

Week 8:

CSS Part 3

ATLS 2200 (Web)
Spring 2022

roadmap

TODAY...

1. Responsive Web
2. Wrap-up + Next Steps

WHILE YOU'RE GETTING SETTLED

Make sure to check in via Canvas (“Week 8 Lecture Check-in”).

announcements

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2. Anthony will be around ATLAS on Wednesday (ATLS201) from 9-11 and 2:30-4.
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**let's build a site for phones and
computers!**

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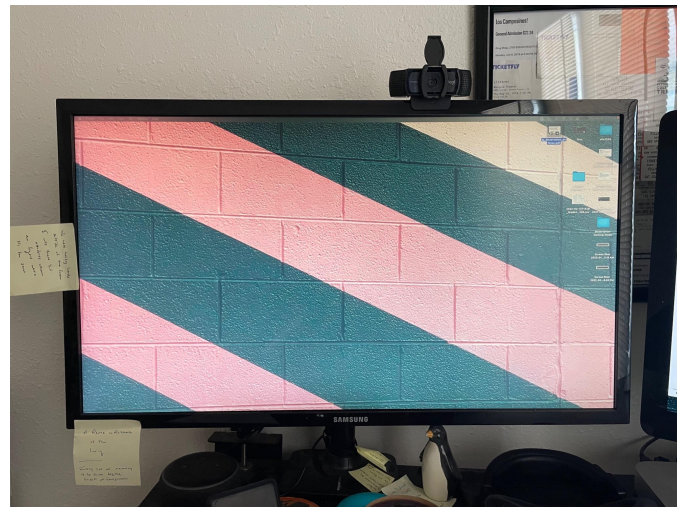
HISTORIC WEB LAYOUTS

In the not so distant past, when designing websites we had two options:

- **Liquid** sites, which stretched to fill a browser window regardless of how big or small the window was
- **Fixed width** sites, which were fixed in size

Of course, this presented problems.

What if I design a site on this screen?



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Liquid sites could result in squashed lines on smaller screens (->) or incredibly long, nearly unreadable lines on larger screens.

Best practice suggests that 66 characters per line (cpl) is ideal, with an acceptable range of 45-75cpl.

This layout is liquid. See what happens if you make the browser window wider or narrow.

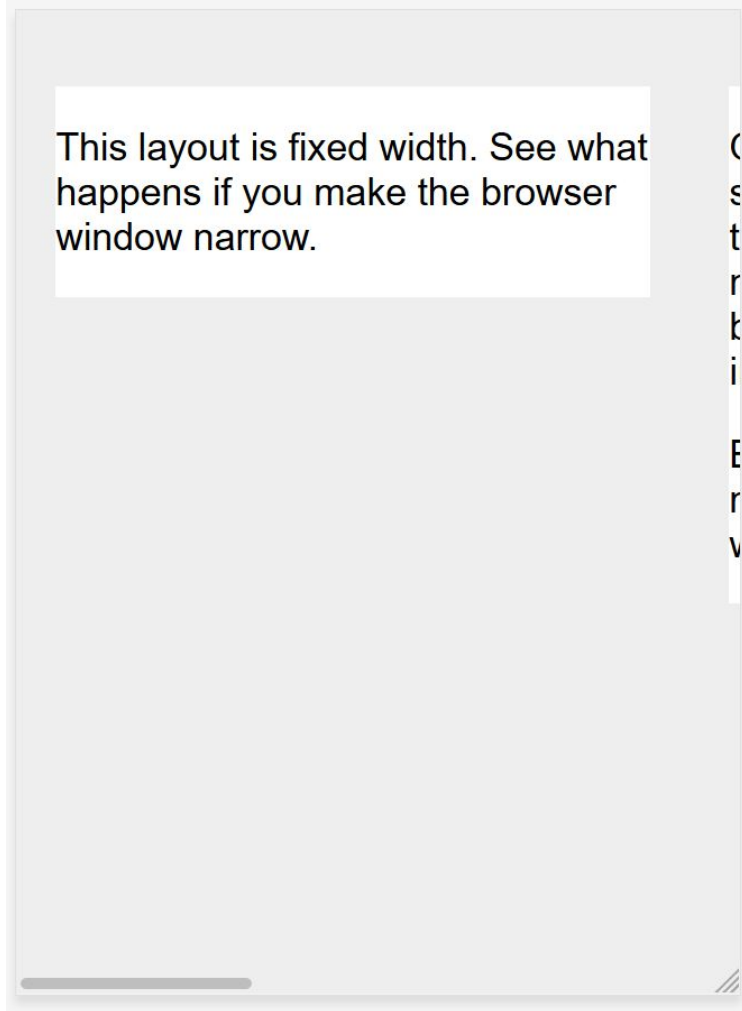
One November night in the year 1782, so the story runs, two brothers sat over their winter fire in the little French town of Annonay, watching the grey smoke-wreaths from the hearth curl up the wide chimney. Their names were Stephen and Joseph Montgolfier, they were papermakers by trade, and were noted as possessing thoughtful minds and a deep interest in all scientific knowledge and new discovery.

Before that night, a

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Fixed-width sites risk having widths too large for certain screens (like smartphones!), or having designs with a lot of empty white space on larger screens (wow, Anthony feels targeted).

This layout is fixed width. See what happens if you make the browser window narrow.



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MOBILE WEB CHANGED THE GAME

As mobile web became more ubiquitous, site admins would often create an entire second site to cater to users who were accessing the Web via their phones.

But this approach is unwieldy – maintaining two sites that are consistent is pain.

Moreover, mobile sites were often constrained in what content they could display, or how it was displayed to the end-user.

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RESPONSIVE DESIGN

Ethan Marcotte coined the term “responsive design” in 2010.

Responsive design uses three techniques in combination to create flexible sites:

1. **Fluid grids** – by using relative measures (like **ems**) instead of pixels (px), we could create grids that are responsive based on the size of the page.
2. **Fluid images** – by setting an image’s max-width property to 100%, it would scale down if its container became smaller, but never get bigger than its original size... preventing pixelation.
3. **Media queries** – allows us to have multiple layouts using only CSS.

typography

WAIT, WHAT'S AN “EM”?

An **em** is a unit in typography.

In typography, an em is equal to the currently specified point size. For example, one em in a 16-point typeface is 16 points.

In CSS, em is a **relative measurement**. It sets font size according to the base font size of the element in question. So **2em** means 2 times the current size.

That can get confusing – after all, different elements have different sizes. To solve that, CSS has the **rem** measurement (not the band).

rem stands for **root em**, and bases all measurements on the font size of the root element of the document. This ensures consistency throughout the document.

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RESPONSIVE DESIGN

Responsive design isn't a separate or new technology.

Instead, it is a way of thinking that is then put into practice via CSS to create websites that respond to whatever device is used to view that particular website.

Let's dive into each of those technologies a bit more in-depth.

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MEDIA QUERIES

A media query runs a series of tests (like screen type or size), and apply CSS based on the results of those tests .

```
@media screen and (min-width: 800px) {  
  .container {  
    margin: 1em 2em;  
  }  
}
```

What does this all mean?

Answer here.

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MEDIA QUERIES

We use multiple media queries to create different layouts based on display **type, size, and orientation**.

The points at which a media query is introduced (or the point at which a media query forces a change) is called a **breakpoint**.

A **mobile-first** design using media queries involves designing a single-column page (which is well suited for mobile devices) and then implementing breakpoints that indicate when a screen is large enough to support multiple columns.

Pro-tip: You might consider designing a mobile-first site for your mid-term.

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MEDIA QUERIES

A basic media query looks like this:

```
@media media-type and (media-feature-rule) {  
    /* CSS rules go here */  
}
```

Media-type refers to the kind of media that the code is for.

We can specify 3 different media-types:

- **Screen** – used when the page is loaded on a screen
- **Print** – used when the page is printed
- **All** – used in all cases

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MEDIA QUERIES

A basic media query looks like this:

```
@media media-type and (media-feature-rule) {  
    /* CSS rules go here */  
}
```

Media-feature-rule specifies what condition(s) will trigger that particular CSS. We can specify the following features:

- **Width and Height** – we can be more specific by using **min-** or **max-**, to trigger the query when the view is above or below a certain height or width
- **Orientation** – are we in portrait or landscape orientation?
- **Pointing Devices** – does the user have the ability to hover over an element (phones don't have this)

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FLEXIBLE GRIDS

Of course, we aren't going to specify every breakpoint that our site might encounter. Instead, we compromise, and only use breakpoints when content looks bad.

We can do this because of **flexible grids**.

This used to be done using floats. Marcotte details a formula for taking a layout designed in pixels and converting it into percentages: $\text{target} / \text{context} = \text{result}$.

For instance, if we have a container (or context) that is 900px wide, and want a target column width of 90px, we could represent that as $90 / 900 = 0.10$, or 10%.

Nowadays, we have **grid** and **flexbox**, which are inherently responsive – no need for percentage conversions!

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FLEXBOX RD 2

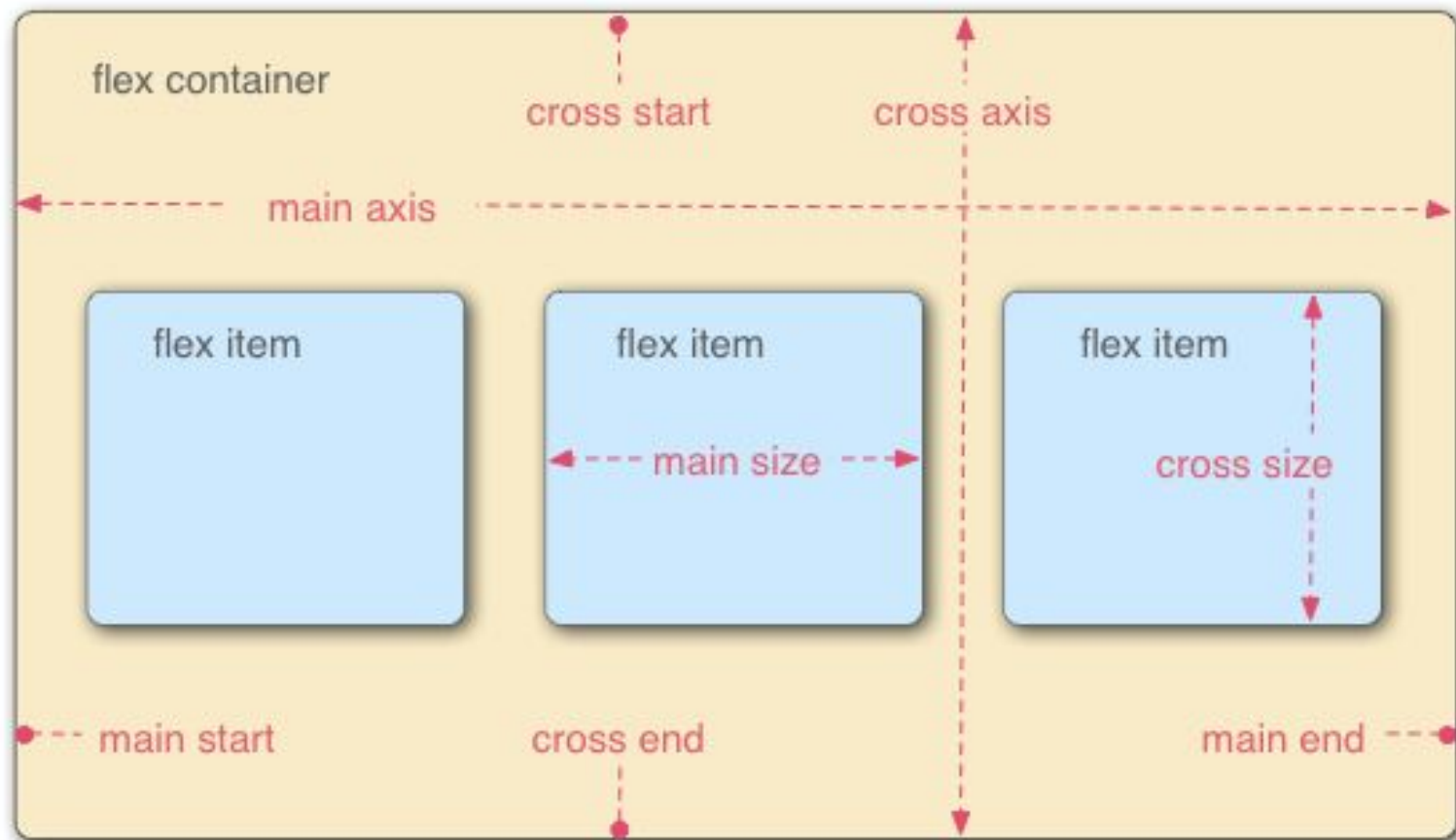
Flexbox works in one-dimension (rows or columns). The default is rows.

To change that, set the **flex-direction** value of the flexbox container to be *column*.

If you have too many flex items, using the **flex-wrap** attribute will cause them to wrap (set the value equal to *wrap*).

We can also use the shorthand **flex-flow** to set both flex-direction and flex-wrap at the same time (e.g., *flex-flow: row wrap*;))

The **flex** attribute (different from *display: flex*;) dictates how much space each flex item will take. A value of 1 will make each box of that type take the same amount of space.



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GRID RD 2

To use the grid layout, we set the display attribute to be **grid**.

Recall that with grid we can use the **fr** unit. **Fr** stands for **fractional**.

The **fr** unit takes up a fraction of the available space. So if you have *1fr 1fr 1fr*, you are creating 3 equally spaced containers.

You can mix fr with fixed length units (like px); in this case, the fixed length container will be set first, with the fractional containers taking the remaining space.

We can set a gap between the grid elements using the **gap** attribute; the value here cannot be an fr unit.

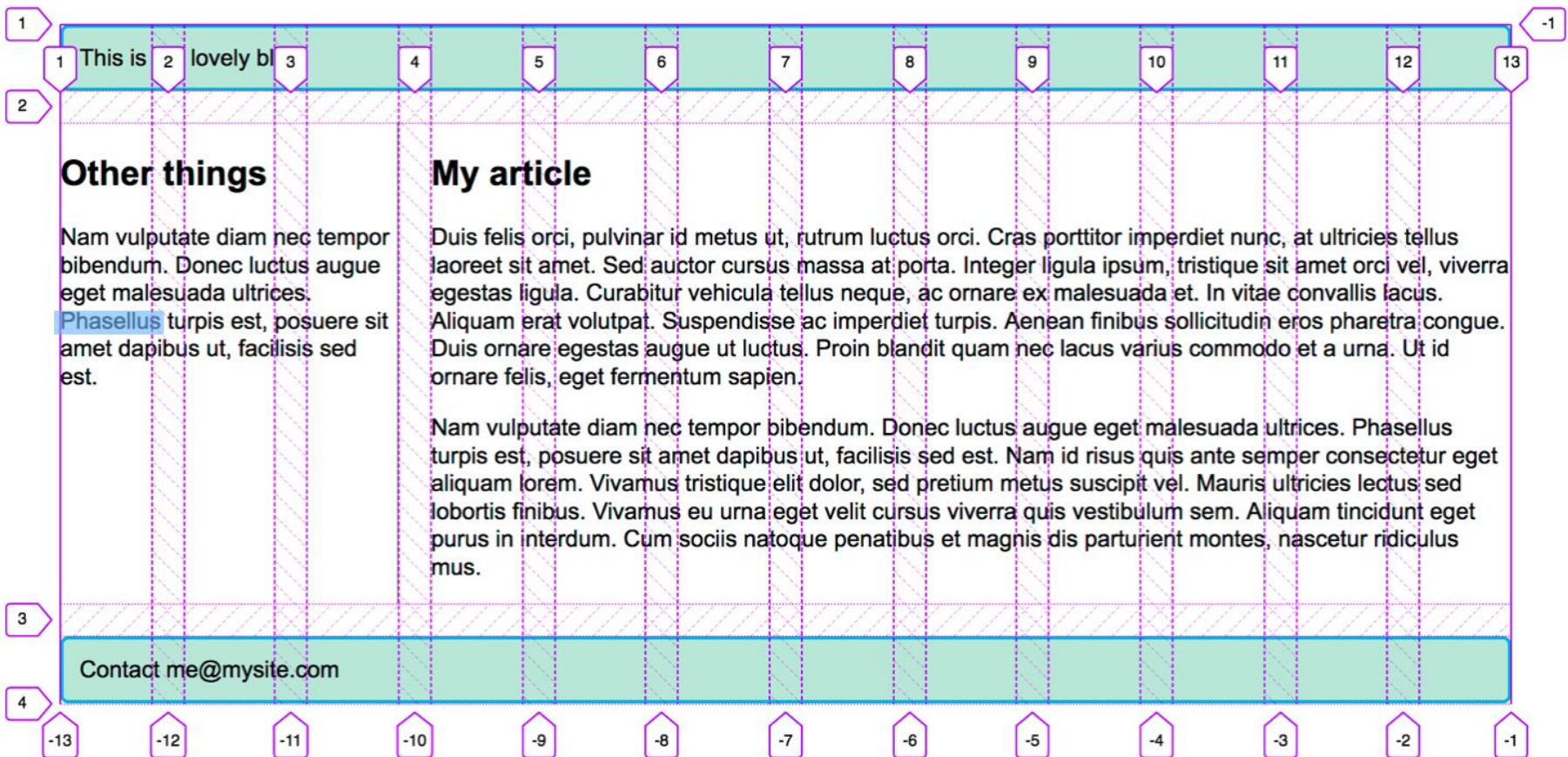
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GRID RD 2

We can assign specific elements to specific parts of the grid.

Grid-column and **grid-row** are used to do this. They take a single value (e.g., 2) or a double value separated by a slash (e.g., 2 / 4).

These values are indicative of the space BEFORE the row or column.



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RESPONSIVE IMAGES

Marcotte's responsive design included a simple approach to images.

Include the largest version of the image that you'll need, and scale it from there using the **max-width** property.

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

Setting this property in your CSS ensures that the image will never be made bigger than 100% of its original size.

Can you think of any downsides to this?

Answer here.

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OTHER CONSIDERATIONS FOR RESPONSIVE DESIGN

–**Responsive typography** is the idea of changing font sizes depending on the media query. This is where em and rem come into play.

–The **viewport meta tag** is used to override any default settings a site or device might have regarding how big a window is.

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

IMPORTANT: You should include this in your `<head>` element from here on out.

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WHAT'S NEXT?

In recitation this week – practice CSS!

Quiz 6 opens at 10:45 AM; due before recitation.

Assignment 8 opened at 10:30 AM; continue on it in recitation; due Sunday by 11:59 PM.

Please make sure you are working on your mid-term.

DAILY NOTE

The daily note will be released via Slack.

Make sure to do it now.