What's new in CSS

Justin Slack

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The web has never been better

Interoperability has never been higher

"Interoperable" is fancy for "implemented with a high degree of parity (sameness) among the evergreen browsers", by which we mean Chrome, Edge, Safari, and Firefox.

What does this mean in practical terms

https://wpt.fyi/interop-2023?stable

The WPT Dashboard, wpt.fyi, displays results for the web-platform-tests, or WPT, a group of test suites for many web platform specifications.

If the web platform were an engineering project, it'd be foolish not to have a test suite that's run regularly. The goal of the WPT Dashboard is to promote viewing the web platform as one entity and making identifying and fixing interoperability issues as easy as possible.

What are these new features, and when can we use them?

The coordinated implementation of new features across browsers these days means we can start to

use these features pretty much as soon as they appear, which is excellent for keeping our stylesheets as

simple as possible. A few single-line properties can now replace multi-line, hacky solutions. In some

cases, newly available features may even mean we can remove JavaScript workarounds we once

needed to get around old limitations!

So what are they

Custom Properties

allow us to define reusable values across our stylesheets

Also referred to as “CSS variables”, Custom properties can be used as an entire value for a property or as partial

values, like the h in an hsl() definition. We can also modify custom properties in JavaScript.

Since custom properties aren’t static like preprocessor variables, for example, in SASS, they open up many

opportunities for more flexible, dynamic styles. Custom properties offer far more than just being

“CSS variables”

Logical Properties

logical variants consider the writing mode and flow of text

For standard English text, we would trade “left/right” for “inline” and “top/bottom” for “block”. Instead of "padding-left", we can write "margin-inline-start". More about this later.

New and Extended Selectors

Specifically, the `:is`, `:where`, `:not`, and `:has` pseudo-classes

Pseudo-class selectors in CSS define a particular state of an element. They start with the colon character(:) and allow you to apply styles based on the interaction or behaviour of the element. Hover is probably the one you are most familiar with.

Modern Responsive Design Features

CSS math functions

Don't be alarmed! You don't have to do any maths. Although you can now do trigonometry functions in CSS, that's for another time.

We are interested in min(), max() and clamp(), functions

that accept multiple values, which makes them excellent companions for dynamically changing numeric

values wherever numbers are accepted. This includes dimension properties, gradients, background-size, box-shadow, font-size, and more.

Container Queries

The most widely requested feature in CSS

Like media queries, they take the form of an at-rule. But they differ from media queries in that, instead of orchestrating changes at the *viewport* level, container queries allow any component or element to respond to a defined container's *width*. (Currently, *height* is still

being considered.) We can use a container query to change styles for a container's children.

If that seems confusing, don't worry, we will go into more detail.

What else is there?

Things we won't discuss today except in passing

@layers

new colour spaces

color-mix()

color-scheme()

relative colour syntax

subgrid

scope

aspect-ratio

media query range syntax

dynamic viewpoint units

scroll control properties

page transitions

A word about units of measure

You are probably familiar with px, em and rem, but many more units of measure are available in CSS.

36 in fact!

Absolute Unit	Description	Example
px	1/96 of 1 inch (96px = 1 inch)	font-size: 12px;
pt	1/72 of 1 inch (72pt = 1 inch)	font-size: 12pt;
pc	12pt = 1pc	font-size: 1.2pc;
cm	centimeter	font-size: 0.6cm;
mm	millimeter (10 mm = 1 cm)	font-size: 4mm;
in	inches	font-size: 0.2in;

Relative Unit	Description
%	Relative to the parent element's value for that property
em	Relative to the current font-size of the element
rem	Relative to the font-size of the root (e.g. the `<html>` element). "rem" = "root em"
ch	Number of characters (1 character is equal to the width of the current font's 0/zero)
vh	Relative to the height of the viewport (window or app size). 1vh = 1/100 of the viewport's height
vw	Relative to the width of viewport. 1vw = 1/100 of the viewport's width.
vmin	Relative to viewport's smaller dimension (e.g. for portrait orientation, the width is smaller than the height so it's relative to the width). 1vmin = 1/100 of viewport's smaller dimension.
vmax	Relative to viewport's larger dimension (e.g. height for portrait orientation). 1vmax = 1/100 of viewport's larger dimension.
ex	Relative to height of the current font's lowercase "x".

New units we will use today

fr, qw

fr

The new unit we can use with grid (and only grid)

fr = fractional unit

qw, qh, qmin, qmax, qi, qb

Query units to be used with container queries

Ok, let's get started

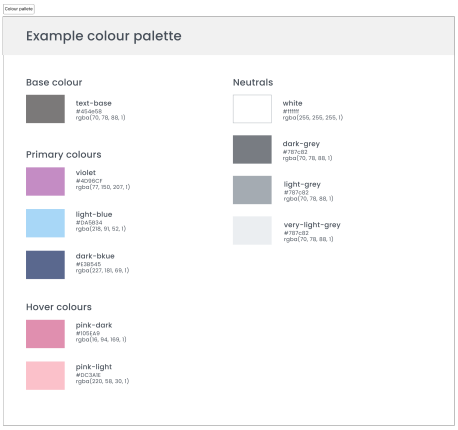
But wait!!!

Some of these properties aren't fully supported yet, so we must enable a Chrome experimental flag.

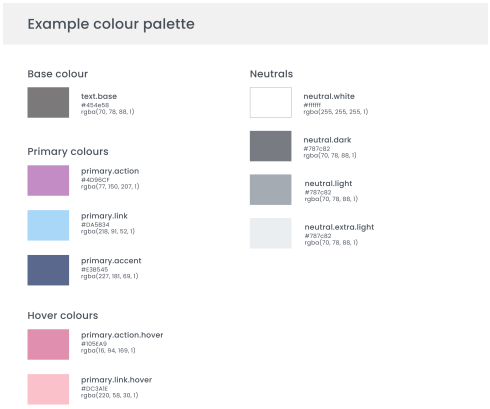
Go to `chrome://flags`, search for “Experimental Web Platform features”, and enable the feature.

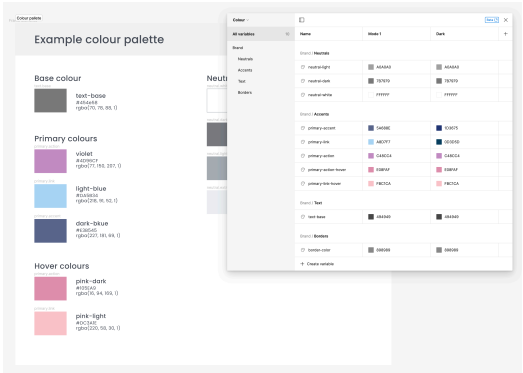
Custom properties (variables)

The wrong way



The right way





CSS variables are values that are defined in a CSS document with the goal of reusability and reducing redundancy in CSS values.

```
.section {
  border: 2px solid #235ad1;
}
```

```
.section-title {
  color: #235ad1;
}

.section-title > span {
  background-color: #235ad1;
}
```

In this snippet, the value #235ad1 is used three times. Imagine this for a large project with different CSS files, and you were asked to change the colour. The best thing you can do is the good old Find & Replace.

```
:root {
  --color-primary: #235ad1;
}
```

First, you need to add the double hyphen -- before a variable name. For now, we will define the variable in the root or the element.

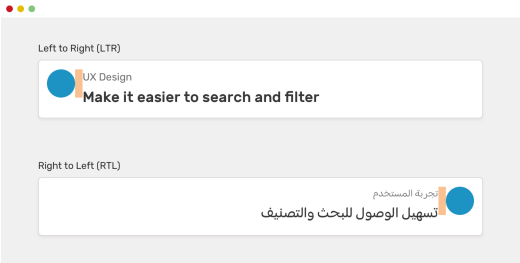
Isn't that much, much cleaner than the previous snippet? The variable --color-primary is a global variable because we defined it in the :root element. However, we can also scope variables to certain elements throughout the document.

```
:root {
  --color-primary: #235ad1;
}

.section {
  border: 2px solid var(--color-primary);
}

.section-title {
  color: var(--color-primary);
}

.section-title > span {
  background-color: var(--color-primary);
}
```

Logical Properties

Use the direction of the HTML document

The basic idea of CSS logical properties is that we won't use physical directions in CSS properties. Instead, we will use properties that depend on the direction of the HTML document. Those properties are called logical properties.



Example from: Ahmad Shadeed

We have a card that contains an avatar and text content. For left-to-right (LTR) layouts, the margin is on the right of the avatar. For right-to-left (RTL) layouts, the margin should be flipped (to the left).

Here is how we can do this without CSS logical properties.

```
.avatar {
  margin-right: 1rem;
}

html[dir="rtl"] .avatar {
  margin-right: 0;
  margin-left: 1rem;
}
```

Notice that margin-right is being reset to 0 for RTL layouts since it's unnecessary. Imagine doing that for a large-scale project. CSS logical properties solve this for us.

```
.avatar {
  margin-inline-end: 1rem;
}
```

What does this mean? Inline refers to the horizontal dimension, and end refers to the direction of the text we read in.

The dimension parallel to the flow of text within a line, i.e., the horizontal dimension in horizontal writing modes and the vertical dimension in vertical writing modes. For standard English text, it is the horizontal dimension.

```
.avatar {
  margin-block-end: 1rem;
}
```

Block refers to the vertical dimension, and again, the end refers to the direction.

The dimension perpendicular to the flow of text within a line, i.e., the vertical dimension in horizontal writing modes and the horizontal dimension in vertical writing modes. For standard English text, it is the vertical dimension.

```
/* <length> values */
margin-block-end: 10px; /* An absolute length */
margin-block-end: 1em; /* relative to the text size */
margin-block-end: 5%; /* relative to the nearest block container's width */

/* Keyword values */
margin-block-end: auto;

/* Global values */
margin-block-end: inherit;
margin-block-end: initial;
margin-block-end: revert;
margin-block-end: revert-layer;
margin-block-end: unset;
```

But what's writing mode?
The CSS writing modes module defines various international writing modes, such as left-to-right (e.g., used by Latin and Indic scripts), right-to-left (e.g., used by Hebrew or Arabic scripts), bidirectional (used when mixing left-to-right and right-to-left scripts), and vertical (e.g., used by some Asian scripts).

Logical properties on MDN
https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_logical_properties_and_values

:not :is :where :has
Conditional CSS

`:not`
The `:not()` CSS pseudo-class represents elements that do not match a list of selectors.

`:not`
Since it prevents specific items from being selected, it is known as the negation pseudo-class.

The :not() CSS pseudo-class requires a comma-separated list of one or more selectors as its argument.

The list must not contain another negation selector or a pseudo-element.

`:not`
`:not(.class)` will match anything that is not `.class` including `<html>` and `<body>`.

`:not`

Selectors can be chained; for example, `:not(.foo, .bar)` is equivalent to `:not(.foo):not(.bar)`

`:not`

If any selector is invalid, the whole rule is invalid

`:not(.foo, :banana)` will invalidate the entire rule

`:is` and `:where`

These functions receive a list of selectors as their argument and proceed to select any element that can be selected by one of the selectors in the list.

`:is` and `:where`

The specification defines :is() and :where() as accepting a “forgiving selector list”.

Unlike :not an invalid selector will not invalidate the entire list

You can probably intuit the functionality of :is() just by looking at it: it’s a means to test if an element is a certain thing, working essentially as a boolean like the if you’ll find in many programming languages. For example, in its simplest form, these two selectors are functionally the same:

`:has`

In CSS, the ":has()" relational pseudo-class enables you to verify whether an element has particular child elements, select it if there are any matches, and apply styling accordingly.

```
/* Selects an h1 heading with a
paragraph element that immediately follows
the h1 and applies the style to h1 */
h1:has(+ p) { margin-bottom: 0; }
```

`:has`

If `:has()` is not supported in a browser, the entire selector block will fail unless :has() is in a forgiving selector list, such as in `:is()` and `:where()`.

```
.selector:has(.class) { ... }

.selector:has(#id) { ... }

.selector:has(div) { ... }
```

Chainability

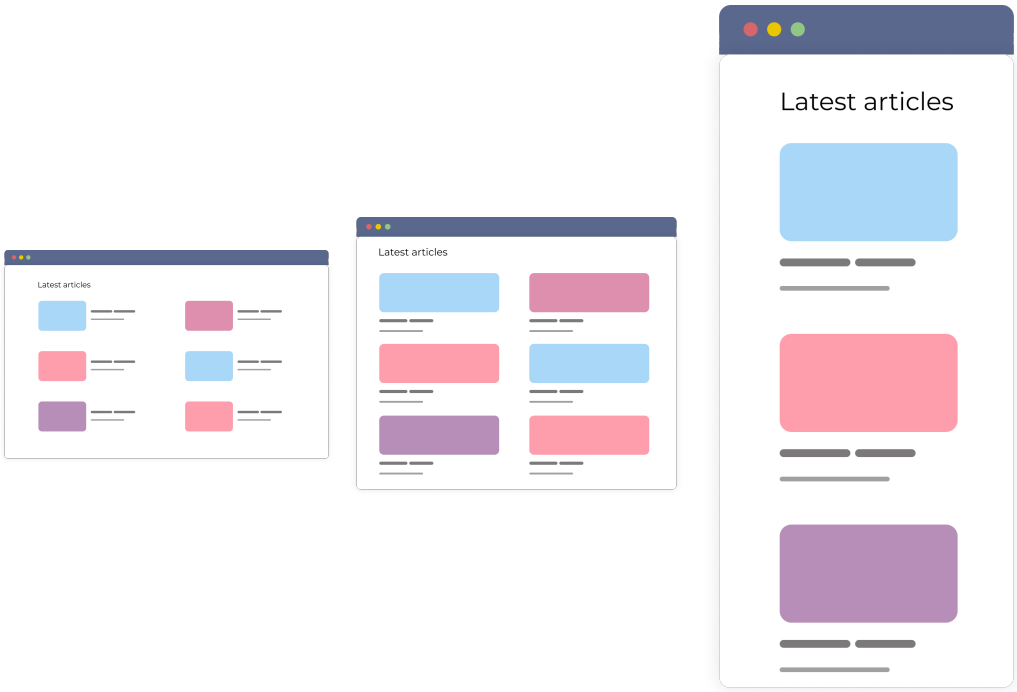
```
/* Chainability */

.selector:has(div):has(.class):has(#id) {...}
```

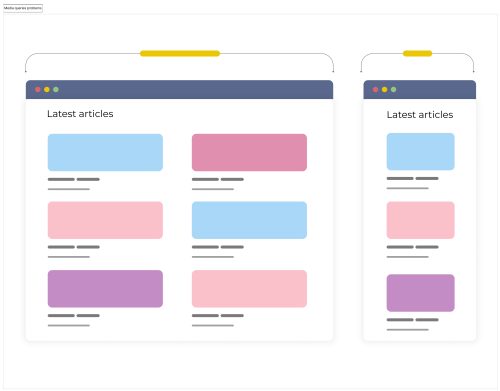
```
/* Argument list for multiple selections */

.selector:has(div, .class, #id) { ... }
```

Move to exercise

```
/* Combinations */

.article-body h3:not(:has(+ p)) {
  margin-bottom: 1.5rem;
}
```

Container queries





Container queries

Container queries allow defining rules for elements to respond to their ancestor container's available space.

This differs from media queries which can only be based on the viewport.

Container queries

The primary benefit of container queries is creating more contextually appropriate layout rules that adapt to available space.

With viewport media queries, rules are effectively orchestrated at the macro page level. But container queries allow responding to layout changes of microelements and components as their context shifts through variable placement in page layouts.

Note that we will concentrate on container sizing today. There are also container-style queries, but that's for another time, as browser support is very thin.

Container queries

Container elements must be explicitly defined, which at the base level is done through the `container-type` property.

```
.container {
   container-type: inline-size;
}
```

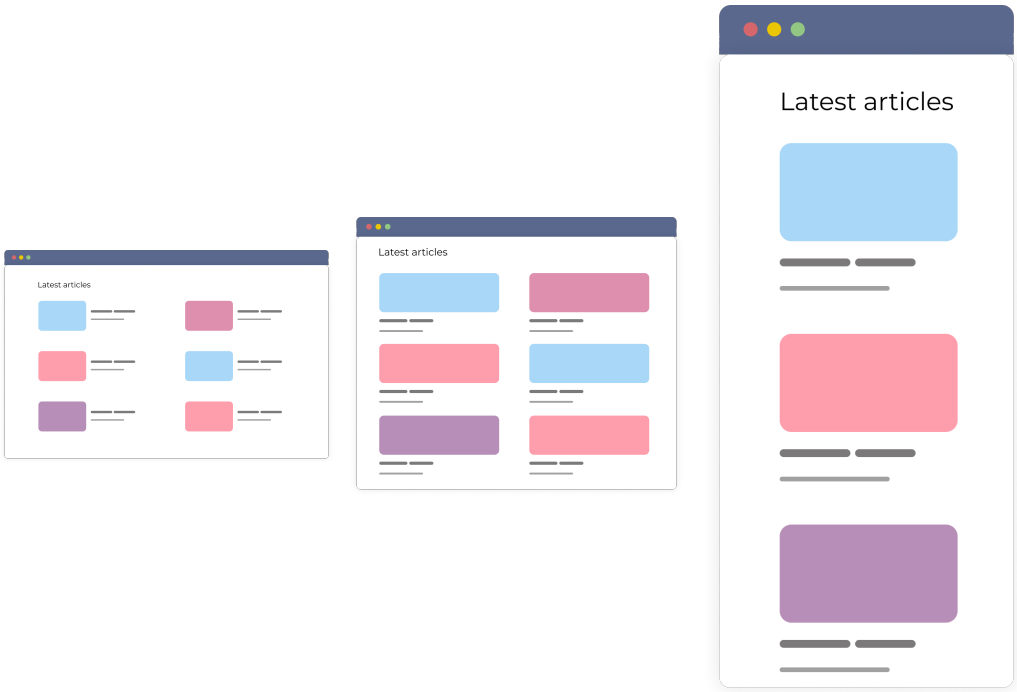
```
 @container (inline-size > 300px) {
   .container .child {
      padding: 2rem;
   }
}
```

The use of the term "inline" rather than "width" is from the precedent set by logical properties, which is why we learned them earlier.

Container Query Units

UNIT	VALUE
cqw	1% of a query container's width
cqh	1% of a query container's height
cqi	1% of a query container's inline size
cqb	1% of a query container's block size
cqmin	The smaller value of either cqi or cqb
cqmax	The larger value of either cqi or cqb

Just as `1vw` equals `1%` of the viewport width, so does `1cqi` equal `1%` of a container's inline size.



Considerations

Make changes to the image size

Font-size

Spacing between the elements