Web Presentation (CSS) for Layout, continued

The CSS **`display:`** property

Defaults for all HTML elements that display content…

display: block;

- Stacks-up, top-over-bottom with other elements
- Uses the “box model” (padding, margin, borders)
- Is 100% wide (takes-up all the width on a line)

display: inline;

- Lines-up, side-by-side with other elements
- Ignores or does strange things to padding, margin, borders (no box model)
- Is only as wide as it needs to be; if wider than 100%, wraps to the next line

Options for layout…

display: inline-block;

- Uses the “box model” (like display: block) AND…
- Is only as wide as it needs to be (like display: inline)

display: table-cell;

- Neighboring block elements line-up side-by-side with equal height
- Ignores some aspects of the “box model”

display: flex;

- Neighboring block elements line-up side-by-side with equal height
- Uses the “box model”

display: grid;

- Everything within a GRID element can be placed anywhere you want, within the grid's box

Step 1: Create Layout Blocks

```
...
  <div class="container">
    <header>header</header>
    <article>main content</article>
    <aside>related info</aside>
    <footer>footer</footer>
  </div><!--.container-->
...
```

Other common structural elements:

- NAV
- MAIN
- SECTION

…and when all else fails:

- DIV

Step 2: Choose a Layout Technique

At some point in your web page, you can break the normal document flow and position content side-by-side to create a columnar layout.

- ~~HTML Table~~ (not acceptable for layout)
- ~~Float layout~~ (old fashioned but still widely used)

- Inline-block ← Okay for small layouts (e.g. navigation elements)
- CSS table layout ← Common practice in the industry

- Flex layout
- Grid layout

} Newest properties - complicated but powerful

Choices

- **HTML tables** are for tabular data only! (Not for layout)
- The CSS **float** property is for moving small content to the side (left or right) and letting the rest of the content flow around it. (Not for layout)
- The CSS **inline-block** property is for lining up block elements side-by-side
- The CSS **table-cell** property is for creating a (simple) page layout with columns and rows (like a table, but not actually an HTML table)
- The CSS **flex** property is for lining up block elements side-by-side in a *one dimensional layout*
- The CSS **grid** property is for creating a any page layout with columns and rows - *a two dimensional layout*

Flex vs. Grid: one dimension vs. two

Flex

- Create a “container” – everything inside lines-up however you want
- Content is not constrained – grows vertically as needed
- Good for presenting a lot of dynamic blocks of content ("flexible")

Grid

- Create a “container” – define what goes where, vertically (columns) and horizontally (rows)
- Content is made to fit the grid as much as possible
- Good for creating a page layout

CSS Grid Layout

New Core Technology from the W3C

Early 2017

- New CSS properties for Grid Layout
  - 18 new properties
  - Three new functions
- Full support
  - Chrome
  - Firefox
  - Safari
  - iOS Safari
  - Android Browser
  - Chrome for Android
  - Edge (recent)
  - IE (not fully)

CSS properties

`grid-template-columns`
`grid-template-rows`
`grid-template-areas`
`grid-template`
`grid-auto-columns`
`grid-auto-rows`
`grid-auto-flow`
`grid`
`grid-row-start`
`grid-column-start`
`grid-row-end`
`grid-column-end`
`grid-row`
`grid-column`
`grid-area`
`grid-row-gap`
`grid-column-gap`
`grid-gap`

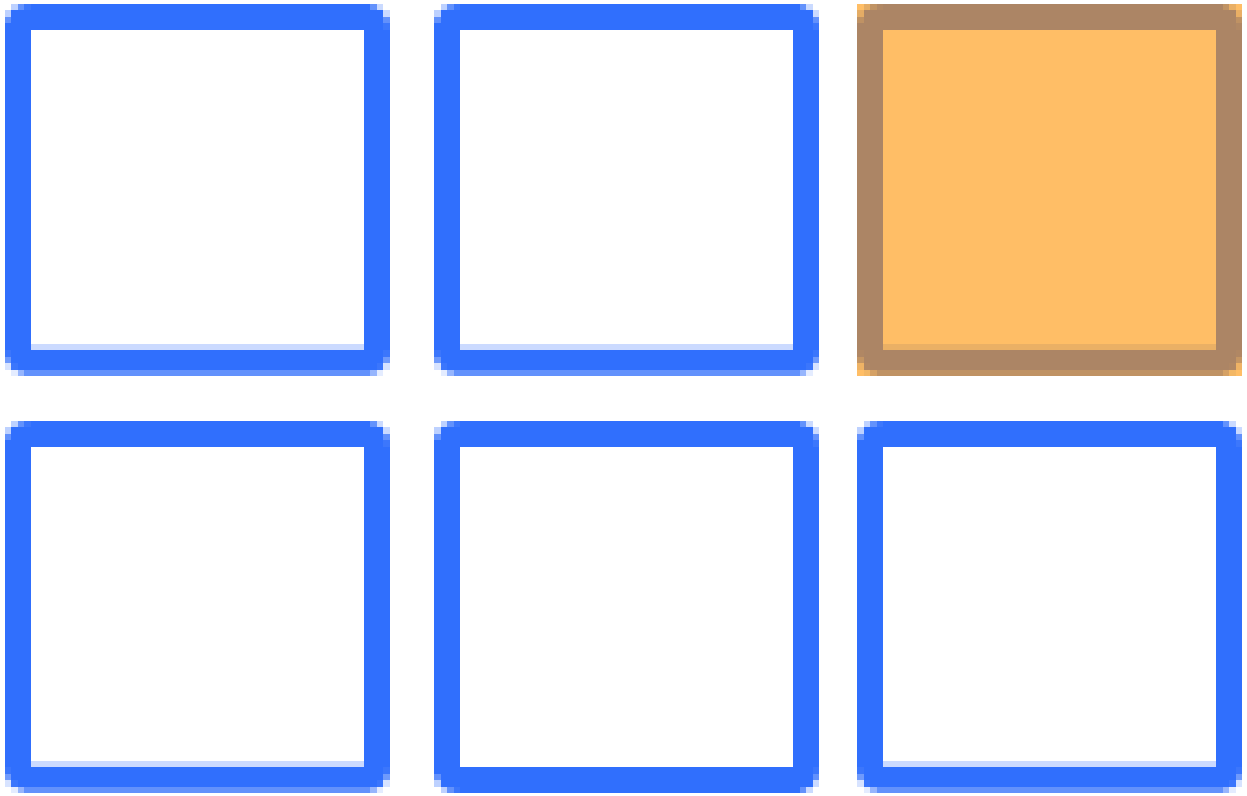
CSS function

`repeat()`
`minmax()`
`fit-content()`

Grid Terminology and Concepts

Grid Cell

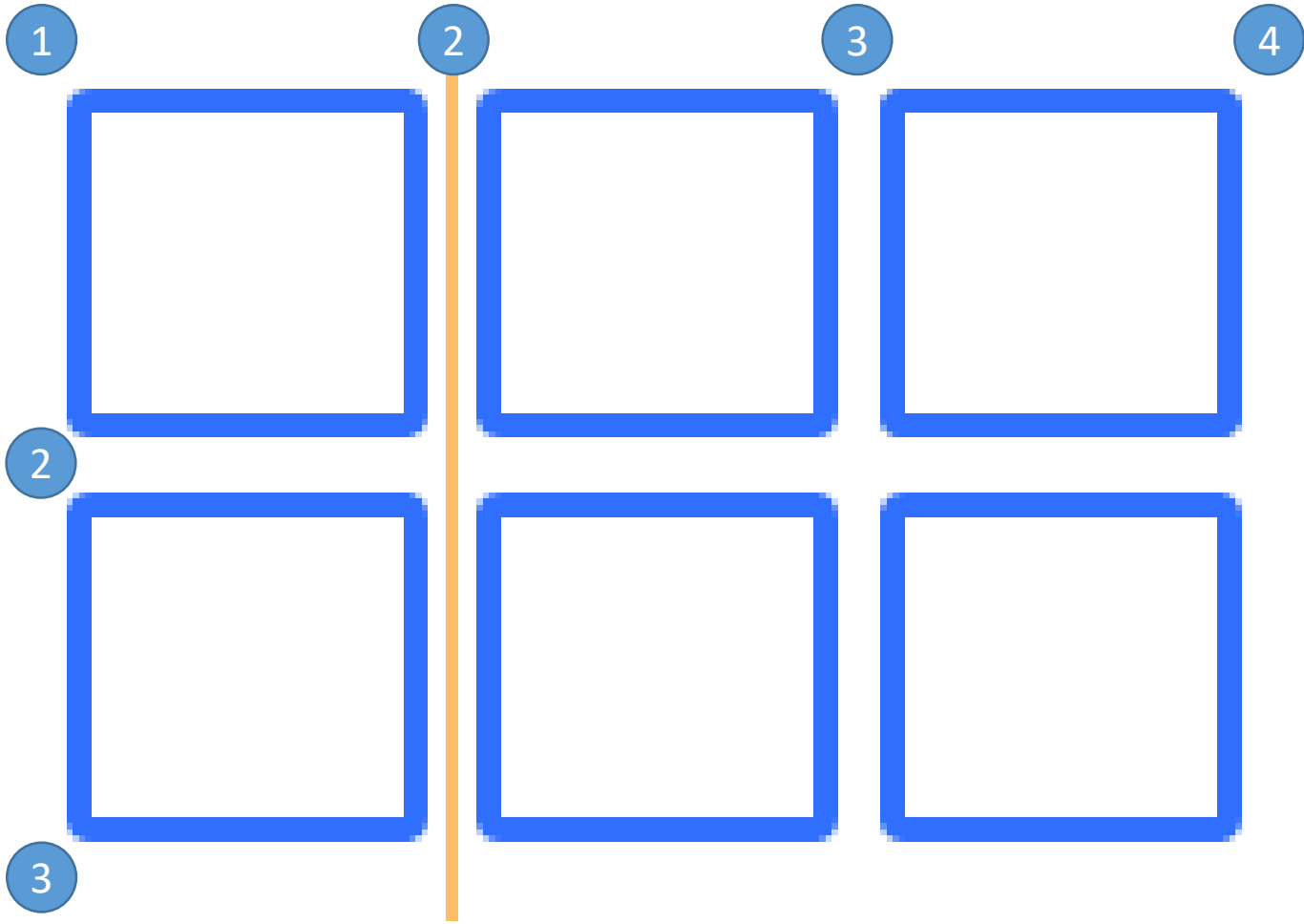
A single unit of a CSS grid



Grid Lines

The vertical and horizontal lines that divide the grid and separate the columns and rows

Programmers beware! Counting lines starts with "one" (not zero)

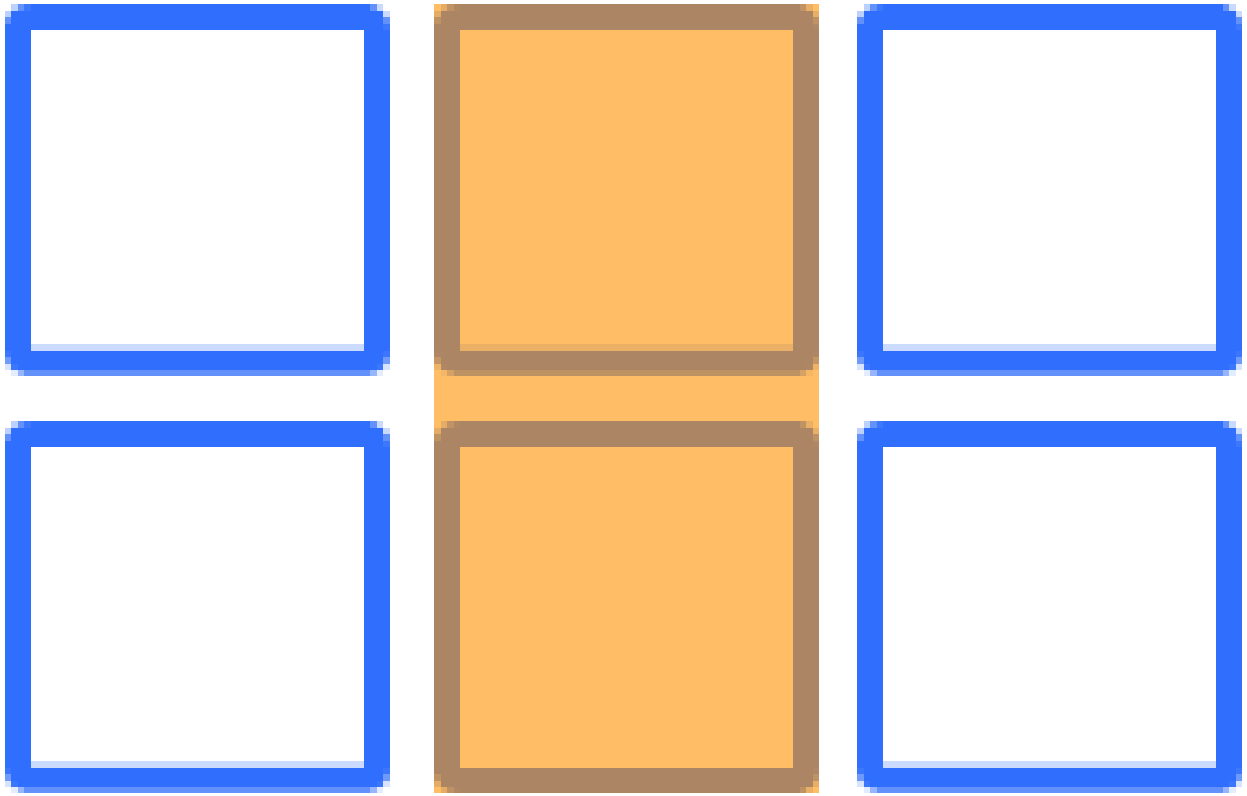


Grid Track

The space between two grid lines. This space can be horizontal or vertical

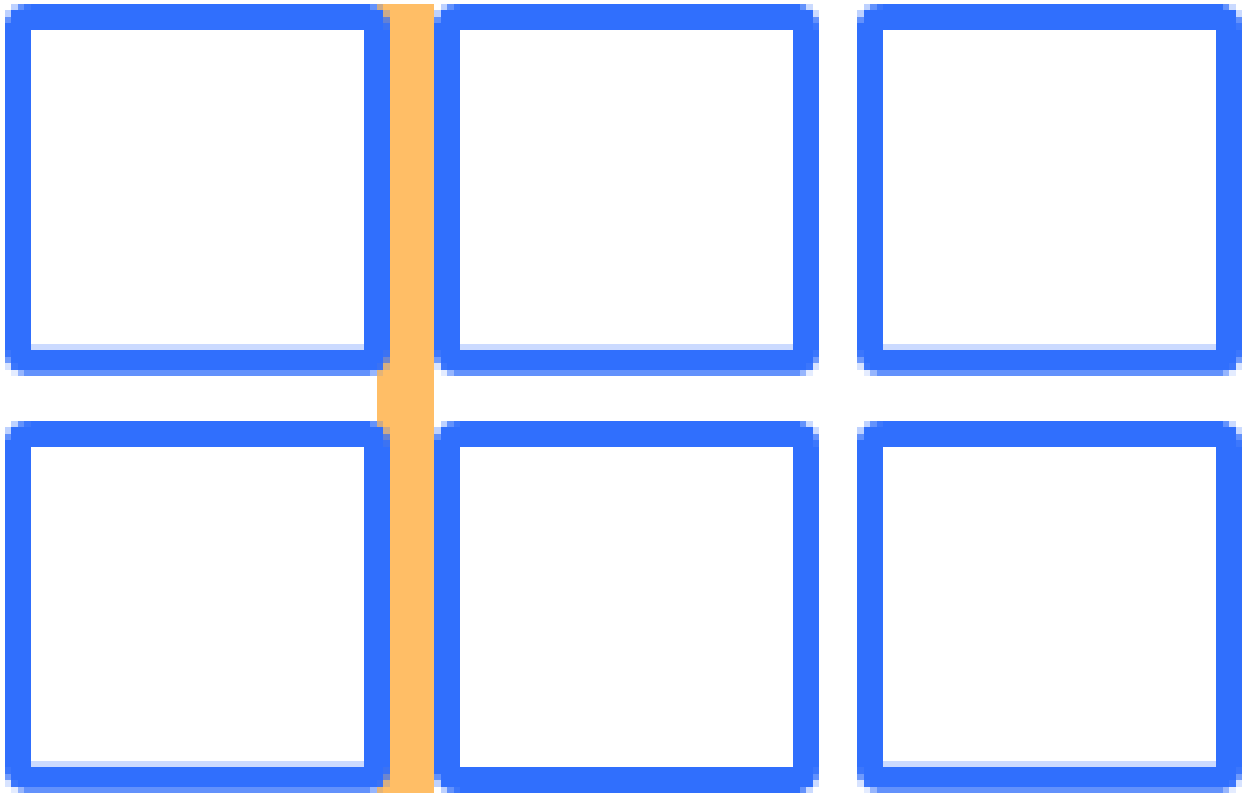
Grid column: a vertical track

Grid row: a horizontal track



Grid Gutter

The optional space between rows and columns in a grid



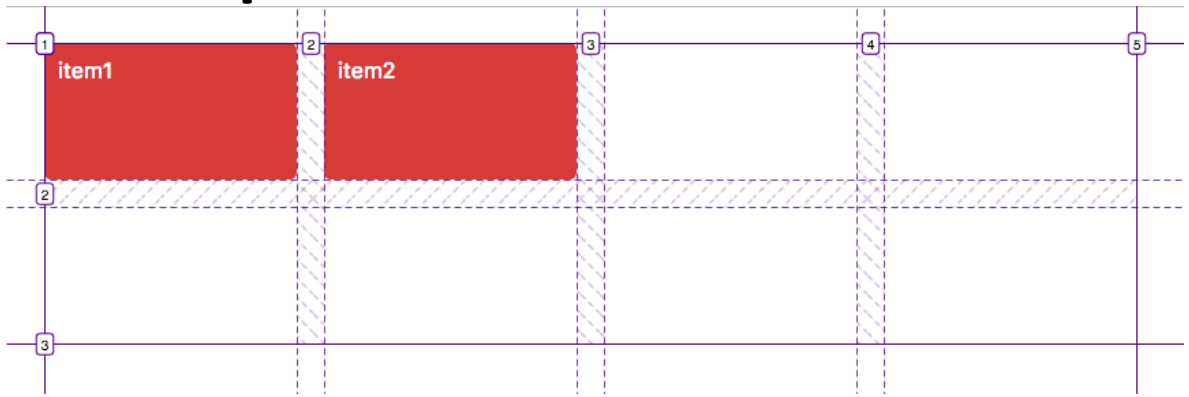
The explicit and implicit grid

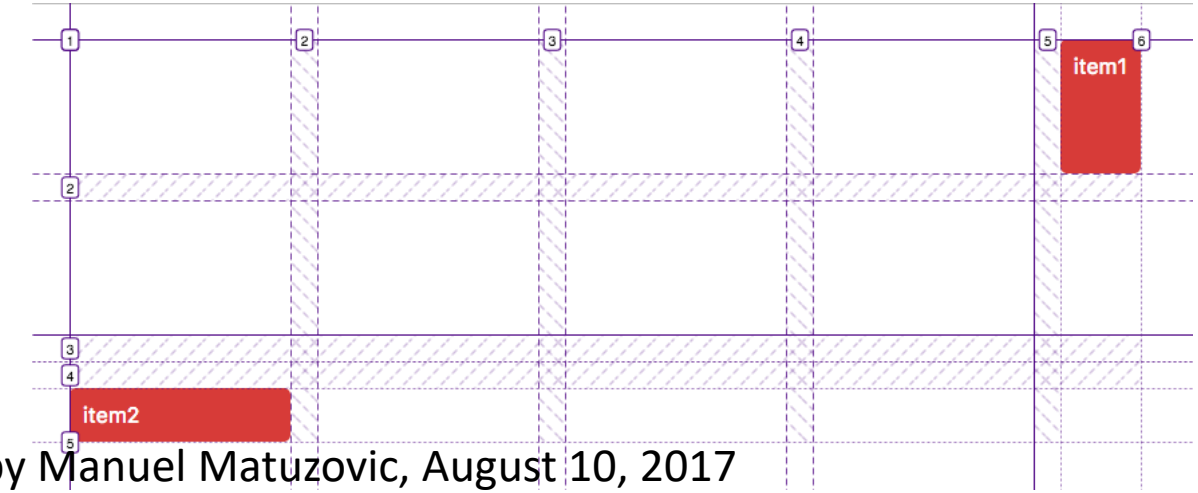
Explicit Grid

- When you use:
  grid-template-columns and
  grid-template-rows
- Everything you setup *within* the column and row tracks are **explicit**

Implicit Grid

- When you use:
  grid-auto-columns and
  grid-auto-rows
  everything is "implicit"





CSS Tricks, **The Difference Between Explicit and Implicit** Grids, by Manuel Matuzovic, August 10, 2017
https://css-tricks.com/difference-explicit-implicit-grids/#implicit-grids

Using the Grid Lines for Positioning

- Use CSS properties…
  grid-column-start and
  grid-column-end, or
  grid-row-start and
  grid-row-end
  …to have cells *span* tracks
- Or use their shortcut counterparts:
  grid-column and **grid-row**
  e.g.

```
grid-column: 1 / 4;
grid-row: 1 / 3;
```