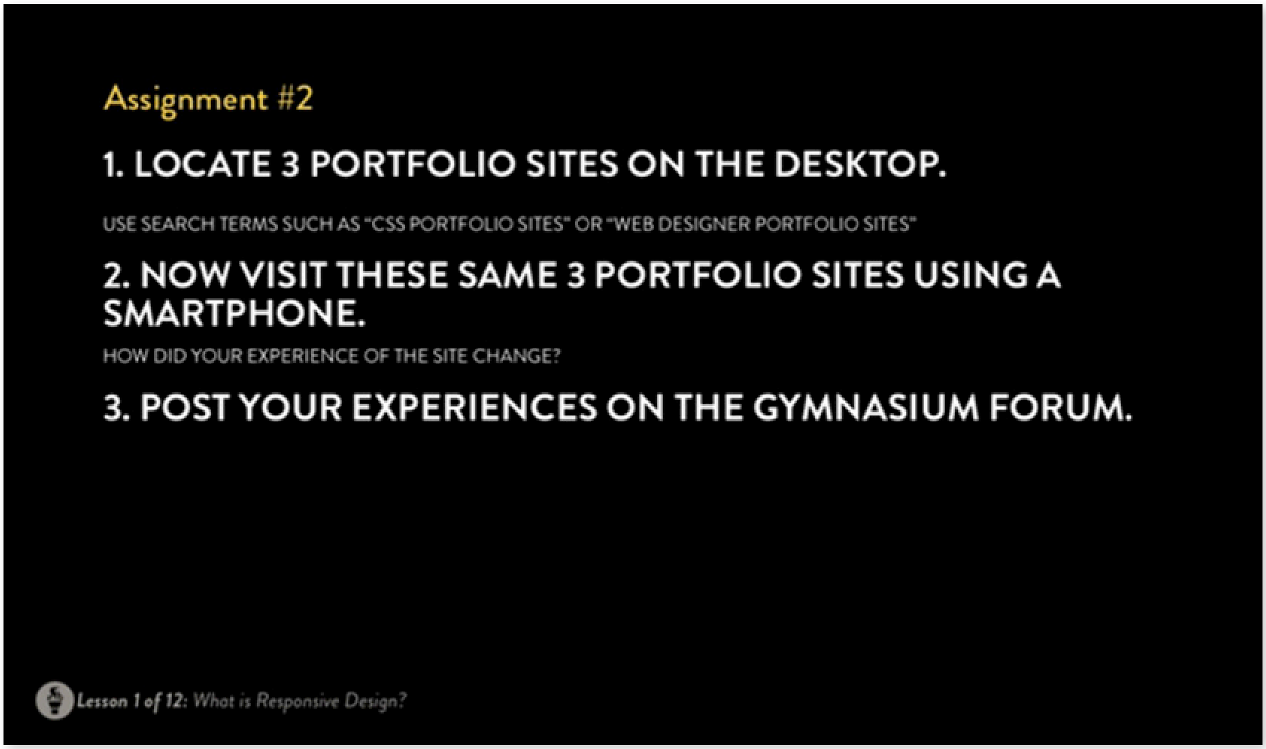




Ultimately, the takeaway here is that media queries aren't just about handling layout for screen sizes, big or small. They're really about tailoring the user's experience based on their device or screen capability.

OK, you made it to the end. Let's talk a little bit about what you need to do. The first homework assignment is a short quiz located on the Gymnasium site. Quizzes are designed to help you retain the information that you learned in this lesson and to help reinforce the concepts as well.

The second assignment is the following. Locate three portfolio sites you've never visited before. You can go online and do this fairly easily by doing a search for CSS portfolio sites or web designer portfolio sites.



Assignment #2

1. LOCATE 3 PORTFOLIO SITES ON THE DESKTOP.

USE SEARCH TERMS SUCH AS "CSS PORTFOLIO SITES" OR "WEB DESIGNER PORTFOLIO SITES"

2. NOW VISIT THESE SAME 3 PORTFOLIO SITES USING A SMARTPHONE.

HOW DID YOUR EXPERIENCE OF THE SITE CHANGE?

3. POST YOUR EXPERIENCES ON THE GYMNASIUM FORUM.

Lesson 1 of 12: What is Responsive Design?

Once you go to the sites, I'd like you to click on at least three links. So navigate the site, go ahead visit those three same sites on a smartphone. When you do that, I want you to take note of what your expectations were.

What happened when you went to the site? Was it what you expected? Was it not? And why? All of these things are going to help you begin thinking about your own portfolio page, when we get to that point.

Keep in mind that we're available here on the Forum. I hope to see you there, and I also hope to see you in the next session.