
Welcome to lecture 13!

Agenda

Session Objectives

- Recap
  - CSS Flexbox
  - Tailwind Basics
- The "Why"
  - Complex Responsive Layouts
- Tailwind
  - Flexbox Utilities & Live Coding
  - Grid Utilities & Live Coding
  - Fine-Tuning Layouts with Arbitrary Values
- Break & Exercise
- Responsive Design with Tailwind & Live Coding
- Quiz Time!

Recap: CSS Flexbox Fundamentals

- What problem did CSS Flexbox solve?
  - Provided a reliable one-dimensional way to align and distribute space among items without floats or tables
- Key Concepts Recap
  - Container (display: flex) & Items.
  - Main Axis & Cross Axis (depend on flex-direction).
  - justify-content: Alignment on Main Axis.
  - align-items: Alignment on Cross Axis.
  - flex-wrap: Handling overflow

Recap: Tailwind CSS Basics

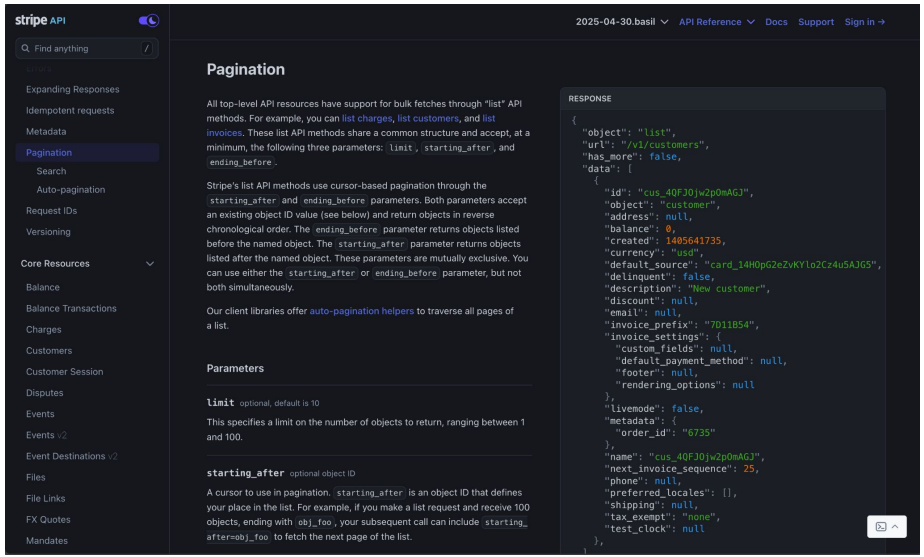
- What's the benefit of Tailwind?
  - Utility-First: Style directly in HTML (p-4, bg-blue-500, font-bold)
- Core Utilities:
  - Spacing (m-, p-), Sizing (w-, h-), Colors (bg-, text-), Typography (text-, font-), Borders (border, rounded-)
- Setup
  - Using <script src="https://cdn.tailwindcss.com"></script>.
- Arbitrary Values: What are they & how do we use them?
  - What: Custom values you specify when Tailwind doesn't support it
  - How: [...] for one-offs (e.g., mt-[11px])
- Example

```
<div class="p-4 bg-indigo-600 text-white rounded-md
font-semibold">Styled Box</div>
```

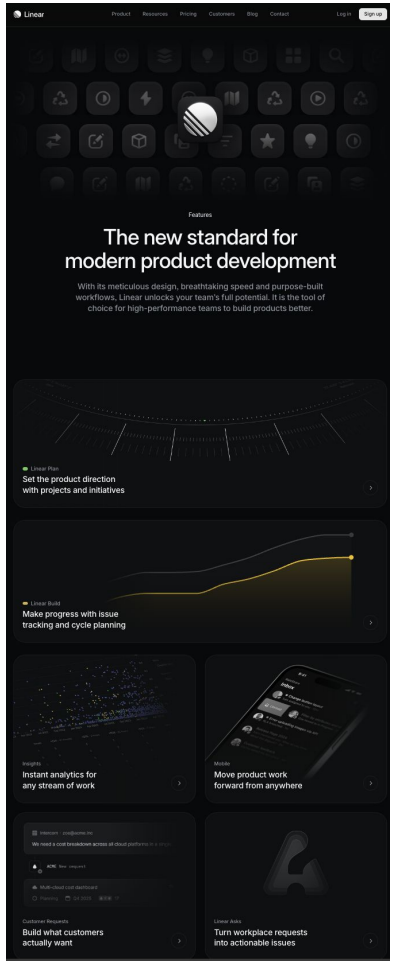
Why: Complex Responsive Layouts

- As we've seen, modern interfaces demand structure and adaptability across devices
- How do sites like these handle layout efficiently?

Stripe

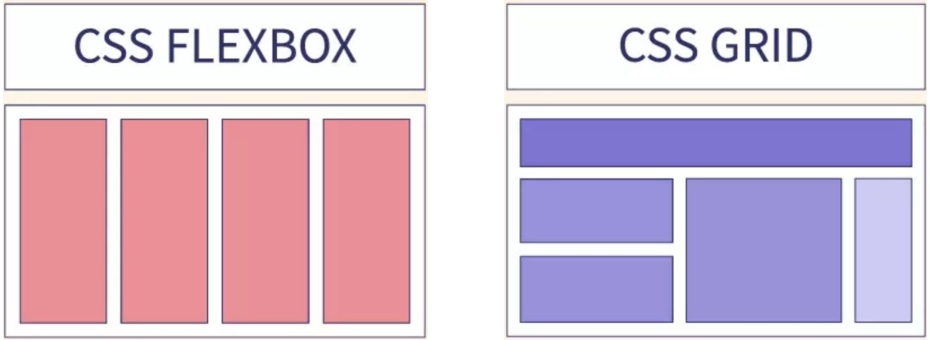


Linear



The "How": Tailwind's Layout Powerhouses

- Tailwind provides intuitive utilities for CSS Flexbox and Grid.
- Flexbox (flex ...):
  - Best for 1D layouts (rows OR columns).
- Use Cases: Navbars, button groups, aligning items inside components.
- Grid (grid ...):
  - Best for 2D layouts (rows AND columns).
  - Use Cases: Page structure, dashboards, galleries, complex forms.
- They often work together!



Flexbox with Tailwind Utilities

Enabling Flexbox & Direction

- Apply to the parent container:
  - flex: Block-level flex container.
  - inline-flex: Inline-level flex container.
- Set item flow direction:
  - flex-row (Default - Left to Right)
  - flex-row-reverse (Right to Left)
  - flex-col (Top to Bottom)
  - flex-col-reverse (Bottom to Top)

Aligning Items: Cross Axis

- item-* aligns children along the cross axis
- On the container:
  - items-start: Align to start.
  - items-center: Align to center (Very Common!).
  - items-end: Align to end.
  - items-stretch (Default): Fill cross axis dimension.
  - items-baseline: Align text baselines.
- Override individual items with self-* (e.g., self-center).
- Quick Check: Where will items inside the div align?
  - ...

Justifying Content: Main Axis

- justify-* aligns children along the mains axis
- On the container:
  - justify-start (Default): Items at start.
  - justify-center: Items in center.
  - justify-end: Items at end.
  - justify-between: Space between items only (Common!).
  - justify-around: Space around each item.
  - justify-evenly: Space evenly distributed.
- Override individual items with self-* (e.g., self-center).
- Quick Check: How will Left/Right be positioned?
  -
    Left
    Right

Handling Overflow & Spacing

- How did we handle overflow and spacing in flexbox?
  - flex-wrap for overflow; gap for spacing
- Control wrapping when items don't fit:
  - flex-nowrap (Default)
  - flex-wrap (Wrap to next line - Essential for RWD!)
  - flex-wrap-reverse
- Add space between items (preferred over margins):
  - gap-{size} (e.g., gap-4 -> 1rem row and column gap)
  - gap-x-{size} (Horizontal gap only)
  - gap-y-{size} (Vertical gap only)

Sizing Flex Items

- Control how items resize
  - flex-1: Grow & shrink equally. Most common way to fill space. CSS reference - flex: 1 1 0%
  - flex-auto: Grow & shrink based on content size. CSS reference - flex: 1 1 auto
  - flex-initial: Shrink if needed, don't grow. CSS reference - flex: 0 1 auto
  - flex-none: Fixed size, no grow/shrink. CSS reference: flex: none
- Use grow, shrink, basis-{size} for fine-grained control
- Quick Check: How will the Search Bar size itself?
  -
    Logo
    Search Bar

  - Answer: It will grow to fill remaining space

Demo Time!

Flexbox: Use Cases & Summary

- Strength
  - Aligning items in a single dimension (rows OR columns)
  - Distributing space along that dimension
  - Great for component-level layouts (navbars, cards, forms, button groups)
- Tailwind makes these common patterns fast to implement
- Quick Check: How will the Search Bar size itself?
  -
    Logo
    Search Bar

  - Answer: It will grow to fill remaining space

Tailwind Grid

Enabling Grid & Defining Tracks

- Apply grid to the parent container.
- Define Columns (Most Common)
  - grid-cols-{number} -> e.g., grid-cols-3 (3 equal columns)
  - Tailwind uses repeat({number}, minmax(0, 1fr)) under the hood.
- Define Rows (Optional, often implicit):
  - grid-rows-{number} -> e.g., grid-rows-2
- Use arbitrary values for complex tracks: grid-cols-[200px_1fr_auto]
- Quick Check: How many columns will this grid have?
  - ...
  - Answer: 4

Grid Gaps

- Spacing between grid cells (gutters)
- Works just like Flexbox gap
  - gap-{size} - Row and Column gaps)
  - gap-x-{size} - Column gap only
  - gap-y-{size} - Row gap only

Spanning Items Across Cells

- Make grid items occupy multiple tracks:
  - col-span-{number} -> e.g., col-span-2 - Item spans 2 columns
  - row-span-{number} -> e.g., row-span-2 - Item spans 2 rows
- Control exact placement (Less common, but available):
  - col-start-{line}, col-end-{line}
  - row-start-{line}, row-end-{line}
- Quick Check: How much horizontal space does 'A' take?
  -
    A
    B

  - Answer: 2/3rds or 2 columns

Fine-Tuning with Arbitrary Values

- What was the purpose of [...]?
  - Define custom values not available in Tailwind's framework
- Very useful for precise layout needs
  - Flex Basis: basis-[45%] or basis-[300px]
  - Grid Tracks: grid-cols-[200px_1fr_auto] or grid-rows-[auto_1fr_auto]
  - Specific Gaps: gap-[18px]
  - Exact Sizing: w-[600px] or h-[calc(100vh-80px)]
- Use when standard utilities (col-3, basis-1/2, etc.) aren't exact enough before using arbitrary values. Ideally, use the standard theme values for consistency

Demo Time!

Grid: Use Cases & Summary

- Strengths
  - Structuring the overall page layout (2D).
  - Complex layouts needing simultaneous row AND column control.
  - Dashboards, image/card galleries, forms needing precise alignment
- The go-to for arranging elements in two dimensions

Break Time + Exercise!

- Task: Create a "Notification" component (Icon + Text, responsive stacking).
  - Container: Padded, border, rounded, light background.
  - Content: Circular icon left, Title+Message right (centered vertically).
  - Responsive: Icon stacks above centered text on screens
- Try it: https://play.tailwindcss.com/

Responsive Design

Tailwind's Responsive Prefixes

- Mobile-First: Design for small screens by default (no prefix).
- Use prefixes to override styles at larger breakpoints:
  - sm: (≥640px)
  - md: (≥768px)
  - lg: (≥1024px)
  - xl: (≥1280px)
  - 2xl: (≥1536px)
- Example: w-full lg:w-1/2 (Full width on mobile, half width on large screens & up)

Applying Responsive Prefixes

- Recall the syntax
  - {breakpoint}:{utility}
- Prefix any utility class to make it responsive
- Layout Examples:
  - Stack columns: flex flex-col md:flex-row
  - Change grid columns: grid grid-cols-1 sm:grid-cols-2 lg:grid-cols-4
  - Adjust alignment: items-center lg:items-start
  - Modify spacing: p-4 md:p-6 lg:p-8
- Visibility Example
  - hidden md:block (Hide on mobile, show as block on medium+)

Demo time!

Quiz!

Question 1

- Which utility class creates a block-level flex container and arranges children horizontally by default?
  - A) grid
  - B) flex flex-col
  - C) flex
  - D) inline-flex

Correct Answer: C

Question 2

- To distribute space evenly between flex items, pushing the first/last to the edges, use
  - A) justify-center
  - B) justify-evenly
  - C) items-between
  - D) justify-between

Correct Answer: D

Question 3

- What utility creates a grid with 2 equal columns?
  - A) flex flex-2
  - B) grid grid-cols-2
  - C) col-span-2
  - D) grid-cols-[1fr_1fr]

Correct Answer: B

Question 4

- You have a 4-column grid. How do you make an item span the first 3 columns?
  - A) grid-cols-3
  - B) col-span-3
  - C) cols-3
  - D) col-start-1 col-end-4

Correct Answer: D is also valid but B is simpler.

Question 5

- Using a mobile-first approach, p-2 lg:p-6 means
  - A) Padding is 6 on large screens, 2 otherwise.
  - B) Padding is 2 on large screens, 6 otherwise.
  - C) Padding is 2 always, except 6 on medium screens.
  - D) Padding is 2 always, except 6 below large screens.

Correct Answer: D

Question 6

- Which class combination would stack items vertically on mobile but place them side-by-side on medium screens and up?
  - A) flex flex-row md:flex-col
  - B) grid grid-cols-1 md:grid-cols-2
  - C) flex flex-col md:flex-row
  - D) flex md:grid

Correct Answer: C

Question 7

- What is the primary advantage of using gap-* over margins for spacing flex/grid items?
  - A) gap works on inline elements.
  - B) gap only applies space between items, not at the edges.
  - C) gap allows negative values.
  - D) gap is faster for the browser to render.

Correct Answer: B

References

- Official Tailwind CSS Docs (Essential!):
  - Flexbox & Grid: start here. Check out the sidebar to cover more sections
  - Responsive Design
- Tailwind Play
  - Experiment!
- Tailwind Labs YouTube
  - Official Tutorials
- CSS Concepts (Underlying Principles):
  - CSS-Tricks Flexbox Guide
  - CSS-Tricks Grid Guide