

# Flexbox Layout — Lesson Notes

## What is Flexbox?

Flexbox is a CSS layout model that makes it easy to align and distribute space among items in a container, even when their sizes are unknown.

## Core Concepts

### Setting Up a Flex Container

```
.container {  
  display: flex;  
  flex-direction: row;      /* row | column | row-reverse |  
                           column-reverse */  
  justify-content: center; /* main axis alignment */  
  align-items: center;     /* cross axis alignment */  
  gap: 16px;              /* space between items */  
}
```

### Main Axis vs Cross Axis

Direction	Main Axis	Cross Axis
row	Horizontal (→)	Vertical (↓)
column	Vertical (↓)	Horizontal (→)

### justify-content Values

- flex-start — Pack items at the start
- flex-end — Pack items at the end
- center — Center items
- space-between — Even spacing, no edge gaps
- space-around — Even spacing, half-size edge gaps
- space-evenly — Equal spacing everywhere

## Flex Item Properties

```
.item {  
  flex-grow: 1; /* How much the item should grow */  
  flex-shrink: 0; /* How much the item should shrink */  
  flex-basis: 200px; /* Initial size before growing/shrinking */  
  /* Shorthand: flex: 1 0 200px; */  
}
```

## Common Patterns

### Centering an element (the classic problem):

```
.parent { display: flex; justify-content: center; align-items: center; }
```

### Navigation bar:

```
.nav { display: flex; justify-content: space-between; align-items: center; }
```

## Key Takeaways

1. Flexbox works in one dimension — either row or column.
2. Use gap instead of margins for spacing between flex items.
3. `flex: 1` makes items grow equally to fill available space.
4. For two-dimensional layouts, combine Flexbox with CSS Grid.