
ASSEMBLING SASS
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ASSEMBLY

1 FOUNDATION

1.1 Sass, Not SASS

1.2 SCSS: Sassy CSS

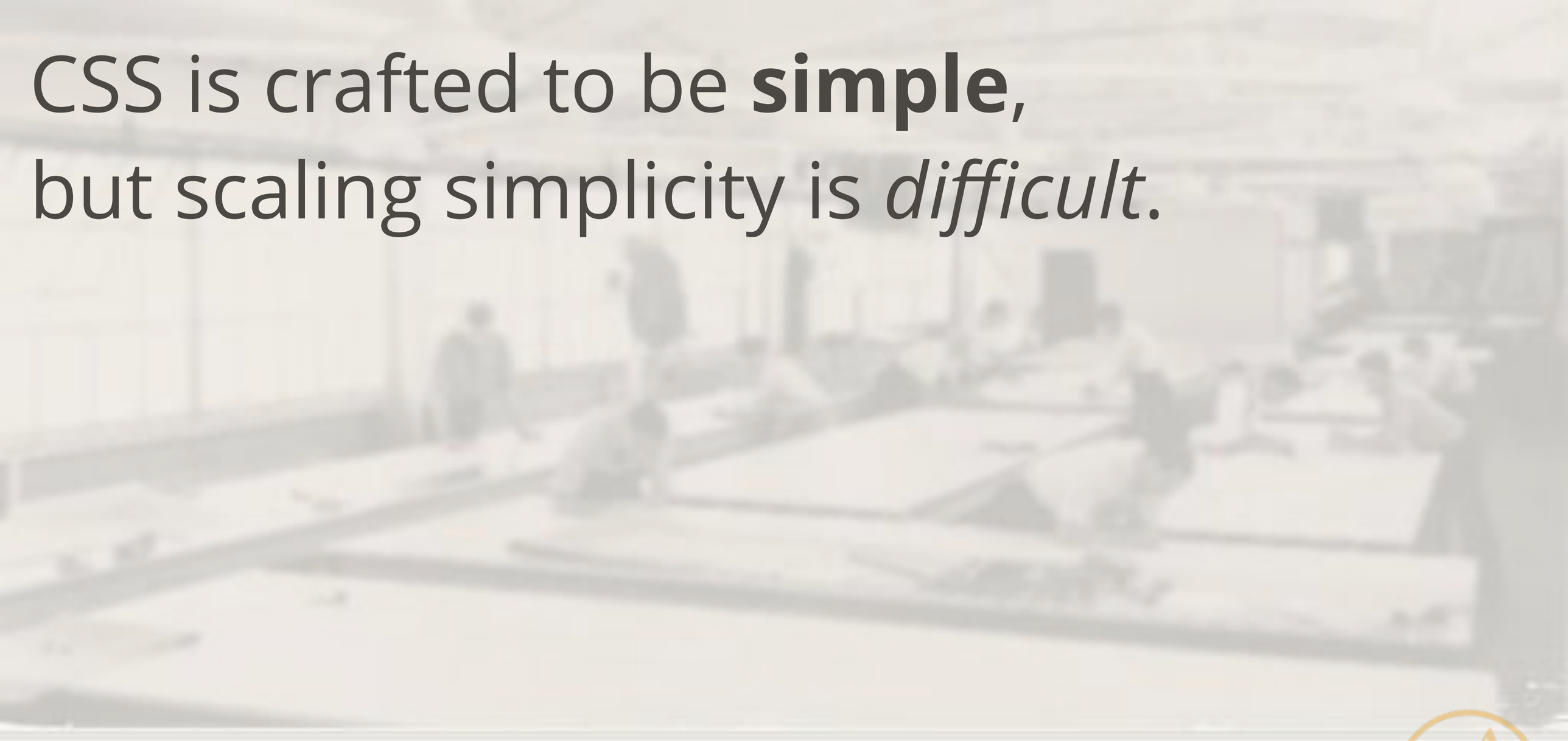
1.3 Commenting

1.4 Importing

1.5 Nesting Selectors

1.6 The Parent Selector

1.7 Nesting Pitfalls



CSS is crafted to be **simple**,
but scaling simplicity is *difficult*.

At Scale

- Slight variations of colors, fonts, numbers, & other properties arise
- Effective curbing of repetition can decline
- Stylesheet size may become unmanageable

Enter Sass

- Syntactically Awesome Stylesheets
- Looks like CSS, but adds features to combat shortcomings
- Preprocessor, like CoffeeScript & Haml:

- Created by Hampton Catlin
- **Primary developers:**
  Nathan Weizenbaum & Chris Eppstein
- Baked into Rails

1.1 Sass, Not SASS

Assembly Tip

~~SASS~~ Sass

1.1 Sass, Not SASS

1.2 SCSS: Sassy CSS

1.3 Commenting

1.4 Importing

1.5 Nesting Selectors

1.6 The Parent Selector

1.7 Nesting Pitfalls

- Sassy CSS (`.scss`) is the default file extension
- CSS **is valid** SCSS
- A second syntax (`.sass`) exists, but we'll focus on SCSS for the course

application.scss

```scss
$main: #444;

.btn {
  color: $main;
  display: block;
}
.btn-a {
  color: lighten($main, 30%);
  &:hover {
    color: lighten($main, 40%);
  }
}
```

application.css

```css
.btn {
  color: #444444;
  display: block;
}
.btn-a {
  color: #919191;
}
.btn-a:hover {
  color: #aaaaaa;
}
```

1.2 SCSS: Sassy CSS

Assembly Tip

Since CSS doubles as valid SCSS, try writing styles normally & slowly incorporate new techniques.

- Sass adds `//` for single line comments - **not** output after compile

1.3 Commenting

application.scss

```
// These comments will
// not be output to the
// compiled CSS file

/* This comment will */
```

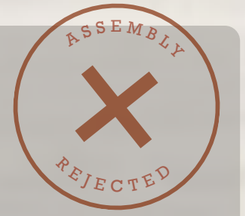
application.css

```
/* This comment will */
```

1.3 Commenting

application.css

```
/*
 *  Imports styles found in 'buttons.css'
 *  when the browser requests application.css
 */

@import "buttons.css";
```



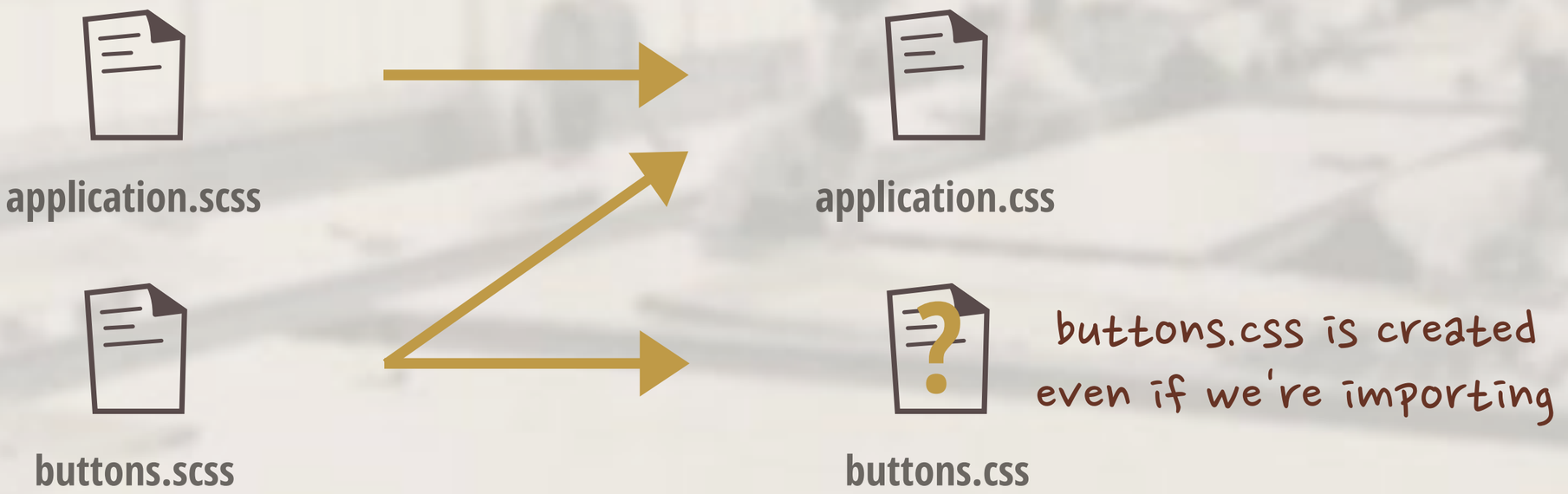
1.4 Importing

- The CSS `@import` rule has been avoided: prevents parallel downloading
- `@import` with `.scss` or `.sass` happens **during compile** rather than client-side
- File extension is optional

1.4 Importing

application.scss

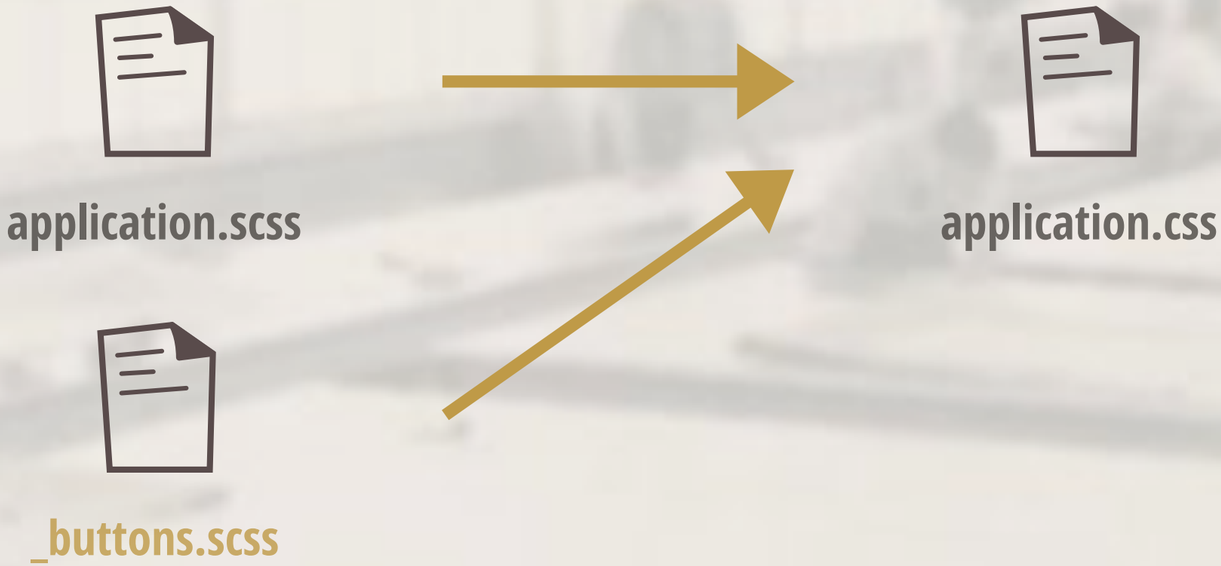
```
// Imports styles found in 'buttons.scss'
// when the compiler processes application.scss

@import "buttons";
```



1.4 Importing

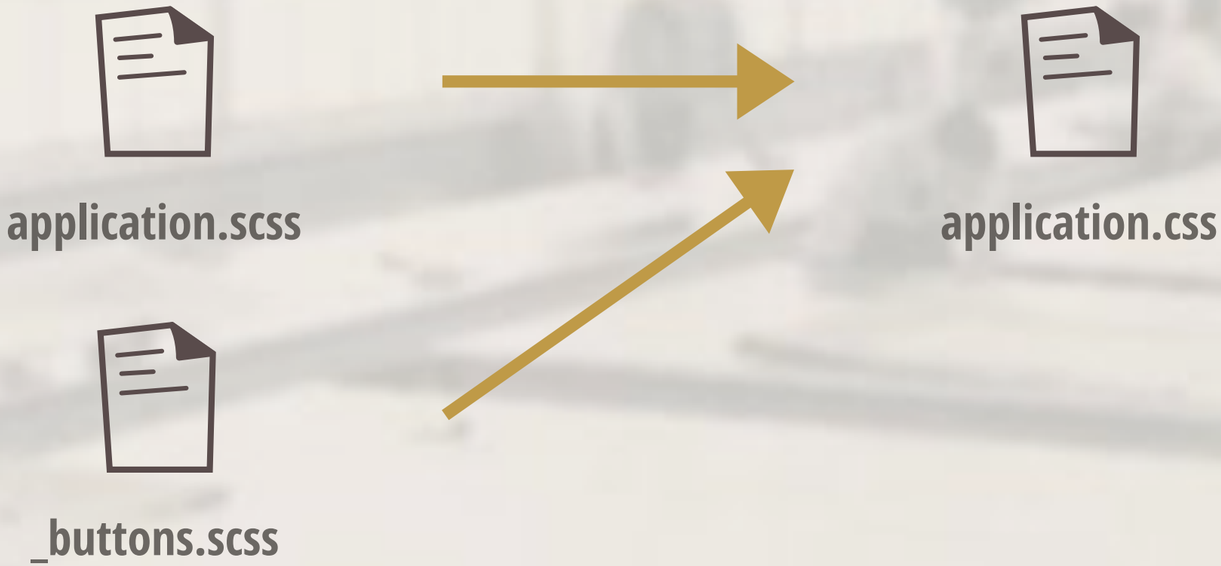
Partials

Adding an underscore creates a **partial**. Partials can be imported, but will not compile to `.css`



application.scss

```
// Will import _buttons.sass, buttons.sass,
// _buttons.scss, or buttons.scss

@import "buttons";
```



1.4 Importing

1.1 Sass, Not SASS

1.2 SCSS: Sassy CSS

1.3 Commenting

1.4 Importing

1.5 Nesting Selectors

1.6 The Parent Selector

1.7 Nesting Pitfalls

application.css


```
.content {
  border: 1px solid #ccc;
  padding: 20px;
}
.content h2 {
  font-size: 3em;
  margin: 20px 0;
}
.content p {
  font-size: 1.5em;
  margin: 15px 0;
}
```

1.5 Nesting Selectors

application.scss

```
.content {
  border: 1px solid #ccc;
  padding: 20px;
}
.content h2 {
  font-size: 3em;
  margin: 20px 0;
}
.content p {
  font-size: 1.5em;
  margin: 15px 0;
}
```

application.css

```
.content {
  border: 1px solid #ccc;
  padding: 20px;
}
.content h2 {
  font-size: 3em;
  margin: 20px 0;
}
.content p {
  font-size: 1.5em;
  margin: 15px 0;
}
```

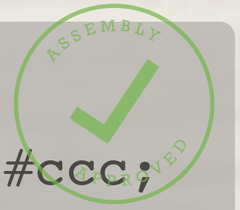
1.5 Nesting Selectors

application.scss

```scss
.content {
  border: 1px solid #ccc;
  padding: 20px;
  h2 {
    font-size: 3em;
    margin: 20px 0;
  }
  p {
    font-size: 1.5em;
    margin: 15px 0;
  }
}
```

application.css

```css
.content {
  border: 1px solid #ccc;
  padding: 20px;
}
.content h2 {
  font-size: 3em;
  margin: 20px 0;
}
.content p {
  font-size: 1.5em;
  margin: 15px 0;
}
```



1.5 Nesting Selectors

Nesting Properties

Certain properties with matching namespaces are nestable:

application.scss

```
.btn {
  text: {
    decoration: underline;
    transform: lowercase;
  }
}
```

application.css

```
.btn {
  text-decoration: underline;
  text-transform: lowercase;
}
```


While nesting, the `&` symbol references the parent selector:

application.scss

```
.content {
  border: 1px solid #ccc;
  padding: 20px;
  .callout {
    border-color: red;
  }
  &.callout {
    border-color: green;
  }
}
```

references:

.content

application.css

```
.content {
  border: 1px solid #ccc;
  padding: 20px;
}
.content .callout {
  border-color: red;
}
.content.callout {
  border-color: green;
}
```

application.scss

```
a {
  color: #999;
  &:hover {
    color: #777;
  }
  &:active {
    color: #888;
  }
}
```

application.css

```
a {
  color: #999;
}
a:hover {
  color: #777;
}
a:active {
  color: #888;
}
```

1.6 The Parent Selector

Parent Selector Nesting

Selectors can also be added **before** the `&` reference:

application.css

```
.sidebar {
  float: right;
  width: 300px;
}
.users .sidebar {
  width: 400px;
}
```

modifies .sidebar in a separate declaration

application.scss

```
.sidebar {
  float: right;
  width: 300px;
  .users & {
    width: 400px;
  }
}
```

references:
.sidebar

application.css


```
.sidebar {
  float: right;
  width: 300px;
}
.users .sidebar {
  width: 400px;
}
```

1.6 The Parent Selector

application.scss

```
.sidebar {
  float: right;
  width: 300px;
  h2 {
    color: #777;
    .users & {
      color: #444;
    }
  }
}
```

references:
.sidebar h2

application.css

```
.sidebar {
  float: right;
  width: 300px;
}
.sidebar h2 {
  color: #777;
}
.users .sidebar h2 {
  color: #444;
}
```

1.6 The Parent Selector

- Nesting is easy, but **dangerous**
- **Do not nest unnecessarily**

1.7 Nesting Pitfalls

application.scss

```
.content {
  background: #ccc;
  .cell {
    h2 {
      a {
        &:hover {
          color: red;
        }
      }
    }
  }
}
```

application.css

```
.content {
  background: #ccc;
}
.content .cell h2 a:hover {
  color: red;
}
```

dangerous level of specificity

1.7 Nesting Pitfalls

Assembly Tip

Try limiting your nesting to 3 or 4 levels and consider refactoring anything deeper.

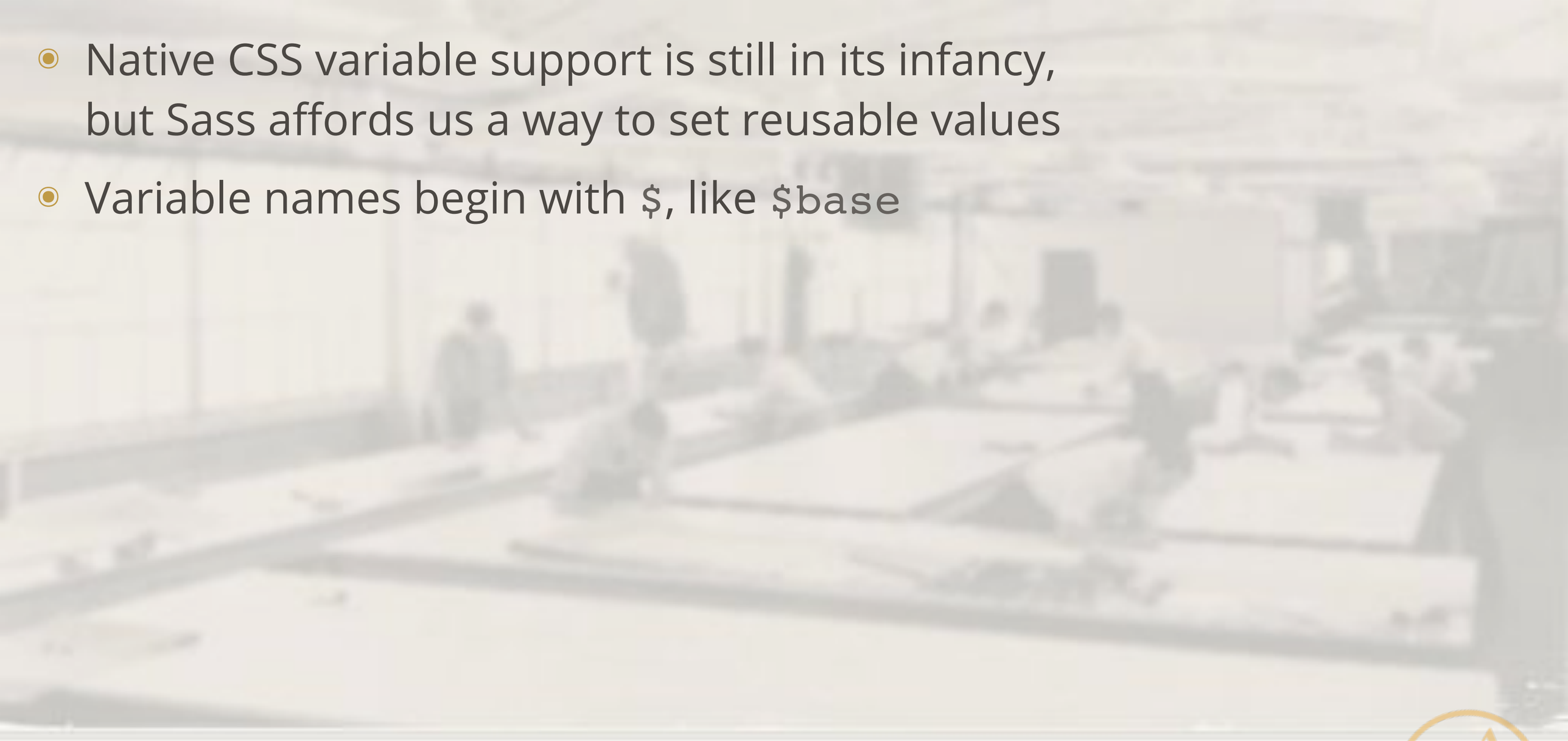
2 VARIABLE

2.1 Variable Declaration + Use

2.2 Types

2.3 Scope

2.4 Interpolation



- Native CSS variable support is still in its infancy, but Sass affords us a way to set reusable values
- Variable names begin with `$`, like `$base`

2.1 Variable Declaration + Use

application.scss

```
$base: #777777;

.sidebar {
  border: 1px solid $base;
  p {
    color: $base;
  }
}
```

application.css

```
.sidebar {
  border: 1px solid #777777;
}
.sidebar p {
  color: #777777;
}
```

2.1 Variable Declaration + Use

The Default Flag

Variable definitions can optionally take the `!default` flag:

application.scss

```
$title: 'My Blog';
$title: 'About Me';

h2:before {
  content: $title;
}
```

overrides the first value

application.css

```
h2:before {
  content: 'About Me';
}
```

application.scss

```
$title: 'My Blog';
$title: 'About Me' !default;

h2:before {
  content: $title;
}
```

since a value exists,
it isn't overwritten

application.css

```
h2:before {
  content: 'My Blog';
}
```

2.1 Variable Declaration + Use

application.scss

```scss
$rounded: 5px;

@import "buttons";
```

_buttons.scss

```scss
$rounded: 3px !default;

.btn-a {
  border-radius: $rounded;
  color: #777;
}
.btn-b {
  border-radius: $rounded;
  color: #222;
}
```

if a value isn't defined elsewhere, used by default

2.1 Variable Declaration + Use

application.scss

```
$rounded: 5px;

@import "buttons";
```

application.css

```
.btn-a {
  border-radius: 5px;
  color: #777;
}
.btn-b {
  border-radius: 5px;
  color: #222;
}
```

2.1 Variable Declaration + Use

Booleans

```
$rounded: false;
$shadow: true;
```

Numbers - can be set with or without units:

```
$rounded: 4px;
$line-height: 1.5;
$font-size: 3rem;
```


Colors

```
$base: purple;
$border: rgba(0, 255, 0, 0.5);
$shadow: #333;
```

Strings - can be set with or without quotes:

```
$header: 'Helvetica Neue';
$callout: Arial;
$message: "Loading...";
```


Lists

```
$authors: nick, dan, aimee, drew;
$margin: 40px 0 20px 100px;
```

Null

```
$shadow: null;
```


2.1 Variable Declaration + Use

2.2 Types

2.3 Scope

2.4 Interpolation

application.scss

```
p {
  $border: #ccc;
  border-top: 1px solid $border;
}
h1 {
  border-top: 1px solid $border;
}
```

$border isn't available outside of p

application.css

```
Syntax error: Undefined
variable: "$border"
```

2.3 Scope

Reassignment in a Declaration

- Variables **set** inside a declaration (within `{ }`) aren't usable outside that block
- Setting **new** values to variables set outside a declaration changes future instances

application.scss

```
$color-base: #777777;

.sidebar {
  $color-base: #222222;
  background: $color-base;
}
p {
  color: $color-base;
}
```

application.css

```
.sidebar {
  background: #222222;
}
p {
  color: #222222;
}
```

overwriting a variable in a declaration is global

2.3 Scope

Use the Ruby-esque `#{$variable}` to shim variables into selectors, property names, and strings:

application.scss

```
$side: top;

sup {
  position: relative;
  #{$side}: -0.5em;
}
.callout-#{$side} {
  background: #777;
}
```

application.css

```
sup {
  position: relative;
  top: -0.5em;
}
.callout-top {
  background: #777;
}
```

Assembly Tip

Be considerate of variable naming. `$color-base` gets a lot more mileage than `$color-blue`.

3 MIXIN

3.1 Mixin Setup + Use

3.2 Adding Arguments

3.3 Multiple Arguments

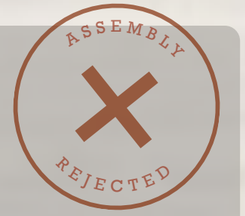
3.4 Variable Arguments

3.5 Interpolation + Mixins

application.css

```
.btn-a {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
```

repeating properties in each declaration



3.1 Mixin Setup + Use

Mixins

Blocks of reusable code that take optional arguments:

_buttons.scss

```
@mixin button {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
```


_buttons.scss

```
@mixin button {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-a {
  @include button;
  background: #777;
}
.btn-b {
  @include button;
  background: #ff0;
}
```

application.css

```
.btn-a {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
  background: #777;
}
.btn-b {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
  background: #ff0;
}
```

3.1 Mixin Setup + Use

Assembly Tip

Make sure the `@mixin` block comes before the `@include`, especially when importing files containing mixins.

Assembly Tip

`@include` = use a mixin

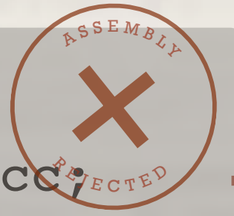
`@import` = import a file

_buttons.scss

```scss
@mixin button {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-a {
  @include button;
  background: #777;
}
.btn-b {
  @include button;
  background: #ff0;
}
```

application.css

```css
.btn-a {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
  background: #777;
}
.btn-b {
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
  background: #ff0;
}
```



repeating properties in each declaration

3.1 Mixin Setup + Use

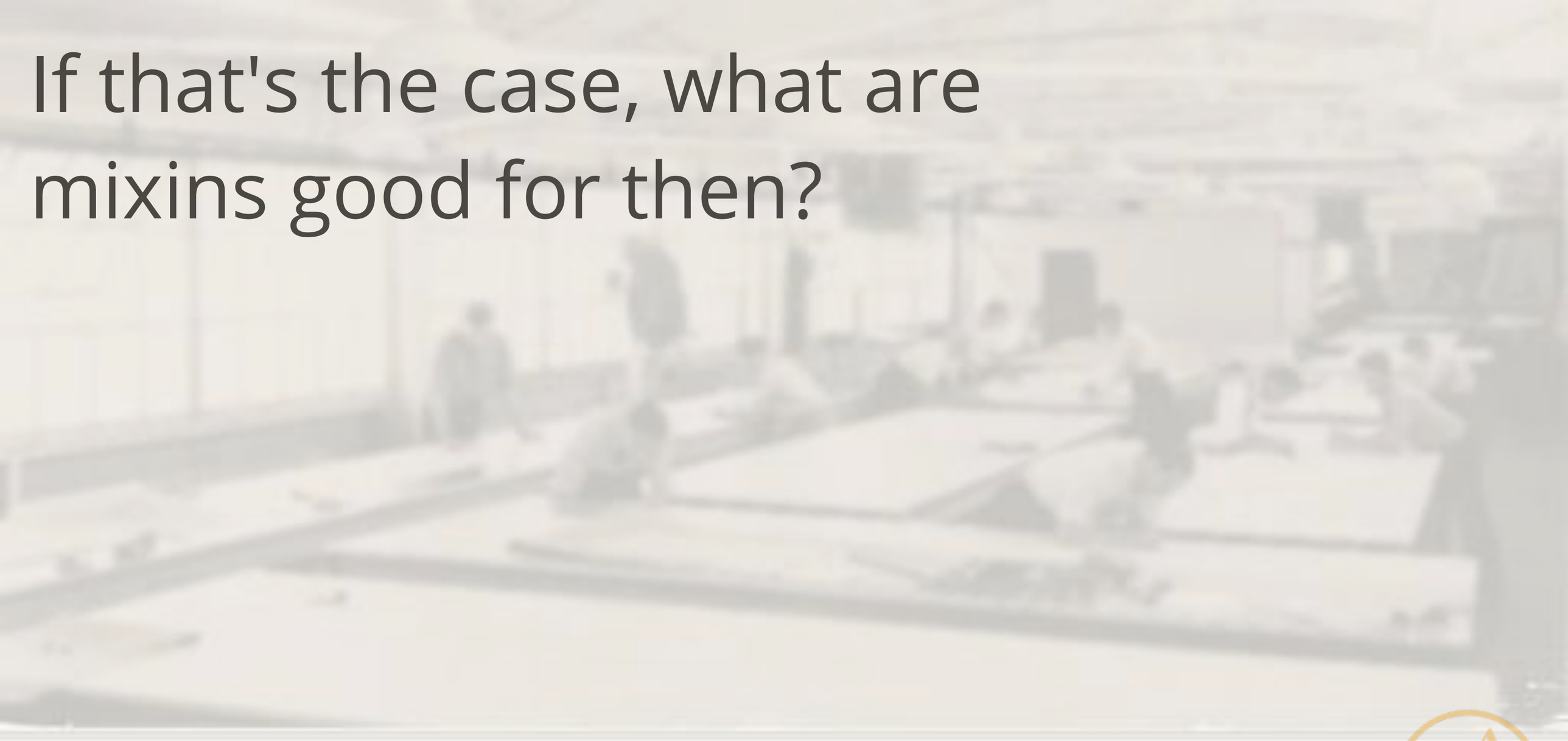
We're Just Repeating Properties

It's more efficient to use CSS here (for now):

application.css

```
.btn-a,
.btn-b {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
}
```


If that's the case, what are mixins good for then?



application.css

```
.content {
  -webkit-box-sizing: border-box;
  -moz-box-sizing: border-box;
  box-sizing: border-box;
  border: 1px solid #ccc;
  padding: 20px;
}
```

writing three mostly-identical properties gets old

3.2 Adding Arguments

application.scss

```
@mixin box-sizing {
  -webkit-box-sizing: border-box;
  -moz-box-sizing: border-box;
  box-sizing: border-box;
}
.content {
  @include box-sizing;
  border: 1px solid #ccc;
  padding: 20px;
}
```

application.css

```
.content {
  -webkit-box-sizing: border-box;
  -moz-box-sizing: border-box;
  box-sizing: border-box;
  border: 1px solid #ccc;
  padding: 20px;
}
```

Still just copying
unchanging properties

3.2 Adding Arguments

Arguments

Values passed into a mixin, potentially altering output:

application.scss

```
@mixin box-sizing($x) {
  -webkit-box-sizing: $x;
  -moz-box-sizing: $x;
  box-sizing: $x;
}
```

application.scss

```
@mixin box-sizing($x) {
  -webkit-box-sizing: $x;
  -moz-box-sizing: $x;
  box-sizing: $x;
}
.content {
  @include box-sizing(border-box);
  border: 1px solid #ccc;
  padding: 20px;
}
.callout {
  @include box-sizing(content-box);
}
```

application.css

```
.content {
  -webkit-box-sizing: border-box;
  -moz-box-sizing: border-box;
  box-sizing: border-box;
  border: 1px solid #ccc;
  padding: 20px;
}
.callout {
  -webkit-box-sizing: content-box;
  -moz-box-sizing: content-box;
  box-sizing: content-box;
}
```

3.2 Adding Arguments

Default Values

Optionally, what arguments will default to if not included:

application.scss

```
@mixin box-sizing($x: border-box) {
  -webkit-box-sizing: $x;
  -moz-box-sizing: $x;
  box-sizing: $x;
}
```

application.scss

```scss
@mixin box-sizing($x: border-box) {
  -webkit-box-sizing: $x;
  -moz-box-sizing: $x;
  box-sizing: $x;
}
.content {
  @include box-sizing;
  border: 1px solid #ccc;
  padding: 20px;
}
.callout {
  @include box-sizing(content-box);
}
```

border-box, if no argument is passed

application.css


```css
.content {
  -webkit-box-sizing: border-box;
  -moz-box-sizing: border-box;
  box-sizing: border-box;
  border: 1px solid #ccc;
  padding: 20px;
}
.callout {
  -webkit-box-sizing: content-box;
  -moz-box-sizing: content-box;
  box-sizing: content-box;
}
```

3.2 Adding Arguments

3.1 Mixin Setup + Use

3.2 Adding Arguments

3.3 Multiple Arguments

3.4 Variable Arguments

3.5 Interpolation + Mixins

_buttons.scss

```
@mixin button($radius, $color) {
  border-radius: $radius;
  color: $color;
}
.btn-a {
  @include button(4px, #000);
}
```

arguments are comma-separated and passed in order

application.css

```
.btn-a {
  border-radius: 4px;
  color: #000;
}
```

3.3 Multiple Arguments

_buttons.scss

```
@mixin button($radius, $color) {
  border-radius: $radius;
  color: $color;
}
.btn-a {
  @include button(4px);
}
```

too few arguments

application.css

```
Syntax error: Mixin button is
missing argument $color.
```

3.3 Multiple Arguments

_buttons.scss

```
@mixin button($radius, $color: #000) {
  border-radius: $radius;
  color: $color;
}
.btn-a {
  @include button(4px);
}
```

optional second argument

application.css

```
.btn-a {
  border-radius: 4px;
  color: #000;
}
```

3.3 Multiple Arguments

_buttons.scss

```
@mixin button($color: #000, $radius) {
  border-radius: $radius;
  color: $color;
}
.btn-a {
  @include button(4px);
}
```

optionals come last

application.css

```
Syntax error: Required argument
$color must come before any
optional arguments.
```

3.3 Multiple Arguments

_buttons.scss

```
@mixin button($radius, $color: #000) {
  border-radius: $radius;
  color: $color;
}
.btn-a {
  @include button($color: #777777,
$radius: 5px);
}
```

keyword arguments allow passing in any order

application.css

```
.btn-a {
  border-radius: 5px;
  color: #777777;
}
```

3.3 Multiple Arguments

application.css

```
.btn-a {
  -webkit-transition: color 0.3s ease-in, background 0.5s ease-out;
  -moz-transition: color 0.3s ease-in, background 0.5s ease-out;
  transition: color 0.3s ease-in, background 0.5s ease-out;
}
```

commas can naturally occur in CSS values

3.4 Variable Arguments

Passing valid, comma-separated CSS as a single value:

_buttons.scss

```
@mixin transition($val) {
  -webkit-transition: $val;
  -moz-transition: $val;
  transition: $val;
}
.btn-a {
  @include transition(color 0.3s
ease-in, background 0.5s ease-out);
}
```

application.css

```
Mixin transition takes 1
argument but 2 were passed.
```

Adding `...` to an argument creates a **variable argument** (vararg):

_buttons.scss

```
@mixin transition($val...) {
  -webkit-transition: $val;
  -moz-transition: $val;
  transition: $val;
}
.btn-a {
  @include transition(color 0.3s
ease-in, background 0.5s ease-out);
}
```

application.css

```
.btn-a {
  -webkit-transition: color 0.3s
ease-in, background 0.5s ease-out;
  -moz-transition: color 0.3s
ease-in, background 0.5s ease-out;
  transition: color 0.3s ease-in,
background 0.5s ease-out;
}
```

3.4 Variable Arguments

Variable arguments in reverse:

_buttons.scss

```
@mixin button($radius, $color) {
  border-radius: $radius;
  color: $color;
}

$properties: 4px, #000;

.btn-a {
  @include button($properties...);
}
```

passes a list which is split into arguments by the mixin

application.css

```
.btn-a {
  border-radius: 4px;
  color: #000;
}
```

_buttons.scss

```scss
@mixin highlight-t($color) {
  border-top-color: $color;
}
@mixin highlight-r($color) {
  border-right-color: $color;
}
@mixin highlight-b($color) {
  border-bottom-color: $color;
}
@mixin highlight-l($color) {
  border-left-color: $color;
}
.btn-a {
  @include highlight-r(#ff0);
}
```

application.css

```css
.btn-a {
  border-right-color: #ff0;
}
```

3.5 Interpolation + Mixins

_buttons.scss

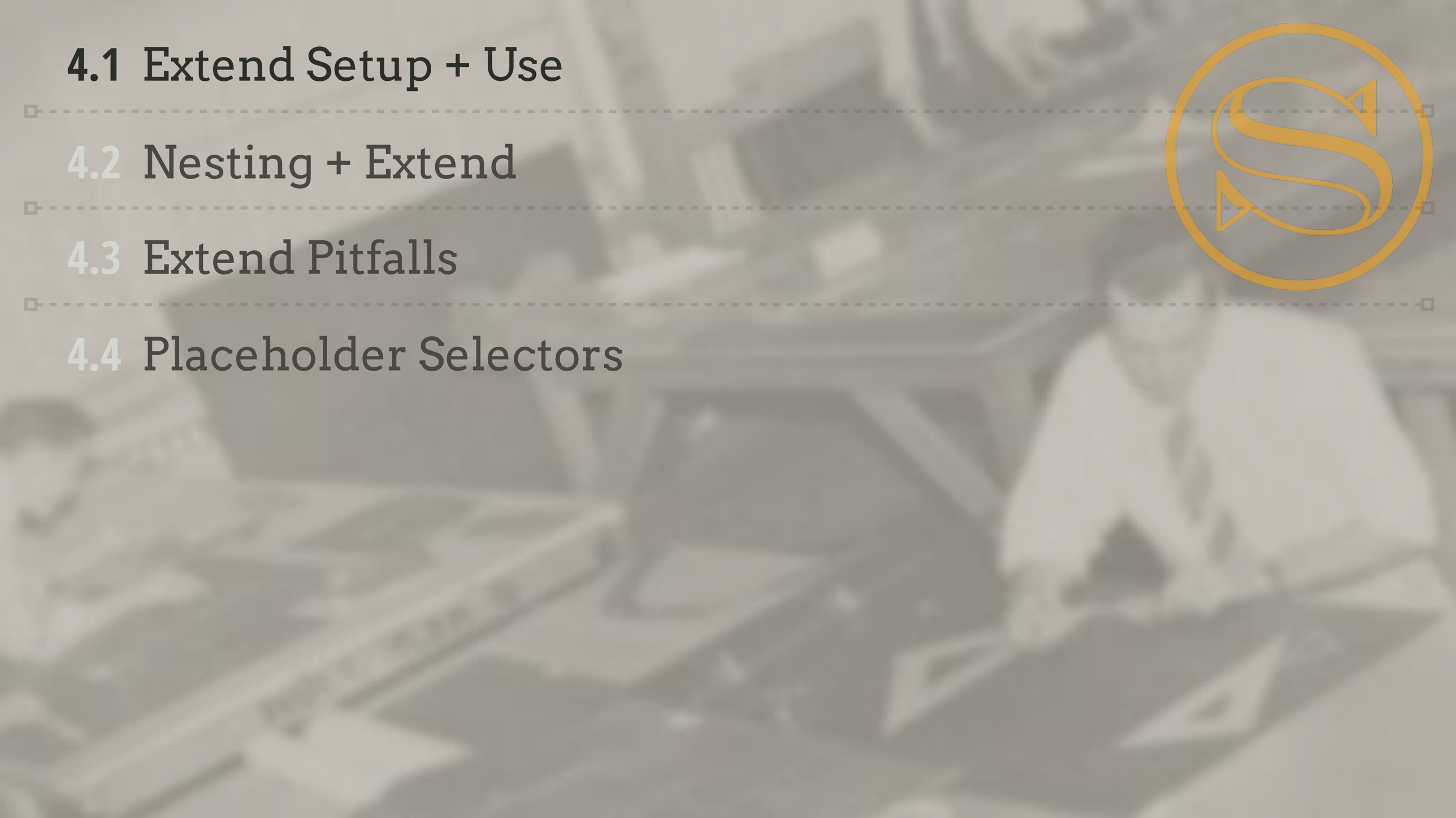
```scss
@mixin highlight($color, $side) {
  border-#{$side}-color: $color;
}
.btn-a {
  @include highlight(#ff0, right);
}
```

application.css

```css
.btn-a {
  border-right-color: #ff0;
}
```

3.5 Interpolation + Mixins

4 EXTEND



4.1 Extend Setup + Use

4.2 Nesting + Extend

4.3 Extend Pitfalls

4.4 Placeholder Selectors

application.css

```
.btn-a {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
```

simplifies to

application.css

```
.btn-a,
.btn-b {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
}
```

4.1 Extend Setup + Use

Extend

Sass will track and automatically combine selectors for us:

_buttons.scss

```
.btn-a {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  @extend .btn-a;
  background: #ff0;
}
```

application.css

```
.btn-a,
.btn-b {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
}
```


```
.btn-b {
  @extend .btn-a;
  background: #ff0;
}
```

```
.btn-a,
.btn-b {
  ...
}
.btn-b {
  ...
}
```

adds a second declaration for unique values

4.1 Extend Setup + Use

application.scss

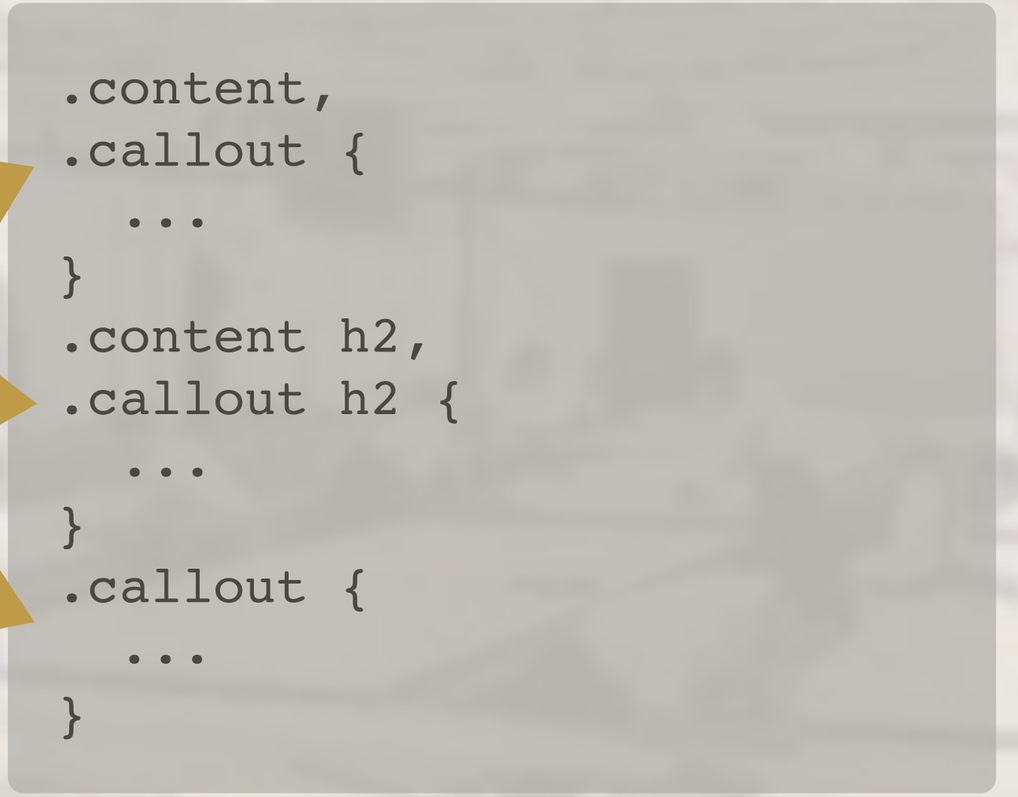
```
.content {
  border: 1px solid #ccc;
  padding: 20px;
  h2 {
    font-size: 3em;
    margin: 20px 0;
  }
}
.callout {
  @extend .content;
  background: #ddd;
}
```

application.css

```
.content,
.callout {
  border: 1px solid #ccc;
  padding: 20px;
}
.content h2,
.callout h2 {
  font-size: 3em;
  margin: 20px 0;
}
.callout {
  background: #ddd;
}
```

4.2 Nesting + Extend

```
.callout {
  @extend .content;
  background: #ddd;
}
```



```
.content,
.callout {
  ...
}
.content h2,
.callout h2 {
  ...
}
.callout {
  ...
}
```

4.2 Nesting + Extend

4.1 Extend Setup + Use

4.2 Nesting + Extend

4.3 Extend Pitfalls

4.4 Placeholder Selectors

_buttons.scss

```scss
.btn-a {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  @extend .btn-a;
  background: #ff0;
}
.sidebar .btn-a {
  text-transform: lowercase;
}
```

application.css


```css
.btn-a,
.btn-b {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
}
.sidebar .btn-a,
.sidebar .btn-b {
  text-transform: lowercase;
}
```

.btn-b is also scoped here

4.3 Extend Pitfalls

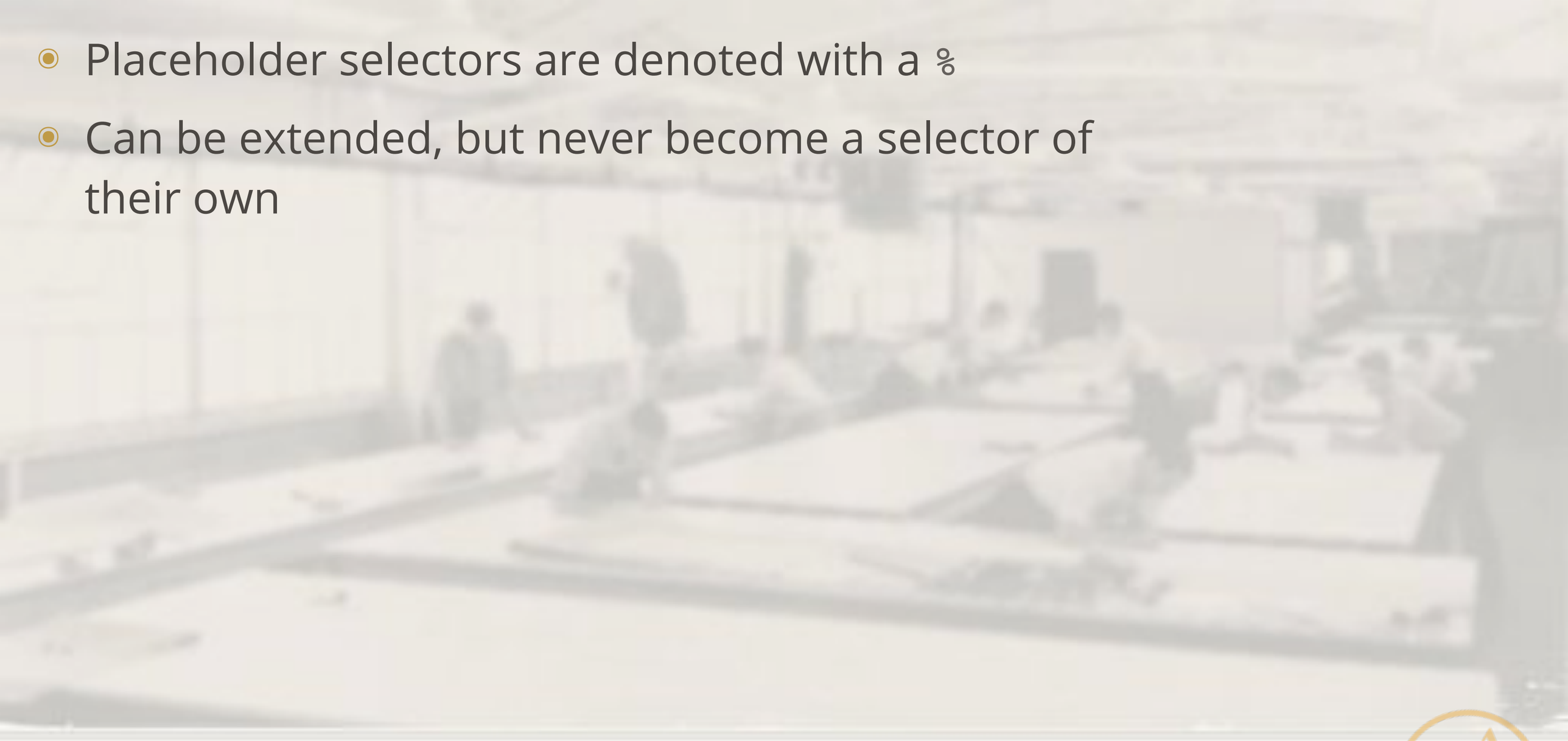
- Since `.btn-b` extends `.btn-a`, every instance that modifies `.btn-a` also modifies `.btn-b`
- Stylesheet bloat, if these extra styles aren't needed
- We can counteract with **placeholder selectors**

4.3 Extend Pitfalls

Assembly Tip

Always, always check the CSS output of your Sass before using it on a live site.

- Placeholder selectors are denoted with a `%`
- Can be extended, but never become a selector of their own



4.4 Placeholder Selectors

_buttons.scss

```
.btn-a {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  @extend .btn-a;
  background: #ff0;
}
.sidebar .btn-a {
  text-transform: lowercase;
}
```

application.css

```
.btn-a,
.btn-b {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
}
.sidebar .btn-a,
.sidebar .btn-b {
  text-transform: lowercase;
}
```

4.4 Placeholder Selectors

_buttons.scss

```scss
%btn {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-a {
  @extend %btn;
}
.btn-b {
  @extend %btn;
  background: #ff0;
}
.sidebar .btn-a {
  text-transform: lowercase;
}
```

application.css


```css
.btn-a,
.btn-b {
  background: #777;
  border: 1px solid #ccc;
  font-size: 1em;
  text-transform: uppercase;
}
.btn-b {
  background: #ff0;
}
.sidebar .btn-a {
  text-transform: lowercase;
}
```

.btn-b is no longer scoped

4.4 Placeholder Selectors

Extend common blocks to avoid extra HTML classes:

application.scss

```
%ir {
  border: 0;
  font: 0/0 a;
  text-shadow: none;
  color: transparent;
  background-color: transparent;
}
.logo {
  @extend %ir;
}
.social {
  @extend %ir;
}
```

application.css

```
.logo,
.social {
  border: 0;
  font: 0/0 a;
  text-shadow: none;
  color: transparent;
  background-color: transparent;
}
```

Assembly Tip

Versions of IE prior to 9 have a limit of 4095 selectors-per-CSS file limit.

5 DIRECTIVE

5.1 Functions

5.2 If

5.3 Each

5.4 For + While

5.5 Mixin' In

Responsive Refresher

- Straight from Journey Into Mobile:

```
target / context
```

- If the target size of our sidebar is `350px` and the context of its parent is `1000px`:

```
350px / 1000px = 0.35
0.35 * 100 = 35%
```

application.scss

```
@function fluidize() {
  @return 35%;
}
.sidebar {
  width: fluidize();
}
```

always returns 35%

application.css

```
.sidebar {
  width: 35%;
}
```

5.1 Functions

application.scss

```
@function fluidize($target, $context) {
  @return ($target / $context) * 100%;
}
.sidebar {
  width: fluidize(350px, 1000px);
}
```

application.css

```
.sidebar {
  width: 35%;
}
```

5.1 Functions

- More on responsive design + Sass later, including a built-in `fluidize` replacement
- Function arguments = **same rules** as mixin arguments

5.1 Functions

Using `@if`, we can conditionally output code:

application.scss

```
$theme: dark;

header {
  @if $theme == dark {
    background: #000;
  }
}
```

application.css

```
header {
  background: #000;
}
```


Comparisons

- == equal to
- != not equal to
- > greater than *
- >= greater than or equal to *
- < less than *
- <= less than or equal to *

* numbers only

application.scss

```
$theme: light;

header {
  @if $theme == dark {
    background: #000;
  }
}
```

5.2 If

`@else` provides a fallback if everything evaluates `false` or `null`:

application.scss

```
$theme: light;

header {
  @if $theme == dark {
    background: #000;
  } @else {
    background: #fff;
  }
}
```

application.css

```
header {
  background: #fff;
}
```


`@else if` allows for multiple comparisons:

application.scss

```
$theme: pink;

header {
  @if $theme == dark {
    background: #000;
  } @else if $theme == pink {
    background: pink;
  } @else {
    background: #fff;
  }
}
```

application.css

```
header {
  background: pink;
}
```


5.1 Functions

5.2 If

5.3 Each

5.4 For + While

5.5 Mixin' In

Interating Over a List

- The `@each` directive allows us to loop through each list item:

```
$authors: nick aimee dan drew;
```


application.scss

```
$authors: nick aimee dan drew;

@each $author in $authors {
  .author-#{$author} {
    background: url(author-
#{$author}.jpg);
  }
}
```

$author

1: nick
2: aimee
3: dan
4: drew

application.css

```
.author-nick {
  background: url(author-nick.jpg);
}
.author-aimee {
  background: url(author-aimee.jpg);
}
.author-dan {
  background: url(author-dan.jpg);
}
.author-drew {
  background: url(author-drew.jpg);
}
```

5.3 Each

application.scss

```
.item {
  position: absolute;
  right: 0;
  @for $i from 1 through 3 {
    &.item-#{$i} {
      top: $i * 30px;
    }
  }
}
```

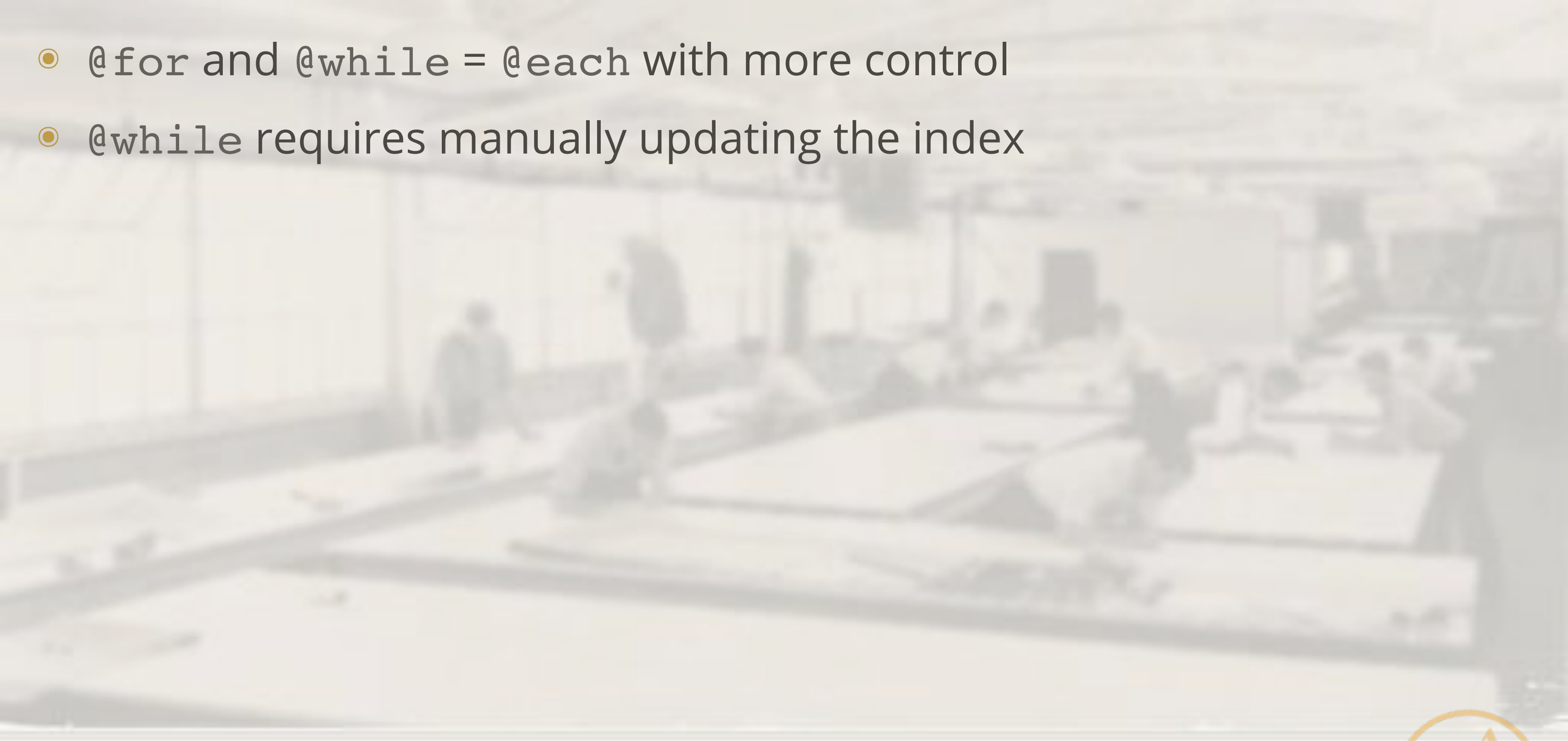
$i → 1: 1, 2: 2, 3: 3

application.css

```
.item {
  position: absolute;
  right: 0;
}
.item.item-1 {
  top: 30px;
}
.item.item-2 {
  top: 60px;
}
.item.item-3 {
  top: 90px;
}
```

5.4 For + While

- `@for` and `@while` = `@each` with more control
- `@while` requires manually updating the index



5.4 For + While

application.scss

```
$i: 1;

.item {
  position: absolute;
  right: 0;
  @while $i < 4 {
    &.item-#{$i} {
      top: $i * 30px;
    }
    $i: $i + 1;
  }
}
```

$i →

1: 1
2: 2
3: 3
4: 4

application.css

```
.item {
  position: absolute;
  right: 0;
}
.item.item-1 {
  top: 30px;
}
.item.item-2 {
  top: 60px;
}
.item.item-3 {
  top: 90px;
}
```

5.4 For + While

application.scss

```
$i: 2;

.item {
  position: absolute;
  right: 0;
  @while $i <= 6 {
    &.item-#{$i} {
      top: $i * 30px;
    }
    $i: $i + 2;
  }
}
```

$i →

1: 2
2: 4
3: 6
4: 8

application.css

```
.item {
  position: absolute;
  right: 0;
}
.item.item-2 {
  top: 60px;
}
.item.item-4 {
  top: 120px;
}
.item.item-6 {
  top: 180px;
}
```

5.4 For + While

5.1 Functions

5.2 If

5.3 Each

5.4 For + While

5.5 Mixin' In

Mixins

- *Similar* sets of properties used multiple times with small variations

Extend

- Sets of properties that match *exactly*

Functions

- Commonly-used operations to determine *values*

_buttons.scss

```
@mixin button($color, $rounded: true) {
  color: $color;
  @if $rounded == true {
    border-radius: 4px;
  }
}
.btn-a {
  @include button(#000, false);
}
.btn-b {
  @include button(#333);
}
```

application.css

```
.btn-a {
  color: black;
}
.btn-b {
  color: #333333;
  border-radius: 4px;
}
```

5.5 Mixin' In

_buttons.scss

```
@mixin button($color, $rounded: false) {
  color: $color;
  @if $rounded {
    border-radius: $rounded;
  }
}
.btn-a {
  @include button(#000);
}
.btn-b {
  @include button(#333, 4px);
}
```

used if $rounded isn't false or null

application.css

```
.btn-a {
  color: black;
}
.btn-b {
  color: #333333;
  border-radius: 4px;
}
```

5.5 Mixin' In

6 MATH + COLOR

6.1 Basic Arithmetic

6.2 Differing Units

6.3 Math Functions

6.4 Math + Color

6.5 Color Shortcuts

6.6 Color Functions

Number Operations

- `+` addition
- `-` subtraction
- `*` multiplication
- `/` division
- `%` modulo

Modulo = **remainder** from a division operation. `12 % 3` results in `0`, while `12 % 5` returns `2`.

Assembly Tip

Sass defaults to returning (up to) five digits after a decimal point.

Division

- The trickiest of the number operations, due to `font`:

```
font: normal 2em/1.5 Helvetica, sans-serif;
```


Triggering Division

- Variable involved - `$size / 10`
- Parenthesis - `(100px / 20)`
- Another arithmetic operation - `20px * 5 / 2`

String Addition

Addition on strings concatenates them:

```
$family: "Helvetica " + "Neue";  // "Helvetica Neue"
```

Initial left-side string determines post-concatenation quotes:

```
$family: 'sans-' + serif  // 'sans-serif'
$family: sans- + 'serif'  // sans-serif
```


If the units differ, Sass attempts combination:

application.scss

```
h2 {
  font-size: 10px + 4pt;
}
```

application.css

```
h2 {
  font-size: 15.33333px;
}
```

Incompatible units will throw an error:

application.scss

```
h2 {
  font-size: 10px + 4em;
}
```

application.css

```
Incompatible units: 'em'
and 'px'.
```

Pre-Defined Math Utilities

- `round($number)` – round to closest whole number
- `ceil($number)` – round up
- `floor($number)` – round down
- `abs($number)` – absolute value
- `min($list)` – minimum list value
- `max($list)` – maximum list value
- `percentage($number)` – convert to percentage

Called the same way as custom functions:

application.scss

```
h2 {
  line-height: ceil(1.2);
}
```

application.css

```
h2 {
  line-height: 2;
}
```

`percentage()` replaces our custom `fluidize()`:

application.scss

```
.sidebar {
  width: percentage(350px/1000px);
}
```

application.css

```
.sidebar {
  width: 35%;
}
```

6.3 Math Functions

`percentage()` replaces our custom `fluidize()`:

application.scss

```
$context: 1000px;

.sidebar {
  width: percentage(450px/$context);
}
```

application.css

```
.sidebar {
  width: 45%;
}
```


6.1 Basic Arithmetic

6.2 Differing Units

6.3 Math Functions

6.4 Math + Color

6.5 Color Shortcuts

6.6 Color Functions

Color Juggling

- Easier recall through variables
- Simplified alteration via **color utility functions**
- Faster representation using **shorthand**

application.scss

```
$color-base: #333333;

.addition {
  background: $color-base + #112233;
}
.subtraction {
  background: $color-base - #112233;
}
.multiplication {
  background: $color-base * 2;
}
.division {
  background: $color-base / 2;
}
```

application.css

```
.addition {
  background: #445566;
}
.subtraction {
  background: #221100;
}
.multiplication {
  background: #666666;
}
.division {
  background: #191919;
}
```

6.4 Math + Color

Assembly Tip

Where possible, use color utility functions instead of color arithmetic: easier to predict and maintain.

application.scss

```
$color: #333333;

.alpha {
  background: rgba(51,51,51,0.8);
}
```

manually finding the rgb value of a color we already have stored

application.css

```
.alpha {
  background: rgba(51,51,51,0.8);
}
```

6.5 Color Shortcuts

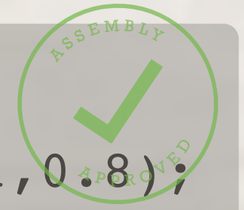
application.scss

```scss
$color: #333333;

.alpha {
  background: rgba($color,0.8);
}
.beta {
  background: rgba(#000,0.8);
}
```

can also use hex values where appropriate

application.css

```css
.alpha {
  background: rgba(51,51,51,0.8);
}
.beta {
  background: rgba(0,0,0,0.8);
}
```



6.5 Color Shortcuts

6.1 Basic Arithmetic

6.2 Differing Units

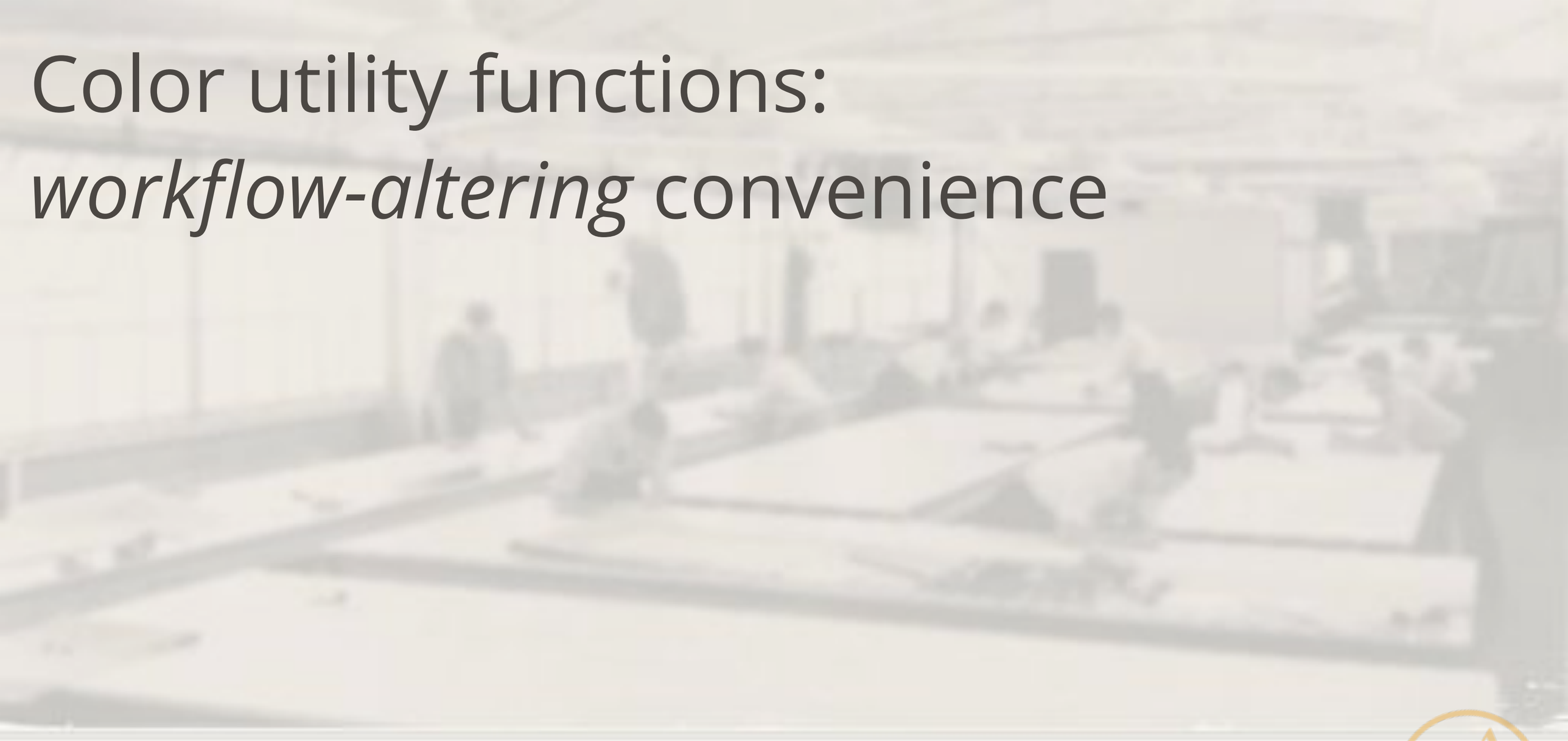
6.3 Math Functions

6.4 Math + Color

6.5 Color Shortcuts

6.6 Color Functions

Color utility functions: *workflow-altering* convenience

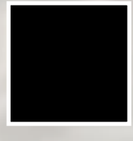


application.scss

```
$color: #333;

.lighten {
  color: lighten($color, 20%);
}
.darken {
  color: darken($color, 20%);
}
```

application.css

```
.lighten {
  background: #666666;
}
.darken {
  background: black;
}
```



6.6 Color Functions

application.scss

```
$color: #87bf64;

.saturate {
  color: saturate($color, 20%);
}
.desaturate {
  color: desaturate($color, 20%);
}
```

application.css

```
.saturate {
  background: #82d54e;
}
.desaturate {
  background: #323130;
}
```

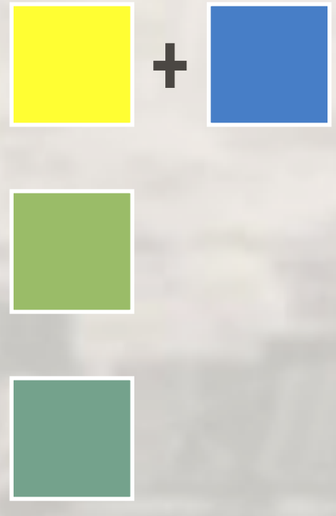
6.6 Color Functions

application.scss

```
.mix-a {
  color: mix(#ffff00, #107fc9);
}
.mix-b {
  color: mix(#ffff00, #107fc9, 30%);
}
```

application.css

```
.mix-a {
  background: #87bf64;
}
.mix-b {
  background: #57a58c;
}
```



6.6 Color Functions

application.scss

```
$color: #87bf64;

.grayscale {
  color: grayscale($color);
}
.invert {
  color: invert($color);
}
.complement {
  color: complement($color);
}
```

application.css

```
.grayscale {
  color: #929292;
}
.invert {
  color: #78409b;
}
.complement {
  color: #9c64bf;
}
```




6.6 Color Functions

Assembly Tip

But wait, there's more!

http://sass-lang.com/docs/yardoc/Sass/Script/Functions.html

7 RESPONSIVE

7.1 The Movement

7.2 Nested Media Queries

7.3 Respond-To

7.4 Responsive Pitfalls

Responsive design rapidly progressed beyond *good idea* and into **common practice**

Media Queries

- Easier fluid calculation and media query handling
- Journey Into Mobile

Media Queries

Basic construction:

application.css

```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```


application.css

```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.2 Nested Media Queries

application.scss

```
.sidebar {
  border: 1px solid #ccc;
  @media (min-width: 700px) {
    float: right;
    width: 30%;
  }
}
```

application.css


```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.2 Nested Media Queries

7.1 The Movement

7.2 Nested Media Queries

7.3 Respond-To

7.4 Responsive Pitfalls

- `@content` - pass a block of properties to a mixin

application.scss

```
.sidebar {
  border: 1px solid #ccc;
  @media (min-width: 700px) {
    float: right;
    width: 30%;
  }
}
```

application.css

```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.3 Respond-To

application.scss

```scss
@mixin respond-to {
  @media (min-width: 700px) {
    @content
  }
}
.sidebar {
  border: 1px solid #ccc;
  @include respond-to {
    float: right;
    width: 30%;
  }
}
```

always outputs the same media query

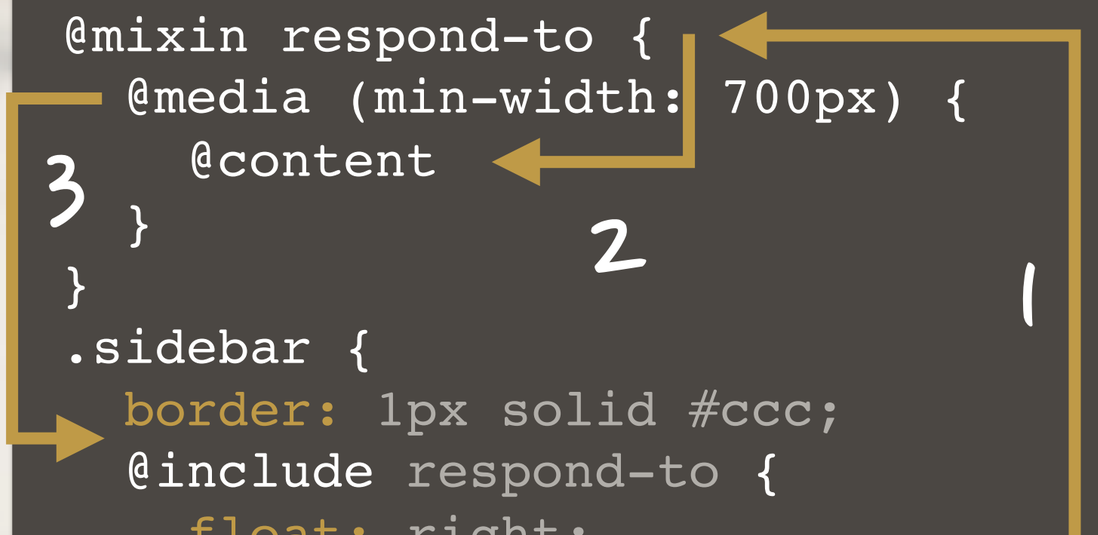
application.css

```css
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.3 Respond-To

application.scss

```
@mixin respond-to {
  @media (min-width: 700px) {
    @content
  }
}
.sidebar {
  border: 1px solid #ccc;
  @include respond-to {
    float: right;
    width: 30%;
  }
}
```



application.css

```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.3 Respond-To

application.scss

```
@mixin respond-to($media) {
  @if $media == tablet {
    @media (min-width: 700px) {
      @content
    }
  }
}
.sidebar {
  border: 1px solid #ccc;
  @include respond-to(tablet) {
    float: right;
    width: 30%;
  }
}
```

application.css

```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 700px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.3 Respond-To

application.scss

```
@mixin respond-to($query) {
  @media (min-width: $query) {
    @content
  }
}
.sidebar {
  border: 1px solid #ccc;
  @include respond-to(900px) {
    float: right;
    width: 30%;
  }
}
```

application.css

```
.sidebar {
  border: 1px solid #ccc;
}
@media (min-width: 900px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.3 Respond-To

application.scss

```
@mixin respond-to($val, $query) {
  @media ($val: $query) {
    @content
  }
}
.sidebar {
  border: 1px solid #ccc;
  @include respond-to(max-width,
600px) {
    float: right;
    width: 30%;
  }
}
```

application.css


```
.sidebar {
  border: 1px solid #ccc;
}
@media (max-width: 600px) {
  .sidebar {
    float: right;
    width: 30%;
  }
}
```

7.3 Respond-To

7.1 The Movement

7.2 Nested Media Queries

7.3 Respond-To

7.4 Responsive Pitfalls

Declarations outside `@media` cannot be extended inside:

application.scss

```
.sidebar {
  border: 1px solid #ccc;
}
.callout {
  @media (min-width: 700px) {
    @extend .sidebar;
    width: 35%;
  }
}
```

deprecation warning for now,
compile error soon

application.scss

```
@media (min-width: 700px) {
  .content {
    border: 1px solid #ccc;
  }
  .aside {
    @extend .content;
    width: 35%;
  }
}
```

extending something in the same media query is ok

application.css

```
@media (min-width: 700px) {
  .content,
  .aside {
    border: 1px solid #ccc;
  }
  .aside {
    width: 35%;
  }
}
```

7.4 Responsive Pitfalls

Matching media queries are not combined:

application.scss

```
.sidebar {
  @media (min-width: 700px) {
    width: 50%;
  }
}
.callout {
  @media (min-width: 700px) {
    width: 35%;
  }
}
```

application.css

```
@media (min-width: 700px) {
  .sidebar {
    width: 50%;
  }
}
@media (min-width: 700px) {
  .callout {
    width: 35%;
  }
}
```


Sometimes, manual combination is best:

application.css

```
@media (min-width: 700px) {
  .sidebar {
    width: 50%;
  }
  .callout {
    width: 35%;
  }
}
```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