CSS Grid
&
Responsive Design

Aside: CSS Variables

You can set up variables that can be used in your CSS to make changing values easier.

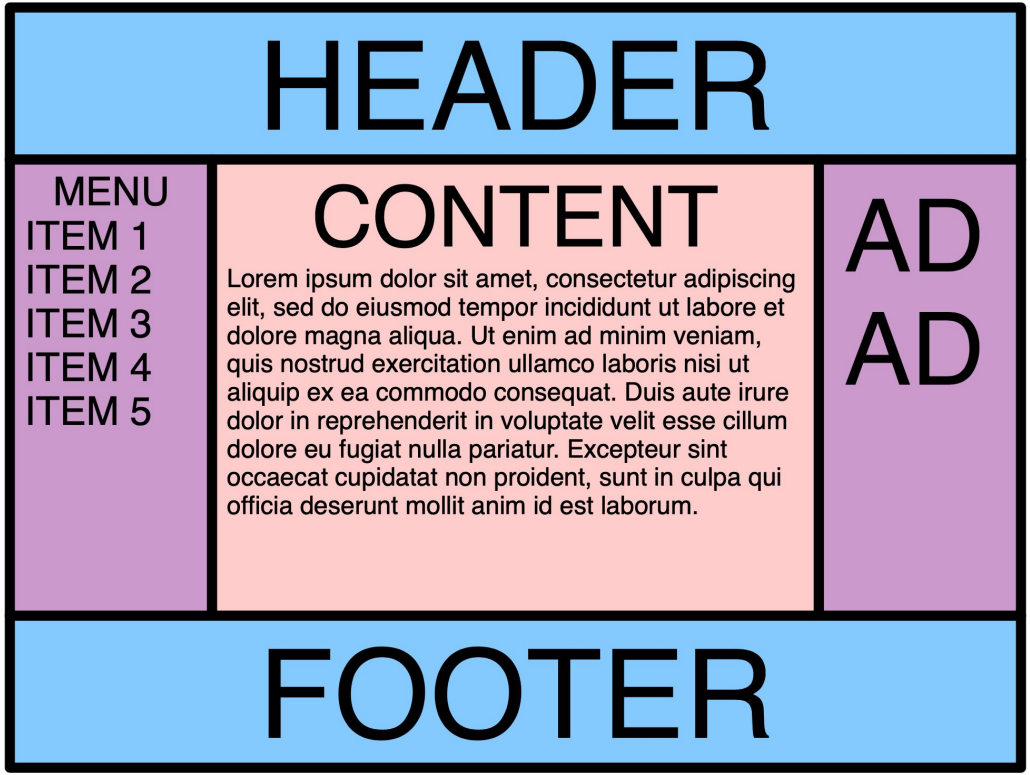
```
:root {
    --main-bg-color: gray;
}

body {
    background-color: var(--main-bg-color);
}
```

Introducing...
CSS Grid

The "Holy Grail" Layout:

The sidebars have a fixed width, with the center column adjusting in size to fill the window (fluid or liquid layout).

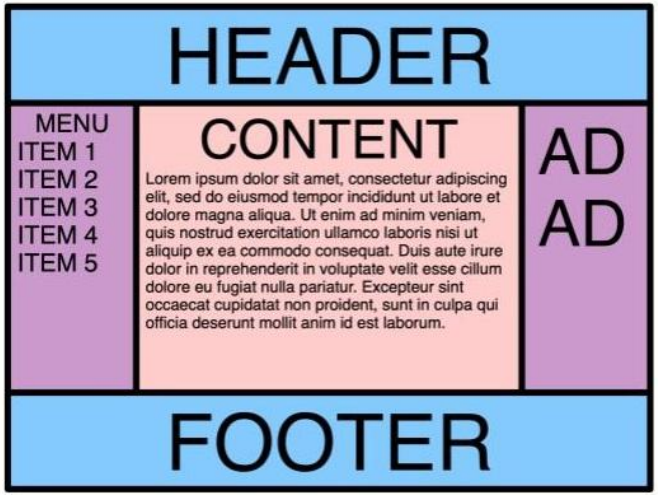
Another common requirement is that, when a page does not contain enough content to fill the screen, the footer should drop to the bottom of the browser window instead of leaving blank space underneath.



Grid Containers

- Usually used to divide a page into sections

- Set up using a **Grid Container**



Grid Containers

- **display: grid;**
- **grid-template-columns**

```
grid-template-columns: 20px 100px 50px;
grid-template-columns: 100px 1fr 1fr;
```

- **grid-template-areas**

```
grid-template-areas:
    "name1 name2 name3"
    ". name4 name 5"
    "name6 name6 name6";
```

Grid Containers

- **`gap: 10px;`**
- **`grid-area`**

```
header {
    grid-area: header;
}
```

- Used in **`grid-template-areas`**

```
grid-template-areas:
    "header header header"
    ". name4 name 5"
    "name6 name6 name6";
```

Grid Containers

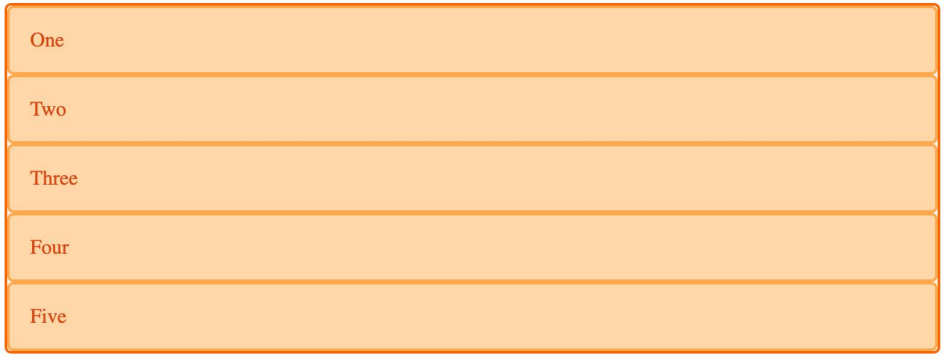
- **`grid-template-rows`**

```
grid-template-rows: 100px 1fr 100px;
```

- Grid items are **direct children** of the grid container in the HTML.

Direct Children as Grid Items

```
<div class="wrapper">
  <div>One</div>
  <div>Two</div>
  <div>Three</div>
  <div>Four</div>
  <div>Five</div>
</div>

.wrapper {
  display: grid;
}
```



Grid Alignment

- **`justify-items`**
  - aligns items along the row axis
    - **`start`**
    - **`end`**
    - **`center`**
    - **`stretch`**

Grid Alignment

- **`align-items`**
  - aligns items along the column axis
    - **`start`**
    - **`end`**
    - **`center`**
    - **`stretch`**

Grid Alignment

- **`justify-self`**
  - overrides row alignment for element.
- **`align-self`**
  - overrides column alignment for element.

Responsive Design

Responsive Design

A page should respond to the user's environment based on screen size, platform, and orientation (landscape / portrait).

Consider:

- Flexible grid layout
  - Use percentages/fractions, not pixels
- Responsive images
  - Use percentages, not pixels

```
img {
     width: 100%;
     height: auto;
}
```

- Change layout entirely based on screen characteristics

Media Queries

Selectively apply CSS based on screen/environment characteristics.

- **`@media`** rule
  - https://www.w3schools.com/cssref/css3_pr_mediaquery.asp
- Apply CSS conditionally based on **`@media`** query

```
@media only screen and (max-width: 768px) {
    .container {
        // override properties
    }
};
```

Breakpoints

- The width where "something changes" in the layout
- Breakpoints are your choice. You may have zero, or many

@media queries used in Bootstrap for reference

```
// Extra small devices (portrait phones, less than 576px)
// No media query since this is the default in Bootstrap

// Small devices (landscape phones, 576px and up)
@media (min-width: 576px) { ... }

// Medium devices (tablets, 768px and up)
@media (min-width: 768px) { ... }

// Large devices (desktops, 992px and up)
@media (min-width: 992px) { ... }

// Extra large devices (large desktops, 1200px and up)
@media (min-width: 1200px) { ... }
```

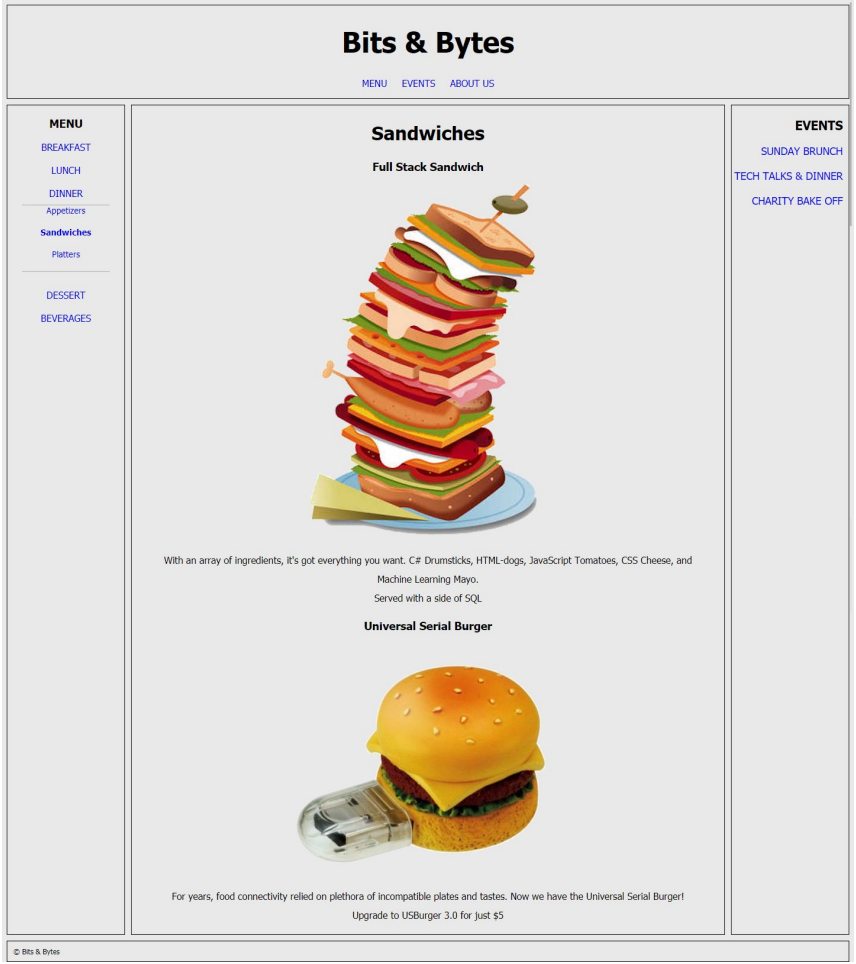
Mobile First

- **Mobile devices**, mobile screens are now the **primary means** in which **users interact** with your applications.
- The term **mobile-first** was coined to indicate that **applications should be developed with a "mobile-first mindset."**
- Instead of adding breakpoints into the design as the width of the screen gets smaller, you should **create breakpoints in the design when the width of the screen gets larger.**
- Start with the small screen first, then expand until it looks bad. At this point, it's time to insert a new breakpoint.

Code Walkthrough

Desktop Layout

This is the layout that should be applied for desktop screen sizes.



Mobile Layout

This is the layout that should be applied for screen sizes smaller than 768px.