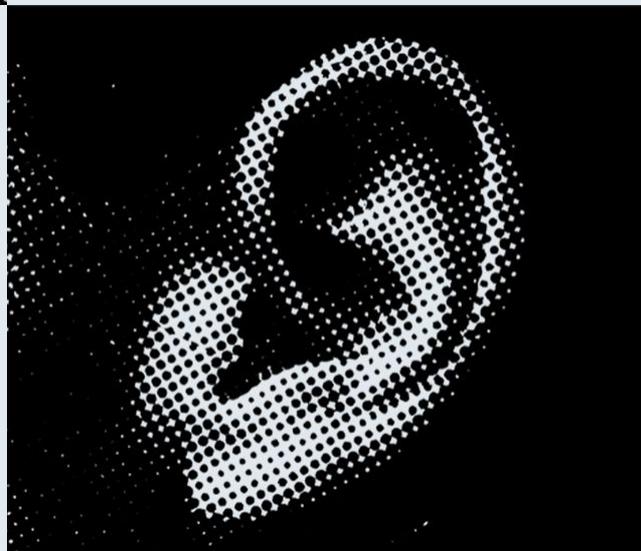
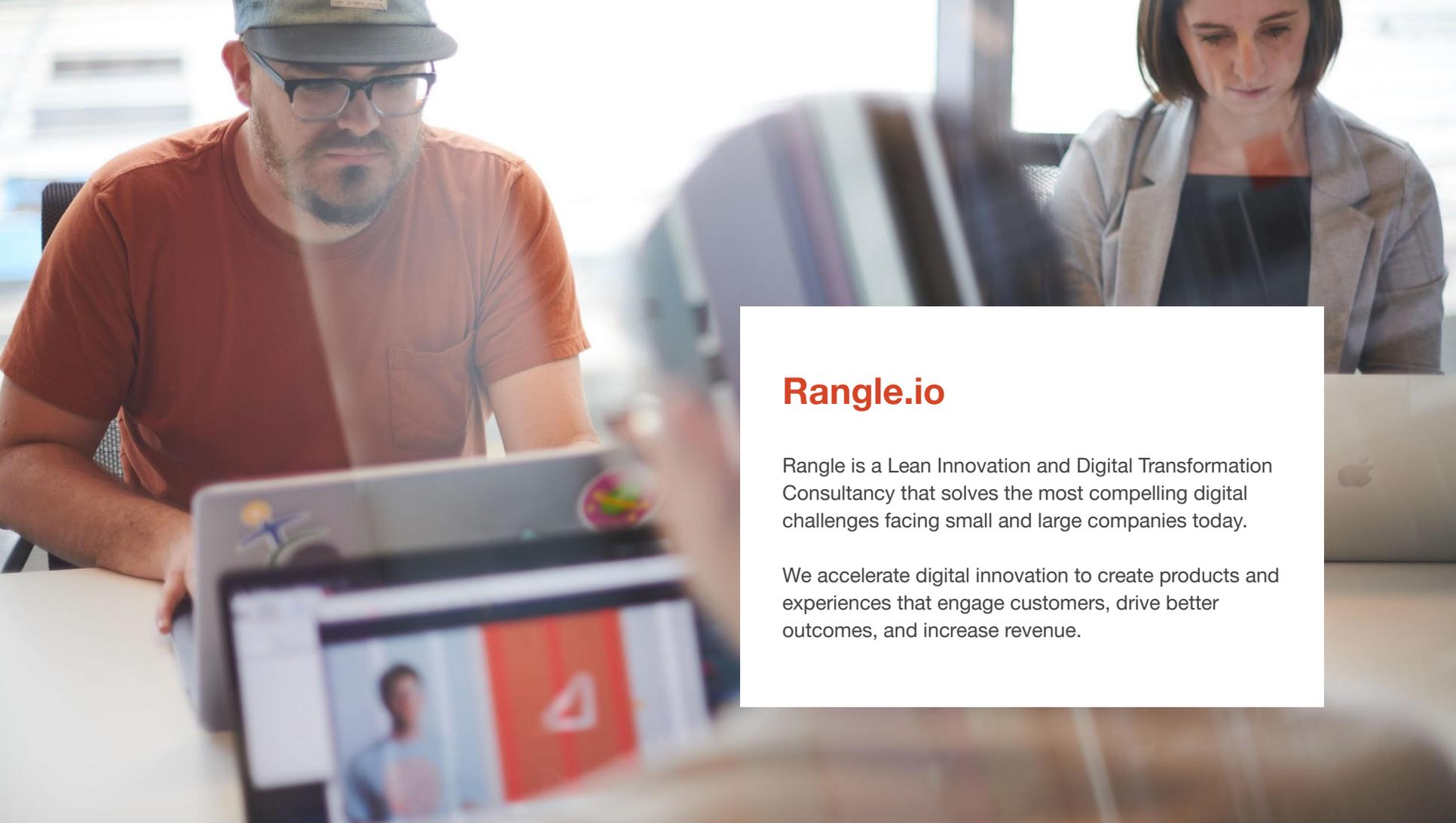


**How accessible
design and
development can
impact your
business**





Rangle.io

Rangle is a Lean Innovation and Digital Transformation Consultancy that solves the most compelling digital challenges facing small and large companies today.

We accelerate digital innovation to create products and experiences that engage customers, drive better outcomes, and increase revenue.



Fernanda Sobreira

Demand Generation
Manager, Rangle.io



**Guest Speaker
Oskar Westin**

Senior Accessibility
Strategy Manager,
Telus Digital



Katrina Rempel

Senior Experience
Designer, Rangle.io



Ankita Kulkarni

Solutions Architect,
Rangle.io

Outline

1. What is Accessibility?
2. Inclusive Design in Practice
3. Building Accessible Software
4. Q&A

What is Accessibility?

What is A11y

**[a11y] is a numeronym
a number-based word used to form an
abbreviation**

pronounced A eleven Y

**“... the design of products,
devices, or services... for people
~~who experience disabilities.~~”**

**Accessibility removes
barriers that restrict ability.**

Types of disabilities

**Degrees of disabilities vary
and can be compounded.**

- **Visual:** low vision, blind, colour blind
- **Hearing:** partial hearing, no hearing d/Deaf
- **Mobility:** fine-motor control, fatigue, paralysis
- **Cognitive:** attention, learning, autism

Assistive Technology

Assistive technology (AT) is a term that describes a variety of tools used by people with disabilities to accomplish tasks.

- **Text to speech engines (screen readers)**
- **Speech to text (Siri, Dragon naturally speaking)**
- **Screen magnifiers (ZoomText)**
- **Alternate input devices
(Switches, pointers, motion/eye tracking)**

Customers may use:

- **screen readers**
- **screen magnifiers**
- **contrast settings**

Customers may use:

- video captions
- video transcripts
- American Sign Language (ASL)

Customers may use:

- **screen to text /voice recognition software**
- **keyboard navigation**
- **switch controls**

Customers may use:

- **voice recognition**
- **screen readers**
- **custom CSS**

By following best practices for **accessibility**, you are making your product more **usable for everyone**.

Outline

1. What is Accessibility?
2. Inclusive Design in Practice
3. Building Accessible Software
4. Q&A

Inclusive Design in Practice

What is Inclusive Design?

[Inclusive design] considers the full range of human diversity with respect to ability, language, culture, gender, age and other forms of human difference.*

*OCAD Inclusive Design Research Center

When we design in a vacuum, we produce products that don't meet the universal needs of the people that use our products.

**Changing the current way of
thinking starts with *empathy*...**

Accessibility affects everyone

	Permanent	Temporary	Situational
Touch	 One arm	 Arm injury	 New parent
See	 Blind	 Cataract	 Distracted driver

	Permanent	Temporary	Situational
Hear	 Deaf	 Ear infection	 Bartender
Speak	 Non-verbal	 Laryngitis	 Heavy accent

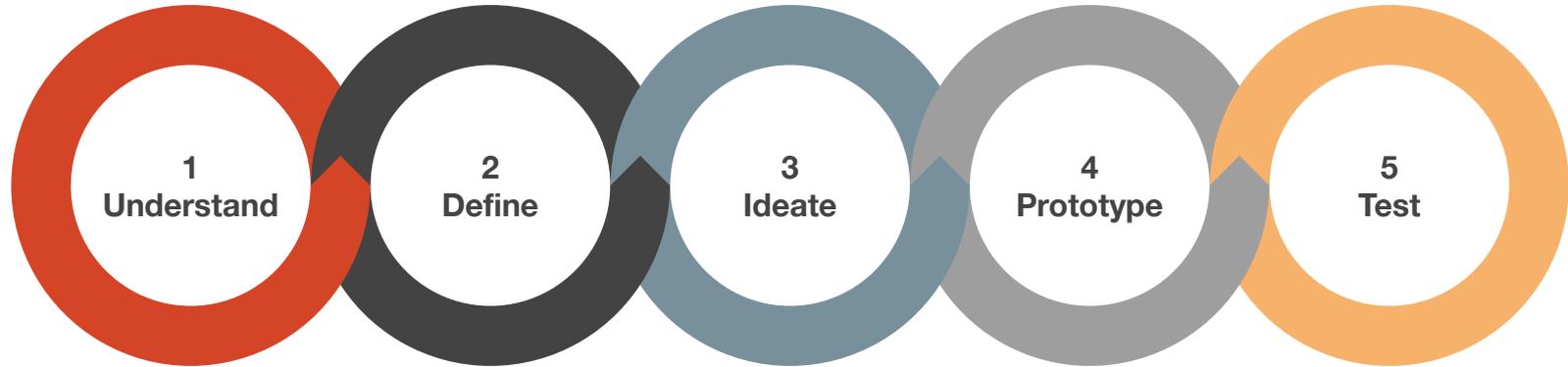
****[Microsoft Inclusive Design](#)**

Design thinking for accessibility needs

- Who will be using your product?
- How will users be accessing the product (eg. using a screen magnifier, screen reader)?
- What situations or contexts might users be in? (eg. noisy environment, limited mobility, low light)
- What **barriers** might we be inadvertently creating?

Accessibility concerns should be addressed in the **all phases** of the design process

Including users in all phases of the process



What is Inclusive Design?

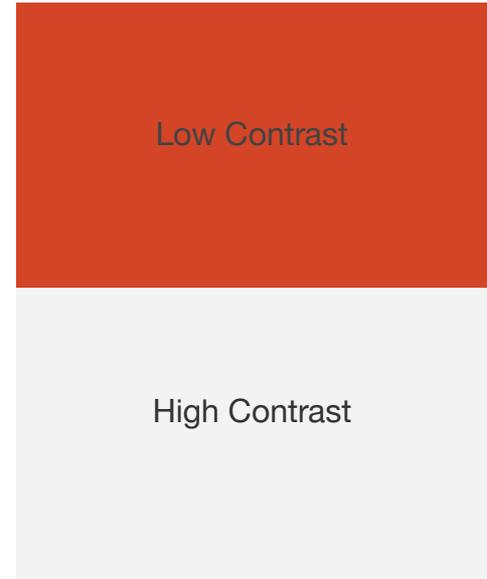
“Everyone has abilities, and limits to those abilities. Designing for people with permanent disabilities actually results in designs that benefit people universally.”

****Microsoft Inclusive Design**

- **Colour & Contrast**
- **Legibility & Typography**
- **Content & Language**
- **Navigation & Operability**

Colour & Contrast

- Colour contrast needs to be high enough for foreground elements (such as text or form fields) to be perceivable
- **Use a contrast checkers to test your colour combinations**
- **Start at the brand level.** Choose a colour palette where suggested colour usage is accessible by default.



Colour & Contrast



Do

Use any light background color with its corresponding text color

Hello

```
background-color: color('orange',  
'light');  
color: color('orange', 'text');
```

Use any primary background color with white text

Hello

```
background-color: color('blue');  
color: color('white');
```



Don't

Mix any color from the palette with a text color from a different part of the palette.

Hello

```
background-color: color('yellow',  
'light');  
color: color('blue', 'text');
```

Use low contrast

Hello

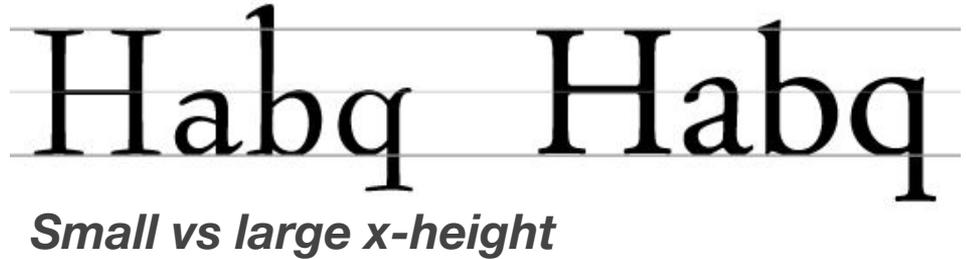
```
background-color: color('blue',  
'light');  
color: color('white');
```

<https://polaris.shopify.com/design/colors#section-color-combinations>

- **Remember to test for colour blindness.** Test designs using plugins for colour blindness to ensure it's still usable.
 - [Stark for Sketch](#)
- **Don't rely on colour alone to communicate information.** (eg. using red borders on form fields to indicate error)

Legibility & Typography

- Basic principles of legible typography apply to accessibility
- Choose a legible font with a large x-height
- Use a large enough font sizes (eg. 14-16px for body copy)



The image shows two instances of the letters 'Habq' on a set of four horizontal lines. The first instance is in a font with a small x-height, where the lowercase 'a' and 'b' are relatively short. The second instance is in a font with a large x-height, where the lowercase 'a' and 'b' are significantly taller, reaching closer to the top line. Below the letters, the text *Small vs large x-height* is written in a bold, italicized sans-serif font.

Small vs large x-height

Legibility & Typography

- Avoid weights that are too thin - they may pass the contrast ratio but can appear light
- Avoid line lengths over 26 characters
- Choose sentence case over titlecase

Legibility & Typography

“The quick brown fox jumps
over the lazy dog”

Helvetica Neue, 30px

“THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG”

Amatic SC, 30px

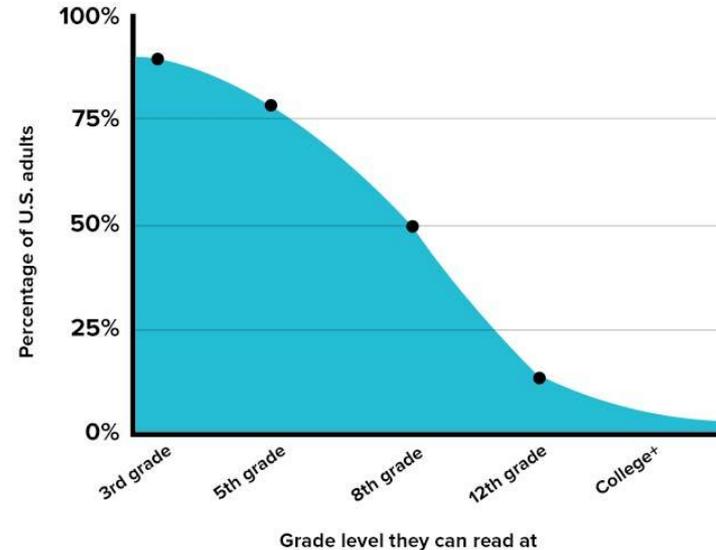
Content & Language

- **The average American adult reads at a 7th to 9th grade level.**
- People prefer to read two grade levels below what they're actually capable of*
- Use simple language. Don't overcomplicate your content.

*<https://www.wriber.com/writing-below-a-grade-8-reading-level/>

How well do U.S. adults read?

@shanesnow



- **Imagery or icons that convey meaning should include descriptive text.**
- Voice-only content (eg. podcast or videos) should include captions or a transcript.
- Avoid distracting content or design elements (eg. auto-playing videos, flashing banners)

- Users should be able to operate the website with use of **keyboard navigation alone**
- Avoid complex or unpredictable navigation patterns.
- Be consistent. A navigation pattern in one part of your site should behave the same everywhere else.

Navigation & Operability

- Allows users to **control their experience**. Avoid scroll-jacking, auto-playing videos or sound. Include volume and play/pause control in media players.
- Pay attention to **clickable area** for buttons, links, and icons

Accessibility + Usability =
Better Design for Everyone

Outline

1. What is Accessibility?
2. Inclusive Design in Practice
3. Building Accessible Software
4. Q&A

Building Accessible Software 🙌

I'm going to take you
on a journey on how
we approach a11y on
projects 🙄

Key considerations

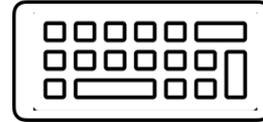
Text

```
<Text>  
  Lorem ipsum  
</Text>
```

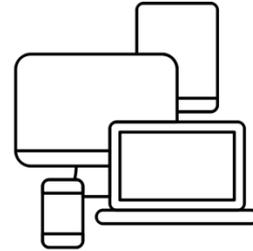
Button States



Keyboards



Screen Sizes



What is **ARIA**? 🤔

The first rule of **ARIA** is
Don't use ARIA 100 💡

**Accessibility is
great for SEO**



Also, you will make the marketing team happy when you get that **SEO** right. 😊

Semantics

<p>Heading1</p>

<div>{...}</div>

<input type="text">...</input>

<button onClick>..</button>

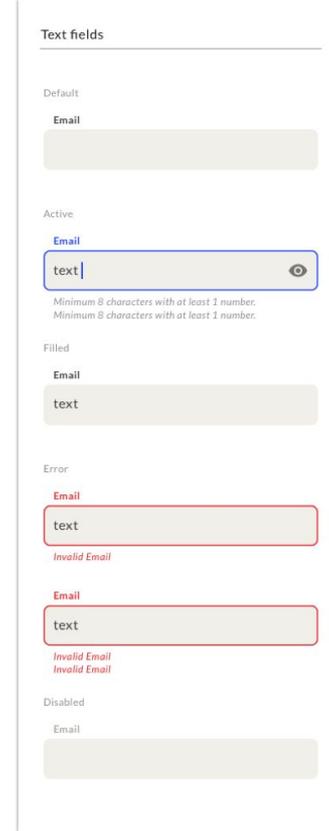
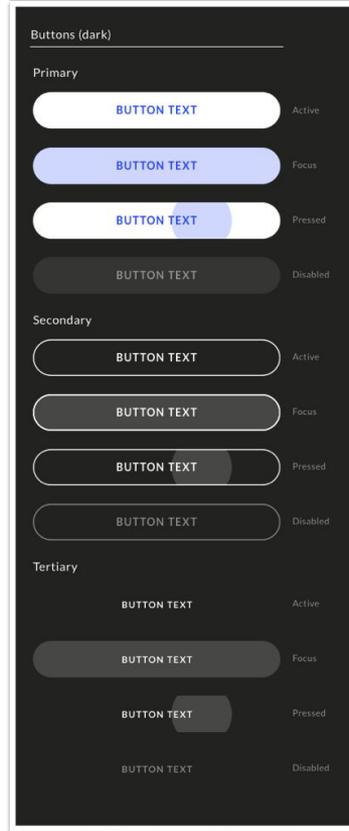
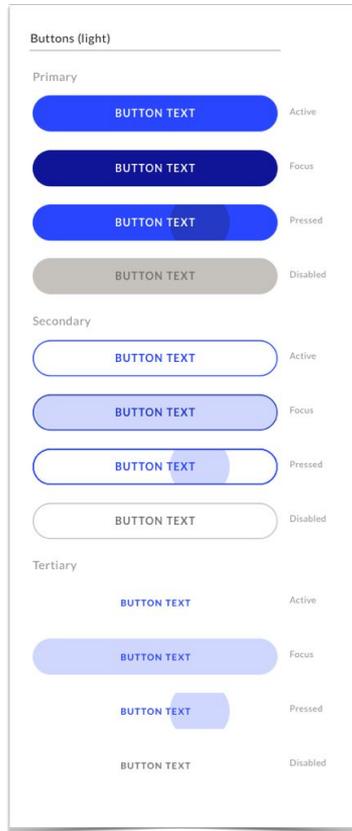
 **<!-- Don't do this -->**

```
<h2 role="tab">heading tab</h2>
```

 **<!-- Do this -->**

```
<div role="tab">  
  <h2>heading tab</h2>  
</div>
```

Make components accessible



Button properties

```
export interface IButtonProps {  
  onClick: () => void;  
  ariaLabel: string;  
  tabIndex?: number;  
  role?: string;  
  text: string;  
  buttonStyle?: any;  
  isDisabled?: boolean;  
  buttonTheme?: any;  
  color: keyof typeof IButtonColors;  
}
```

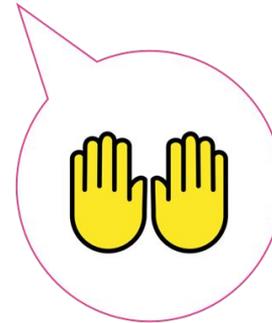
Build a design system of accessible components

COMPONENTS

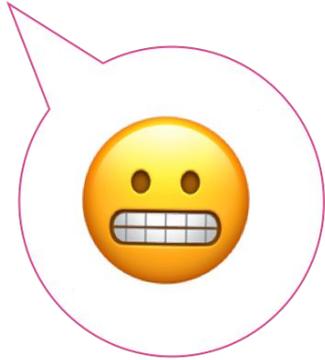
- Button
- Checkbox
- Dialog (Modal)
- Form 🗨️
- Group
- Menu
- Popover
- Radio
- Separator
- Tab
- Toolbar
- Tooltip
- VisuallyHidden

ABSTRACT COMPONENTS

- Box
- Hidden
- Portal
- Rover
- Tabbable



Does this make my entire web app accessible? 🤔



Reakit example

Reakit is featured on Product Hunt!

Usage

Button

```
import { Button } from "reakit/Button";

function Example() {
  return <Button>Button</Button>;
}
```

Accessibility

- Button has role `button`.
- When Button has focus, `Space` and `Enter` activates it.

Button

```
import { Button } from "reakit/Button";

function Example() {
  return (
    <Button as="div" onClick={() => alert("clicked")}>
      Button
    </Button>
  );
}
```

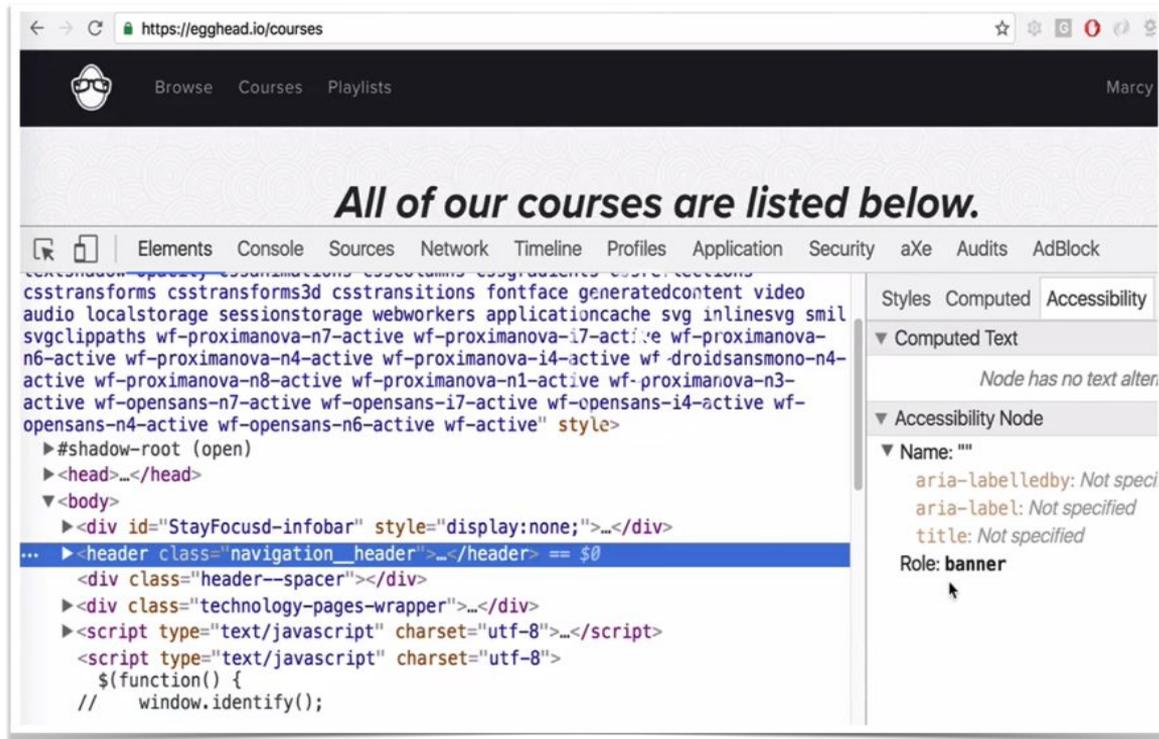
- If `disabled` prop is true, Button has `disabled` and `aria-disabled` attributes set to `true`.

Button

```
import { Button } from "reakit/Button";

function Example() {
  return /
```

Accessibility tree



The screenshot shows the Firefox Developer Tools interface. The browser window displays the URL `https://egghead.io/courses` and the page content: "All of our courses are listed below." The Accessibility tree is open on the right side, showing the following structure:

- Computed Text
 - Node has no text alter
- Accessibility Node
 - Name: ""
 - aria-labelledby: Not speci
 - aria-label: Not specified
 - title: Not specified
 - Role: banner

**Firefox inspector

Animations ✨

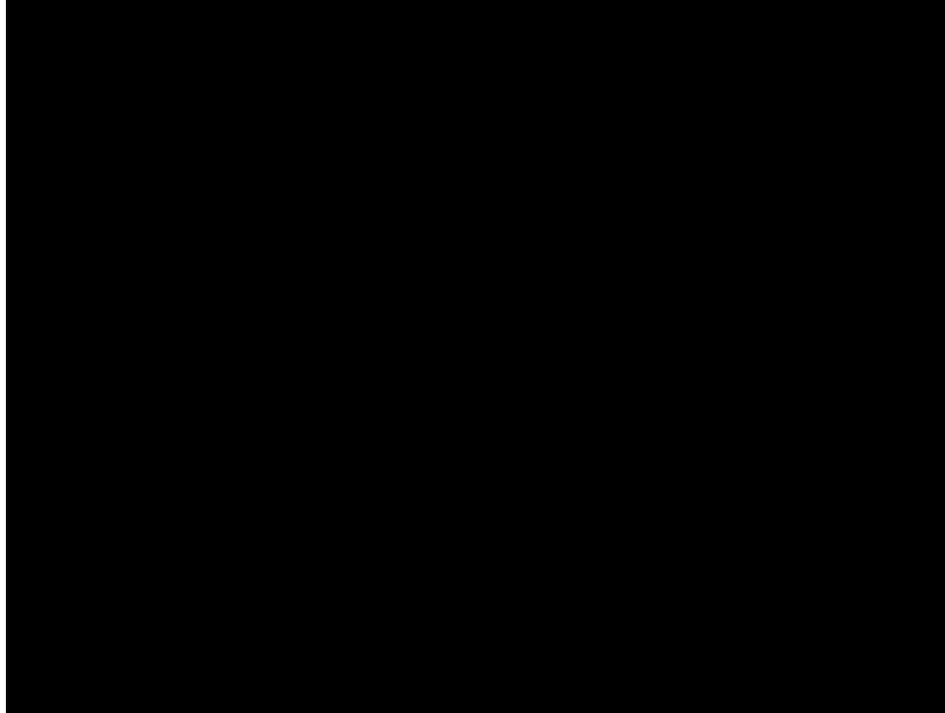


**Pokemon incident

Example: Checkbox component ✓

<https://react-checkbox-a11y.stackblitz.io/>

Example: Checkbox component



[Video Link](#)**

Accessibility checklist

ACCESSIBILITY

0% Accessibility items are ✓

- Progressive enhancement:** Major functionality like main navigation and search should work without JavaScript enabled. ^
BEST PRACTICES
- Color contrast:** Color contrast should at least pass WCAG AA (AAA for mobile). ^
BEST PRACTICES
- H1:** All pages have an H1 which is not the title of the website. ^
BEST PRACTICES SEO
- Headings:** Headings should be used properly and in the right order (H1 to H6). ^
BEST PRACTICES
- Specific HTML5 input types are used:** This is especially important for mobile devices that show customized keypads and widgets for different types. ^
- Label:** A label is associated with each input form element. In case a label can't be displayed, use aria-label instead. ^
- Accessibility standards testing:** Use the WAVE tool to test if your page respects the accessibility standards. ^
TESTING
- Keyboard navigation:** Test your website using only your keyboard in a previsible order. All interactive elements are reachable and usable. ^
TESTING
- Screen reader:** All pages were tested in two or more screen readers (such as JAWS, VoiceOver, and NVDA). ^
TESTING
- Focus style:** If the focus is disabled, it is replaced by visible state in CSS. ^
TESTING

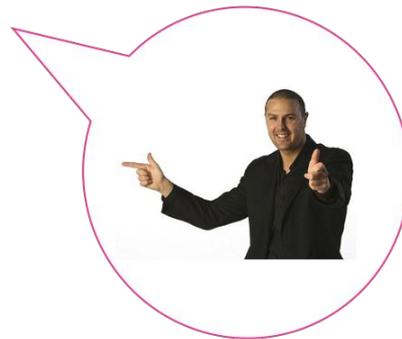
**Checklist

Testing tools

- Use aXe, Wave or ARC toolkit for automated testing
 - [W3C provides quick manual tests to review the user experience](#)
- Complement it with manual testing

**Accessibility is a
priority, not an
afterthought**

You did it 🙌



Outline

1. **What is Accessibility?**
2. **Inclusive Design in Practice**
3. **Building Accessible Software**
4. **Q&A**

Q&A

Thank you!

Fernanda Sobreira

fernanda.sobreira@rangle.io

Katrina Rempel

katrina.rempel@rangle.io

Ankita Kulkarni

ankita.kulkarni@rangle.io

[@kulkarniankita9](https://twitter.com/kulkarniankita9)

Oskar Westin

oskar.westin@telus.com

[@oskarWestinTO](https://twitter.com/oskarWestinTO)

Get in touch with Rangle

info@rangle.io

<http://rangle.io>

Follow #a11yTO

a11yTO.com

[@a11yTO](https://twitter.com/a11yTO)