

{ POWER.CODERS }

CSS Layout techniques

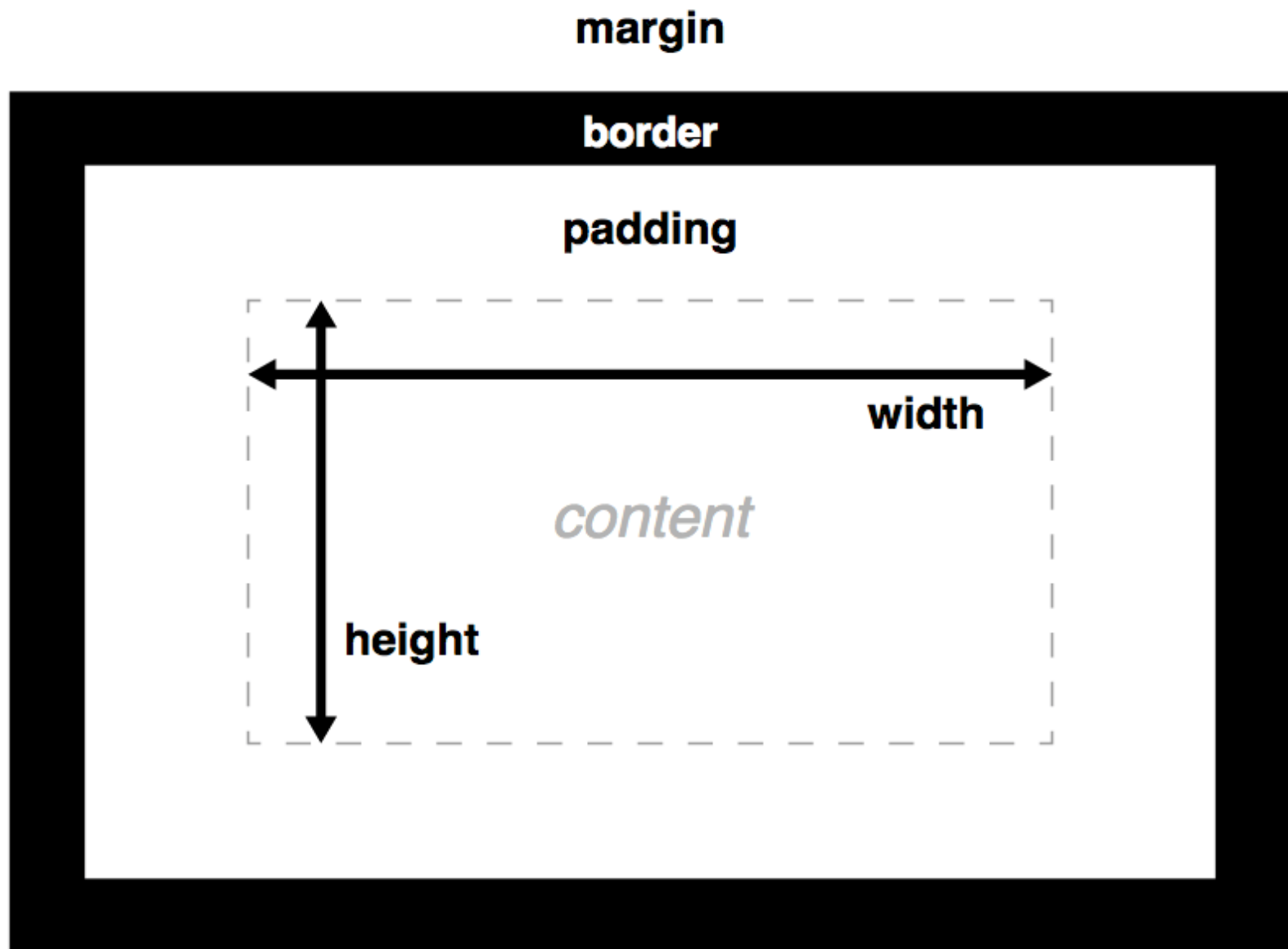
AGENDA

Today we will learn about different CSS layout techniques

- Box model
- Document flow
- CSS Flexbox
- CSS Grid
- CSS Multi columns

Box MODEL

A solid red horizontal line positioned directly beneath the 'Box' portion of the title 'Box MODEL'.



DEFAULT BOX RULES

- > `width` is the width of the content area
- > `height` is the height of the content area
- > `background` properties apply to padding as well as content
- > `padding` adds to the total size of the box
- > Like padding, `border` adds to the total size of the box

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- > Like padding, `border` adds to the total size of the box

Calculating the total height and width of elements can be difficult. Especially for responsive websites.

box-sizing: content-box

Default box rules apply

The total height of an element is the sum of

- > content height
- > plus padding-top and -bottom
- > plus border-top and -bottom

The total width of an element is the sum of

- > content width
- > plus padding-left and -right
- > plus border-left and -right

box-sizing: border-box

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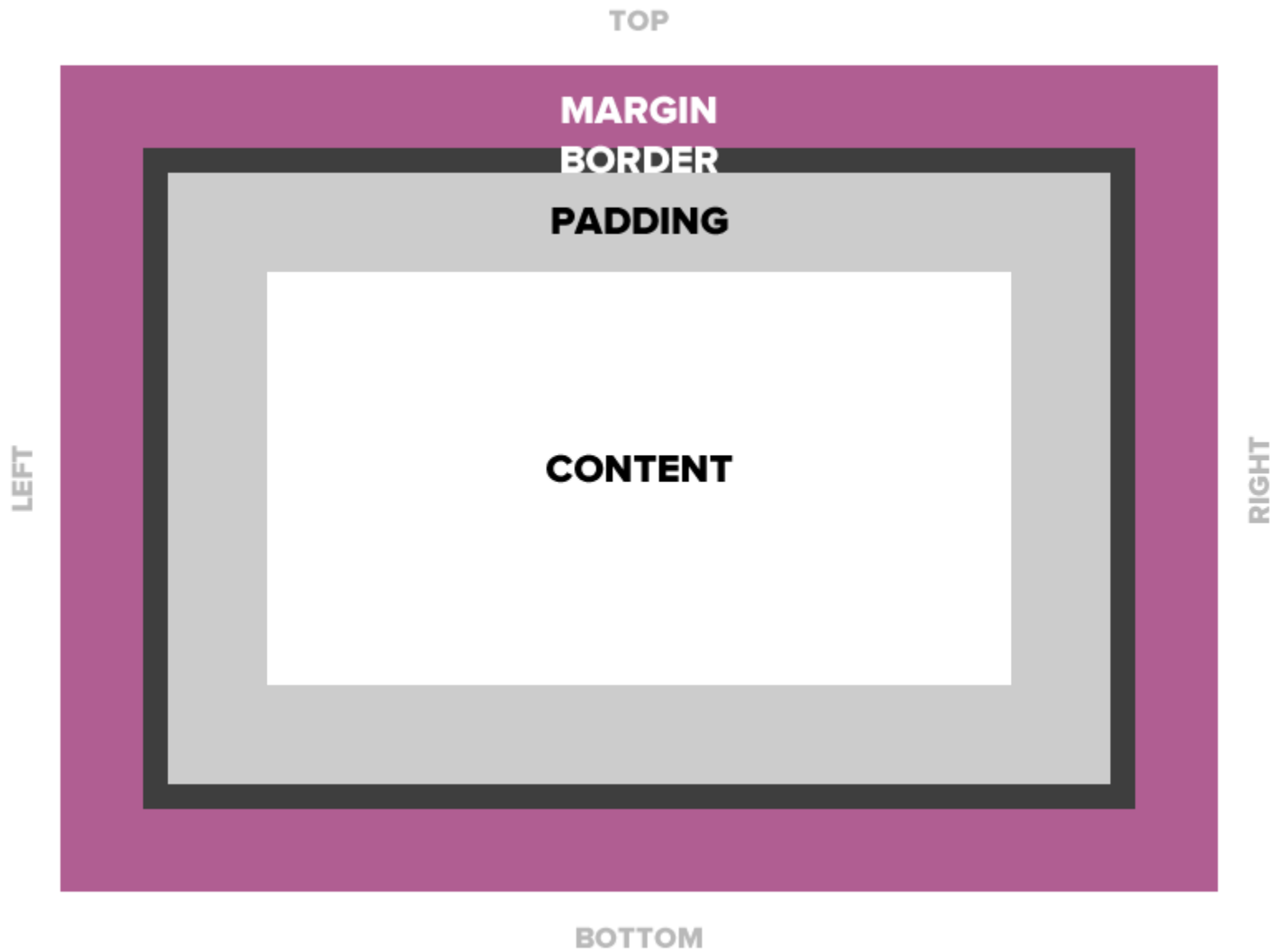
Best practice to use always this value

- The total height of an element is identical to the content height and includes padding and border.
- The total width of an element is identical to the content width and includes padding and border.

Set border-box **once** on html selector and inherit for all other elements.

BEST PRACTICE

```
html {  
  box-sizing: border-box;  
}  
  
*, *:before, *:after {  
  box-sizing: inherit;  
}
```



margin

Four values: 10px on top, 5px on right, 3px on bottom, 5px on left

```
margin: 10px 5px 3px 5px; /* clockwise order: top right bottom left */
```

Two values: 10px top and bottom, 15px left and right

```
margin: 10px 15px; /* top/bottom right/left */
```

One value: 15px on all side

```
margin: 15px;
```

One side: 10px only on top

```
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margin-top: 10px;
```

margin: auto

If a margin is set to auto on a box that has a given width, it will take up as much space as possible.

Centered

```
margin: auto;  
width: 50%;
```

Flush right

```
margin-left: auto;  
margin-right: 0.5rem;  
width: 50%;
```


MARGIN COLLAPSE

Collapsing margins happen when two **vertical margins** come in contact with one another. If one margin is **greater** than the other, then that margin overrides the other, leaving **one margin**.

This happens in these 3 cases:

- Adjacent sibling elements: sharing the same parent
- Parent and first / last child
- Empty blocks

AN EXAMPLE

```
<body>
  <h1>Title</h1>
  <p>Paragraph</p>
</body>
```

```
h1 {
  margin-bottom: 25px;
}

p {
  margin-top: 50px;
}
```

AN EXAMPLE

```
<body>
  <h1>Title</h1>
  <p>Paragraph</p>
</body>
```

```
h1 {
  margin-bottom: 25px;
}

p {
  margin-top: 50px;
}
```

You would expect 75px, but instead you get **50px** margin between the `h1` and the `p`. It's like the bigger margin ate the smaller one: **bigger margin = total vertical margin**

NEGATIVE MARGIN

```
h1 {  
  margin-bottom: -25px;  
}  
  
p {  
  margin-top: 50px;  
}
```

NEGATIVE MARGIN

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h1 {  
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p {  
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$$50\text{px} + (-25\text{px}) = 25\text{px}$$

NEGATIVE MARGIN

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h1 {  
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}  
  
p {  
  margin-top: 50px;  
}
```

$$50\text{px} + (-25\text{px}) = 25\text{px}$$

If one margin is negative, the negative margin is subtracted from the positive margin, reducing the total vertical margin.

If both margins are negative, the bigger negative margin eats the smaller one: **bigger negative margin = total negative vertical margin**

padding

Four values: 10px on top, 5px on right, 3px on bottom, 5px on left

```
padding: 10px 5px 3px 5px; /* clockwise order: top right bottom left */
```

Two values: 10px top and bottom, 15px left and right

```
padding: 10px 15px; /* top/bottom right/left */
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One value: 15px on all sides

```
padding: 15px;
```

One side: 10px only on top

* `background` properties apply to padding as well as content.

border

Borders are specified as "thickness, style, color."
You can specify each property separately, or all three together.

```
border: 1px solid #ff0000;
```

```
border-top: 4px dotted #000000;
```

```
border-width: 10px;  
border-style: dashed;  
border-color: #666666;
```

DOCUMENT FLOW



IT'S ALL ABOUT THE FLOW

Document flow is the arrangement of page elements, as defined by CSS positioning statements, and the order of HTML elements.

Regarding the order of the HTML elements, their definition as **inline** or **block-level** element defines the space they take up in the document.

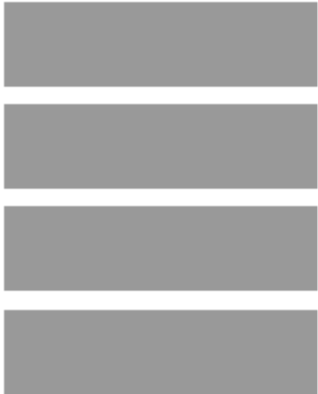
Document flow = how each element takes up space and how other elements position themselves accordingly.

FLOW OF HTML ELEMENTS

A thick red horizontal line underlining the first few letters of the title.

FLOW OF HTML ELEMENTS

BLOCK:



INLINE:



display

defines how an element is displayed. You can turn block-level elements to inline and vice versa.

```
a {  
  display: block; /* block-level element */  
}
```

```
h1 {  
  display: inline; /* inline element, will break at end of line */  
}
```

```
li {  
  display: inline-block; /* appears inline, does not break across lines */  
}
```

```
#footer {  
  display: none; /* hidden */  
}
```

display: inline-block

Block-level elements are stacked underneath each other in one **column**.

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Changing their `display`-property to `inline-block` results in a **row** of these elements.

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Block-level elements are stacked underneath each other in one **column**.

Changing their `display`-property to `inline-block` results in a **row** of these elements.

Is the maximum width of the parent (wrapping) container reached, the elements will automatically wrap into a new line.

TIPPS WHEN USING INLINE-BLOCK

`inline-block` elements need to have a **width** defined.

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Use `vertical-align` to make sure that the elements are aligned properly in one row.

When two elements with `display: inline-block` are sitting next to each other, whitespace between them becomes a space character. **Remove the whitespace.**

CSS POSITIONING



position: static

> Initial value to all elements

position: static

- Initial value to all elements
- Static positioned element stay **in-flow**

`position: relative`

- Relative positioned element stay in-flow, but **interact** with out-of-flow elements.

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- Acts as the container for out-of-flow children. The children respect the box boundaries of the relatively positioned element.

position: relative

- Relative positioned element stay in-flow, but **interact** with out-of-flow elements.
- Acts as the container for out-of-flow children. The children respect the box boundaries of the relatively positioned element.
- The content of a relative positioned box can be shifted out-of-flow by offset properties: top, right, bottom, left.

`position: absolute`

- > Absolute positioned element is removed from the flow entirely = **out-of-flow** element.

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- Absolute positioned element is removed from the flow entirely = **out-of-flow** element.
- Their position is **assigned to the first parent** element, which has a non-static position (relative, absolute, fixed or sticky).
- The offset properties (top, right, bottom, left) are based on the **top left corner** of that parent.
- Each absolute positioned elements get its **own layer**. You can stack the layer with the CSS property `z-index`.

`position: fixed`

- Fixed positioned element is removed from the flow entirely = out-of-flow element.

`position: fixed`

- Fixed positioned element is removed from the flow entirely = out-of-flow element.
- It is assigned a position to the viewport (browser window) and creates a new layer.

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`position: sticky`

- Mix between relative positioned element and fixed positioned element.

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- It acts like relative positioned until it is scrolled beyond a specific offset, then it turns to fixed position.

position: sticky

- Mix between relative positioned element and fixed positioned element.
- It acts like relative positioned until it is scrolled beyond a specific offset, then it turns to fixed position.
- Can is use position sticky?

float

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- Floated elements are **out-of-flow**. The parent container loses its content height and width.

Floated elements are still often used for typical website layouts.

CLEARFIX

Is used to solve the parent height problem of floated elements

```
.clearfix:before,  
.clearfix:after {  
  content: "";  
  display: table;  
}  
  
.clearfix:after {  
  clear: both;  
}  
  
.clearfix {  
  *zoom: 1;  
}
```

TIPPS WHEN USING FLOAT

Use the `.clearfix` snippet to ensure the parent element takes up enough space in the document flow.

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Use the `.clearfix` snippet to ensure the parent element takes up enough space in the document flow.

Use `clear` if you want following elements to move below the floated element.

CSS FLEXBOX



ALIGNMENT



DIRECTION



ORDER



SIZE

display: flex

> Use `display: flex;` to create a flex container.

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- > Use `justify-content` to define the horizontal alignment of items.

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- > Use `flex-direction` if you need columns instead of rows.

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- > Use `align-items` to define the vertical alignment of items.
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- > Use the `row-reverse` or `column-reverse` values to flip item order.

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- > Use `flex` to create flexible boxes that can stretch and shrink.

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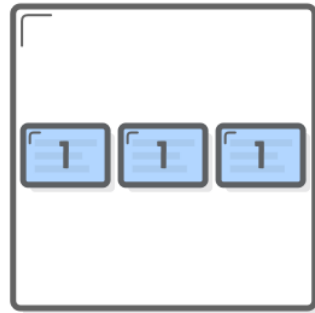
Flexbox is an easy way to create **responsive websites** as scalability is built-in.

FLEXIBLE CONTAINERS

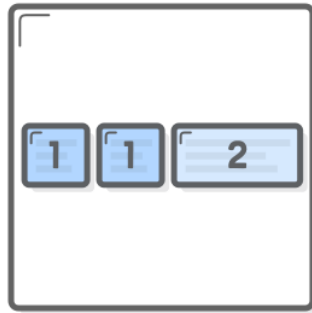
With the property `flex` on the items you have the first step for a responsive website.



NO FLEX



EQUAL FLEX

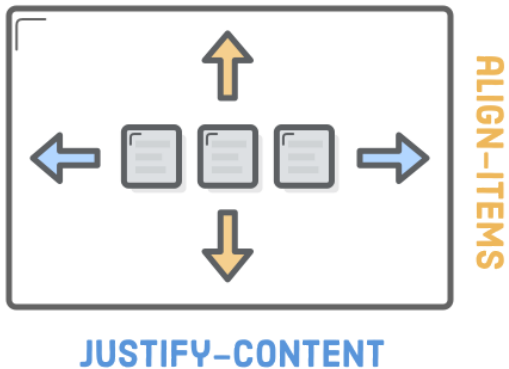


UNEQUAL FLEX

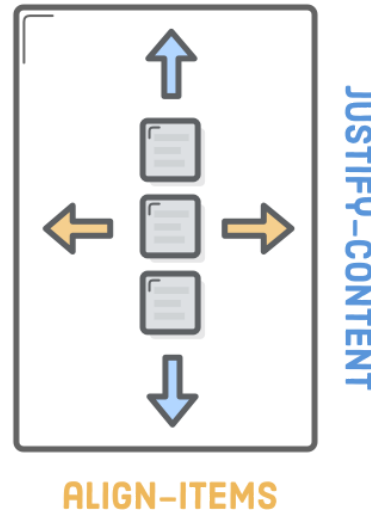
TIPPS WHEN USING FLEX

Depending on the `flex-direction` the properties **justify-content** and **align-items** switch meaning.

FLEX-DIRECTION: ROW;



FLEX-DIRECTION: COLUMN;



CSS GRID

It is the latest CSS layout technique.

All **major web browsers** support it though, so use it.

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- Use `grid-template-rows` to define the number (and height) of rows.
- Use `grid-template-columns` to define the number (and width) of columns.
- Use `grid-gap` or `grid-row-gap` / `grid-column-gap` to define the gutter between grid items.

`display: grid`

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- Auto-place items by using `grid-auto-rows`, `grid-auto-columns` and `grid-auto-flow`.

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- > Use `grid-template-areas` to define names for your grid, e.g. header, content, sidebar and footer.
- > Place the items in the grid by using `grid-column-start` and `grid-column-end`.
- > Auto-place items by using `grid-auto-rows`, `grid-auto-columns` and `grid-auto-flow`.
- > Use `justify-items` and `align-items` to align the items inside your grid.

CSS MULTI COLUMNS

Newspaper-style columns, often used as fallback for `flex` and `grid` layouts or for masonry-like layouts (like pinterest).

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- > Use `column-width` to define the width of each column.

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- > Use `column-rule` to display a vertical line between the columns.

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- > Use `column-span` on child elements you want to span all columns.

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- > Use `column-rule` to display a vertical line between the columns.
- > Use `column-span` on child elements you want to span all columns.
- > Use `break-inside` and similar properties on children to control content breaks.

REFERENCE SHEETS

- > CSS intro
- > CSS positioning

ONLINE RESSOURCES FOR CSS GRID

- > Complete Guide to Grid on CSS Tricks
- > Grid by Example by Rachel Andrew
- > The CSS Workshop by Jen Simmons
- > Spring Into CSS Grid by Joni Trythall

ONLINE RESSOURCES

- Youtube Channel: Layout Land by Jen Simmons
- Flexbox - a friendly tutorial for modern CSS Layouts
- CSS multiple column layout by Rachel Andrew
- Responsive CSS columns
- Visual guide for flexbox, grid and positioning
- Ten modern layouts in one line of CSS
- Sketching with CSS Cheatsheet

EXERCISES

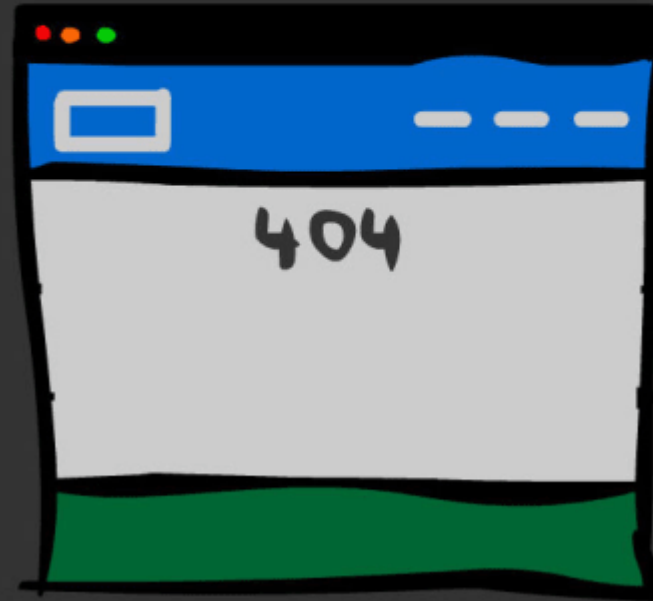


1. STICKY FOOTER

Definition: A sticky footer pattern is one where the footer of your page "sticks" to the bottom of the viewport in cases where the content is shorter than the viewport height.

Assignment: Create a basic website layout with a sticky footer at the bottom. Once with CSS grid, once with flex.

[Link to replit](#)



2. RESPONSIVE LAYOUT IN GRID AND FLEX

3. PLAY GAMES

- > CSS grid garden
- > Flexbox Froggy