Case study: Squarespace Layout

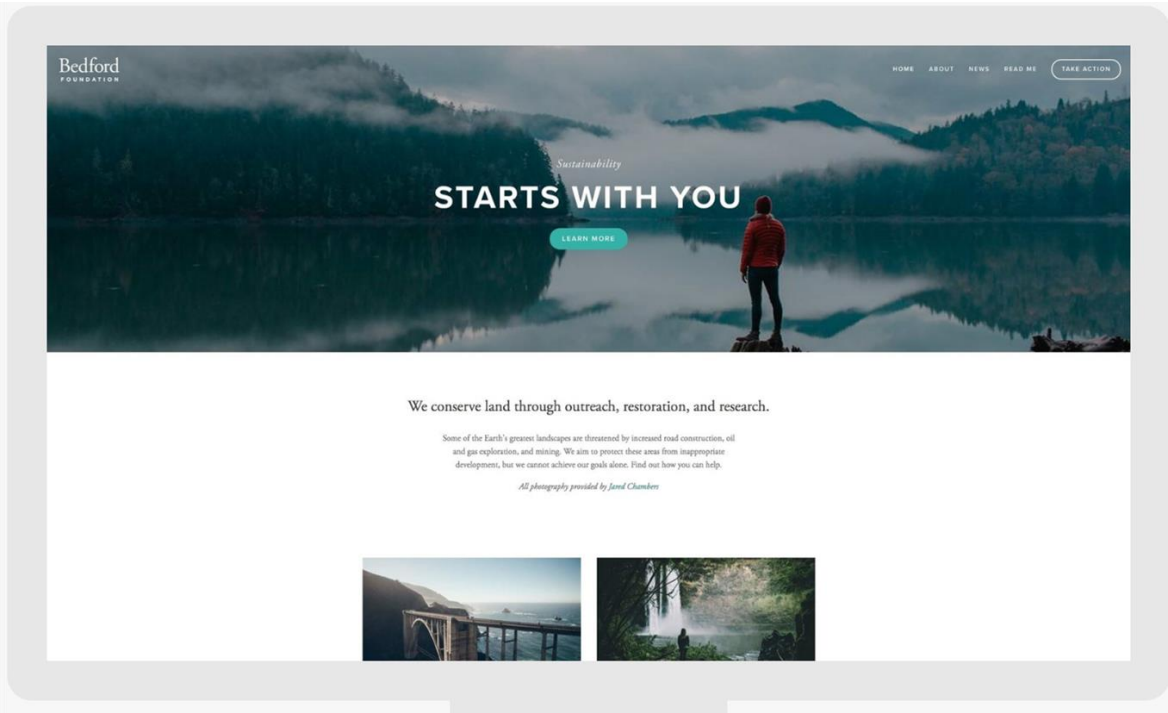
Case study: Squarespace Layout

- Flex box
- Misc helpful CSS

Layout exercise

Squarespace template

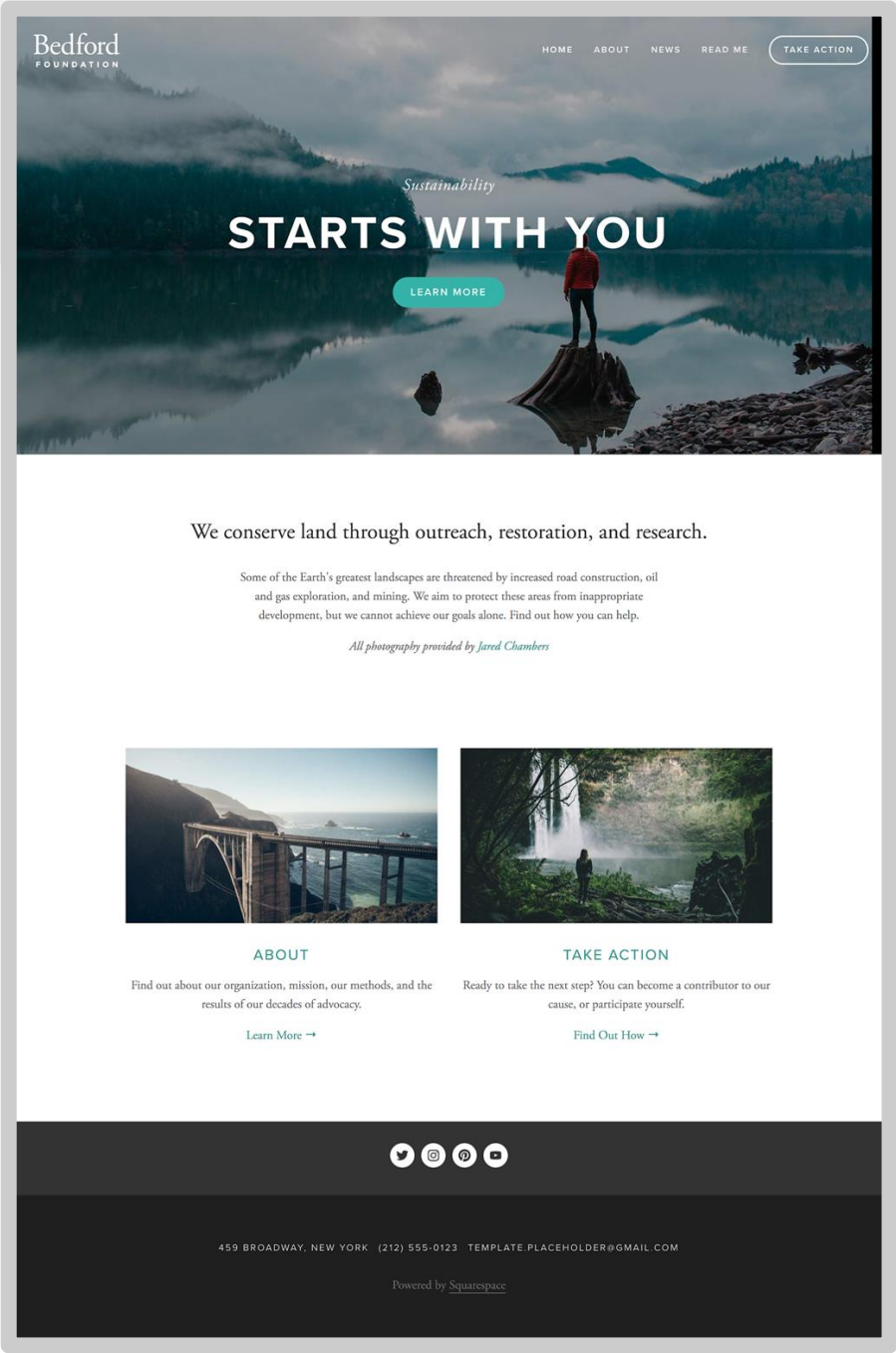
Squarespace's most popular template looks like this:



Q: Do we know enough to make something like that?

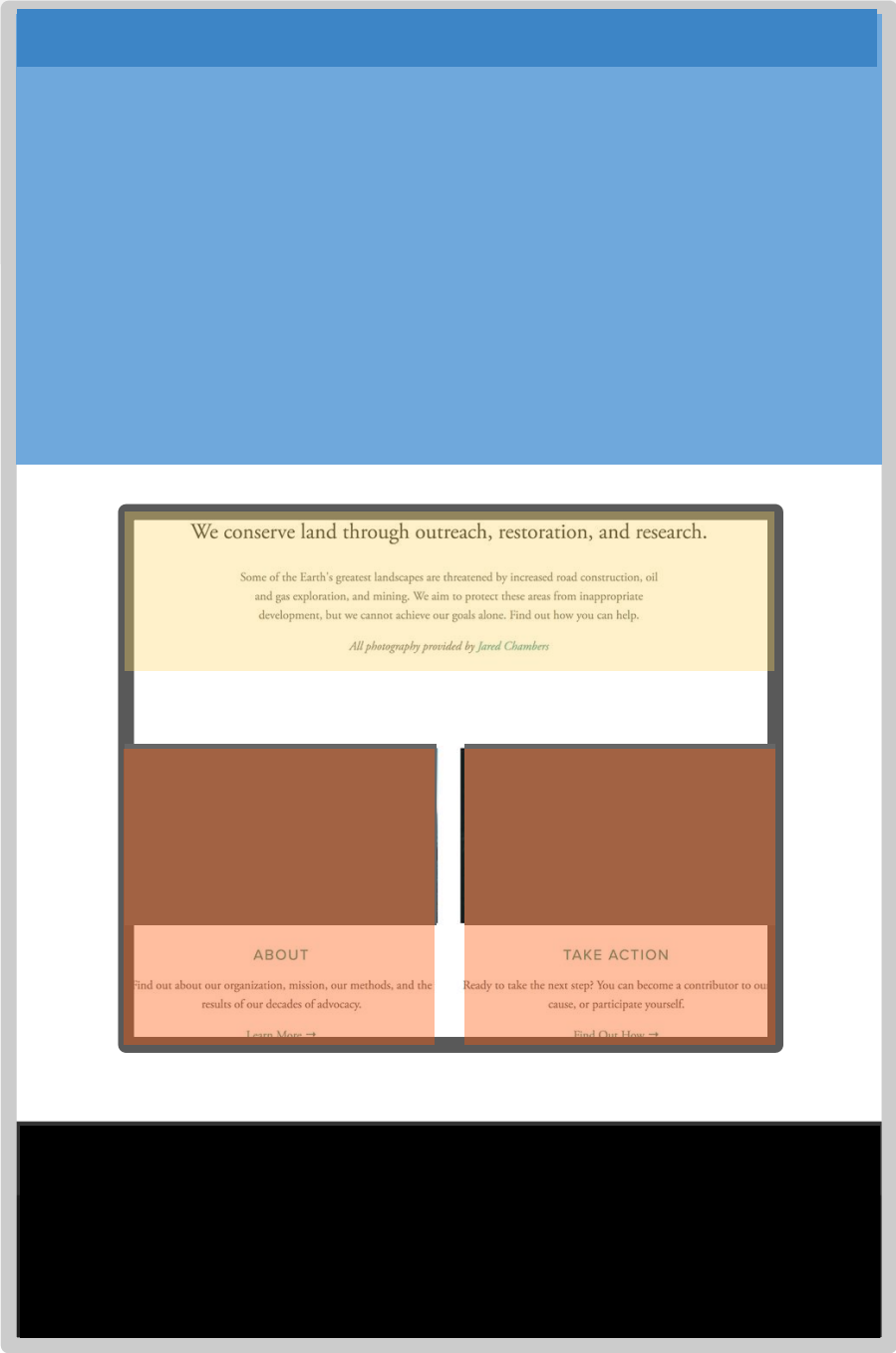
Basic shape

Begin visualizing the layout in terms of boxes:



Basic shape

Begin visualizing the layout in terms of boxes:

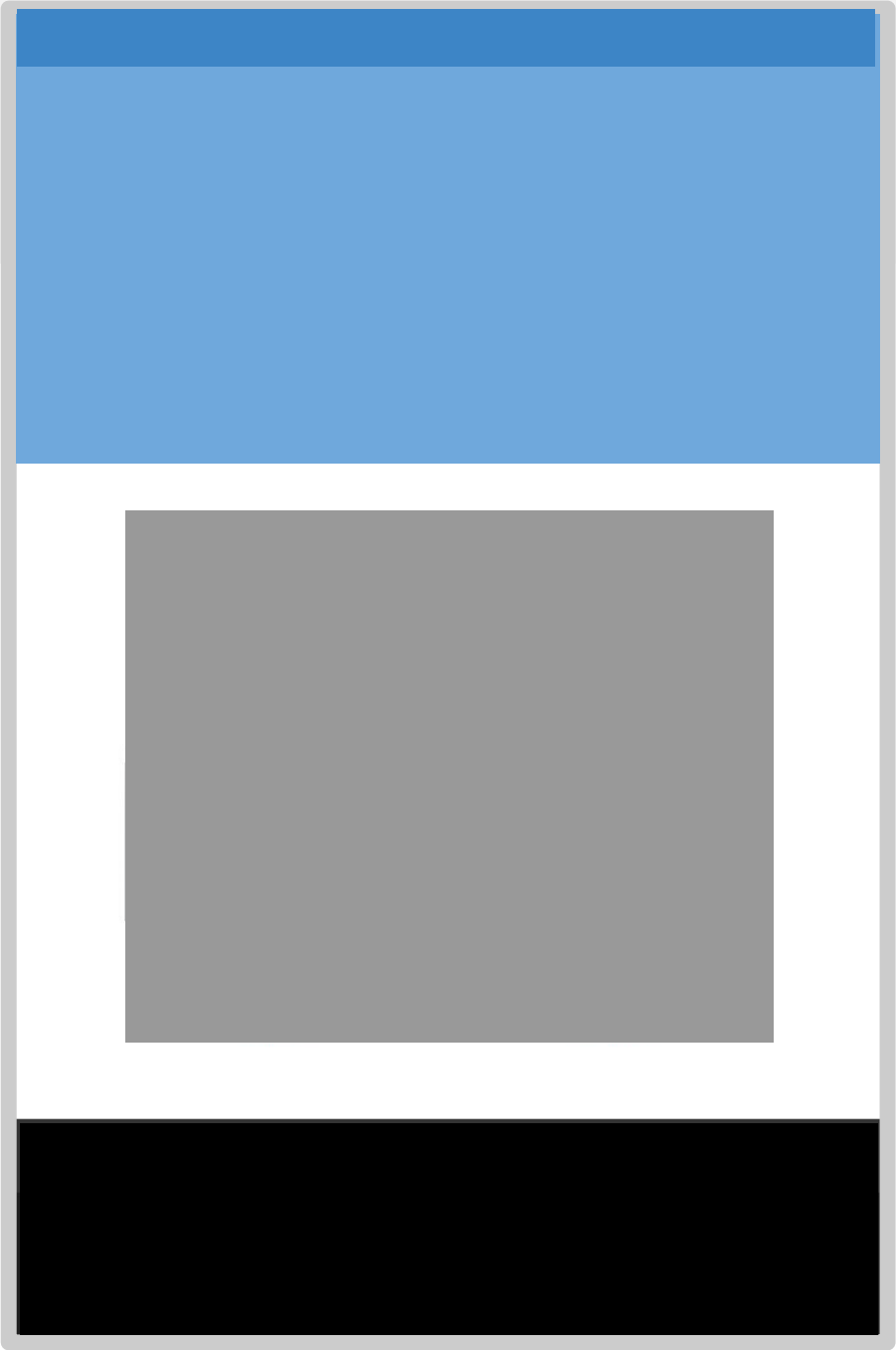


Basic shape

Begin visualizing the layout in terms of boxes:

Let's first try making this layout!

Codepen Link



Content Sectioning elements

Name	Description
`<p>`	Paragraph (mdn)
`<h1>-<h6>`	Section headings (mdn)
`<article>`	A document, page, or site (mdn) This is usually a root container element after body.
`<section>`	Generic section of a document (mdn)
`<header>`	Introductory section of a document (mdn)
`<footer>`	Footer at end of a document or section (mdn)
`<nav>`	Navigational section (mdn)

These elements do not "do" anything; they are basically more descriptive `<div>`s. Makes your HTML more readable. See MDN for more info.

Content Sectioning elements

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`<article>`	A document, page, or site (mdn) This is usu
`<section>`	Generic
`<header>`	Introdu
`<footer>`	Footer a
`<nav>`	Navigat

Prefer these elements to `<div>` when it makes sense!

These elements do not "do" anything, they are basically more descriptive `<div>`s. Makes your HTML more readable. See MDN for more info.

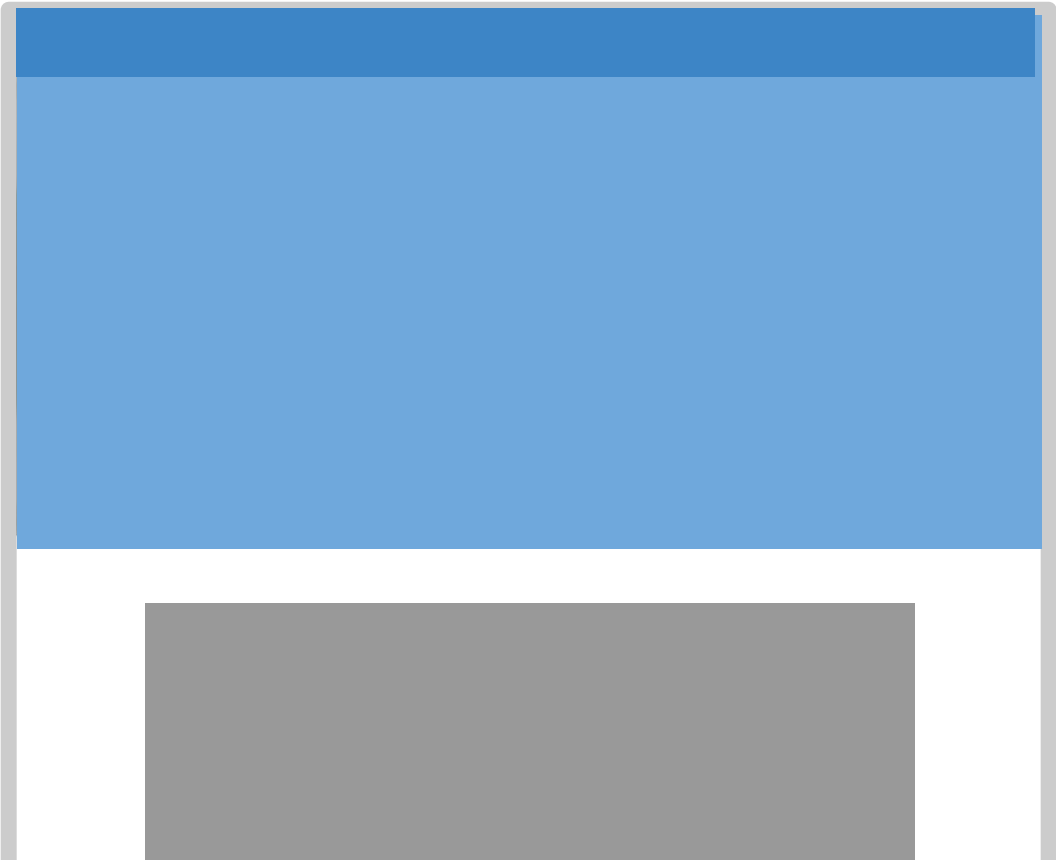
Header

Navbar:

- Height: 75px
- Background: royalblue
- <nav>

Header:

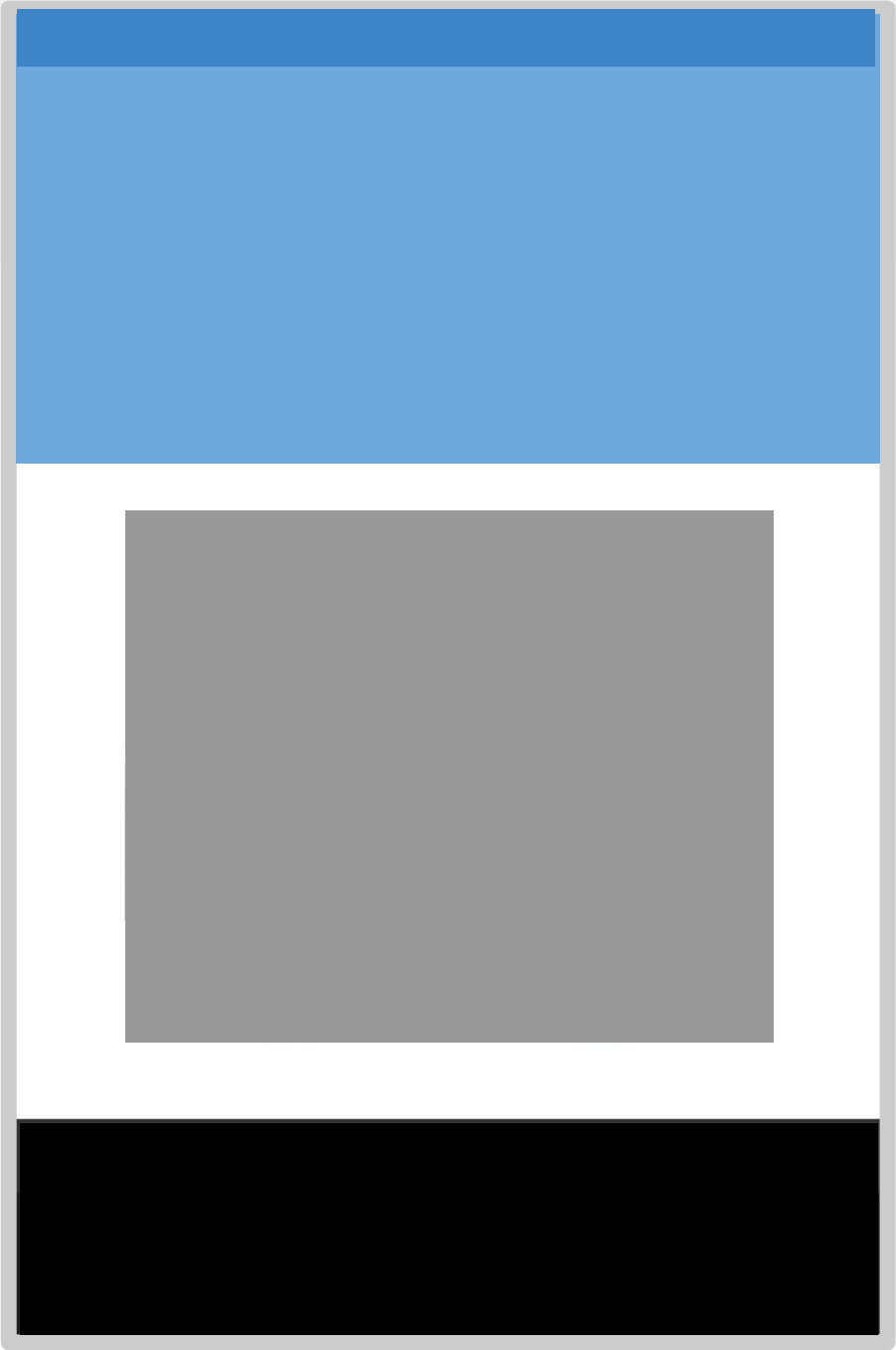
- Height: 400px;
- Background: lightskyblue
- <header>



Main section

Gray box:

- Surrounding space: 75px above and below; 100px on each side
- Height: 500px
- Background: gray
- `<section>`



Footer

Footer:

- Height: 100px
- Background: Black
- `<footer>`

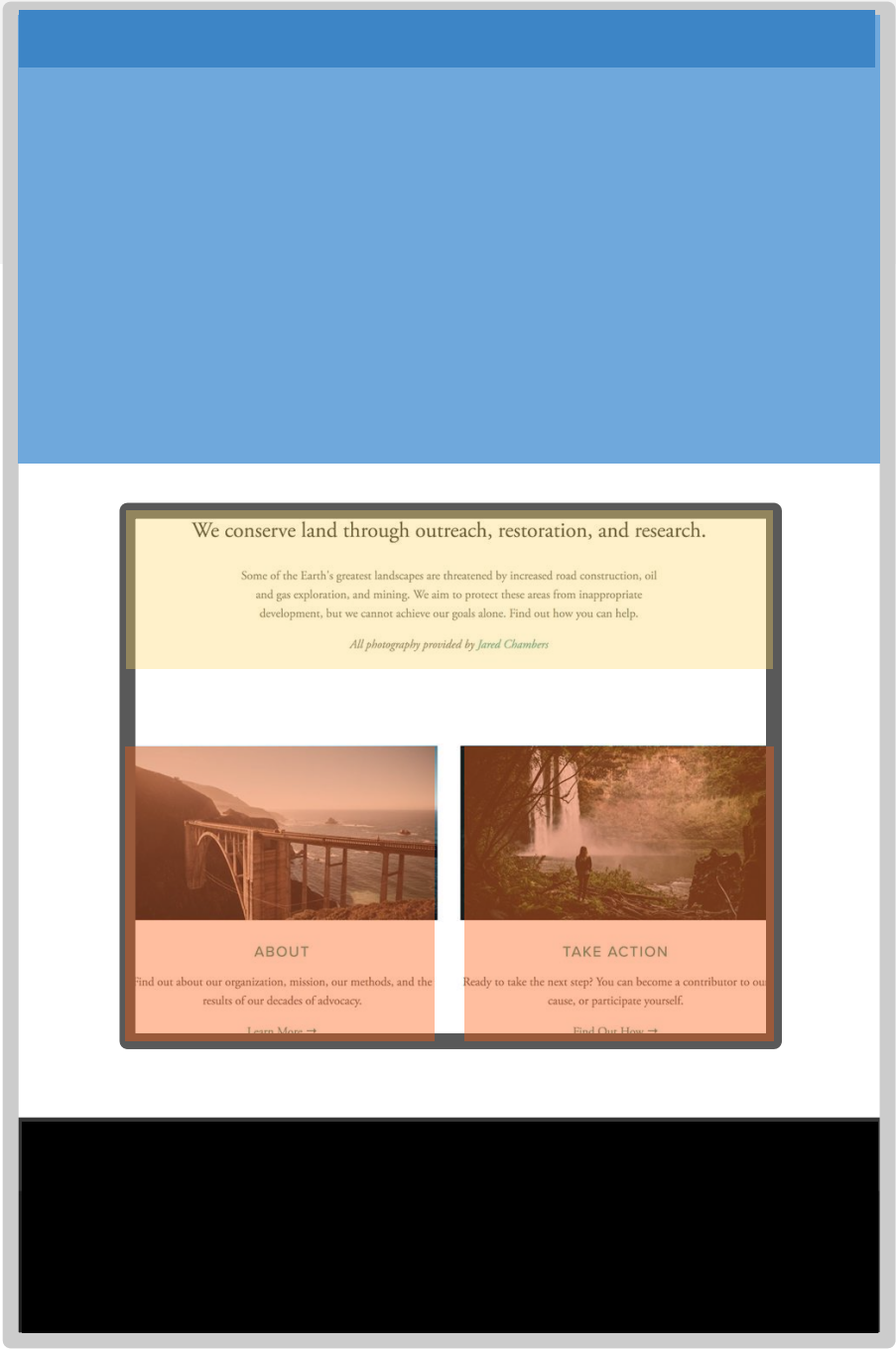
Main contents

Yellow paragraph:

- Height: 200px
- Background: khaki
- Space beneath: 75px
- `<p>`

Orange box:

- Height: 400px;
- Width: 48% of the parent's width, with space in between
- Background: tomato
- `<div>`

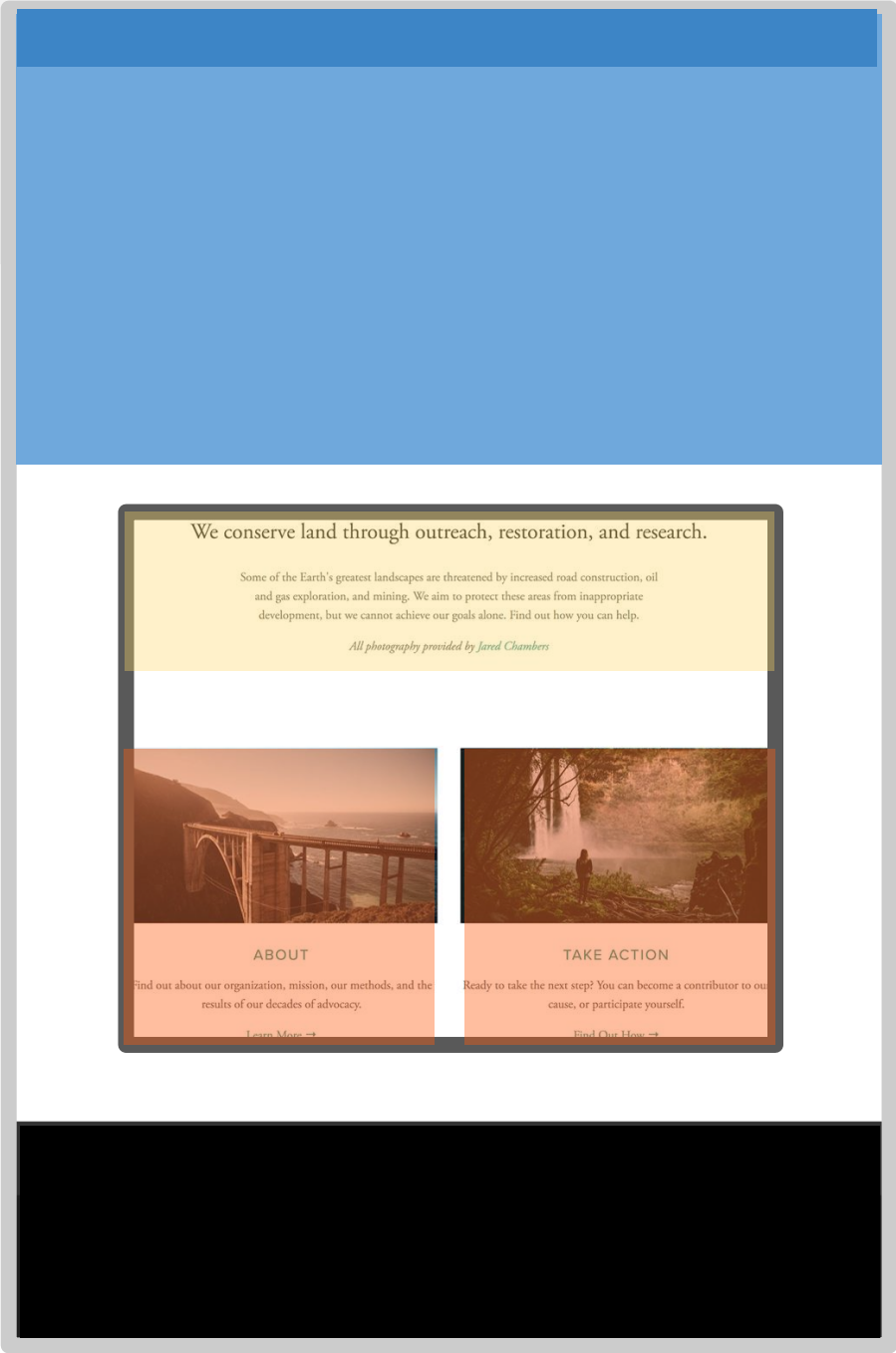


Main contents

Orange box:

- Height: 400px;
- Width: 48% of the parent's width, with space in between
- Background: tomato
- `<div>`

This is where we get stuck.



Flexbox

CSS layout so far

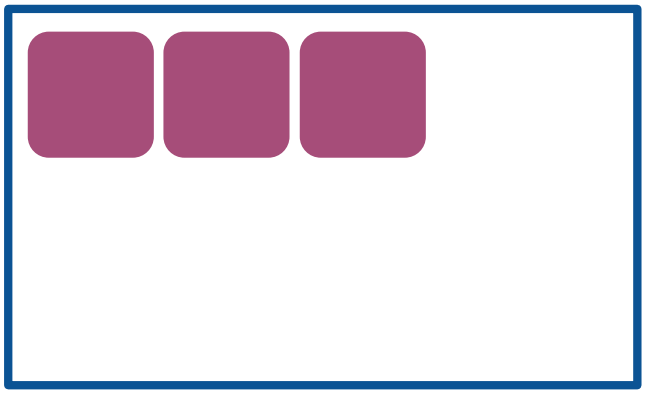
Block layout:
Laying out large sections of a page

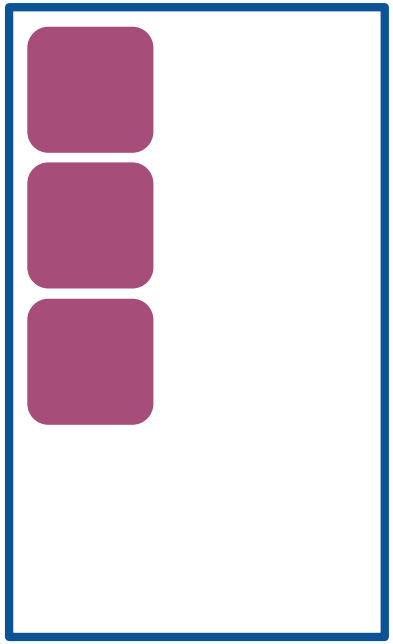
Inline layout:
Laying out text and other inline content within a section

Flex layout

To achieve more complicated layouts, we can enable a different kind of CSS layout rendering mode: **Flex layout.**

Flex layout defines a special set of rules for laying out items in rows or columns.

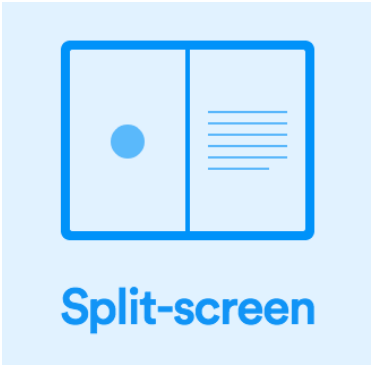


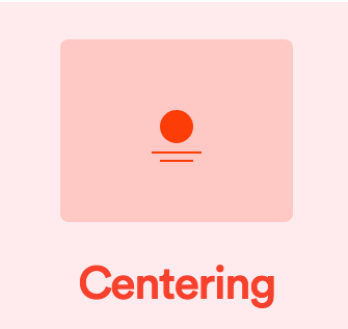


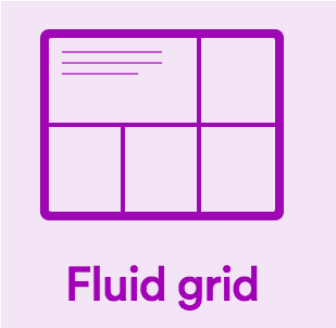
Flex layout

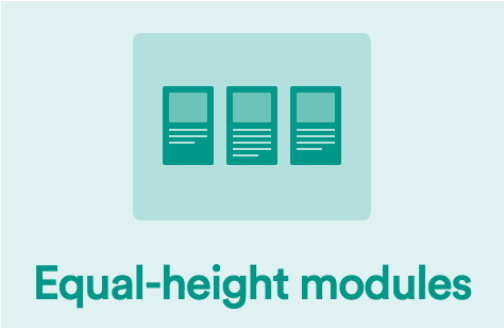
Flex layout solves all sorts of problems.

- Here are some examples of layouts that are easy to create with flex layout (and really difficult otherwise):









Flex layout

But today we're only covering the basics!

Flex layout solves all sorts o

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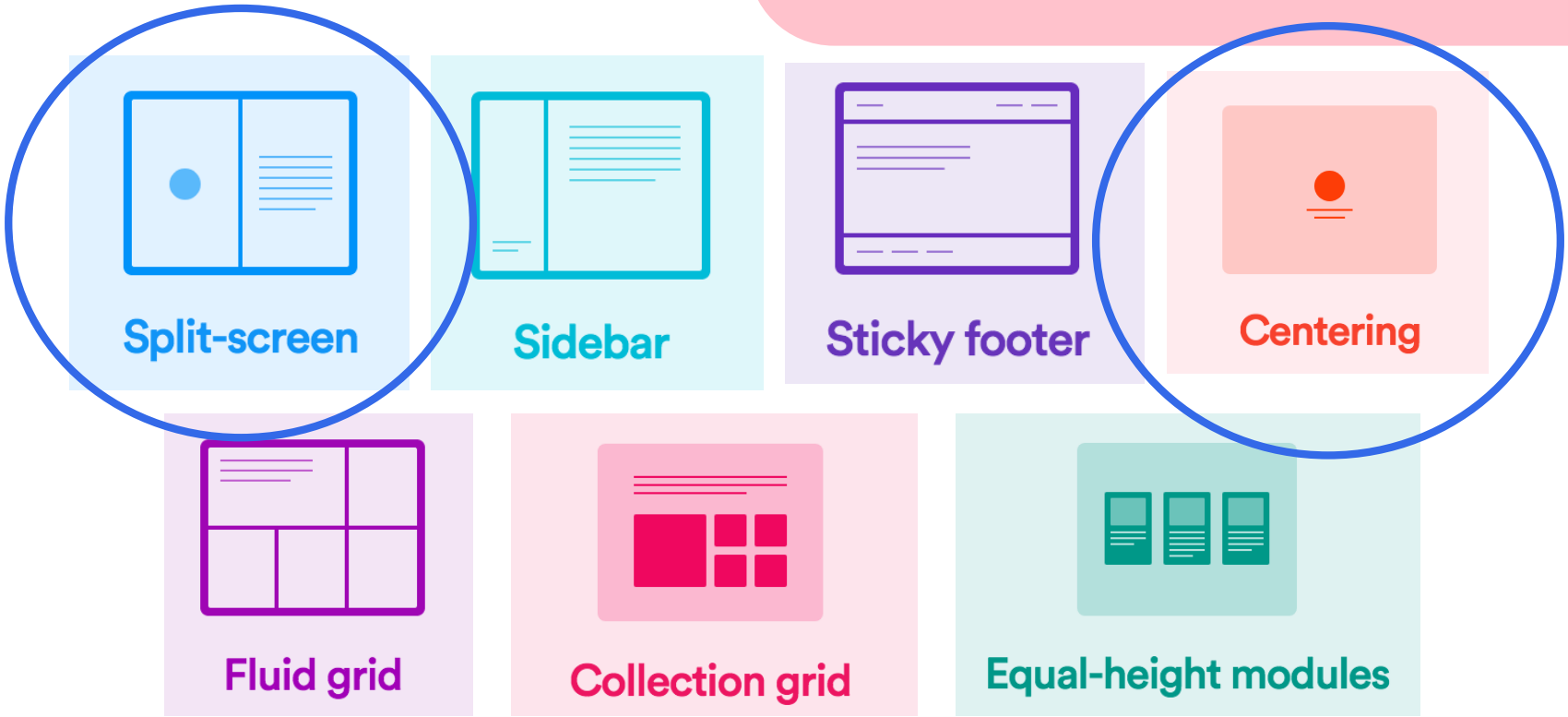
  flex layout (and really difficult

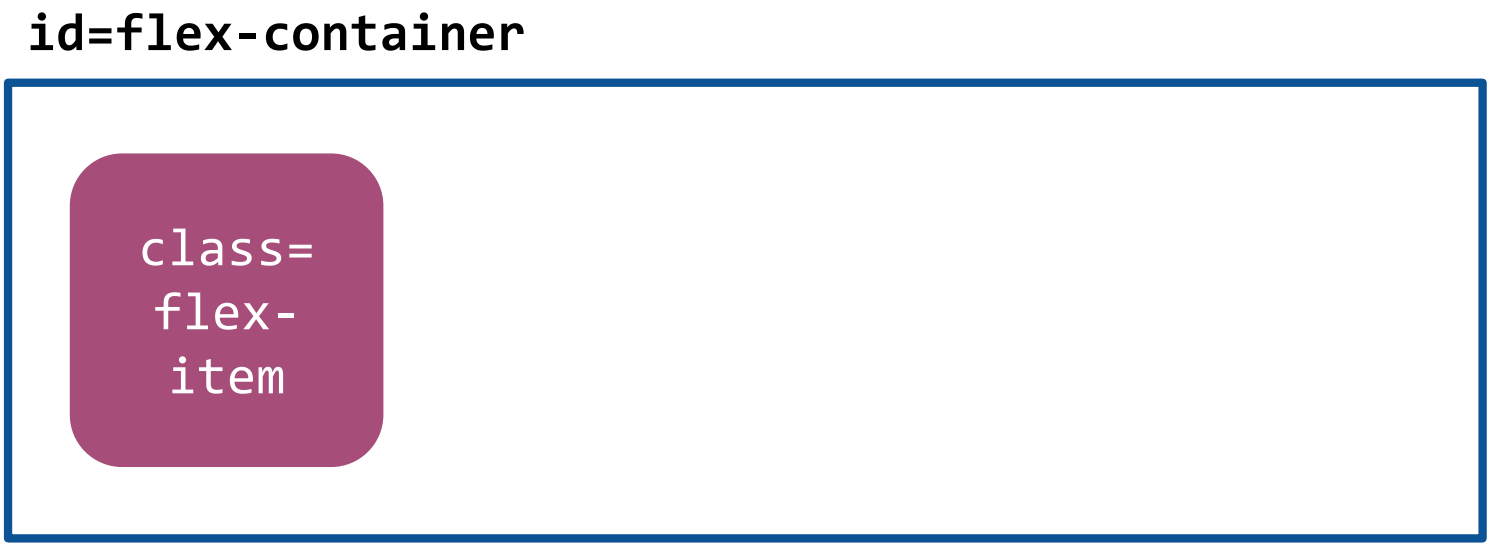


Flex basics

Flex layouts are composed of:

- A **Flex container**, which contains one or more:
  - **Flex item**(s)

You can then apply CSS properties on the **flex container** to dictate how the flex items are displayed.



Flex basics

To make an element a flex container, change `display`:

- Block container: `display: flex;` or
- Inline container: `display: inline-flex;`

Follow along in [Codepen]

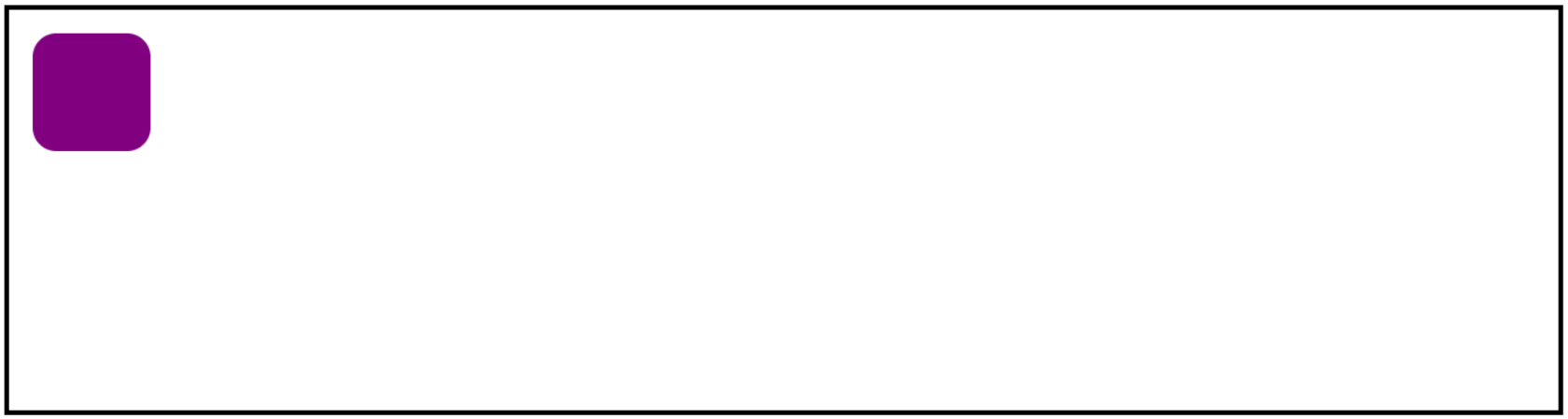
HTML

```html
<html>
  <head>
    <meta charset="utf-8">
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <div class="flex-item"></div>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  padding: 10px;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  height: 50px;
  width: 50px;
}
```

JS



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}

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  border-radius: 10px;
  background-color: purple;
  height: 50px;
```

(So far, this looks exactly the same as `display: block`)

Flex basics: `justify-content`

You can control where the item is horizontally* in the box by setting `justify-content` on the flex container:

```
#flex-container {
  display: flex;
  justify-content: flex-start;
}
```

*when flex direction is `row`. We'll get to what "flex direction" means soon.

Flex basics: `justify-content`

You can control where the item is horizontally* in the box by setting `justify-content` on the flex container:

```
#flex-container {
  display: flex;
  justify-content: flex-end;
}
```

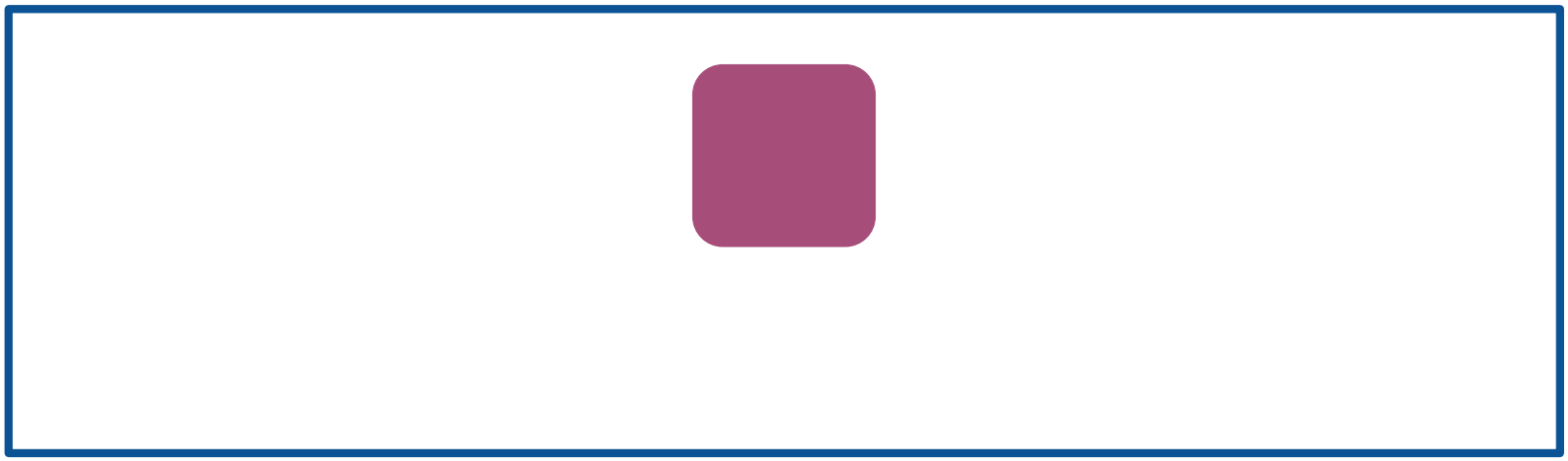
*when flex direction is `row`. We'll get to what "flex direction" means soon.

Flex basics: `justify-content`

You can control where the item is horizontally* in the box by setting `justify-content` on the flex container:

```
#flex-container {
  display: flex;
  justify-content: center;
}
```

*when flex direction is `row`. We'll get to what "flex direction" means soon.



Flex basics: `align-items`

You can control where the item is vertically* in the box by setting `align-items` on the flex container:

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#flex-container {
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#flex-container {
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*when flex direction is `row`. We'll get to what "flex direction" means soon.

Multiple items

Same rules apply with multiple flex items:

```
#flex-container {
  display: flex;
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  align-items: center;
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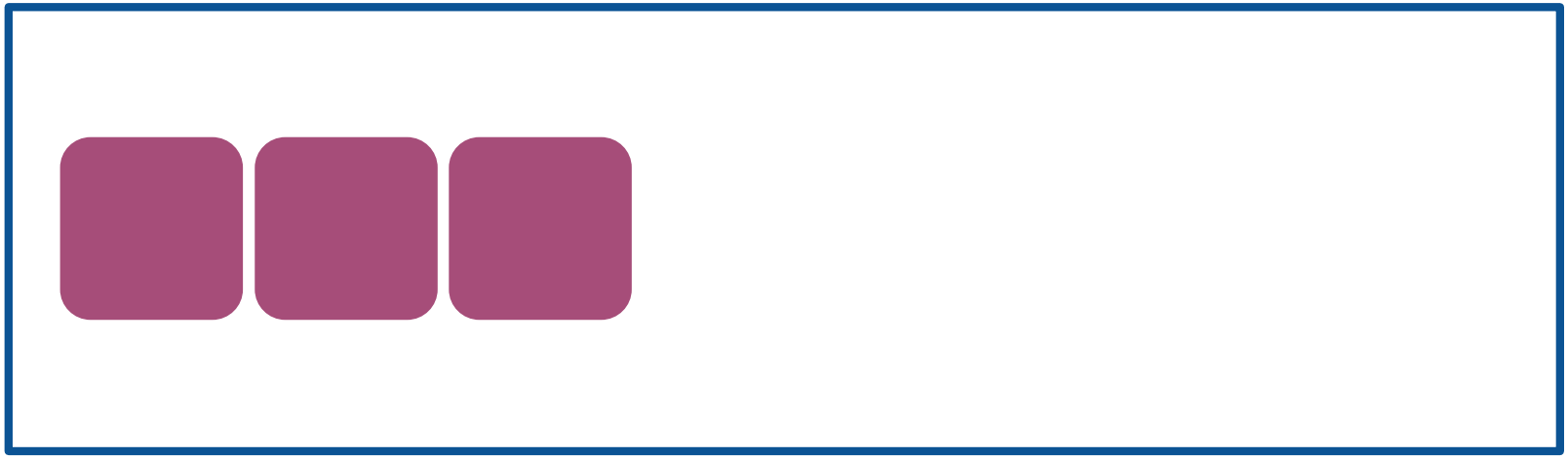
```



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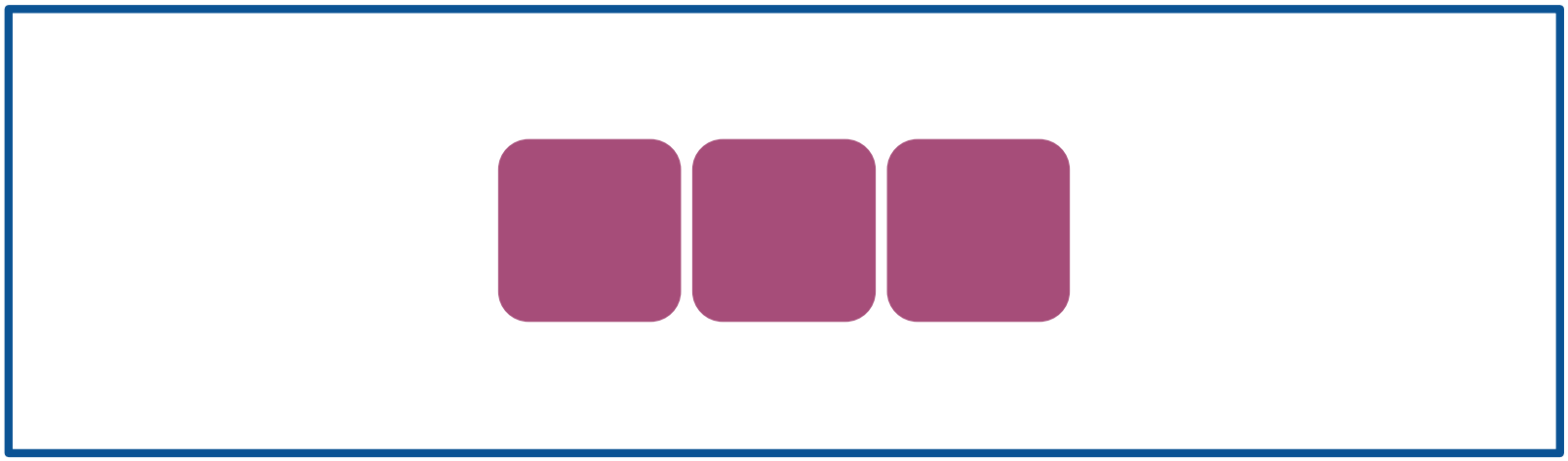
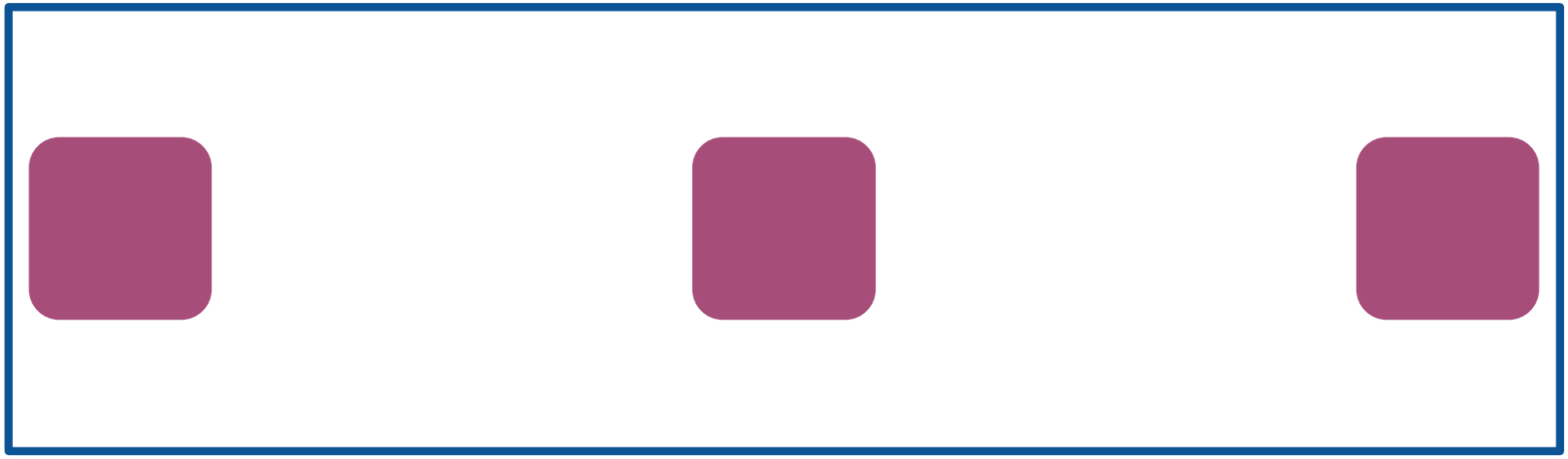


Multiple items

And there is also **space-between** and **space-around**:

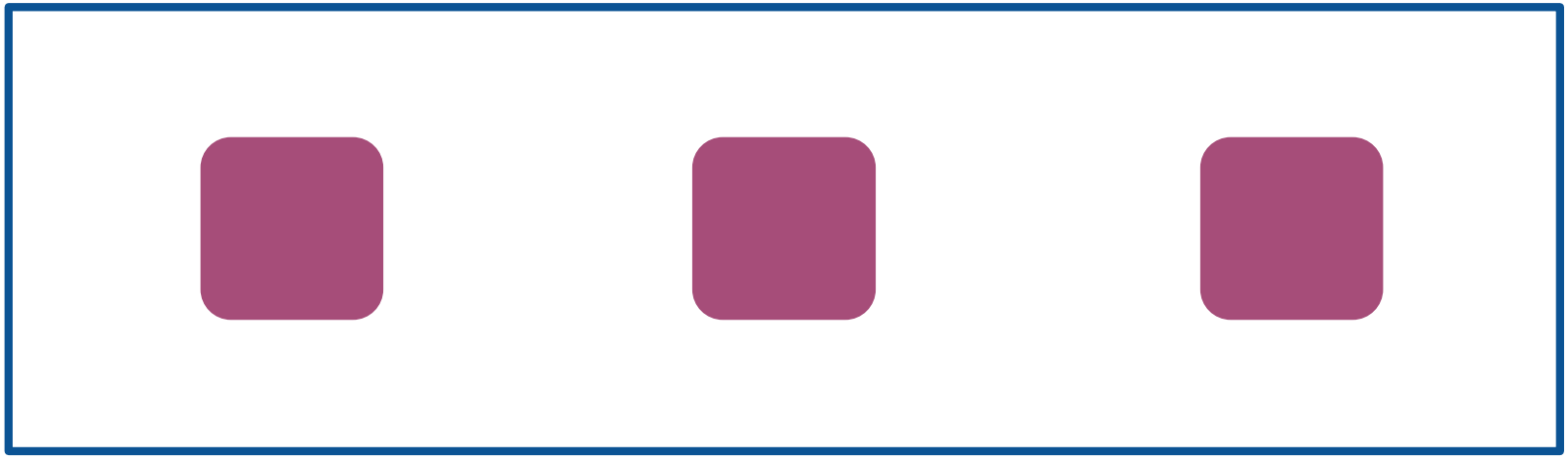
```
#flex-container {
  display: flex;
  Justify-content: space-between;
  align-items: center;
}
```



Multiple items

And there is also **space-between** and **space-around**:

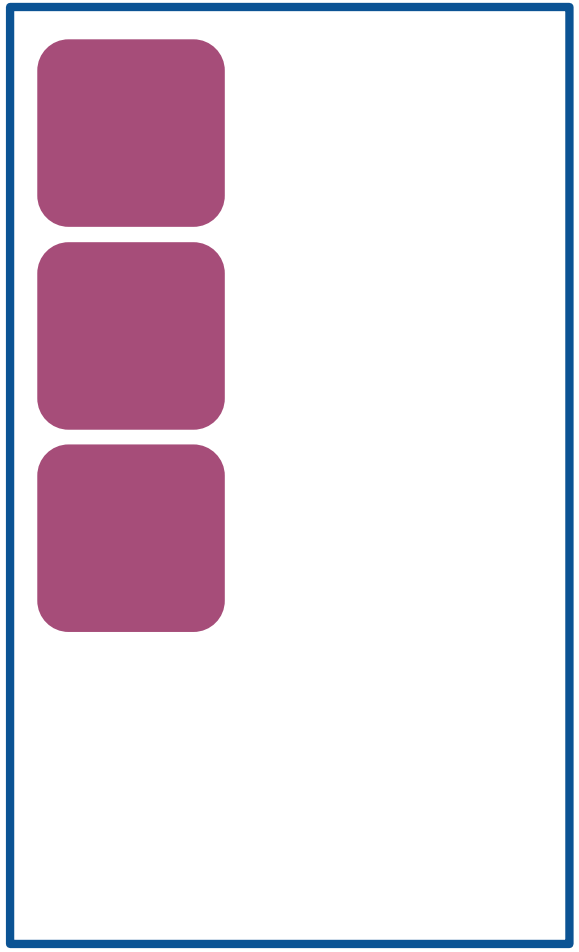
```
#flex-container {
  display: flex;
  Justify-content: space-around;
  align-items: center;
}
```



flex-direction

And you can also lay out columns instead of rows:

```
#flex-container {
  display: flex;
  flex-direction: column;
}
```



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```
#flex-container {
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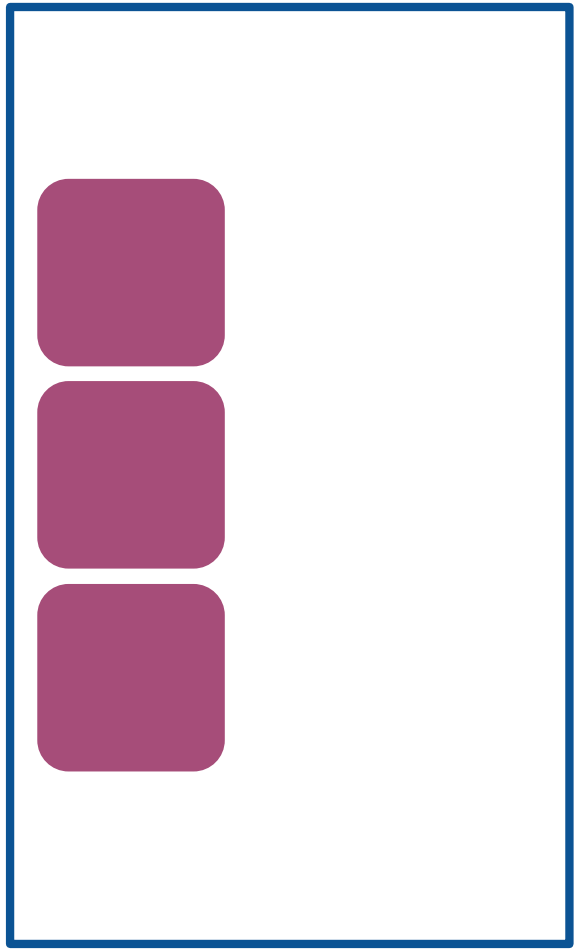
}
```

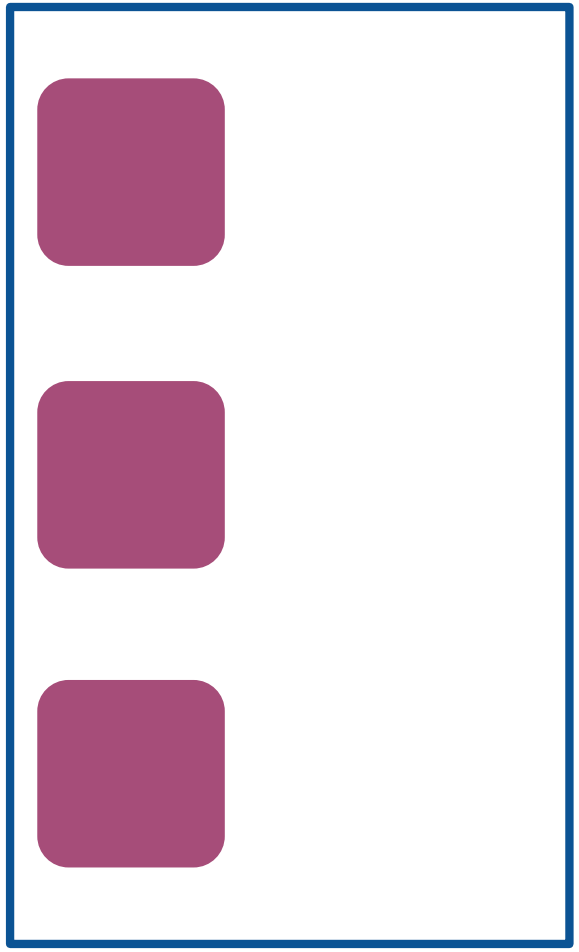


Now **`justify-content`** controls where the column is vertically in the box

flex-direction

And you can also lay out columns instead of rows:

```
#flex-container {
  display: flex;
  flex-direction: column;
  justify-content: space-around;
}
```



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flex-direction

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```
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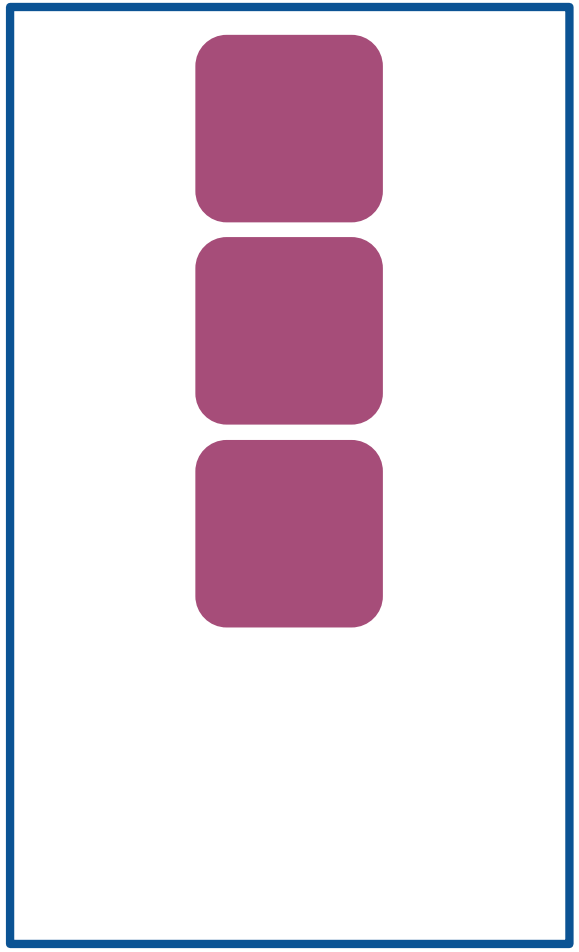
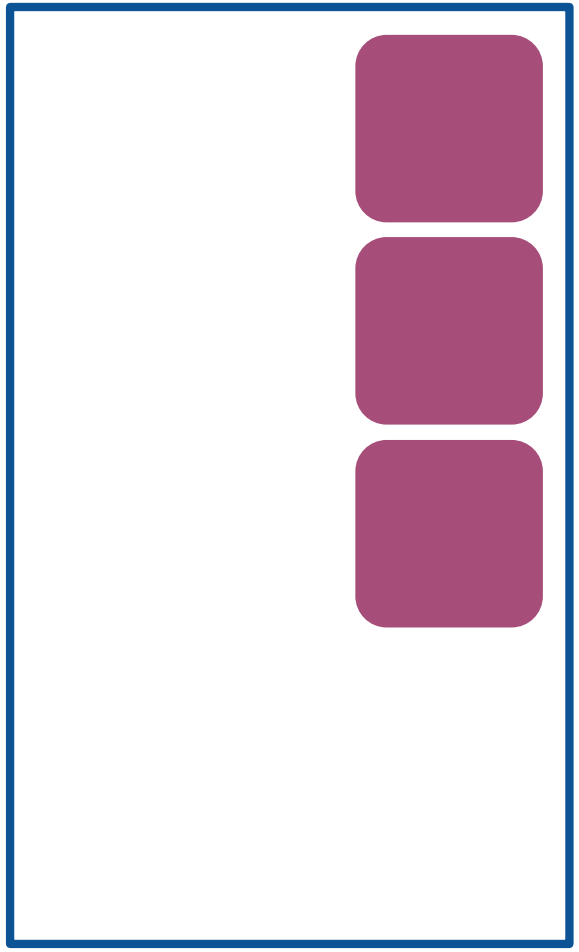


Now **`align-items`** controls where the column is horizontally in the box

flex-direction

And you can also lay out columns instead of rows:

```
#flex-container {
  display: flex;
  flex-direction: column;
  align-items: flex-end;
}
```



Now **`align-items`** controls where the column is horizontally in the box

Before we move on...

What happens if the flex item is an inline element?

HTML

```html
<html>
  <head>
    <meta charset="utf-8">
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <span class="flex-item"></span>
      <span class="flex-item"></span>
    </div>

  </body>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  height: 50px;
  width: 50px;
  margin: 5px;
}
```

JS

???

HTML

```html
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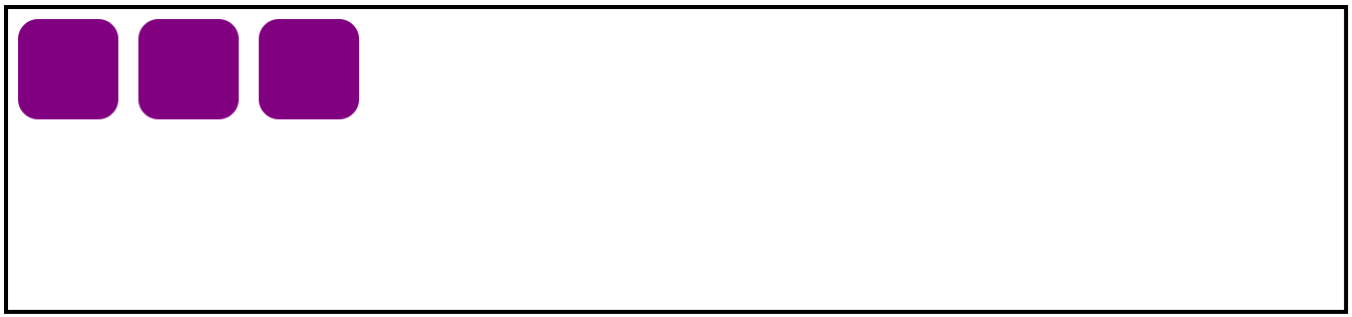

Recall: block layouts

If `#flex-container` was **not** `display: flex`:

HTML

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```

Then the span `flex-items` would not show up because span elements are inline, which don't have a height and width

Flex layouts

HTML

```html
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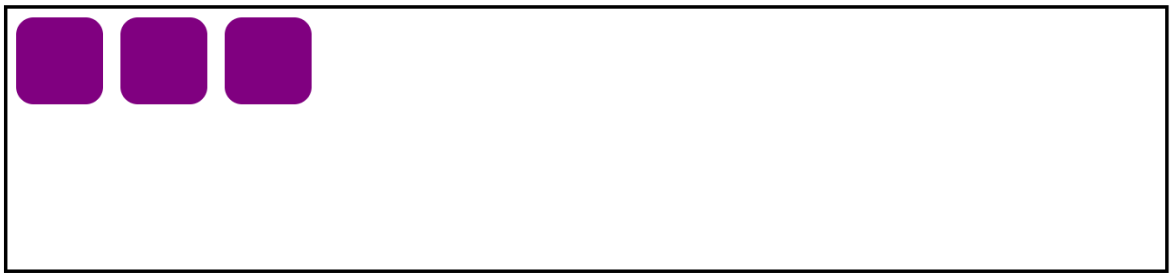


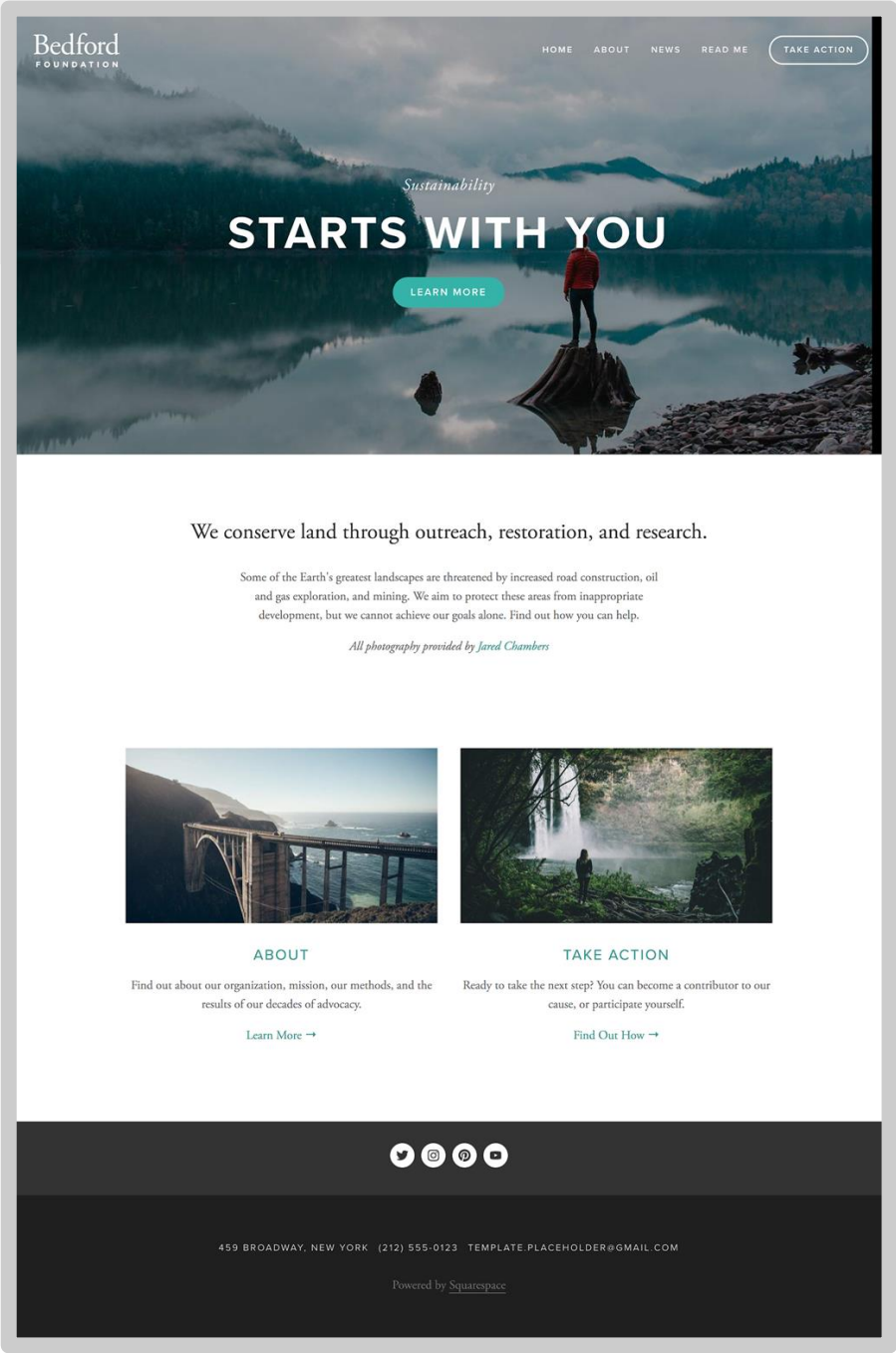
Why does this change when `display: flex`?

Why do inline elements suddenly seem to have height and width?

Break time!

Goal

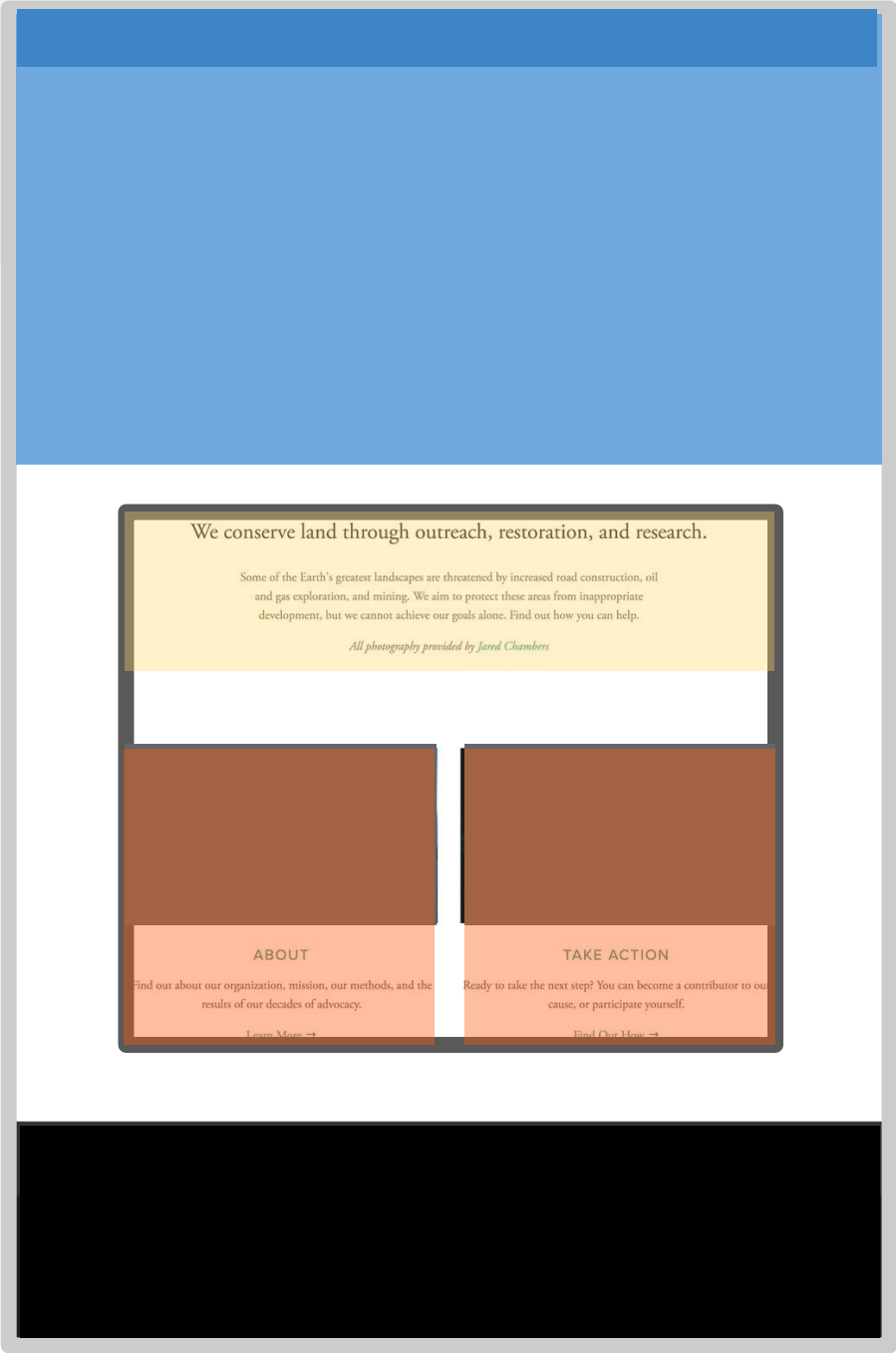
We were trying to create a layout that looks sort of like this:



Status

We broke up the layout into a bunch of colored boxes:

And we got kind of stuck trying to position the orange boxes.



Recall: block layouts

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Then the span `flex-items` would not show up because span elements are inline, which don't have a height and width

(Review block and inline!)

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  height: 50px;
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  margin: 5px;
}
```

(Please make sure you completely understand why the elements do not show up!)

Check out **block vs inline guide**

What happens if the flex item is an inline element?

HTML

```html
<html>
  <head>
    <meta charset="utf-8">
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <span class="flex-item"></span>
      <span class="flex-item"></span>
    </div>

  </body>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  height: 50px;
  width: 50px;
  margin: 5px;
}
```

JS

???

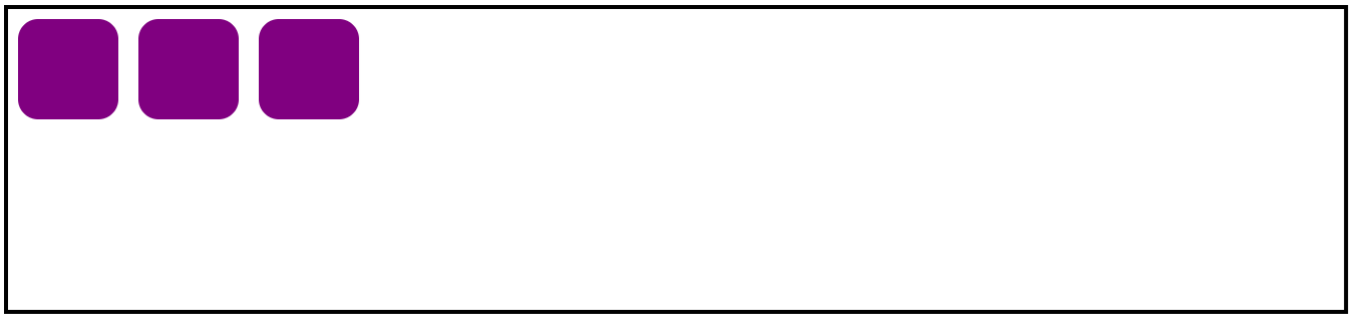
HTML

```html
<html>
  <head>
    <meta charset="utf-8">
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <span class="flex-item"></span>
      <span class="flex-item"></span>
    </div>

  </body>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  height: 50px;
  width: 50px;
  margin: 5px;
}
```

JS



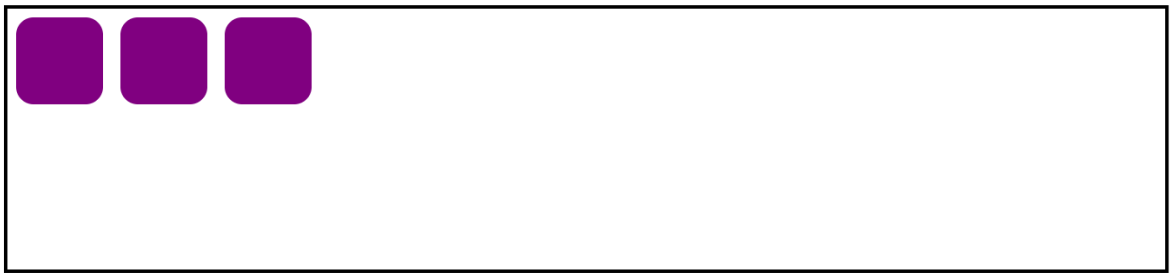
Flex layouts

HTML

```html
<html>
  <head>
    <meta charset="utf-8">
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <span class="flex-item"></span>
      <span class="flex-item"></span>
    </div>

  </body>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  height: 50px;
  width: 50px;
  margin: 5px;
}
```



Why does this change when `display: flex`?

Why do inline elements suddenly seem to have height and width?

Flex: A different rendering mode

- When you set a container to `display: flex`, the direct children in that container are **flex items** and follow a new set of rules.
- **Flex items are not block or inline;** they have different rules for their height, width, and layout.
  - The *contents* of a flex item follow the usual block/inline rules, relative to the flex item's boundary.
- The **height** and **width** of flex items are… complicated.

Follow along on CodePen

Flex item sizing

Flex basis

Flex items have an initial width*, which, by default is either:

- The content width, or
- The explicitly set **`width`** property of the element, or
- The explicitly set **`flex-basis`** property of the element

This initial width* of the flex item is called the **flex basis**.

*width in the case of rows; height in the case of columns

Flex basis

Flex items have an initial width*, which, by default is either:

- The content width, or
- The explicitly set **`width`** property of the element, or
- The explicitly set **`flex-basis`** property of the element

This initial width* of the flex item is called the **flex basis**.

The explicit width* of a flex item is respected *for all flex items*, regardless of whether the flex item is inline, block, or inline-block.

*width in the case of rows; height in the case of columns

Flex basis

If we unset the `height` and `width`, our flex items disappears, because the **flex basis** is now the content size, which is empty:

HTML

```html
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <div class="flex-item"></div>
      <span class="flex-item"></span>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  margin: 5px;
}
```

`flex-shrink`

The width* of the flex item can automatically shrink **smaller than the flex basis** via the **`flex-shrink`** property:

`flex-shrink`:

- If set to 1, the flex item shrinks itself as small as it can in the space available.
- If set to 0, the flex item does not shrink.

Flex items have `flex-shrink`: 1 by default.

*width in the case of rows; height in the case of columns

```
#flex-container {
  display: flex;
  align-items: flex-start;
  border: 2px solid black;
  height: 150px;
}
```

```
.flex-item {
  width: 500px;
  height: 100px;

  border-radius: 10px;
  background-color: purple;
  margin: 5px;
}
```

The flex items' widths all shrink to fit within the container.

```
#flex-container {
  display: flex;
  align-items: flex-start;
  border: 2px solid black;
  height: 150px;
}
```

```
.flex-item {
  width: 500px;
  height: 100px;
  flex-shrink: 0;

  border-radius: 10px;
  background-color: purple;
  margin: 5px;
}
```

Setting `flex-shrink: 0;` undoes the shrinking behavior, and the flex items do not shrink in any circumstance:

`flex-grow`

The width* of the flex item can automatically **grow larger than the flex basis** via the `flex-grow` property:

`flex-grow`:

- If set to 1, the flex item grows itself as large as it can in the space remaining.
- If set to 0, the flex-item does not grow.

Flex items have `flex-grow: 0` by default.

*width in the case of rows; height in the case of columns

flex-grow example

Let's unset the height and width of our flex items again:

HTML

```html
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <div class="flex-item"></div>
      <span class="flex-item"></span>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  background-color: purple;
  margin: 5px;
}
```

flex-grow example

If we set `flex-grow: 1`, the flex items fill the empty space:

HTML

```html
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <div class="flex-item"></div>
      <span class="flex-item"></span>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  flex-grow: 1;
  background-color: purple;
  margin: 5px;
}
```

Flex item height**?!

Note that `flex-grow` only controls width*.

So why does the height** of the flex items seem to "grow" as well?

HTML

```html
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <div class="flex-item"></div>
      <span class="flex-item"></span>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  flex-grow: 1;
  background-color: purple;
  margin: 5px;
}
```

*width in the case of rows; height in the case of columns

**height in the case of rows; width in the case of columns

align-items: stretch;

The default value of `align-items` is `stretch`, which means every flex item grows vertically* to fill the container by default.

(This will not happen if the `height` on the flex item is set)

HTML

```html
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <div class="flex-item"></div>
      <span class="flex-item"></span>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  flex-grow: 1;
  background-color: purple;
  margin: 5px;
}
```

*vertically in the case of rows; horizontally in the case of columns

align-items: stretch;

If we set another value for `align-items`, the flex items disappear again because the height is now content height, which is 0:

HTML

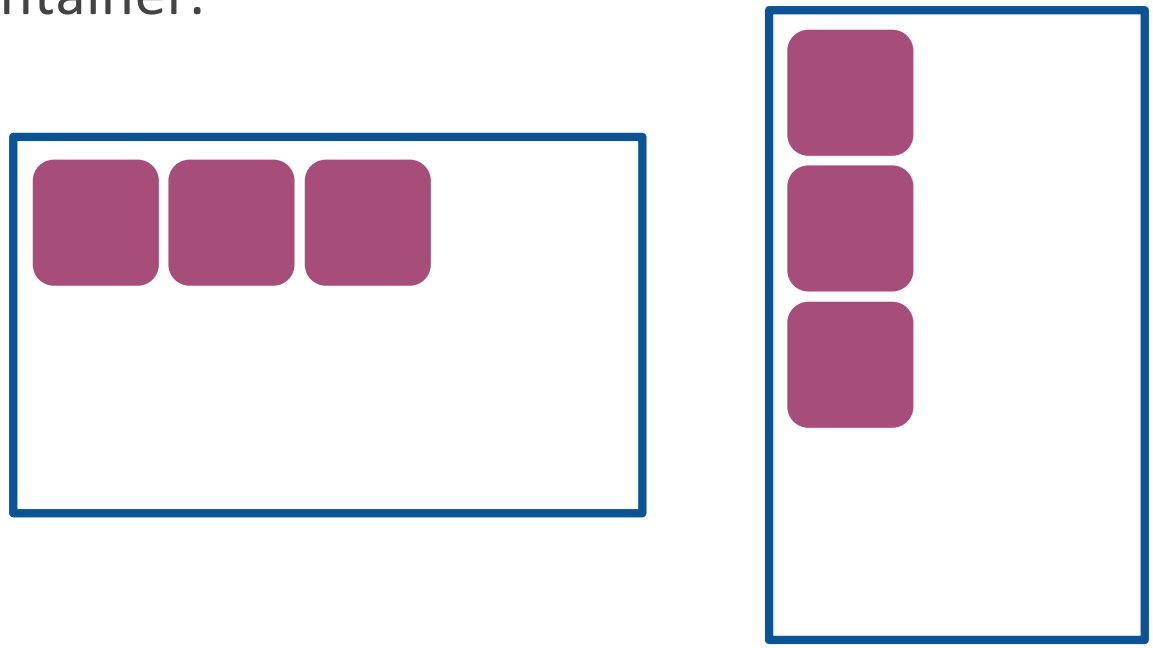
```html
    <title>Flexbox example</title>
  </head>
  <body>

    <div id="flex-container">
      <span class="flex-item"></span>
      <div class="flex-item"></div>
      <span class="flex-item"></span>
    </div>

  </body>
</html>
```

CSS

```css
#flex-container {
  display: flex;
  align-items: flex-start;
  border: 2px solid black;
  height: 150px;
}

.flex-item {
  border-radius: 10px;
  flex-grow: 1;
  background-color: purple;
  margin: 5px;
}
```

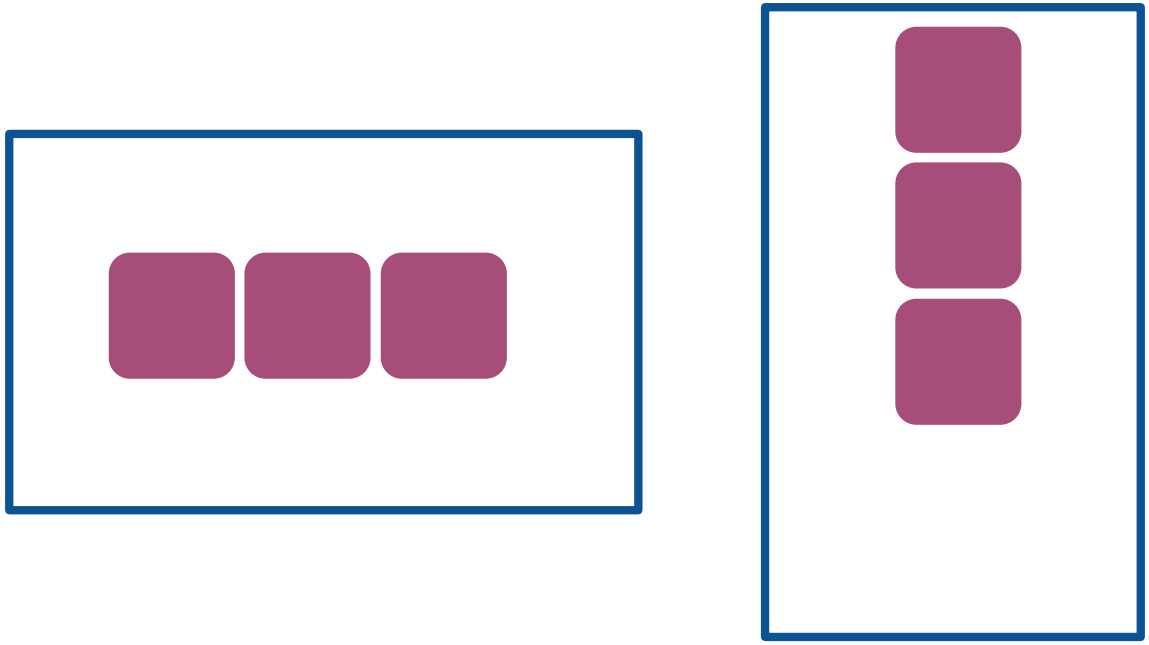
Flex layout recap

- If you set `display: flex`, the element is now a **flex container** and its direct children are **flex items**.
- The items in a flex container will layout in a `row` or `column` depending on the `flex-direction` of the container.



Flex layout recap

- **`justify-contents`** distributes the items horizontally for `flex-direction: row`, vertically for `column`
- **`align-items`** distributes the items vertically for `flex-direction: row`, horizontally for `column`



Flex layout recap

For `flex-direction: row`:

- The **flex basis** is the initial width of a flex item
  - This is either the explicitly set `width`, the explicitly set `flex-basis`, or the content width
- The width of a flex item will **shrink** to fit the container if `flex-shrink` is set to 1 (disabled if 0)
- The width of a flex item will **grow** to fit the remaining space if `flex-grow` is set to 1 (disabled if 0)

Flex layout recap

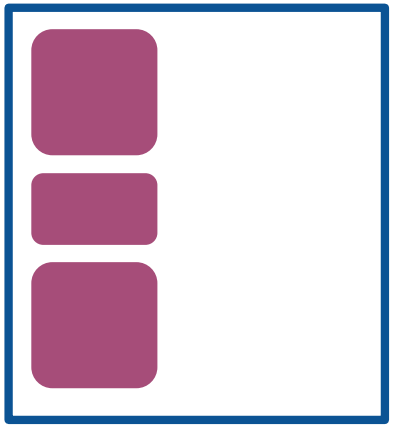
For `flex-direction: row`:

- The height of a flex item is either:
  - the explicitly set `height` on the item, or
  - the content height on the item, or
  - the height of the container if the container's `align-items: stretch;`

Flex layout recap

For `flex-direction: column`:

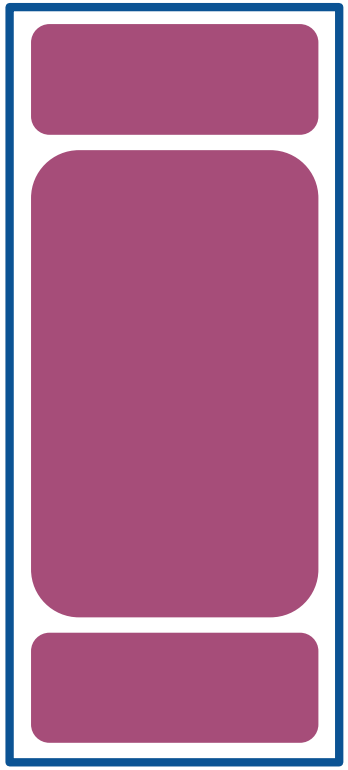
- The **flex basis** is the initial height of a flex item
  - This is either the explicitly set `height`, the explicitly set `flex-basis`, or the content height
- The height of a flex item will **shrink** to fit the container if `flex-shrink` is set to 1 (disabled if 0)
- The height of a flex item will **grow** to fit the remaining space if `flex-grow` is set to 1 (disabled if 0)



Flex layout recap

For `flex-direction: column`:

- The width of a flex item is either:
  - the explicitly set `width` on the item, or
  - the content width on the item, or
  - the width of the container if the container's `align-items: stretch;`



That's still just scratching the surface of flex box...

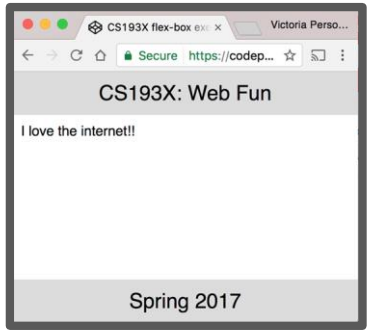
...but we now know enough to continue our layout!

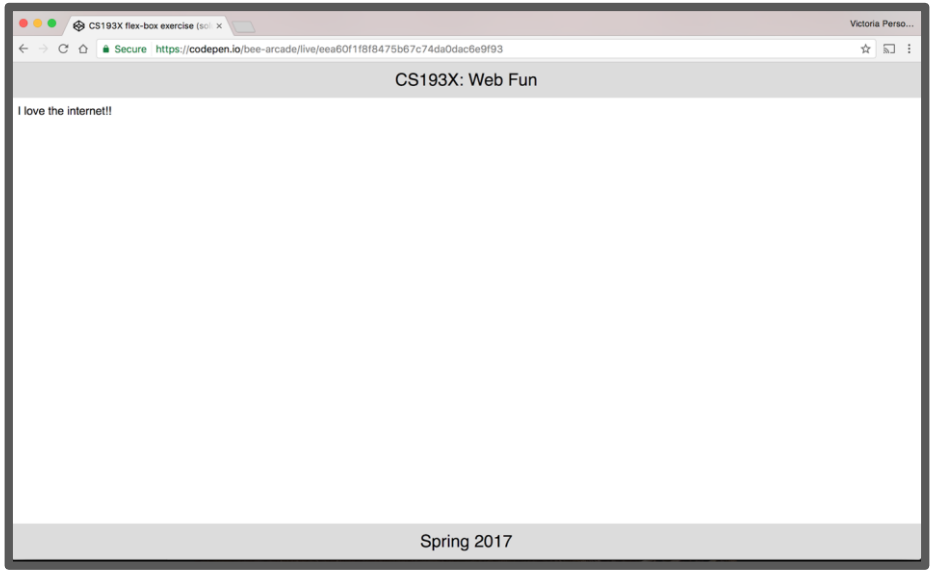
Follow along on [Codepen]

Height and width quirks: `vh`, `vw`, `box-sizing`

Flexbox example

How do we make a layout that looks like this? (Codepen)





The header and footer stay at the top and bottom of the viewport. (Live example)

`height` and `width` percentages

When `width` is defined as a percentage:

- `width` is specified as a percentage of the **containing block's** `width`.

When `height` is defined as a percentage:

- `height` is specified as a percentage of the **containing block's** `height`.

In other words, `height` and `width` are defined **relative to their parent element** when defined as a percentage.

height and width percentages

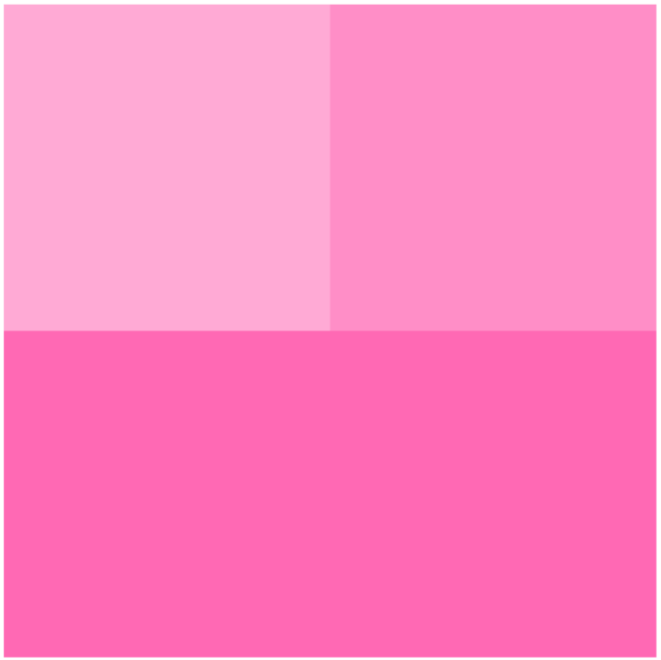
HTML

```html
<div id="box">
  <div id="upper-half">
    <div id="upper-quarter"></div>
  </div>
</div>
```

CSS

```css
#box {
  height: 500px;
  width: 500px;
  background-color: hotpink;
}

#upper-half {
  height: 50%;
  width: 100%;
}

#upper-quarter {
  height: 100%;
  width: 50%;
}

#box div {
 background-color: rgba(255, 255, 255, 0.25);
}
```

OUTPUT

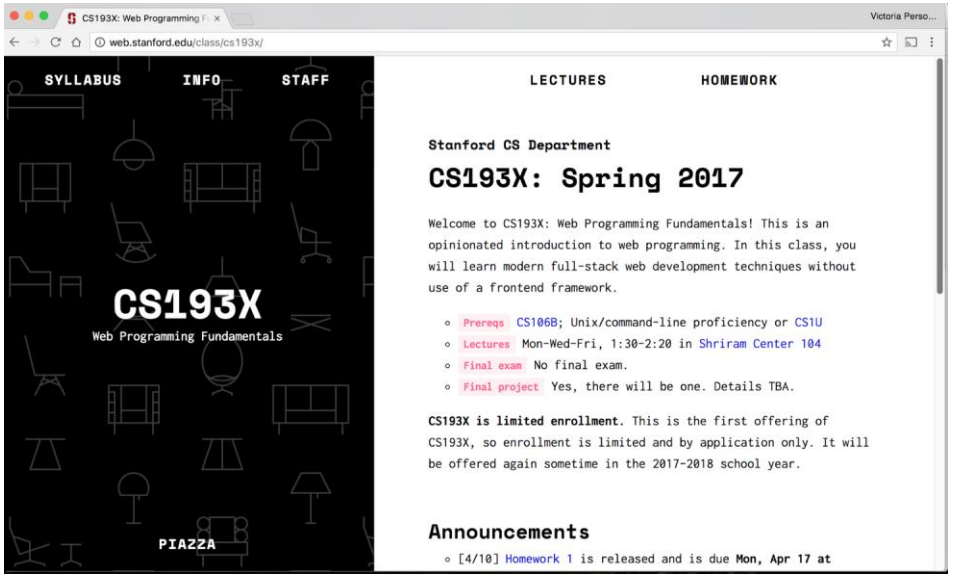


(Codepen)

Viewport?

Browser vocabulary:

- **viewport:** the rectangle where the webpage shows up, scrollable via a scrollbar
- **chrome:** all the UI that's *not* the webpage, i.e. everything but the viewport

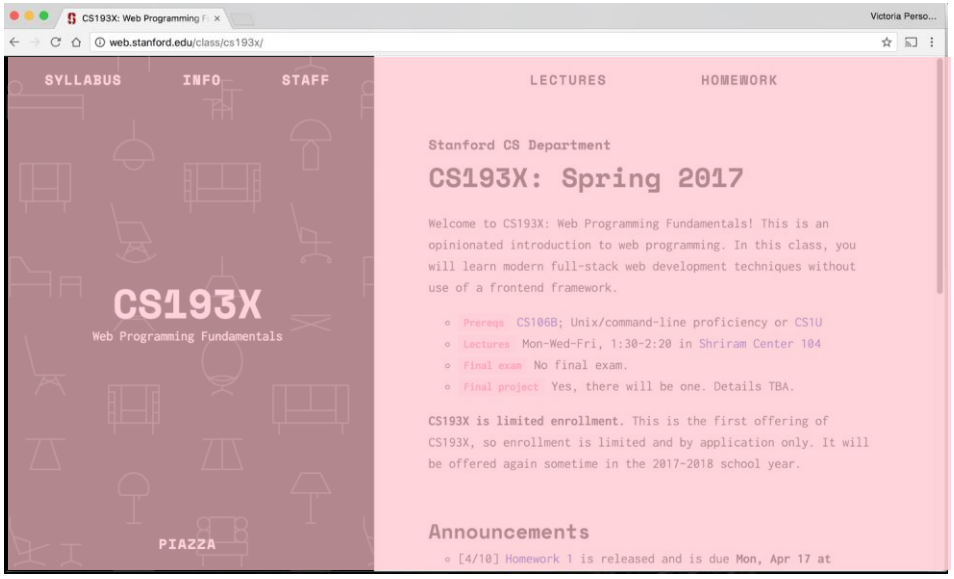


Viewport?

Browser vocabulary:

- **viewport:** the rectangle where the webpage shows up, scrollable via a scrollbar
- **chrome:** all the UI that's *not* the webpage, i.e. everything but the viewport

The viewport

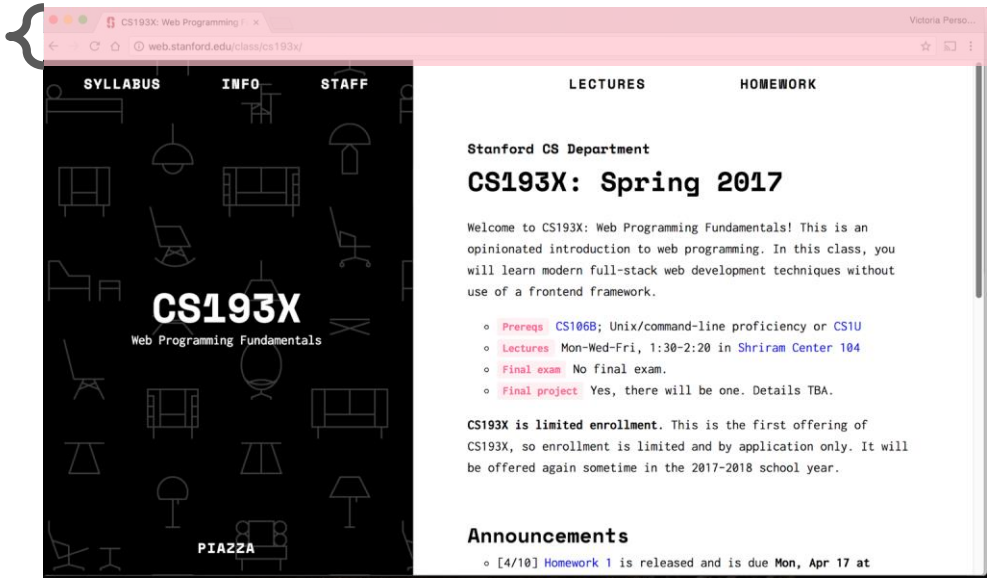


Viewport?

Browser vocabulary:

- **viewport:** the rectangle where the webpage shows up, scrollable via a scrollbar
- **chrome:** all the UI that's *not* the webpage, i.e. everything but the viewport

The chrome



vh and vw

You can define `height` and `width` in terms of the viewport

- Use units `vh` and `vw` to set `height` and `width` to the percentage of the viewport's height and width, respectively (mdn)
- `1vh` = 1/100th of the viewport height
- `1vw` = 1/100th of the viewport width

Example:

- `height: 100vh;`
- `width: 100vw;`

Flexbox example, solved

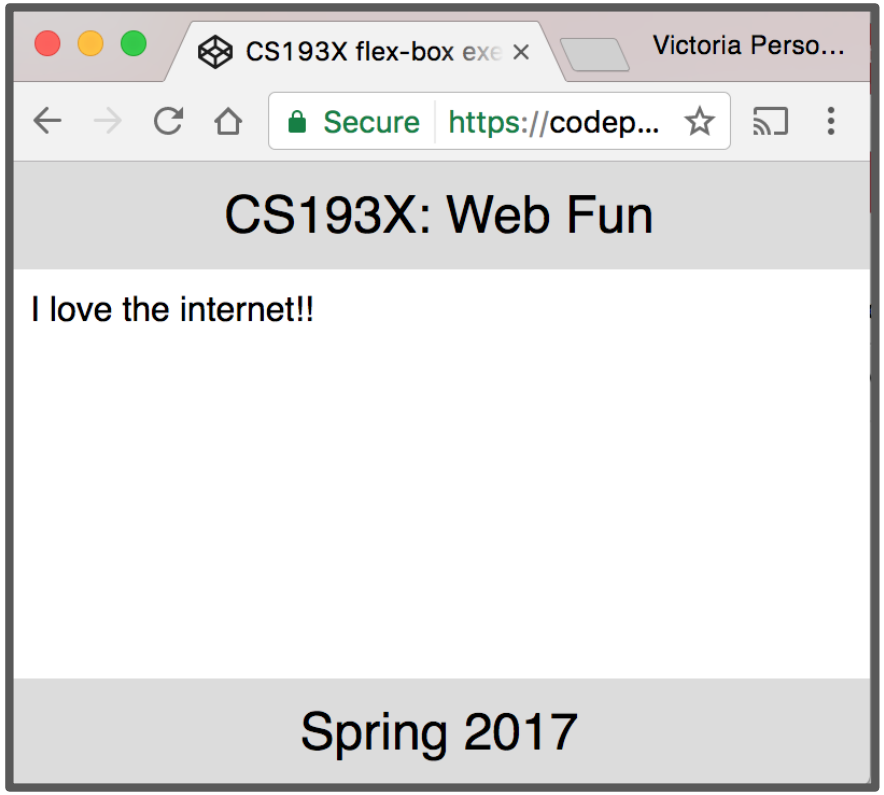
HTML

```html
<article>
  <header>CS193X: Web Fun</header>
  <section>
    <p>I love the internet!!</p>
  </section>
  <footer>Spring 2017</footer>
</article>
```

CSS

```css
article {
  display: flex;
  flex-direction: column;
  height: 100vh;
  width: 100%;
}

section {
  flex-grow: 1;
  padding: 10px;
}
```

(rest of the CSS)



(CodePen)

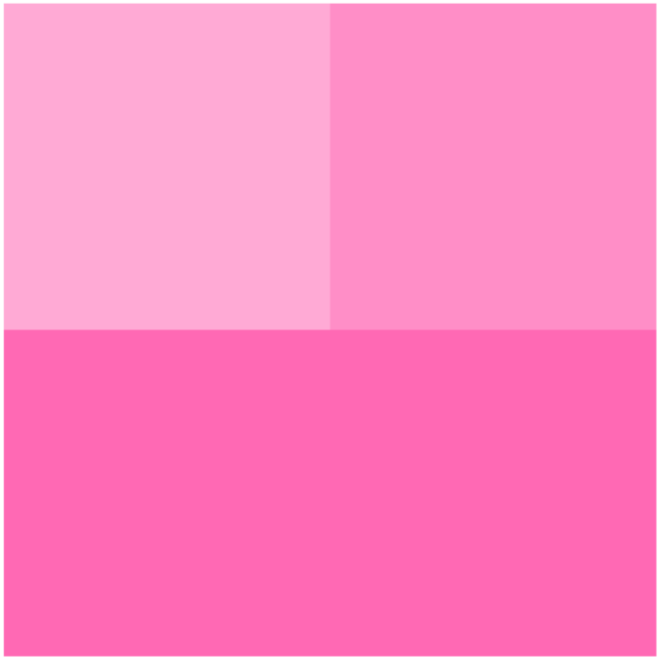
Aside: sizing

Q: What happens if we add a border to `#upper-half`?

```
<div id="box">
  <div id="upper-half">
    <div id="upper-quarter"></div>
  </div>
</div>
```

```
#upper-half {
  height: 50%;
  width: 100%;
}
```

(rest of the css)

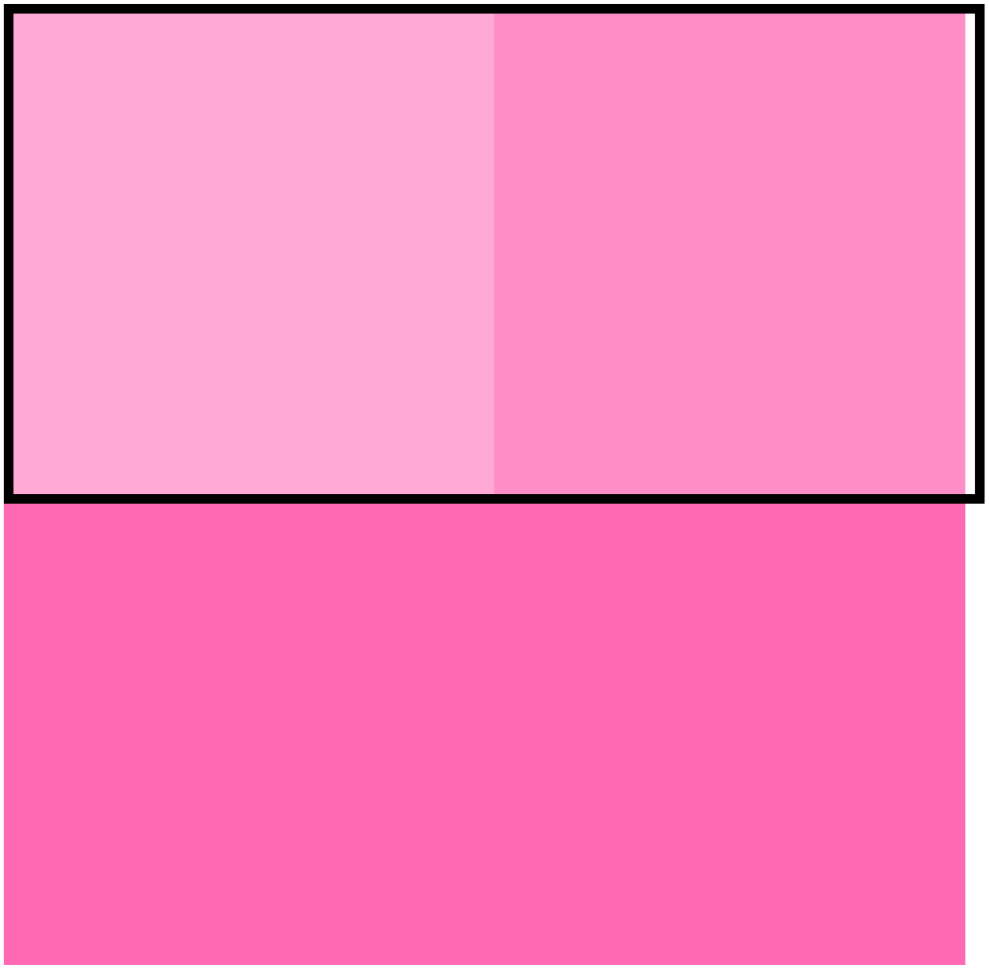


??

?

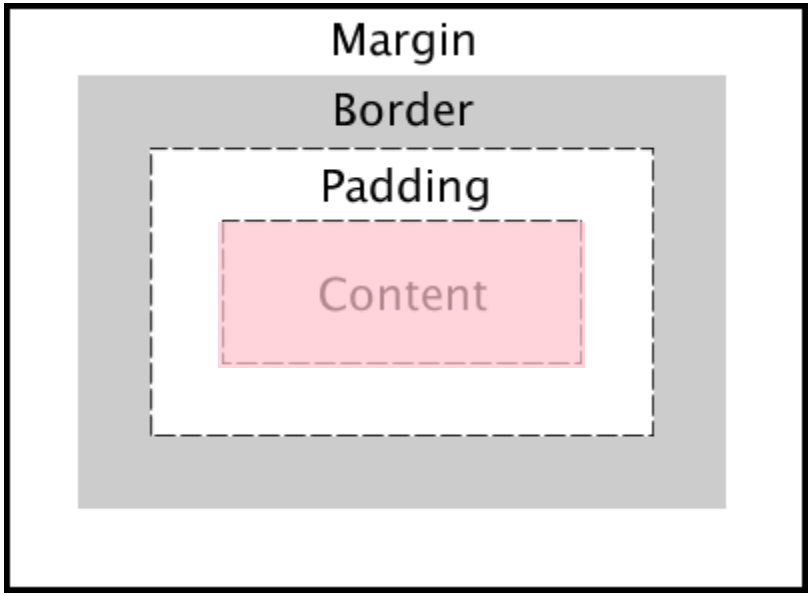
```
#upper-half {
  height: 50%;
  width: 100%;
  border: 5px solid black;
}
```

(rest of the CSS)



CSS box model width and height

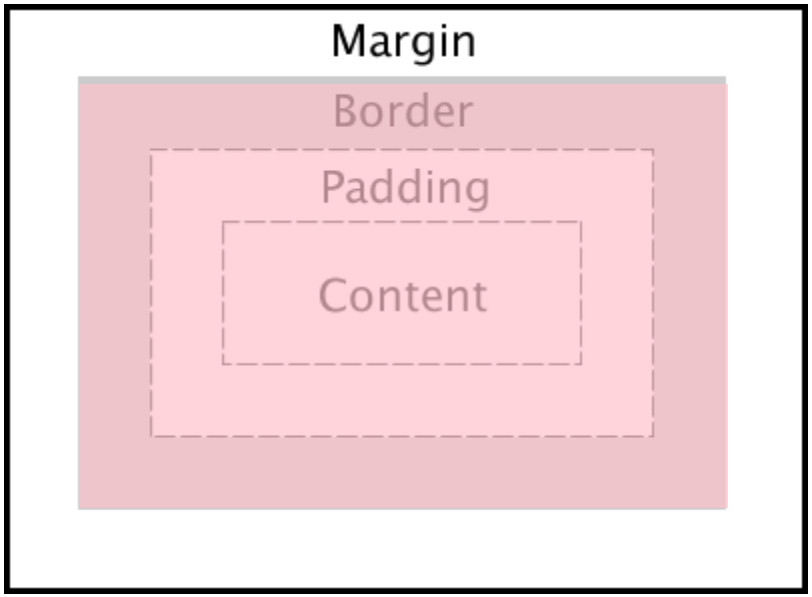
The box model defines CSS `width` and `height` properties to refer to the element's **content** width and height:



box-sizing

If you want to have `width` and `height` refer to the element's **border** width and height, use `box-sizing`:

- `box-sizing: border-box;`

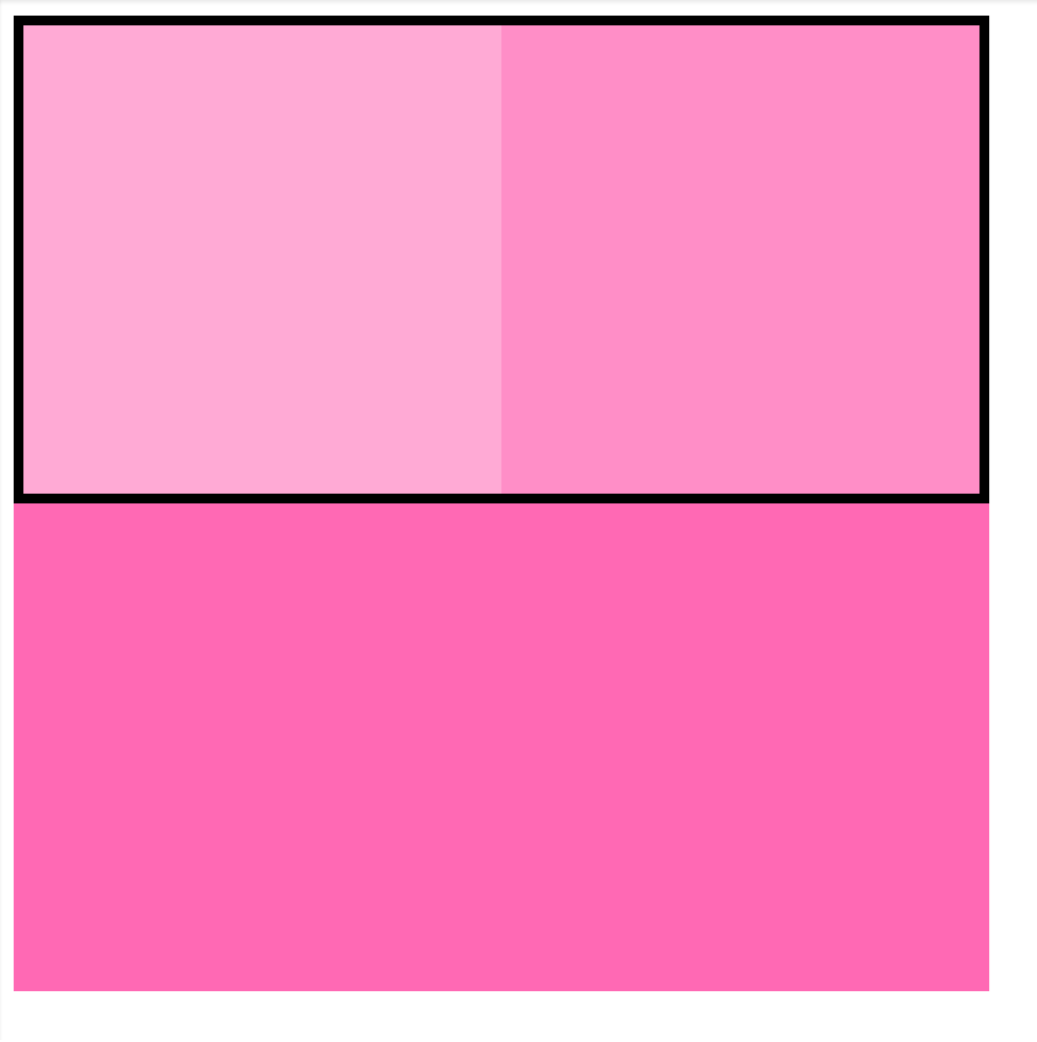


Note: Using `border-box` will include padding in the `width` and `height` as well.
Note: You **cannot** select padding-box or margin-box.

Fixed example

```
#upper-half {
  height: 50%;
  width: 100%;
  border: 5px solid black;
  box-sizing: border-box;
}
```

(rest of the CSS)



Another rendering mode: `position`

Next time!