2017: THE YEAR OF CSS GRID

Revolutionising visual design on the web
Me trying to Write CSS

CSS FLOATS
Y U NO CLEAR YOURSELF?!?

Tricky CSS inheritance issue on Monday

CHALLENGE ACCEPTED

Important

Tricky CSS inheritance issue on Friday

at the things!
Web layouts over the years

[Images showing different web layouts over time]
CSS Grid arrives

<table>
<thead>
<tr>
<th></th>
<th>March 2017</th>
<th></th>
<th>March 2017</th>
<th>October 2017</th>
<th>October 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>Mon</td>
<td>Tue</td>
<td>Wed</td>
<td>Thu</td>
<td>Fri</td>
</tr>
<tr>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

https://www.chenhuijing.com/slides/gdaygt-2017

@hj_chen
“Our ‘Age of Anxiety’ is, in great part, the result of trying to do today’s job with yesterday’s tools—with yesterday’s concepts.”

—Marshall McLuhan
Grid browser support

CSS Grid Layout

Method of using a grid concept to lay out content, providing a mechanism for authors to divide available space for layout into columns and rows using a set of predictable sizing behaviors. Includes support for all `grid-*` properties and the `fr` unit.

<table>
<thead>
<tr>
<th></th>
<th>IE</th>
<th>Edge</th>
<th>Firefox</th>
<th>Chrome</th>
<th>Safari</th>
<th>Opera</th>
<th>iOS Safari</th>
<th>Opera Mini</th>
<th>Android Browser</th>
<th>Chrome for Android</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td></td>
<td>14</td>
<td>54</td>
<td>60</td>
<td>10</td>
<td>45</td>
<td>10.2</td>
<td></td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>15</td>
<td>55</td>
<td>61</td>
<td>10.1</td>
<td>47</td>
<td>10.3</td>
<td></td>
<td>4.4.4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>16</td>
<td>56</td>
<td>62</td>
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<td>48</td>
<td>11</td>
<td>all</td>
<td>56</td>
<td>61</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>57</td>
<td>63</td>
<td>TP</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data from caniuse.com | Embed from caniuse.bitsofo.de

Global: 89.57% + 8.77% = 78.34%
Team Layout

- Display
- Box Alignment
- Flexible Box
- Grid Layout
- Ruby Layout
- Inline Layout
- Positioned Layout
- Writing Mode
- Shapes
- Transforms

And more...

https://www.chenhuijing.com/slides/gdaygt-2017
Team Layout

- Display
- Box Alignment
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- Inline Layout
- Positioned Layout
- Writing Mode
- Shapes
- Transforms

https://www.chenhuijing.com/slides/gdaygt-2017
@hj_chen
Grid versus Flexbox?
Grid versus textbox?

Wrong Question
Flexbox ➔ single dimension

flex-direction: row

flex-direction: column
What is CSS grid?

Defines a two-dimensional grid-based layout system, optimized for user interface design.
“Grid works from the **container** in, other layout methods start with the **item**”

—Rachel Andrew
Layout technique: inline-block

```
.inlineblock_item {
  display: inline-block;
  width: calc(100% / 3);
}
```
**Layout technique:** float

<table>
<thead>
<tr>
<th>Item A</th>
<th>Item B</th>
<th>Item C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item D</td>
<td>Item E</td>
<td>Item F</td>
</tr>
</tbody>
</table>

```css
.float__item {
  float: left;
  width: calc(100% / 3);
}
```
Layout technique: flex

```css
.flexbox {
  display: flex;
  flex-wrap: wrap;
}

.flexbox__item {
  flex: 0 0 calc(100% / 3);
}
```
“Grid is the only layout technique that establishes a relationship between rows and columns of grid items.”
CSS grid basics

Define your grid.  Place items in the grid.
Defining the Grid

The grid formatting context only applies to child elements

body {
display: grid;
grid-template-columns: 25% 25% 25% 25%;
grid-template-rows: 20em 1fr 20em;
}
Explicit Grid and Implicit Grid

```
.grid-container {
  display: grid;
  grid-template-columns: 150px 150px
  grid-template-rows: 150px 150px;
}

.item {
  grid-column: 5 / 6; /* grid-column-end */
  grid-row: 2 / 3; /* grid-row-start */
}
```

The browser will create an implicit grid to hold items placed outside the grid.

https://www.chenhuijing.com/slides/gdaygt-2017
“Cede control of your designs to the browsers that render them.”
The `repeat()` function

To specify a large number of columns or rows that follow a similar pattern

```javascript
repeat( [ <positive-integer> | auto-fill | auto-fit ], <track-list> )
```
auto-fill vs. auto-fit

Allow browser to determine how many tracks to create depending on track size.

\[
\text{repeat(auto-fill, 100px);} \\
\text{repeat(auto-fit, 100px);} \\
\]

auto-fit collapses empty tracks.
.keyword {
  display: grid;
  grid-template-columns: repeat(auto-fill, minmax(2.5em, 1fr));
}
Fixed CSS grid

```css
.container {
    display: grid;
    grid-template-columns: repeat(5, 10em);
}
```
The fr unit

Represents a fraction of the free space in the grid container.
Fluid CSS grid

.container {
    display: grid;
    grid-template-columns: repeat(3, 3fr 2fr);
}

https://www.chenhuijing.com/slides/gdaygt-2017
The `minmax()` function

Defines a size range greater than or equal to min and less than or equal to max.
Responsive CSS grid

```css
.container {
  display: grid;
  grid-template-columns: repeat(5, minmax(10em, 1fr));
}
```
Basic terminology

- Grid line
- Grid track
- Grid area
- Grid cell
- Grid gap
Named areas

```
.grid-container {
    display: grid;
    grid-template-areas:  "logo stats"
                         "score stats"
                         "board board"
                         "... controls";
}

.logo { grid-area: logo; }
.score { grid-area: score; }
.stats { grid-area: stats; }
.board { grid-area: board; }
.controls { grid-area: controls; }
```
# Aligning your grid items

<table>
<thead>
<tr>
<th>Property</th>
<th>Axis</th>
<th>Aligns</th>
<th>Applies to</th>
</tr>
</thead>
<tbody>
<tr>
<td>justify-content</td>
<td>main/inline</td>
<td>content within element</td>
<td>block containers, flex containers and grid containers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(effectively adjusts padding)</td>
<td></td>
</tr>
<tr>
<td>align-content</td>
<td>cross/block</td>
<td></td>
<td></td>
</tr>
<tr>
<td>justify-self</td>
<td>inline</td>
<td>element within parent</td>
<td>block-level boxes, absolutely-positioned boxes and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(effectively adjusts margins)</td>
<td>grid items and grid items</td>
</tr>
<tr>
<td>align-self</td>
<td>cross/block</td>
<td></td>
<td>absolutely-positioned boxes, flex items and grid</td>
</tr>
<tr>
<td>justify-items</td>
<td>inline</td>
<td>items inside box</td>
<td>block containers and grid containers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(controls child items)</td>
<td></td>
</tr>
<tr>
<td>align-items</td>
<td>cross/block</td>
<td></td>
<td>flex-containers and grid-containers</td>
</tr>
</tbody>
</table>

Source: CSS Box Alignment Module Level 3

https://www.chenhuijing.com/slides/gdaygt-2017
justify/align-content

content-distribution properties

```css
.content {
  justify-content: normal;
  align-content: normal;

display: grid;
grid-template-columns: repeat(3, 25%);
grid-template-rows: repeat(3, 20%);
grid-gap: 1em;
grid-template-areas:
  "a b b"
  "a b b"
  "c c d";
}

.content_itemA {
  grid-area: 1 / 1 / 2 / 2;
}
```
<table>
<thead>
<tr>
<th>Values</th>
<th>justify-content</th>
<th>align-content</th>
</tr>
</thead>
</table>
justify/align-self

self-alignment properties

```css
.self {
  display: grid;
  grid-template-columns: repeat(4, 1fr);
  grid-gap: 1em;
  grid-auto-rows: calc(25% - 1em);
  grid-template-areas:
    "a a b b"
    "a a b b"
    "c c d d"
    "c c d d";
}

.self_itemA {
  grid-area: a;
}
```

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@hj_chen
justify/align-items

defaults for justify/align-self

```css
.items {
  justify-items: normal;
  align-items: normal;

display: grid;
grid-template-columns: repeat(4, 1fr);
grid-gap: 1em;
grid-auto-rows: calc(25% - 1em);
grid-template-areas:
  "a a b b"
  "a a b b"
  "c c d d"
  "c c d d";
}
```

Der Apparat wird umgekippt (Zeichen eines Tiefeinrutsches erstellt.) Unter den Straßenzügen die ausgebaute Kläranlage auf dem Wasserspiegel.


Unter den Straßenzügen die ausgebaute Kläranlage, Lichtplanz auf dem Wasserspiegel.
Self-alignment properties, maybe?

These are not the borders you are looking for
Flexbox to the rescue

That’s more like it
Vertical whitespace

Founded in 2005, Whitespace is a culturally savvy design agency providing creative direction, branding and interactive services across various mediums, platforms and time zones.
grid-row and grid-column

```css
grid-template-columns: [first sidebar-start] 250px [content-start] 1fr [last]
grid-template-rows: [first header-start] 100px [content-start] 1fr [footer-start]
```

![Diagram showing grid layout]

https://www.chenhuijing.com/slides/gdaygt-2017

@hj_chen
.whitespace {
    display: grid;
    grid-template-columns: repeat(4, 1fr);
    grid-template-areas: "a . . ." 
                        " . b . ." 
                        " . . . c";
}

.a { grid-area: a; }
.b { grid-area: b; }
.c { grid-area: c; }
Braun HiFi
Steuergerät
audio 300

In der modernen Aufnahmetechnik
ist keine Miete zu groß, kein
Aufwand zu kostspielig, um auch
der letzte Feinheiten einer
Interpretation zu erhalten.

Demgegenüber gibt es aber nur
wenige HiFi Geräte, die es
fertigbringen, den ganzen
Nuancenreichtum wieder vollends
hörbar zu machen.

Ein Gerät mit diesen Fähigkeiten ist

Kompaktanlage mit ungewöhnlicher
technischer Ausrüstung und einem
formalen Konzept, das Braun
höchste internationale
Auszeichnungen eintrag.
With his bold, stripped-back typographic approach, Hanson Ho founded H55 in 1999. It is now one of the most recognised and celebrated graphic design studios in Singapore.
THINK

GLOBAL

GROW

LOCAL


WE FIND THE OFFICES OF FIGTREE NETWORK TUCKED AWAY IN A QUIET BUT COOL STREET IN THE WANCHAI DISTRICT OF THE CITY. AFTER VISITING THE MONOCLE STORE ACROSS THE ROAD, WE POP IN TO CHAT WITH DAVID AND OUR CONVERSATION QUICKLY LEADS TO THE RISE OF THE CREATIVE SECTOR IN HIS NEW HOMELAND.

DAVID: I think there is a push going on, though not as strongly as in Singapore, which is a shame. In Hong Kong the government have identified the creative industries as one of six areas of growth as they try to expand beyond finance, property and shipping.

We were told that in Hong Kong it is hard to find hip new restaurants and bars. But we took the opportunity to visit a few and were pleasantly surprised. It seems that the city has a thriving nightlife and that there are plenty of options for foodies.

Sure, this is the big leap for Asian businesses. Initially Chinese businesses need to make. We had the experience of going through that process with HTC. Many businesses are not yet ready to make that leap, so our first strategy when we came here was to help Asian businesses build global brands. But it’s not as simple as just doing communications. They have to invest quite heavily in a long-term strategy, acquire new competencies, they never had innovation, marketing. It is a big jump for companies that are used to making things for other people, and not designing things for themselves. HTC was a bit further along because they designed stuff for mobile networks so they had all the competencies already and marketing.

How did Figtree Network get started?

We are about seven years old. Orange was the foundation client. I joined shortly after it was incorporated. You need eight good clients for an agency. HTC is our most recent large one and we have a couple more big ones in the UK right now.

OK so how many offices does Figtree have?

These. We’ve got London — which is our HQ — there are about forty people here. About three or four work in Paris, then eight of us here in Hong Kong.

Did you initially work on the London brand?

Yeah. Back in the days when we were three guys in a garage, just like Google.

What brought you to Hong Kong?

Opportunity and change of scene. I was getting a bit bored with London, the weather, the hail, high tax, low growth. I found that I was stepping over at Hong Kong when I was on my way to Taiwan, so I went to check it out. The weather was great, high tax, low growth. I met a few people and the opportunity to work here appealed to me. I thought, so what if we could do better here, so here we are.
The Orange Issue

```css
.container {
    display: grid;
    grid-template-columns: repeat(9, 1fr);
    grid-template-rows: repeat(6, 1.25em);
}

h2 {
    grid-row: 3 / 5;
    grid-column: 1 / 10;
}

.container::before {
    grid-row: 1 / 7;
    grid-column: 1 / 7;
}

.container::after {
    grid-row: 1 / 7;
    grid-column: 4 / 10;
}
```
Building a grid layout

Tycho

Earlier this year, San Francisco-bred artist and designer Tycho announced a new album on the way for 2016, but gave scant details about the project, leaving fans to speculate about just what the ambient master had in store. Fans need no longer worry, as Tycho’s fifth studio album, Epoch, has arrived in grand fashion.

9.24.16 PHILADELPHIA
THE ELECTRIC FACTORY

TOUR DATES

READ MORE

Design credit: Drew Sullivan

https://www.chenhuijing.com/slides/gdaygt-2017
Good ol' pencil and paper
Tycho

Artist Spotlight

Tycho is an American ambient music project led by Scott Hansen as primary composer, songwriter and producer. Hailing from San Francisco, California, he is known as ISO50 for his photographic and design works. His music is a combination of downtempo vintage style synthesizers and ambient melodies.

Read more

Tycho

ARTIST SPOTLIGHT

Tycho is an American ambient music project led by Scott Hansen as primary composer, songwriter and producer. Hailing from San Francisco, California, he is known as ISO50 for his photographic and design works. His music is a combination of downtempo vintage style synthesizers and ambient melodies.

READ MORE
“Websites do **NOT** have to look the same in every browser.”
Tycho

ARTIST SPOTLIGHT

Tycho is an American ambient music project led by Scott Hansen as primary composer, songwriter and producer. Hailing from San Francisco, California, he is known as ISO50 for his photographic and design works. His music is a combination of downtempo vintage-style synthesizers and ambient melodies.

Read More
CSS grid in action

```css
@supports (display:grid) {
  @media (min-width: 42em) and (min-height: 25em) {
    main {
      max-width: none;
      padding: 0;
      display: grid;
      grid-template-columns: 2fr minmax(10em, 1fr) 1fr;
      grid-template-rows: 35vh 40vh 15vh 10vh;
    }
  }
  h1 {
    grid-column: 3 / 6;
    grid-row: 1 / 2;
    z-index: 2;
    padding-left: 0.25em;
    margin-bottom: initial;
  }
  h2 {
    grid-row: 1 / -1;
    grid-column: 6 / 7;
    writing-mode: vertical-rl;
    margin-bottom: initial;
    color: $text;
  }
}
```
Tycho is an American ambient music project led by Scott Hansen as primary composer, songwriter and producer. Hailing from San Francisco, California, he is known as ISO50 for his photographic and design works. His music is a combination of downtempo vintage-style synthesizers and ambient melodies.

10.2.2010 TORONTO
THE DRAKE HOTEL
Fallback with feature queries

A conditional group rule whose condition tests whether the user agent supports CSS property: value pairs.
```css
main {
  display: flex;
  flex-wrap: wrap;
  justify-content: space-between;
}

.title {
  width: 100%;
}

card {
  flex: auto;
  min-width: 12em;
  height: 12em;
}
```
## Browser support for `@supports`

### CSS Feature Queries

CSS Feature Queries allow authors to condition rules based on whether particular property declarations are supported in CSS using the `@supports` at rule.

<table>
<thead>
<tr>
<th>IE</th>
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<td>10.2</td>
<td>all</td>
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</tr>
<tr>
<td>10</td>
<td>15</td>
<td>55</td>
<td>61</td>
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<td>11</td>
<td>48</td>
<td>11</td>
<td>all</td>
<td>56</td>
<td>61</td>
</tr>
<tr>
<td></td>
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<td>57</td>
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<td>TP</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data from caniuse.com | Embed from caniuse.bitsofecto.de

Global: 92.59% + 0% = 92.59%
@supports (display: grid) {
  main {
    display: grid;
    grid-template-columns: repeat();
    grid-auto-rows: 8em;
  }
}

.title {
  width: initial;
}

.card {
  min-width: initial;
  height: initial;
}

@media screen and (max-width: 30em) {
  main {
    grid-template-rows: 3em repeat();
  }
}

@media screen and (min-aspect-ratio: 1) {
  main {
    grid-template-columns: repeat();
    grid-template-rows: repeat();
  }
}
.selector {
    /* Styles that are supported in old browsers */
}

@supports (property:value) {
    .selector {
        /* Styles for browsers that support the spec */
    }
}
“CSS isn’t a programming language. It’s a stylesheet language. We shouldn’t expect it to behave like a programming language. It has its own unique landscape and structures, ones that people with programming language mental maps might not expect.”

—Danielle Huntrods
Shape the web we use and build for:

- CSS specifications are **all on GitHub**
- Raising browser bugs **can and does make a difference**
- Write and talk about CSS features
- Browser developers are people too, provide feedback and be nice about it.
The CSS Layout Workshop

Does this sound familiar?

“...I love designing a site, but then find I have to compress the design when it comes to building it with CSS.

“My approach to building layouts is to try things, mix and match and see what happens.

“...I use a framework to do my layouts. I’d love to know what it is really doing under the hood.

“...Once I get my CSS working I’m afraid to make changes in case it all falls apart again.

“...I’ve never really understood why margins collapse.

https://thecssworkshop.com/

http://labs.jensimmons.com/

https://www.chenhuijing.com/slides/gdaygt-2017
Demos and examples

- Space Jam website
- Regular grids
- Braun HiFi print posters
- Simple overlap
- Tycho artist profile
- Fallback with feature queries
- Wismut Labs website
- Demos source code on GitHub
Useful resources

- CSS Grid Layout Module Level 1
- Codrops CSS Grid reference
- Grid by Example
- Learn CSS Grid
- Grid Auto-Placement Is Ready
- Automatizing the Grid
- Deep Dive into Grid Layout Placement
- CSS Grid Layout and positioned items
- The Story of CSS Grid, from Its Creators
- CSS Grid Layout is Here to Stay
- The New Layout Standard For The Web: CSS Grid, Flexbox And Box Alignment

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Thank you!

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