

Using Design Tokens To Up Your Accessibility Game

Enabling designers to proactively embed accessibility considerations in their design systems

November 13, 2024

level
access

Meet Karen Hawkins



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Level Access



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Today's agenda

1. Learn what types of design token decisions affect the accessibility of UI (User Interface) elements.
2. Learn how to use design tokens to improve the accessibility of UI elements.
3. Understand the importance of using design tokens to ensure a consistent experience across a wide set of UI elements.

SECTION 1

Foundations

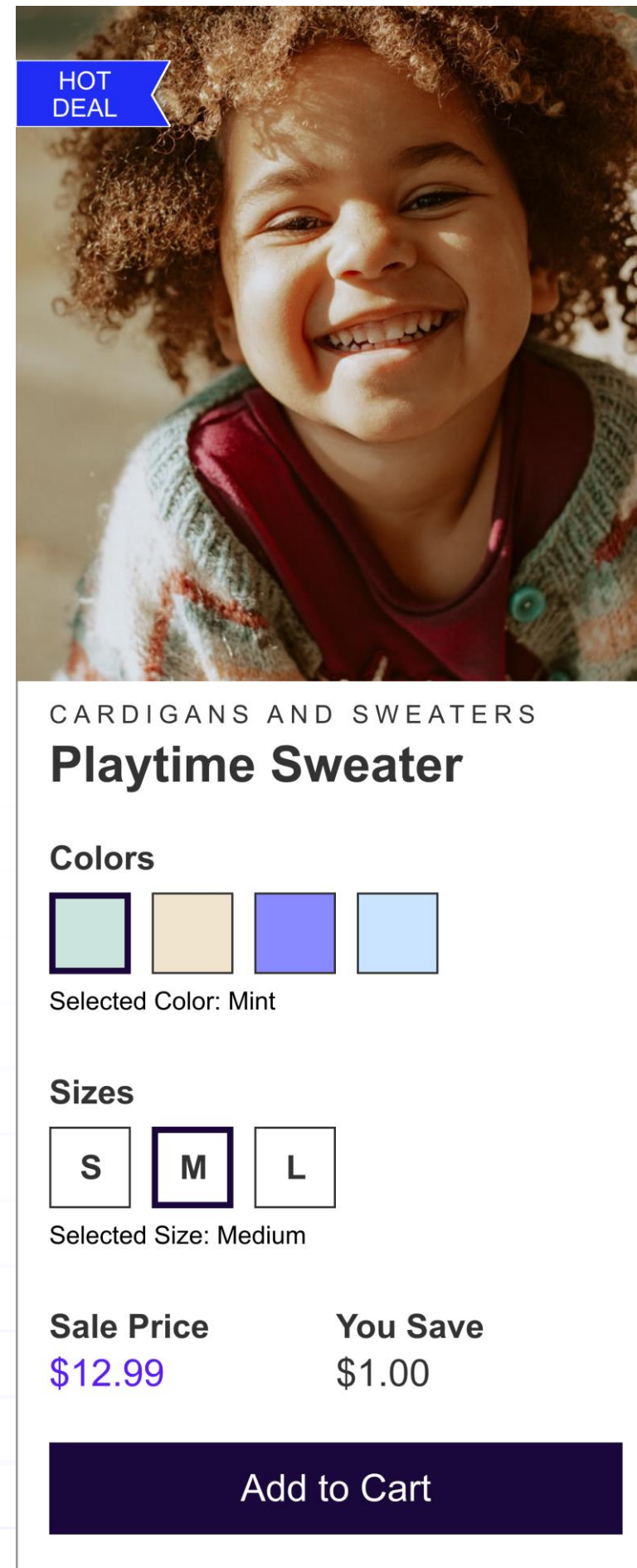
Design systems are like Lego kits

- Contain reusable components and instructions
- Components meet clear standards
- Components can be assembled in a variety of ways
- Instructions are for both creation and use




Pattern

Design systems map well to our mental model of component-ization

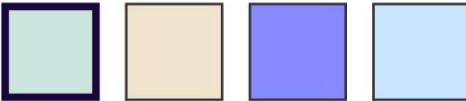


HOT DEAL




CARDIGANS AND SWEATERS
Playtime Sweater

Colors



Selected Color: Mint

Sizes



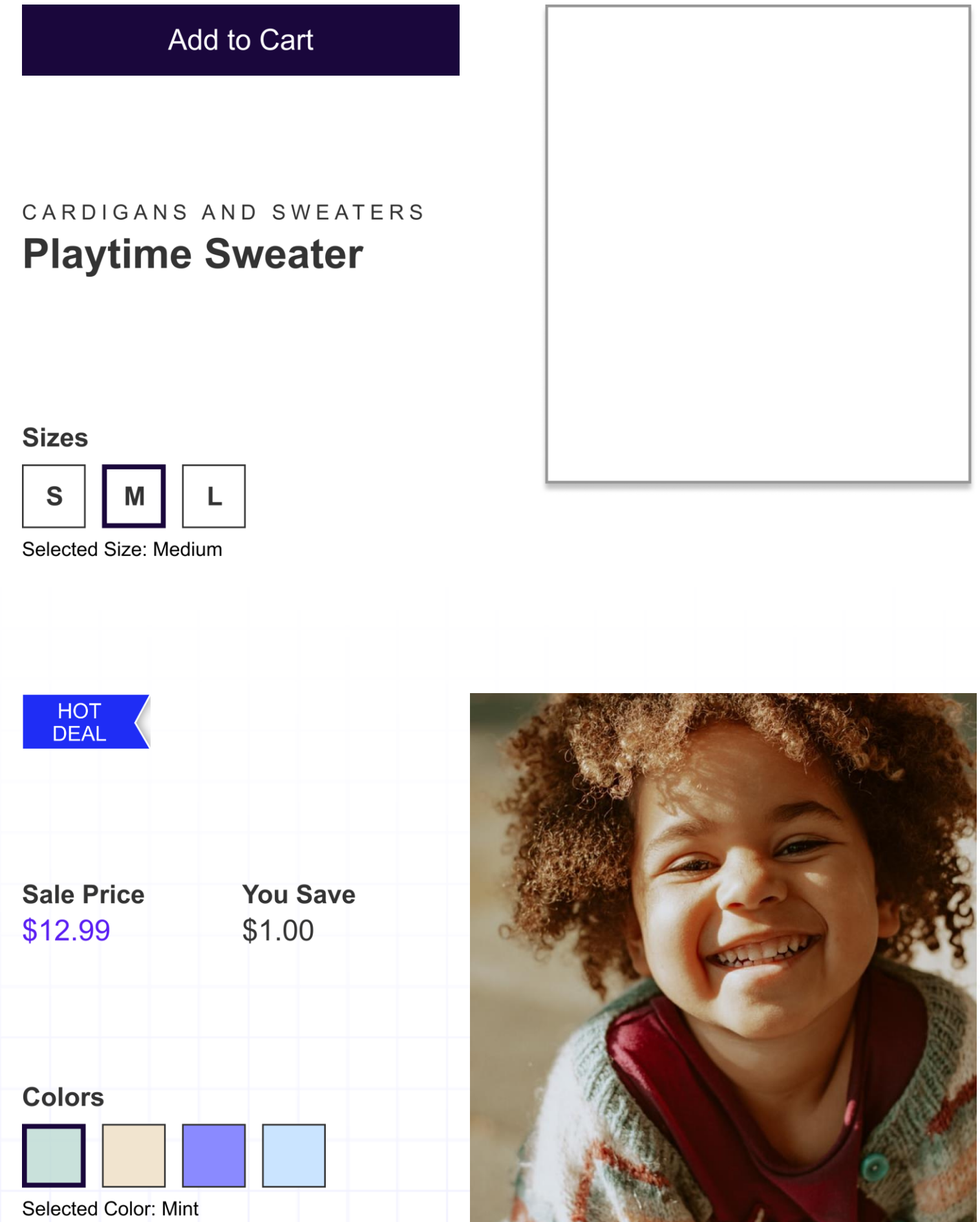
Selected Size: Medium

Sale Price
\$12.99

You Save
\$1.00

Add to Cart


Components



Add to Cart

CARDIGANS AND SWEATERS
Playtime Sweater

Sizes




Selected Size: Medium

HOT DEAL


Sale Price
\$12.99

You Save
\$1.00

Colors



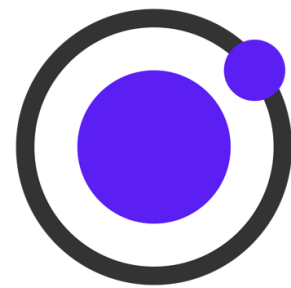
Selected Color: Mint



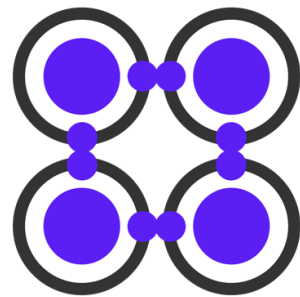
Atomic design is a methodology for creating design systems



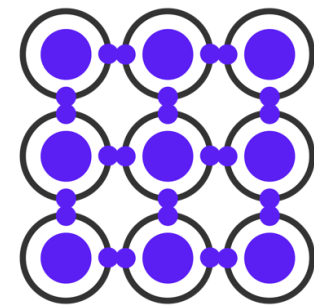
Sub-atomic particles



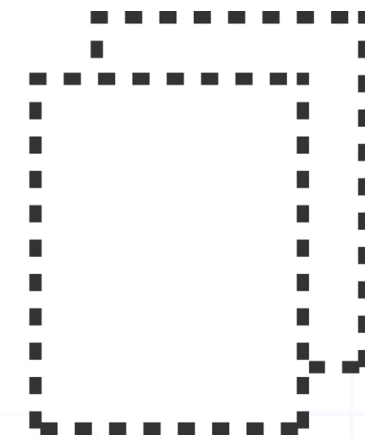
Atoms



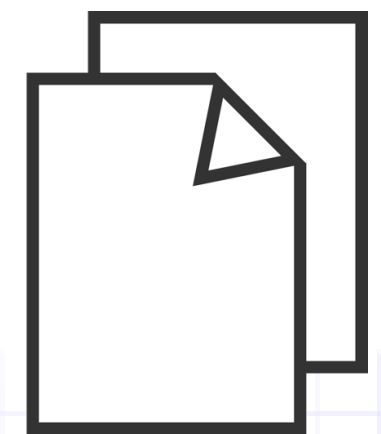
Molecules



Organisms



Templates



Pages

Atomic breakdown of a button

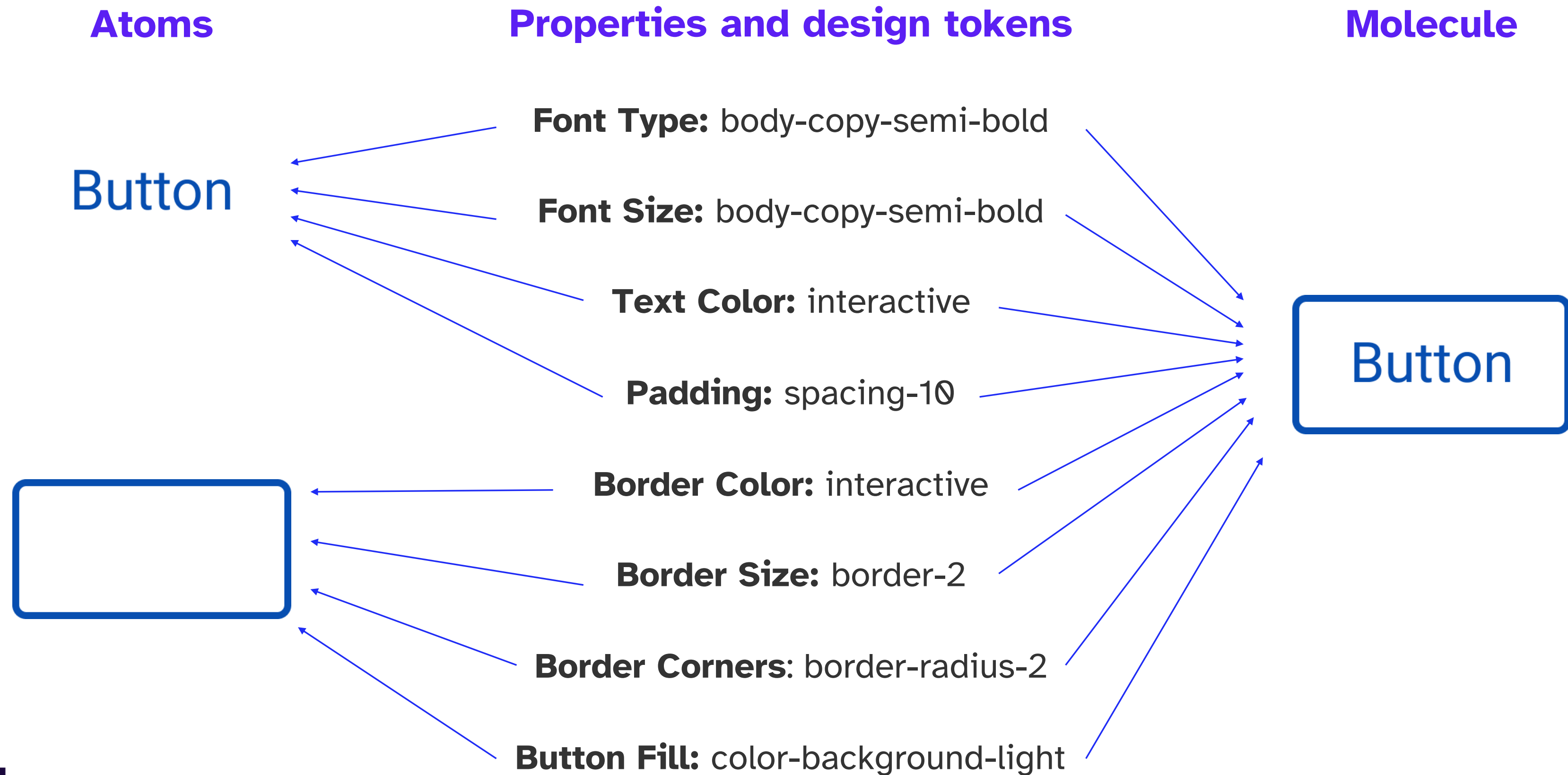
Atoms

Molecule

Button



Subatomic breakdown of a button



Design tokens fill some of the accessibility gaps in design systems



Remaining gaps are filled with other aspects of design, content, and documentation

Molecule

Postal Code

Other element

Error message

Molecular states

Focused / Typing

Postal Code

Focused / Typing / Formatted

Phone Number

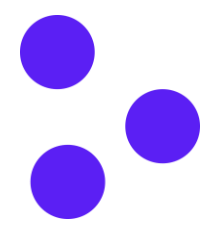
Error

Postal Code

! Postal code is too short

Style guides map to sub-atomic particles












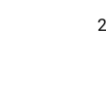



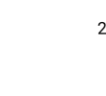




Focus on tokens



Headings

Characteristics	Breakpoint	Visual
ds-heading-100 Font: Rubik Weight: semi bold (600) Size: 28 px (1.75 REM) Line height: 42 px (~2.625 REM)	Desktop and tablet	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet
ds-heading-100 Font: Rubik Weight: semi bold (600) Size: 24 px (1.5 REM) Line height: 36 px (2.25 REM)	Mobile	
ds-heading-200 Font: Roboto Weight: semi bold (600) Size: 24 px (1.5 REM) Line height: 36 px (2.25 REM)	Desktop and tablet	
ds-heading-200 Font: Roboto Weight: semi bold (600) Size: 22 px (1.375 REM) Line height: 33 px (~2.100 REM)	Mobile	
ds-heading-300 Font: Roboto Weight: semi bold (600) Size: 20 px (1.25 REM) Line height: 30 px (1.875 REM)	Desktop, tablet, and mobile	
ds-heading-400 Font: Roboto Weight: semi bold (600) Size: 18 px (1.125 REM) Line height: 27 px (~1.690 REM)	Desktop, tablet, and mobile	
ds-heading-500 Font: Roboto Weight: semi bold (600) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	
ds-heading-600 Font: Roboto Weight: medium (500) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)	Desktop, tablet, and mobile	

Colours

#6A95D0 \$blue-200  \$ds-color-primary-light \$ds-color-interactive-inactive	#074EB0 \$blue-500  \$ds-color-primary \$ds-color-interactive	#FAFAFA \$gray-000  \$ds-color-background-alt	#F4364C \$coral-500  \$ds-color-severity-critical
#063E8D \$blue-700  \$ds-color-primary-dark \$ds-color-interactive-hover	#042F6A \$blue-800  \$ds-color-tooltip-background	#D9E9D9 \$green-500  \$ds-color-focus	#000000 \$black-500  \$ds-color-text-dark
#F3F6FB \$blue-000  \$ds-color-background-primary	#FFFFFF \$white  \$ds-color-text-light	#4CAF50 \$green-500  \$ds-color-focus	#FFCDD2 \$red-500  \$ds-color-error
#333333 \$gray-850  \$ds-color-text-dark	#8C8C8C \$gray-500  \$ds-color-border \$ds-color-text-inactive	#FFEB3B \$yellow-500  \$ds-color-focus	#FFCDD2 \$red-500  \$ds-color-error
#A30083 \$purple-500  \$ds-color-focus	#B10606 \$red-500  \$ds-color-error	#FFEB3B \$yellow-500  \$ds-color-focus	#FFCDD2 \$red-500  \$ds-color-error

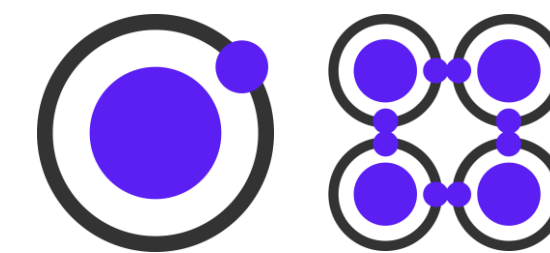
Spacing

Token name	Pixel value	REM value	Image
\$ds-spacing-00	0 px	0 REM	
\$ds-spacing-02	1 px	0.0625 REM	·
\$ds-spacing-05	2 px	0.125 REM	·
\$ds-spacing-10	4 px	0.25 REM	·
\$ds-spacing-20	8 px	0.5 REM	■
\$ds-spacing-30	16 px	1 REM	■
\$ds-spacing-40	24 px	1.5 REM	■
\$ds-spacing-50	32 px	2 REM	■
\$ds-spacing-60	40 px	2.5 REM	■
\$ds-spacing-70	48 px	3 REM	■
\$ds-spacing-90	64px	4 REM	■

Components map to atoms and molecules

Focus on foundational aspects:

- States
- Variations
- Zoom
- Keyboard interactions
- Screen reader experiences
- Touch experiences
- Voice control experiences
- Etc.



This link is an [inline link](#) in the middle of some text.



List of selections *

Instructions

Select all

Label

Label

Label

Label

Label

Label

List of selections *

Instructions

Label

Label

Label

Label

Label

Label

Select label *

Instructions

Select an option



Label *

Instructions

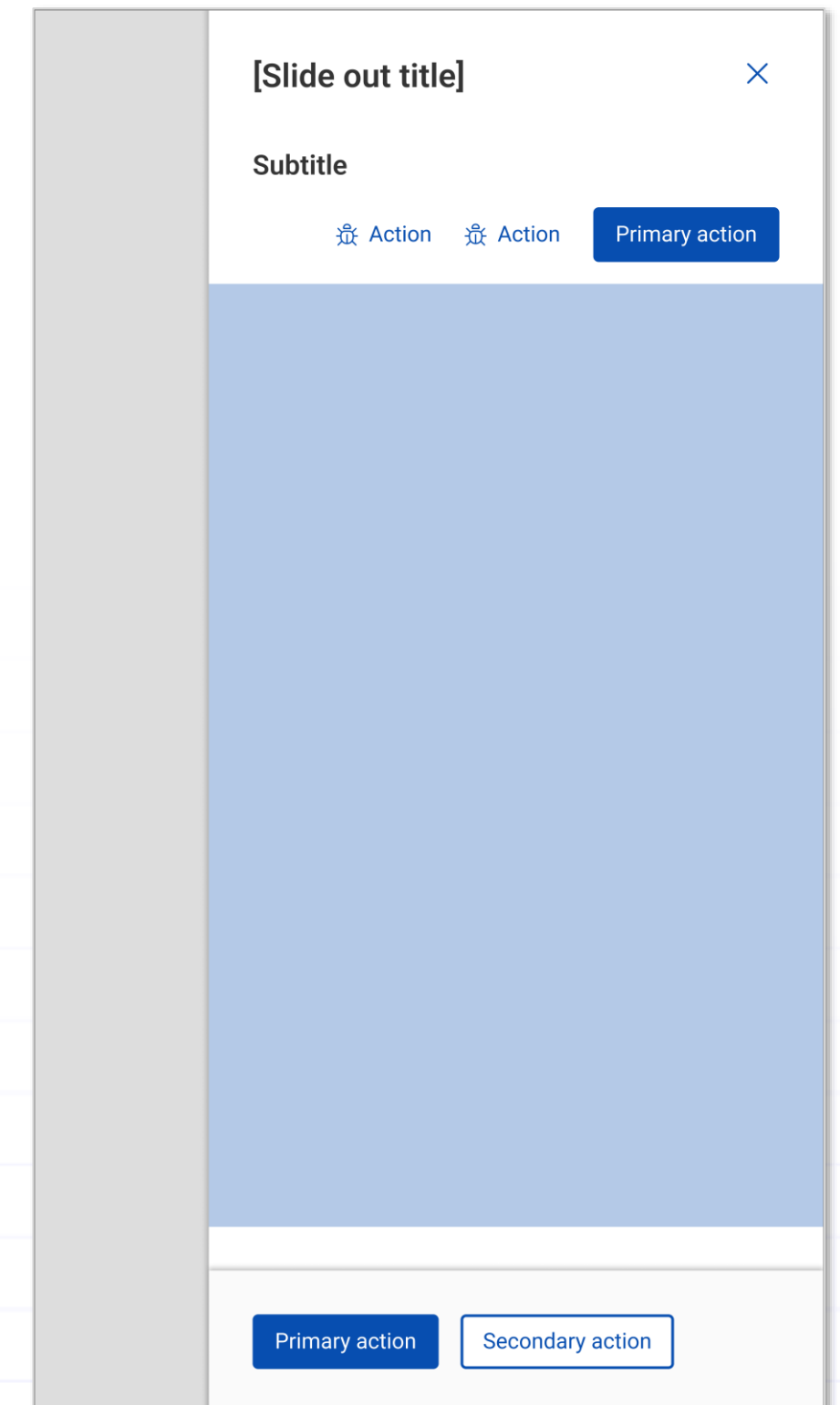
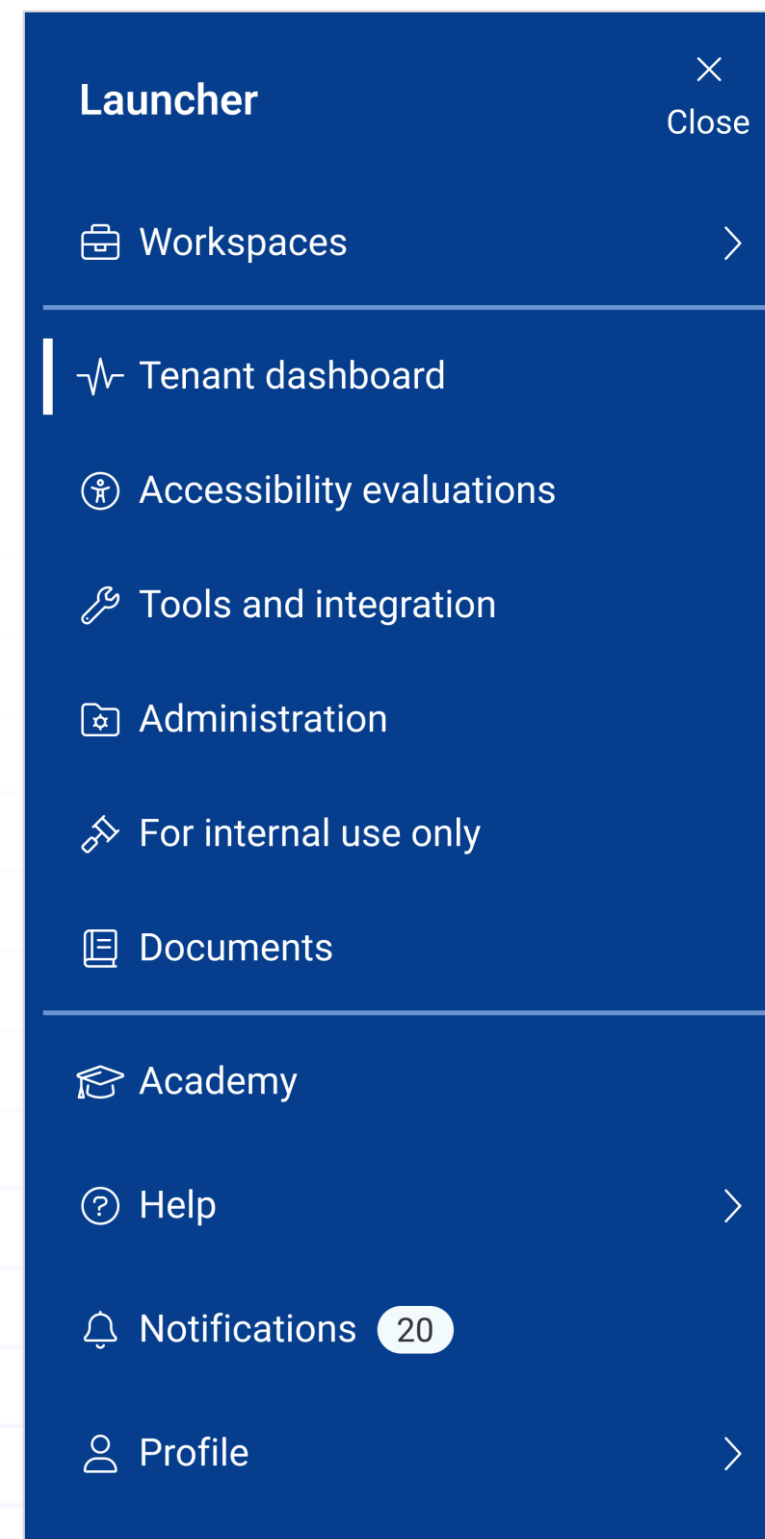
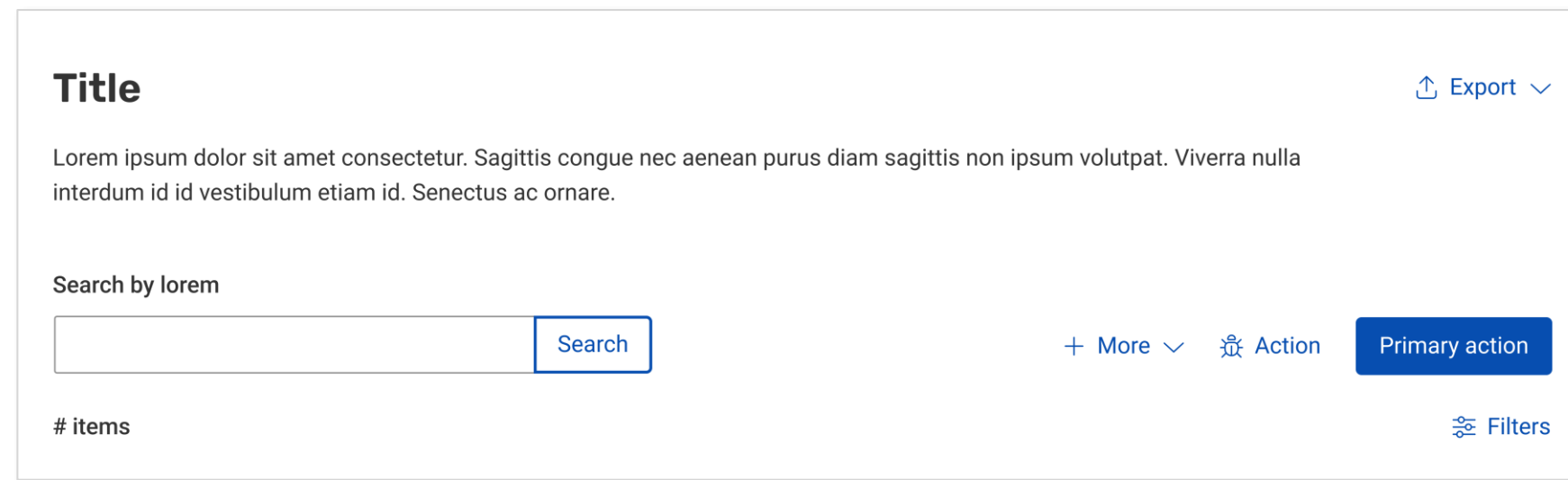
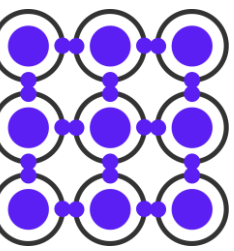
Text

0/###

Patterns map to organisms

Focus on higher order thinking:

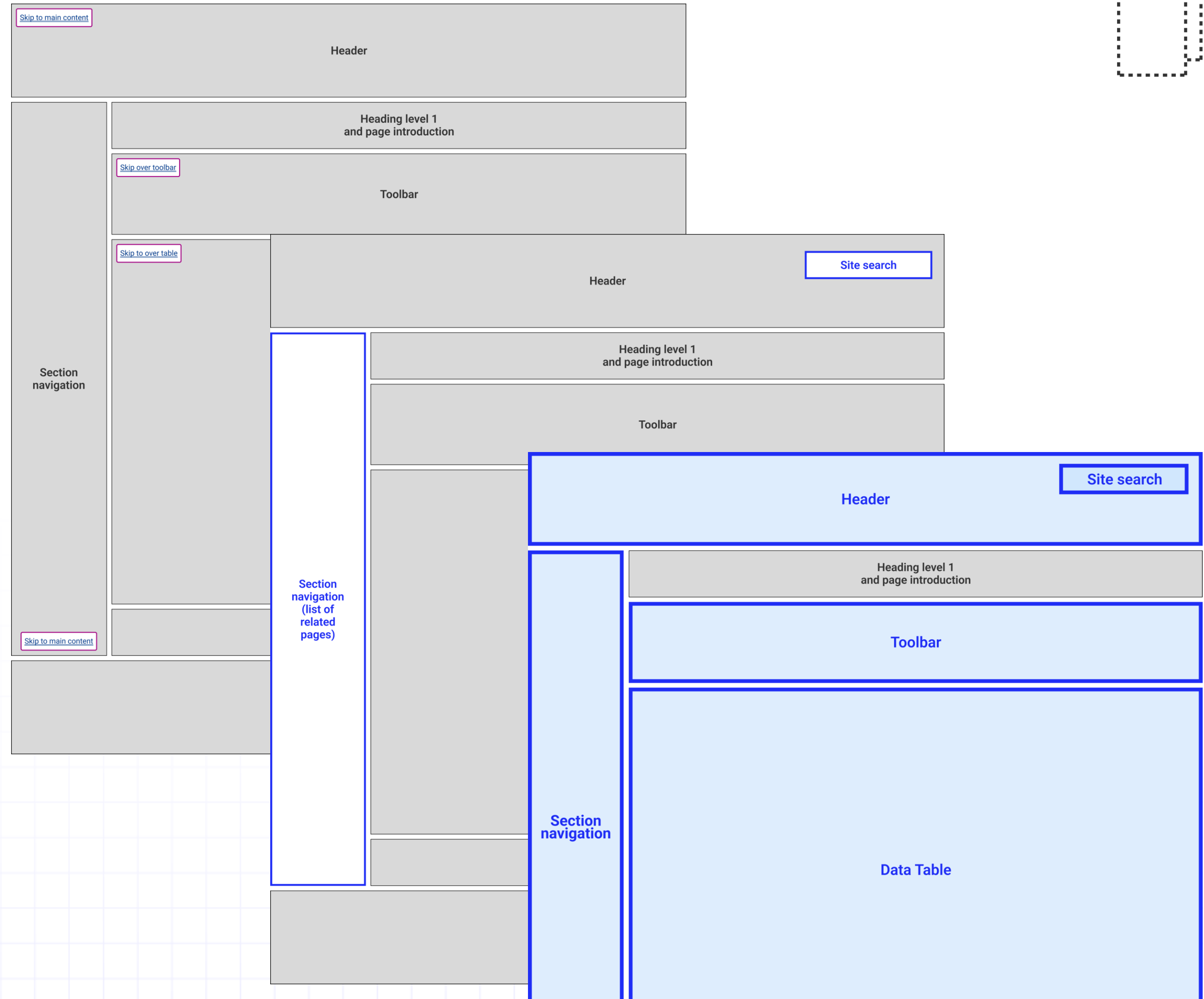
- Reading order / focus order
- Feedback
- Focus management
- Skip links
- Interdependencies between multiple components
- Etc.



Templates map to templates

Focus on additional navigational paradigms:

- Skip links
- Landmarks
- Additional navigational and orientation support
- Consistent help
- Etc.



Fully designed pages map to pages

Focus on the content:

- Page titles
- Page / site / section language
- Plain language
- Content uniqueness and differentiation
- Alternative text
- Media (audio, video, images, etc.)
- Etc.

The screenshot shows a web application interface for 'Main website manual evaluation'. The top navigation bar includes 'LEVEL ACCESS', 'Workspaces', 'Children's Brand', 'Academy', and a notification bell. The main navigation menu has 'Dashboard', 'Websites/Apps', 'Design', 'PDF', 'Projects/Tasks', and 'Files'. The 'Websites/Apps' section is active, showing 'Main Website' and sub-navigation for 'Overview', 'Monitoring', 'Scans', and 'Evaluations'. The main content area is titled 'Main website manual evaluation' and contains a search bar, a table with 10 rows and 6 columns, and a 'Related links' section with four categories of links. A footer contains copyright information and a cookie consent banner.

Main website manual evaluation

Search by severity
For multiple keywords, separate by comma

1-10 of 30 results

<input type="checkbox"/>	Column header 1	Column header 2	Column header 3	Column header 4	Column header 5	Actions
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮
<input type="checkbox"/>	Column 1 cell	Column 2 cell	Column 3 cell	Column 4 cell	Column 5 cell	⋮

Related links

Category 1	Category 2	Category 3	Category 4
Link name 1 goes here	Link name 5 goes here	Link name 9 goes here	Link name 13 goes here
Link name 2 goes here	Link name 6 goes here	Link name 10 goes here	Link name 14 goes here
Link name 3 goes here	Link name 7 goes here	Link name 11 goes here	Link name 15 goes here
Link name 4 goes here	Link name 8 goes here	Link name 12 goes here	Link name 16 goes here

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Select label *

Instructions

Select an option



Button

This link is an [inline link](#) in the middle of some text.

Token use: maximize component accessibility

Headings

Characteristics	Breakpoint	Visual
ds-heading-100 Font: Rubik Weight: semi bold (600) Size: 28 px (1.75 REM) Line height: 42 px (~2.625 REM)	Desktop and tablet	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-heading-100 Font: Rubik Weight: semi bold (600) Size: 24 px (1.5 REM) Line height: 36 px (2.25 REM)	Mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-heading-200 Font: Roboto Weight: semi bold (600) Size: 24 px (1.5 REM) Line height: 36 px (2.25 REM)	Desktop and tablet	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-heading-200 Font: Roboto Weight: semi bold (600) Size: 22 px (1.375 REM) Line height: 33 px (~2.100 REM)	Mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-heading-300 Font: Roboto Weight: semi bold (600) Size: 20 px (1.25 REM) Line height: 30 px (1.875 REM)	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
ds-heading-400	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.

SECTION 2

Using tokens to make components accessible

Example primary button (default state)

Design tokens

Font Type: body-copy-semi-bold

Font Size: body-copy-semi-bold

Text Color: color-text-light

Padding: spacing-10

Border Color: interactive

Border Size: border-2

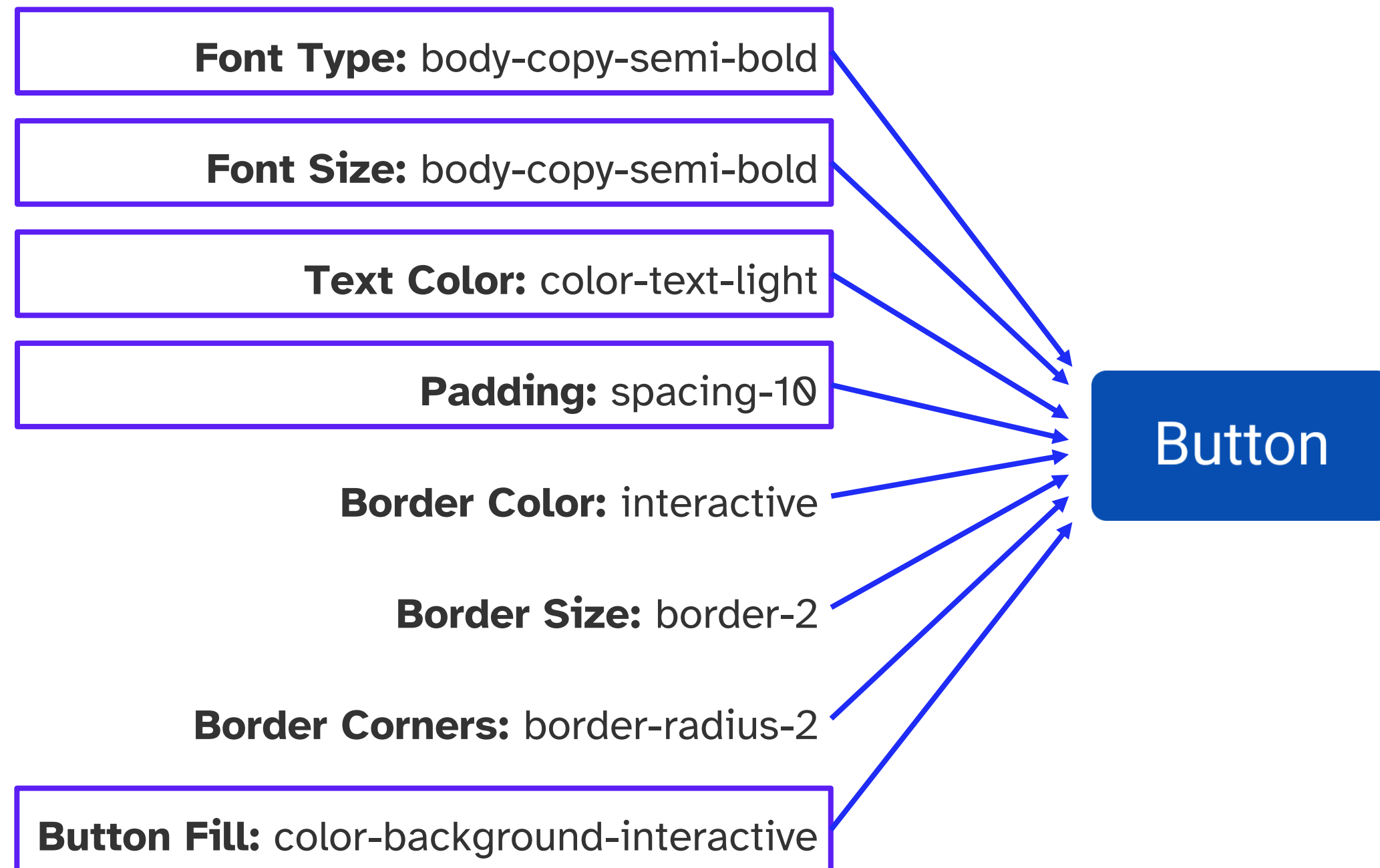
Border Corners: border-radius-2

Button Fill: color-background-interactive



Example primary button (default state) tokens, requirements, and best practices

Design tokens



Accessible design requirements

- Text to fill contrast 4.5:1 or better
- Target size 24px X 24px or larger
- Has a label

Accessible design best practices

- Readability of selected font (minimalist and clear character differentiation)
- Minimum font size 12pt (16px)
- Fill to background contrast 3:1 or better

QUESTION

What's the point of states?

ANSWER

To communicate the status of a component or interactive element.

ANSWER

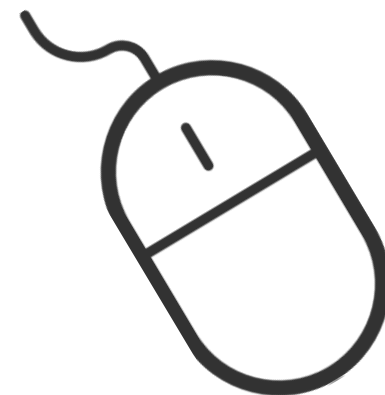
To **communicate** the status of a component or interactive element.

Minimum states to design

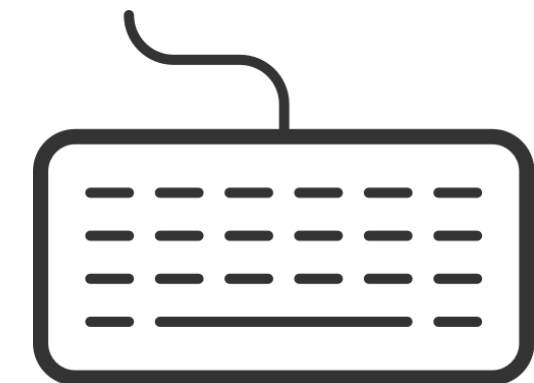
Default



Hover – for pointers



Focus – for keyboards



QUESTION

What's the point of hover and focus states?

ANSWER

They provide “you are here” feedback.

Button hover and focus state accessible design requirements and best practices

Accessible design requirements

- Text to fill contrast 4.5:1 or better
- Target size 24px X 24px or larger
- Has a label
- **Additional to default state:**
 - Cannot rely on color alone to indicate meaning (must use redundant coding)
 - Every actionable element must have a designed focus state which includes a focus indicator



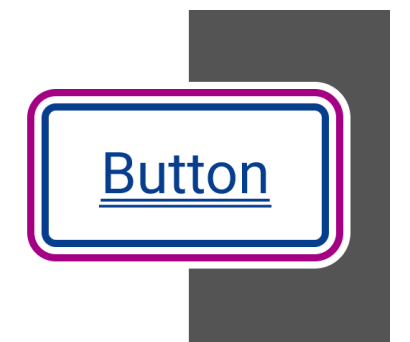
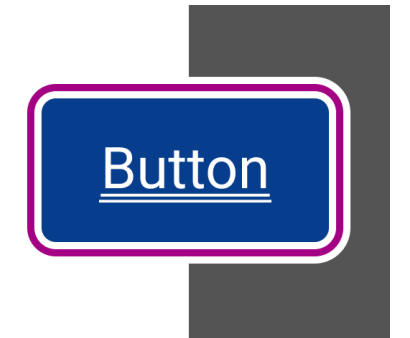
Accessible design best practices

- Readability of selected font (minimalist and clear character differentiation)
- Minimum font size 12pt (16px)
- Fill to background contrast 3:1 or better
- **Additional to default state:**
 - **All states should be visually differentiated**
 - **Hover and focus states should be highly salient**

Focus indicator design

Accessible design requirements

- Every actionable element must have a visible focus indicator



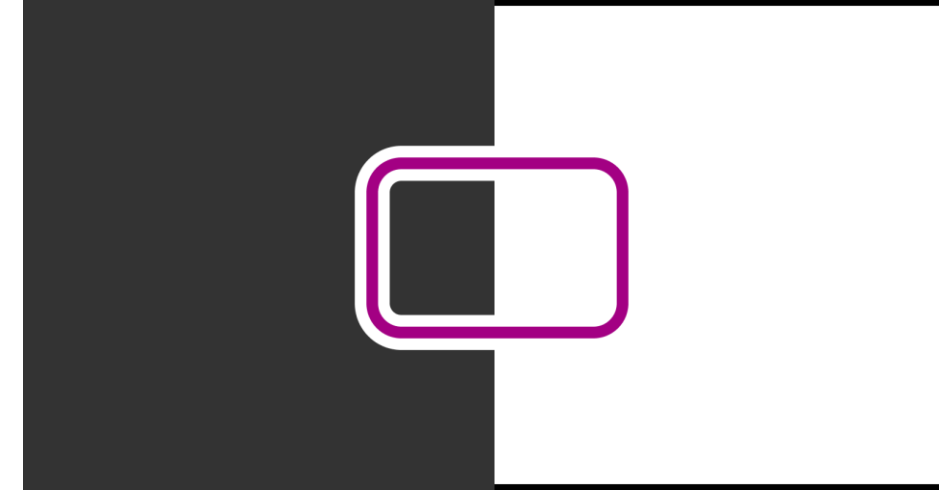
Accessible design best practices

- The focus indicator should be highly salient
- Focus indicator should have sufficient contrast and size
 - Contrast of 3:1 or better between focused and unfocused pixels
 - Area equivalent to 2px thick perimeter or larger



SIDEBAR

Example focus indicator tokens



Anatomy

Outline name

Token names

Inner outline

\$white
outline-M
border-radius-M

Middle outline

\$focus
outline-M
border-radius-M

Outer outline

\$white
outline-M
border-radius-M

Usage

Token name

Usage

spacing-S

Around text

spacing-00

Around boxes

spacing-M

Around icons

Button hover and focus state design examples

Default



Hover



- Dark blue (token)
- Double underline (token)

Focus



- Dark blue (token)
- Double underline (token)
- Focus indicator (tokens)

Hover state options: color only

Default



Options



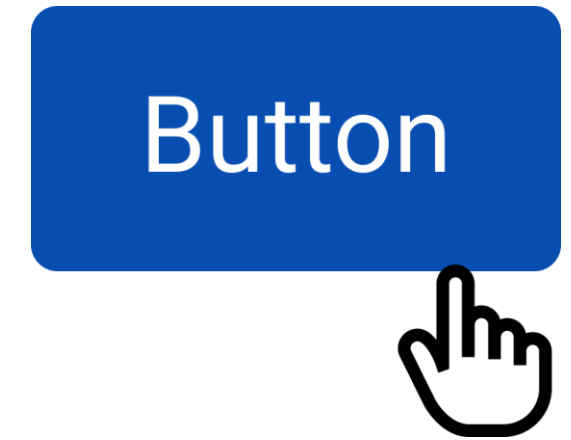
SIDEBAR

Relying on external indicators

Default



Hover



Default



Focus



SIDEBAR

Using only color to indicate focus

Default - #074EB0



#074EB0 and #333333
Contrast - 1.63:1



#074EB0 and #000000
Contrast - 2.72:1



#074EB0 and #6A95D0
Contrast - 2.5:1



#074EB0 and #A30083
Contrast - 1.05:1



#074EB0 and #FFFFFF
Contrast - 7.7:1



BEST PRACTICE

Have the element convey its state.

HINT

Change something structural.

Hover state options: underline, bold text, larger text, and smaller text

Default

Button

Options

Button

Button

Button

Button

Button

Button

Button

Button

Button

Button

Hover state options: size

Default



Options



Hover state options: invert colors

Default



Options



Hover state options: thick lines

Default



Options



Hover state options: border thickness

Default



Options



Hover state options: border radius

Default



Options



Hover state options: shadow

Default



Button

Options



Button



Button



Button



Button



Button

Hover state options: animation

Default



Options

Consider all variations required by your design system

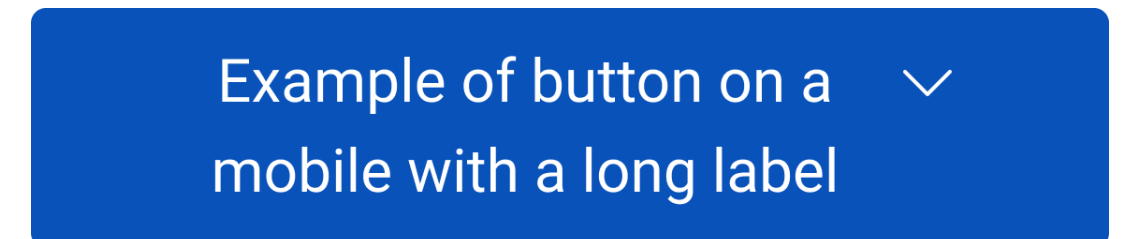
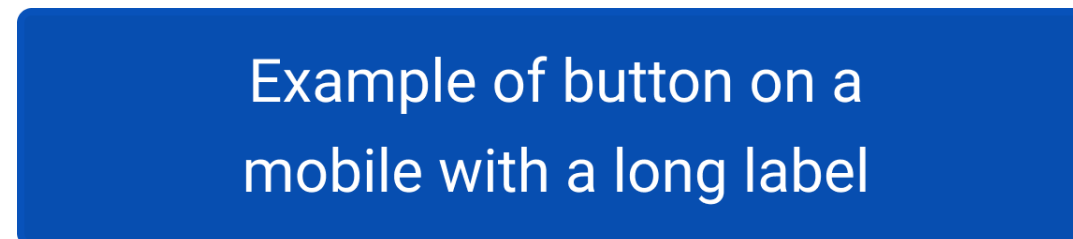
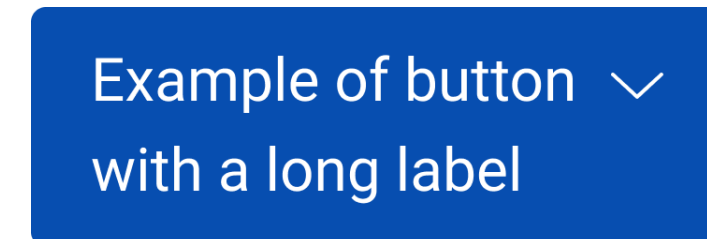
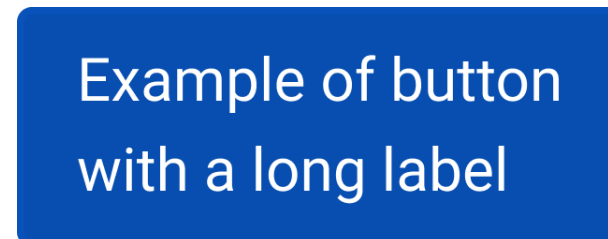
Mobile



Icons



Text wrapping



Include additional variations as required by accessibility requirements

Default



200% text



400% zoom ~ mobile



TIP

Pressure test your foundational and complex components at 200% text

Body copy

Characteristics	Breakpoint	Visual
<p>ds-body-copy</p> <p>Font: Roboto Weight: regular (400) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)</p>	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
<p>ds-body-copy-highlight</p> <p>Font: Roboto Weight: medium (500) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)</p>	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
<p>ds-body-copy-semi-bold</p> <p>Font: Roboto Weight: semibold (600) Size: 16 px (1 REM) Line height: 24 px (1.5 REM)</p>	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
<p>ds-small-copy</p> <p>Font: Roboto Weight: regular (400) Size: 14 px (0.875 REM) Line height: 21 px (~1.315 REM)</p>	Desktop, tablet, and mobile	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
<p>ds-body-copy-200%</p> <p>Font: Roboto Weight: regular (400) Size: 32 px (2 REM) Line height: 48 px (3 REM)</p>		Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.
<p>ds-small-copy-200%</p> <p>Font: Roboto Weight: regular (400) Size: 28 px (1.75 REM) Line height: 42 px (2.625 REM)</p>		Lorem ipsum dolor sit amet, consectetur adipiscing elit. Quam amet morbi magna ornare nunc netus dictum sit.

TIP

Pressure test your foundational and complex components on a 320px screen width

- 400% zoom minimum design size:
 - $1280\text{px} / 4 = 320\text{px}$ for vertically scrolling content
 - Or $1024\text{px} / 4 = 256\text{px}$ for horizontally scrolling content
- Additional benefits:
 - Ensures a design for 1 column of content
 - Enforces designing responsively / for mobile

Grid size	Token name	Min width	Max width
Small	<code>\$ds-grid-small</code>	320	575
Medium	<code>\$ds-grid-medium</code>	576	991
Large	<code>\$ds-grid-large</code>	992	1440

Example style decisions applied to multiple button types

	Default	Hover	Focus	Inactive
Primary				
Secondary				
Tertiary				

Example style decisions applied to links

Default



Standalone Link

This link is an [inline link](#) in the middle of some text.

Hover



Standalone Link

This link is an [inline link](#) in the middle of some text.

Focus



Standalone Link

This link is an [inline link](#) in the middle of some text.

Inactive



Standalone Link

This link is an [inline link](#) in the middle of some text.

Example style decisions extended to radio buttons and checkboxes

Default

Hover

Focus

Inactive

Unselected radio button



Selected radio button



Unselected checkbox



























Selected checkbox



Partially selected checkbox
level
access



Example style decisions extended to interactive icons

Unselected			Selected		
Default	Hover	Focus	Default	Hover	Focus
 Upload	 Upload	 Upload	 Upload	 Upload	 Upload
 Add	 Add	 Add	 Add	 Add	 Add
 Attach	 Attach	 Attach	 Attach	 Attach	 Attach
 Calendar	 Calendar	 Calendar	 Calendar	 Calendar	 Calendar
 Chat	 Chat	 Chat	 Chat	 Chat	 Chat

Example style decisions extended to text inputs and dropdowns

Default

Field label *
Instructions

Select label *
Instructions

Hover

Field label *
Instructions

Select label *
Instructions

Focus

Field label *
Instructions

Select label *
Instructions

Inactive

Field label *
Instructions

This field can't be changed.

Select label *
Instructions

This option can't be changed.

Error

Field label *
Instructions

ⓘ Error message

Select label *
Instructions

ⓘ Error message

Example style decisions extended to exposed dropdown panels

States on an unselected item

Default

Select label *

Instructions

Select an option ^

Select an option

Option 1

Option 2

Option 3

Hover

Select label *

Instructions

Select an option ^

Select an option

Option 1

Option 2

Option 3

Focus

Select label *

Instructions

Select an option ^

Select an option

Option 1

Option 2

Option 3

States on a selected item

Default

Select label *

Instructions

Option 2 ^

Select an option

Option 1

Option 2

Option 3

Hover

Select label *

Instructions

Option 2 ^

Select an option

Option 1

Option 2

Option 3

Focus

Select label *

Instructions

Option 2 ^

Select an option

Option 1

Option 2

Option 3

SIDEBAR

Some design options to indicate selected states

Select an option

Option 1

Option 2

Option 3

Select an option

Option 1

Option 2

Option 3

Select an option

Option 1

Option 2

Option 3

Select an option

Option 1

Option 2

Option 3

★ Select an option

Option 1

Option 2

Option 3

Select an option ★

Option 1

Option 2

Option 3

Select an option

Option 1

Option 2

Option 3

Select an option

Option 1

Option 2

Option 3

Select an option

Option 1

Option 2

Option 3

QUESTION

Why is consistency so important?



Consistency is key to usability

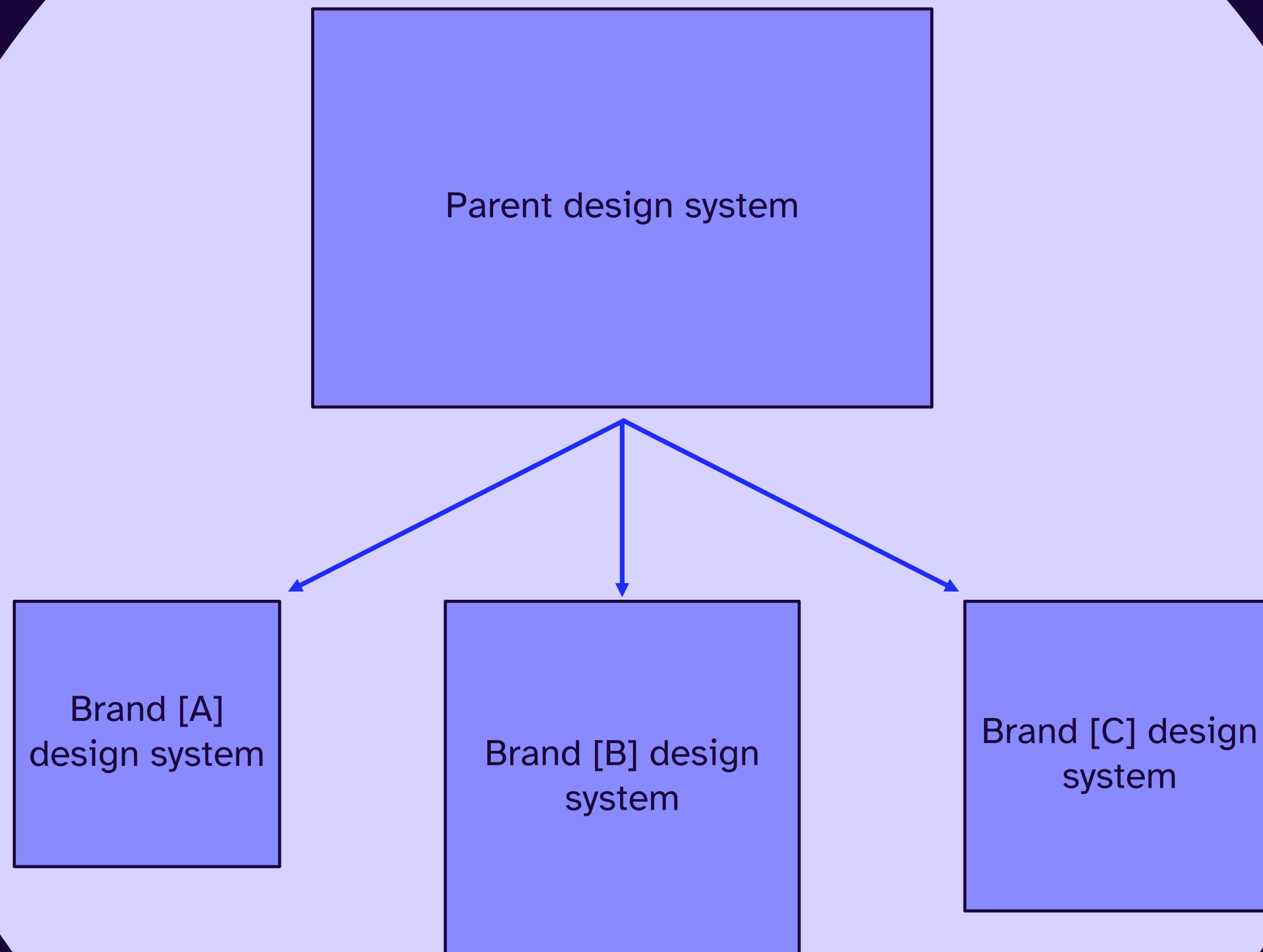
Usability quality attributes

- Learnability
- Memorability
- Efficiency
- Error tolerance
- Satisfaction

Consistent experiences are

- Easy to learn
- Easy to remember
- Efficient
- Error tolerant
- Pleasant to use

Design system inheritance



Inheritance examples

Parent

Default

Postal Code

Border Thickness: 1px
Border Color: #333333
Corner Radius: 0

Focused / Typing

Postal Code

Border Thickness: 3px
Border Color: #333333
Corner Radius: 0

Child 1

Default

Postal Code

Border Thickness: 1px
Border Color: #333333
Corner Radius: 0

Focused / Typing

Postal Code

Border Thickness: 3px
Border Color: #B0008E
Corner Radius: 0

Child 2

Default

Postal Code

Border Thickness: 1px
Border Color: #002D04
Corner Radius: 0

Focused / Typing

Postal Code

Border Thickness: 5px
Border Color: #002D04
Corner Radius: 0

Child 3

Default

Postal Code

Border Thickness: 3px
Border Color: #413B94
Corner Radius: 0

Focused / Typing

Postal Code

Border Thickness: 1px
Border Color: #413B94
Corner Radius: 0

SECTION 3

Summary

Key takeaways

- Set up your tokens to maximize component design accessibility
- Component design:
 - Design as many variations as required by your design system
 - Augment that set with additional variations as required by accessibility requirements
 - Use redundant coding / at least 2 ways to communicate
 - Aim for consistency across element families

**Any
questions?**

Get in touch with me



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LinkedIn

level
access

Thank you