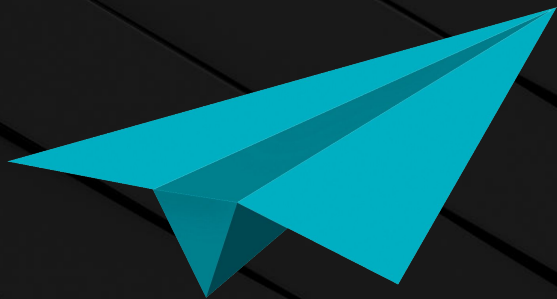


Skills Bootcamp in Front-End Web Development

Lesson 2.2





Office Hours

30 Minutes

The background is a dark charcoal gray with a series of parallel diagonal lines running from the top-left to the bottom-right. Overlaid on this are several teal-colored geometric shapes: a large central triangle pointing right, a smaller triangle to its left, and a square to its right. Scattered around these shapes are various white line-art symbols, including a plus sign, a minus sign, a circle with a dot, a circle with a horizontal line, a circle with a vertical line, a circle with a diagonal line, a circle with a cross, a circle with a dot, a circle with a horizontal line, a circle with a vertical line, a circle with a diagonal line, a circle with a cross, a circle with a dot, a circle with a horizontal line, a circle with a vertical line, a circle with a diagonal line, and a circle with a cross.

WELCOME

Today's Objectives

By the end of class today, you will:



Design and code basic grids using CSS Grid.



Build layouts by positioning elements inside grids.



Create a complex layout by nesting HTML elements inside of a grid.



Write media queries in code to create a responsive grid layout.

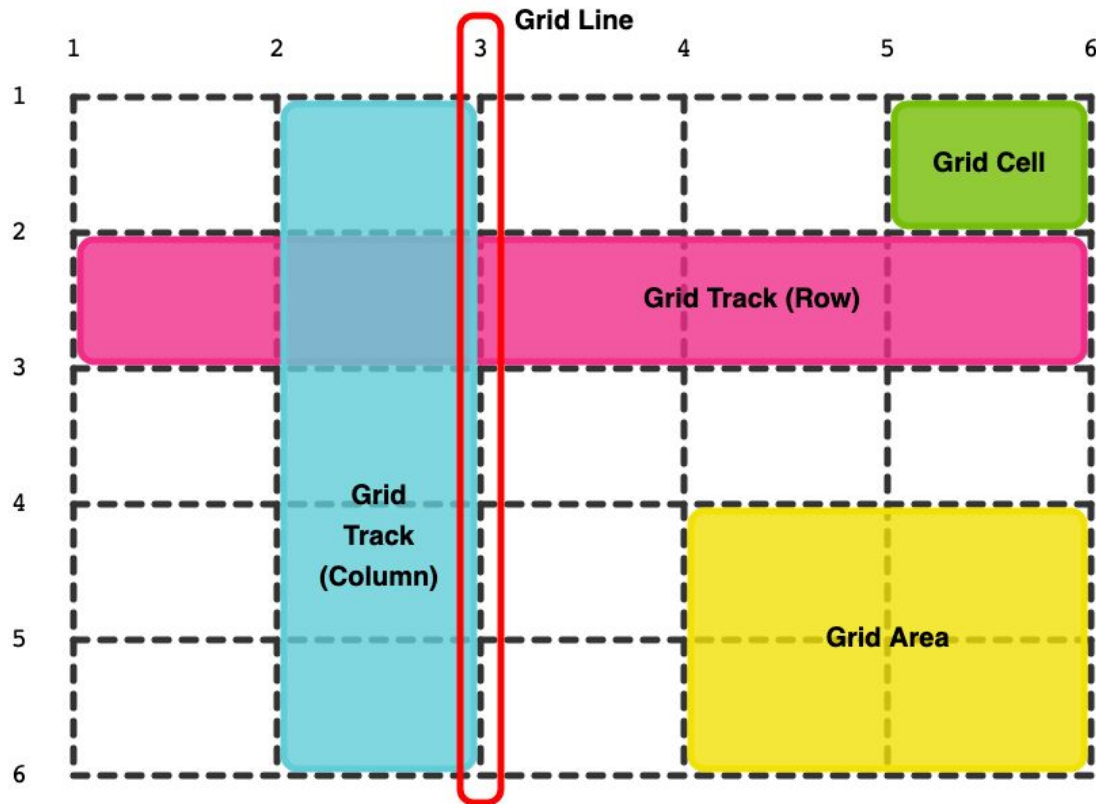


Introduction to CSS Grids

Grid Layouts

CSS Grids are used to create two-dimensional layouts that can span multiple columns or rows.

Grids allow you to define the layout section by section, allowing you to create children that span rows or columns and line up next to each other.



Before Flex and CSS Grids

Before flex and grids, building layouts was a frustrating and difficult experience.

To build interesting layouts, many CSS hacks were introduced, but the ability to create flexible complex layouts was near impossible, and getting them supported by all browsers was basically impossible.



Before Flex and CSS Grids

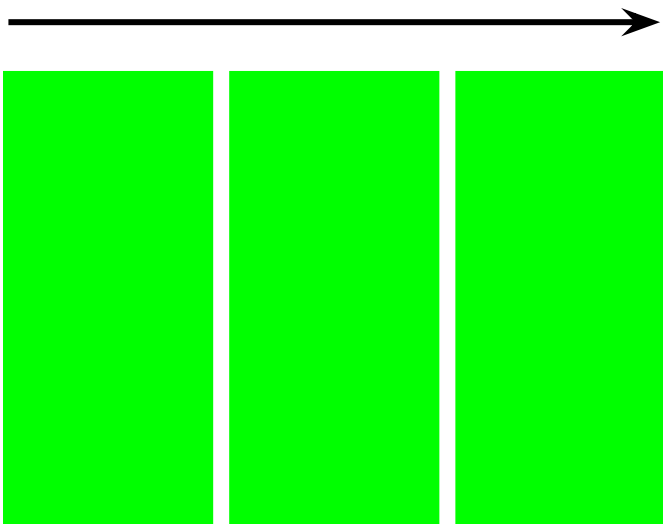
In 2013, Microsoft's Edge browser shipped its implementation of the CSS Grid and was quickly adopted by the W3 Consortium (W3C) and soon standardized and supported by all browsers.

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Blackberry Browser	Opera Mobile	Chrome for Android	Firefox for Android	IE Mobile
		2-39	4-28										
		3 40-51	1 29-56		10-27								
6-9	2 12-15	4 52-53	4 57	3.1-10	1 28-43	3.2-10.2							
2 10	16-17	54-66	58-74	10.1-12	44-57	10.3-12.1		2.1-4.4.4	7	12-12.1			2 10
2 11	18	67	75	12.1	58	12.2	all	67	10	46	75	67	2 11
	76	68-69	76-78	13-TP		13							

Flexbox vs. CSS Grids

CSS Grids are used to build two-dimensional layouts, meaning you can create full, complex designs as opposed to one-dimensional layouts, which are only left-right or top-bottom.

Flexbox is one-dimensional.



CSS Grids are two-dimensional.



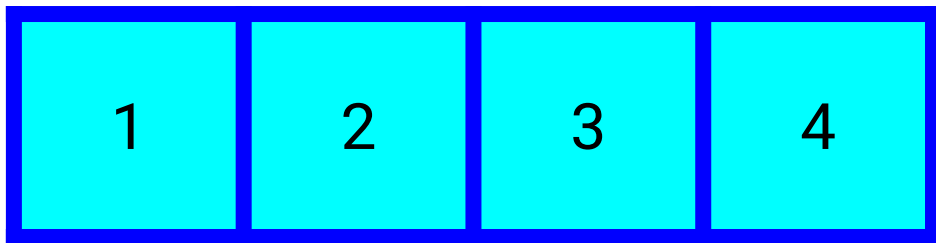
CSS Grid Containers

In order to use a grid, you need a **grid container**.

Grid containers are very similar to flex.

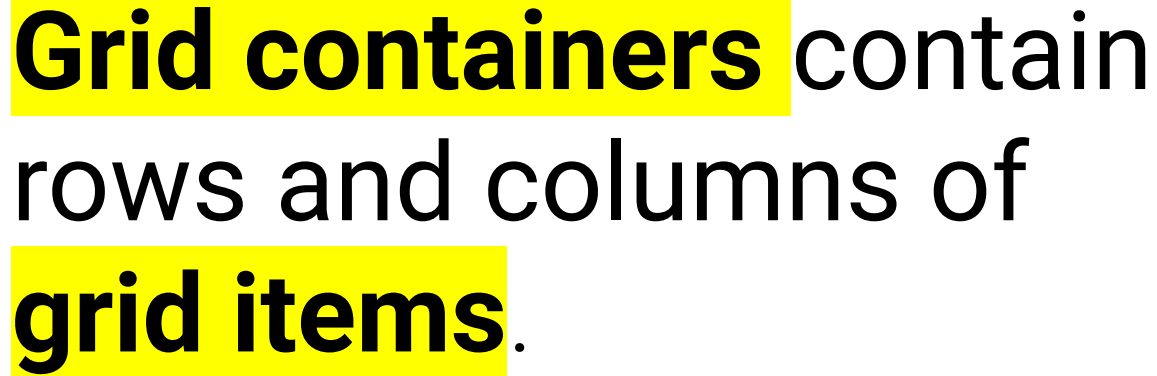
Converting an HTML element into a container is easy. All you need to do is set `display: grid` to any HTML element.

If that element has any children nested inside of it, they become **grid items**.



```
.containerGrid {  
  display: grid;  
  background-color: #2196F3;  
  padding: 10px;  
}
```

```
<div class="containerGrid">  
  <div>1</div>  
  <div>2</div>  
  <div>3</div>  
  <div>4</div>  
</div>
```



Grid containers contain
rows and columns of
grid items.

CSS Grid Containers

Grids are defined by using two CSS properties:

01

`grid-template-columns` is used to specify the number of columns based on the children you have in your container.

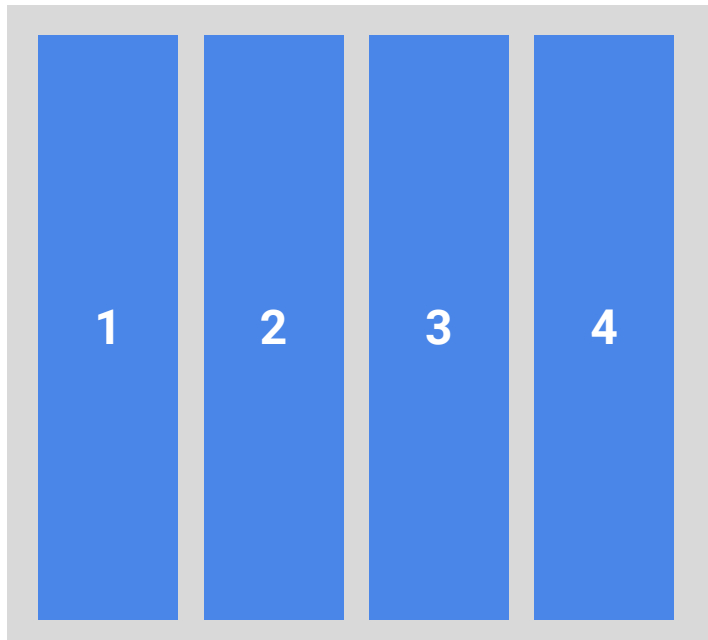
02

`grid-template-rows` is used to specify the number of rows of content that will display in your container.

The `grid-template-columns` Property

CSS Property: `grid-template-columns`

This specifies the number of columns based on the children you have in your container.



```
.containerGrid {  
  display: grid;  
  grid-template-columns: 25% 25% 25% 25%;  
}
```

CSS Property: `grid-template-columns`

You can customize grid columns to be any size you'd like.

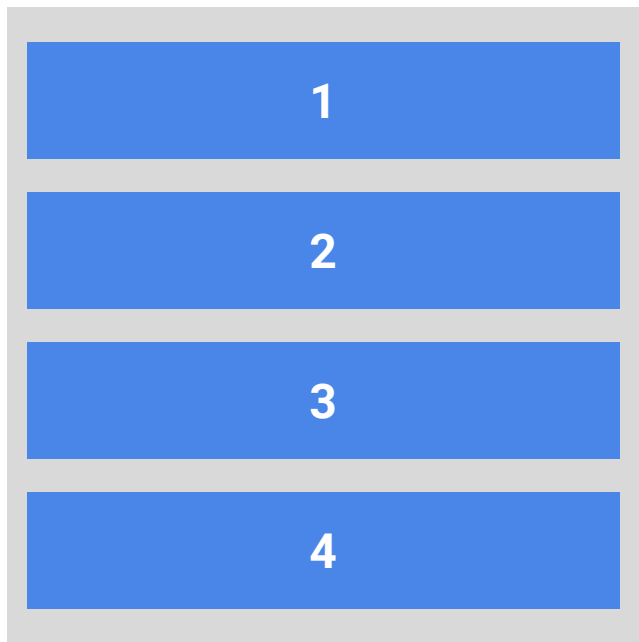


```
.containerGrid {  
  display: grid;  
  grid-template-columns: 25% 75%;  
}
```

The `grid-template-rows` Property

CSS Property: `grid-template-rows`

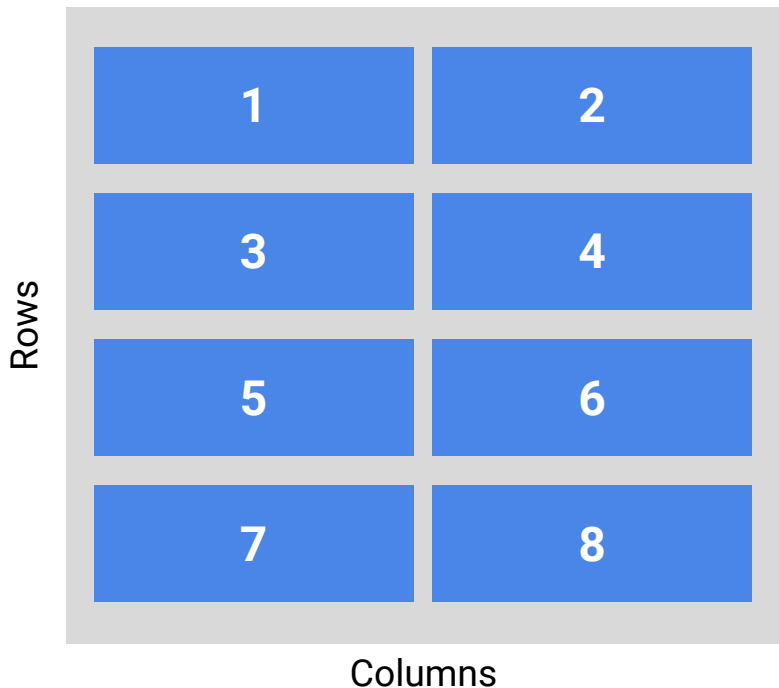
This specifies how many rows (top–bottom) your grid template will have. With fraction units (more on this later) or percentages, grid children will take the height of their containers.



```
.containerGrid {  
  display: grid;  
  grid-template-rows: 25% 25% 25% 25%;  
}
```

Columns and Rows Create Grids

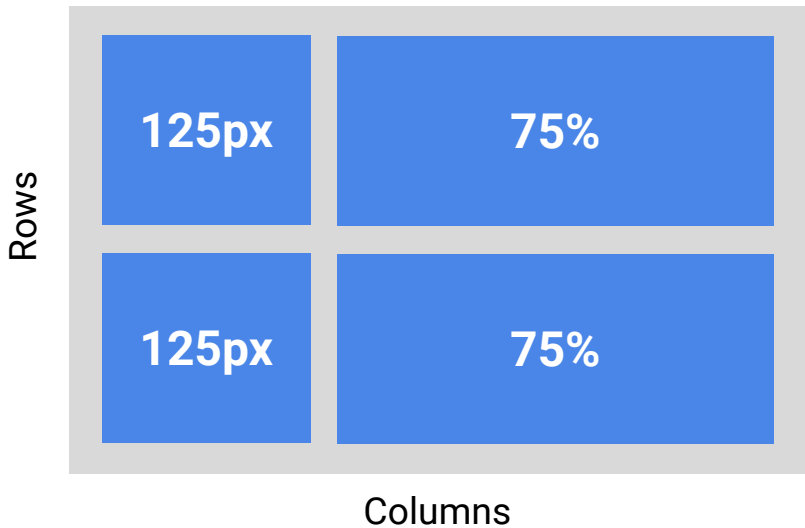
The properties `grid-template-rows` and `grid-template-columns` are used together to create full grid layouts.



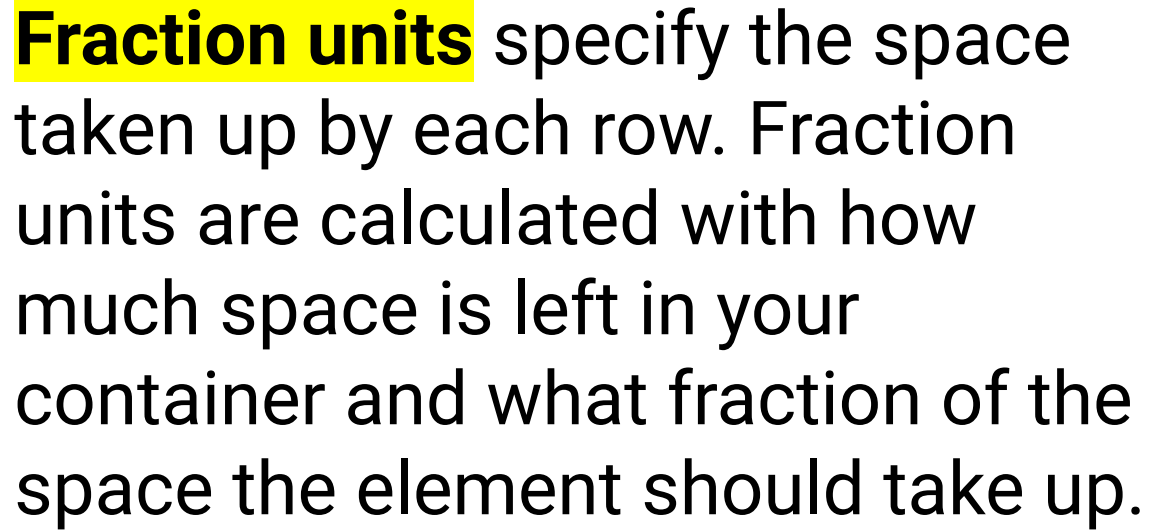
```
.containerGrid {  
  display: grid;  
  grid-template-rows: 25% 25% 25% 25%;  
  grid-template-columns: 50% 50%;  
}
```

Sizing Grid Areas

CSS Grid areas can be built by using a combination of pixel widths, percentages, or fraction units.



```
.containerGrid {  
  display: grid;  
  Grid-template-rows: 50% 50%;  
  grid-template-columns: 125px 75%;  
}
```

Fraction units specify the space taken up by each row. Fraction units are calculated with how much space is left in your container and what fraction of the space the element should take up.

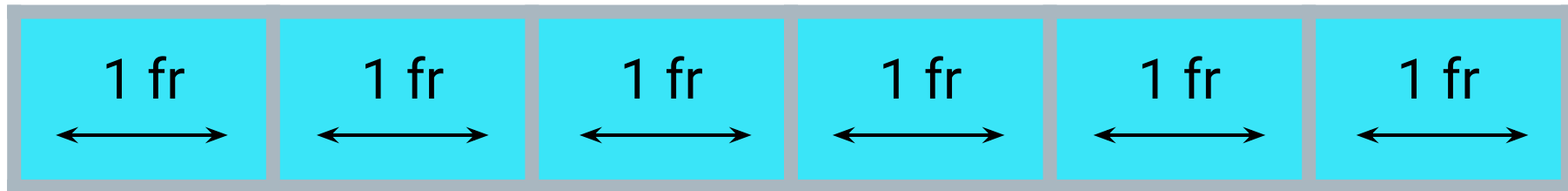
Fraction Units (fr)

Fraction units are calculated with how much space is left in your container and what fraction of the space the element should take up.

Two child elements



Six child elements



The `grid-template-areas` Property



All the properties we just talked about are used to create templates, which are specified by `grid-template-areas`.

Templates are used to display how your content lays out on the page.

CSS Property: `grid-template-areas`

Grid template areas are easy to set up; all you need to do is create a class that targets any individual grid element by using `grid-area`.

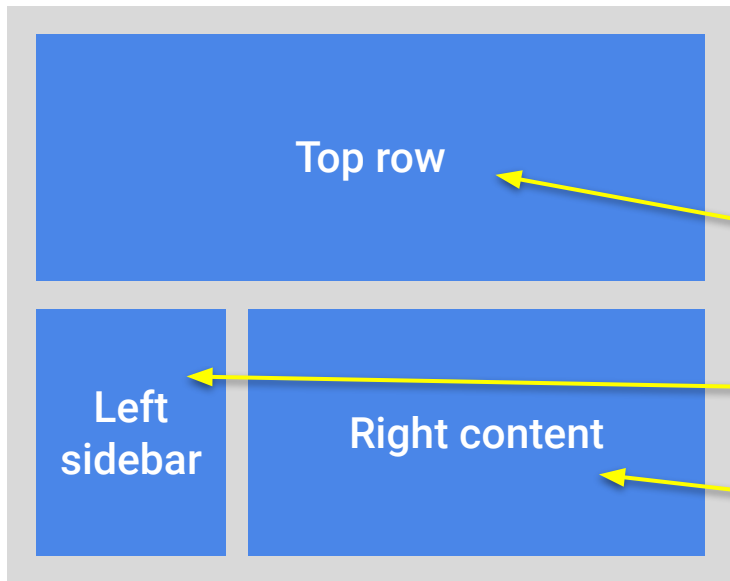


```
<div class="containerGrid">
  <div class="topRow">topRow</div>
  <div class="leftSidebar">Left Sidebar</div>
  <div class="rightContent">Right Content</div>
</div>
```

```
.containerGrid {
  display: grid;
  height: 500px;
}
.topRow {
  grid-area: topRow;
}
.leftSidebar {
  grid-area: leftSidebar;
}
.rightContent {
  grid-area: rightContent;
}
```

CSS Property: `grid-template-areas`

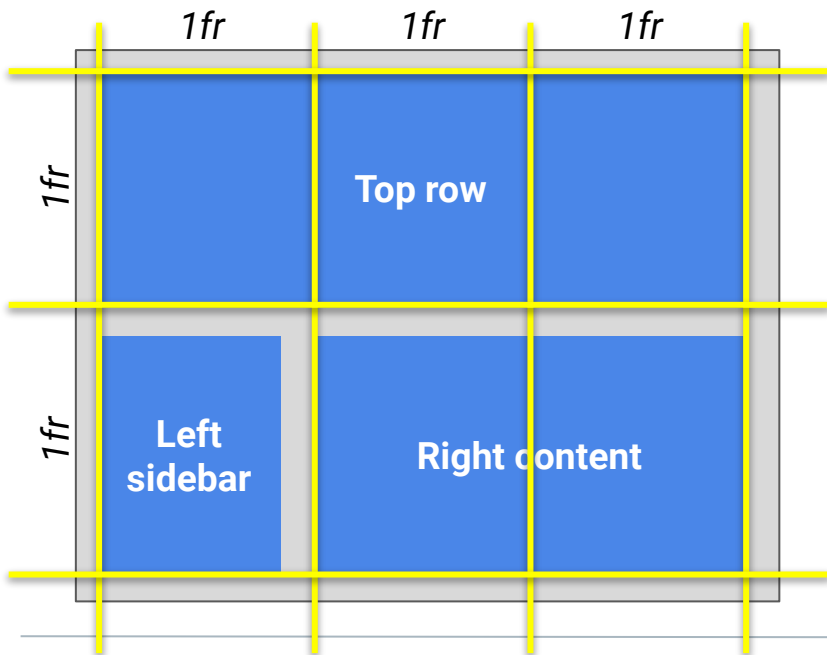
The property `grid-template-areas` are easy to set up; all you need to do is create a class that targets any individual grid element.



```
.containerGrid {  
  display: grid;  
  grid-template-columns: 1fr 1fr 1fr;  
  grid-template-rows: 1fr 1fr;  
  grid-template-areas:  
    "topRow topRow topRow"  
    "leftSidebar rightContent rightContent"  
  ;  
}  
  
.topRow {  
  grid-area: topRow;  
}  
  
.leftSidebar {  
  grid-area: leftSidebar;  
}  
  
.rightContent {  
  grid-area: rightContent;  
}
```


CSS Property: `grid-template-areas`

Our `grid-template-areas` provide a visual view (in our code) of how our grid is going to display in relation to the columns and rows we set.



```
.containerGrid {  
  display: grid;  
  grid-template-columns: 1fr 1fr 1fr;  
  grid-template-rows: 1fr 1fr;  
  grid-template-areas:  
    "topRow topRow topRow"  
    "leftSidebar rightContent rightContent"  
  ;  
}  
  
.topRow {  
  grid-area: topRow;  
}  
  
.leftSidebar {  
  grid-area: leftSidebar;  
}  
  
.rightContent {  
  grid-area: rightContent;  
}
```



Instructor Demonstration

grid-template-areas



Activity: CSS Grid, Part 1

In this activity, you'll test out creating grid-based layouts for yourselves.



CSS

Suggested Time:

30 minutes



Time's Up! Let's Review.

Let's Review: CSS Grid , Part 1



What happens to the children of a parent container when you set it to `display: grid`?



What is a fraction unit in grids?



Why are grid-template-areas powerful?

Grid Positioning

CSS Grid Positioning: `align-content`

The property `align-content` positions items contained in a grid container along the column axis (top–bottom).

- `start`: Pack items from the start.
- `end`: Pack items from the end.
- `center`: Pack items around the center.
- `stretch`:– Stretch “auto”-sized items to fit the container.
- `space-around`: Lines are evenly distributed in the container with half-size spaces on either end.
- `space-between`: Lines are evenly distributed in the container.
- `space-evenly`: Lines are evenly distributed and centered inside the container.



`align-content: start;`



`align-content: end;`



`align-content: center;`



`align-content: stretch;`



`align-content: space-around;`



`align-content: space-between;`



`align-content: space-evenly;`

CSS Grid Positioning: `justify-content`

The property `justify-content` is used to justify the grid items along the row axis (left–right).

- `start`: Pack items from the start.
- `end`: Pack items from the end.
- `center`: Pack items around the center.
- `stretch`: Stretch “auto”-sized items to fit the container.
- `space-around`: Lines are evenly distributed in the container with half-size spaces on either end.
- `space-between`: Lines are evenly distributed in the container.
- `space-evenly`: Lines are evenly distributed and centered inside the container.



`justify-content: start;`



`justify-content: end;`



`justify-content: center;`



`justify-content: stretch;`



`justify-content: space-around;`



`justify-content: space-between;`



`justify-content: space-evenly;`

Nesting CSS Grids

Nesting CSS Grids

All layouts are built by nesting HTML elements inside each other. When you nest a grid inside another grid, you can control the position of the child grid, allowing you to create complex layouts.

You do this by declaring a child element of a grid container that it is now `display: grid;`. It will accept all the properties that we have been practicing in the previous examples.

```
1 .content {  
2   grid-area: content;  
3   display: grid;  
4   grid-template-columns: 1fr 1fr 1fr;  
5 }
```

```
> <div class="grid">  
  <div class="title">Title</div>  
  <div class="header">Header</div>  
  <div class="sidebar">Sidebar</div>  
  <div class="content">  
    <div class="nestedGrid"></div>  
    <div class="nestedGrid"></div>  
    <div class="nestedGrid"></div>  
  </div>  
  <div class="footer">footer</div>  
</div>
```



Instructor Demonstration

Nesting Grids

A close-up, high-angle shot of a computer keyboard. The central focus is a large, white, rectangular key with rounded corners. On this key, there is a dark blue icon of a coffee cup with three wavy lines above it representing steam. Below the icon, the word "Break" is printed in a dark blue, serif font. The key is set against a light-colored, textured keyboard surface. Surrounding the main key are other keys: to the left, a key with double quotation marks; above, a key with a right square bracket; and to the right, a key with a left square bracket. The lighting is soft and even, highlighting the texture of the keys and the surface.

Break



Activity: CSS Grid, Part 2

In this activity, you'll keep working on the same file.



CSS

Suggested Time:

30 minutes



Time's Up! Let's Review.

Let's Review: CSS Grid, Part 2



What does the property `align-content` do?

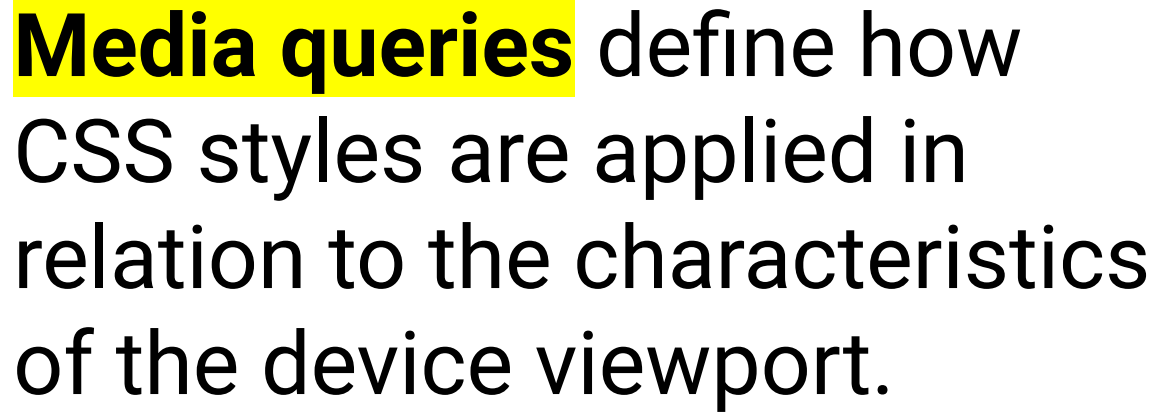


What does the property `justify-content` do?



Why would you want to nest a grid inside a grid?

Responsive Web Design and Media Queries

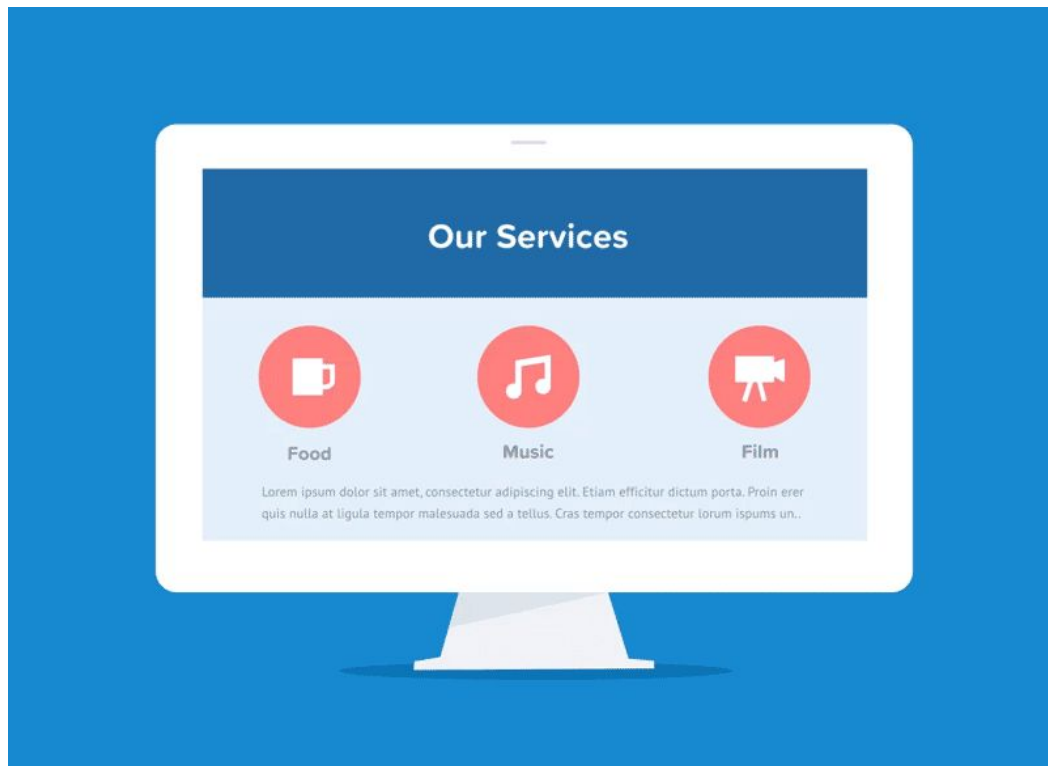


Media queries define how CSS styles are applied in relation to the characteristics of the device viewport.

Media Queries

In layman's terms, media queries overwrite previously written CSS properties to alter our code to display correctly for different sizes.

This could be a smartphone, tablet, or even a projector. Websites need to respond correctly to all device sizes.



Media Queries

← → ↻ https://mediaqueri.es ☆ New Z G P bw C 7% 10 G A W B R |

Media Queries

Mattermost

#1 Slack Alternative

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Messaging and workflow for developers. Write, deploy, and debug code as a team.

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THE FEATURE ARCHIVE

The latest from YaleNews

Shared Center Initiative, renewed this year, budget concerns, continues

At alumni assembly, leading faculty address Yale's future in the 21st century

1



The **viewport** is the window
of whatever device you
are visiting the website on.

Viewport

(min-width: 800px)
(min-device-aspect-ratio: 1/1)



(min-width: 768px)
(min-device-width: 1024px)



(min-width: 320px)
(min-device-width: 480px)



↑ Designing mobile-friendly web-mapping applications using CSS3 media queries can provide an improved experience to your end users.

A @media screen and (orientation: landscape)

B @media screen and (orientation: portrait)

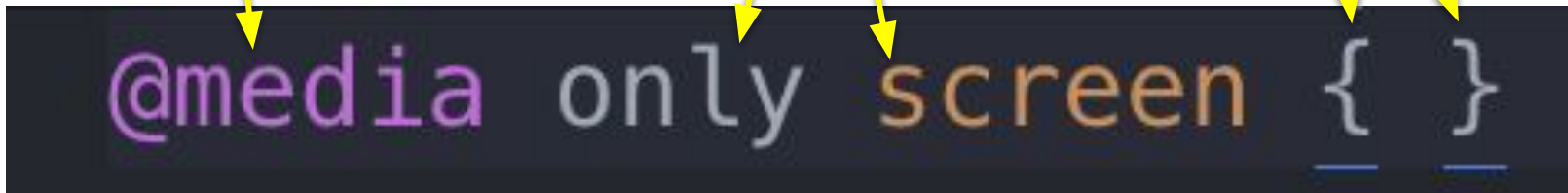
Media Query Syntax

The `@media` selector specifies the start of our media query.

Here, we select what type of devices we are targeting. This one is targeting screens. You can also use:

- `all`
- `print`
- `screen`
- `speech`

We write new styles that will overwrite our old ones between the brackets.



```
@media only screen { }
```


The diagram illustrates the syntax of a media query. It features a dark blue background with the code `@media only screen { }` in a light blue monospace font. Four yellow arrows point from the explanatory text above to specific parts of the code: one arrow points to `@media`, two arrows point to `only` and `screen`, and two arrows point to the opening and closing curly braces `{ }`. The words `only` and `screen` are highlighted in a light blue color, while the curly braces are underlined.

Media Query Syntax

What about if we want to target specific widths? In this media query, we have two different statements.

The first is the viewport must be a **screen** and.

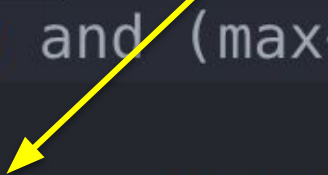
With **max-width**, this media query will be applied when the viewport is under 600px.



```
@media only screen and (max-width: 600px) {  
  body {  
    background-color: lightblue;  
  }  
}
```

Media Query Syntax

When this device's screen size is under 600px, the body's `background-color` will be changed to light blue.



```
@media only screen and (max-width: 600px) {  
  body {  
    background-color: lightblue;  
  }  
}
```

Media Query Syntax

How do they work?

Media queries overwrite previous properties you have specified in your CSS, but only when the viewport is the correct size.

This allows you to restructure your content however you see fit depending on the screen size.



```
body {  
  background-color: red;  
}  
  
@media only screen and (max-width: 600px) {  
  body {  
    background-color: lightblue;  
  }  
}
```

The diagram illustrates how media queries work by showing two CSS rules for the `body` element. The first rule sets `background-color: red;`. The second rule, enclosed in a media query `@media only screen and (max-width: 600px) {`, overwrites the first rule with `background-color: lightblue;` when the viewport width is 600px or less. A yellow arrow points from the text "previous properties you have specified in your CSS" to the first `body {` block. Another yellow arrow points from the text "but only when the viewport is the correct size" to the `@media` query block.

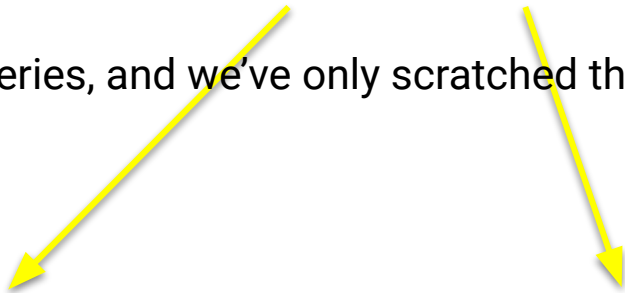


What if I need to set up a media query between two specific sizes?

Media Query Syntax

This code is checking for a browser width between 1024px and 1280px.

There are many ways to write media queries, and we've only scratched the surface on how to write them.



```
@media all and (min-width: 1024px) and (max-width: 1280px) {  
  body {  
    background-color: green;  
  }  
}
```



Activity: CSS Grid: Part 3

In this activity, you'll keep working on the same file.



CSS

Suggested Time:

15 minutes



Time's Up! Let's Review.

Let's Review: Custom Breakpoints Review



Where

did you struggle in
setting your
breakpoints?

What

would you do
differently the next
time you're setting
breakpoints?

What

worked well?

Let's Review: Custom Breakpoints Review

01

Why do we care about grid layouts?

02

What are nested grids?

03

What is a breakpoint?

04

How do media queries work?



Congratulations! Recap

Today, we learned:

01

CSS Grids

How to code a grid and use layout processes.



02

HTML nesting

How to think about making coded objects work together.



03

CSS positioning

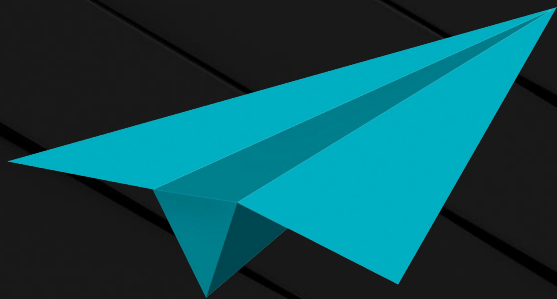
How to move elements inside a grid container.



Questions?



*The
End*



Office Hours

30 Minutes