Responsive Design

Today's Plan

A quick look at how responsive design works

Intro to Twitter Bootstrap for responsive design
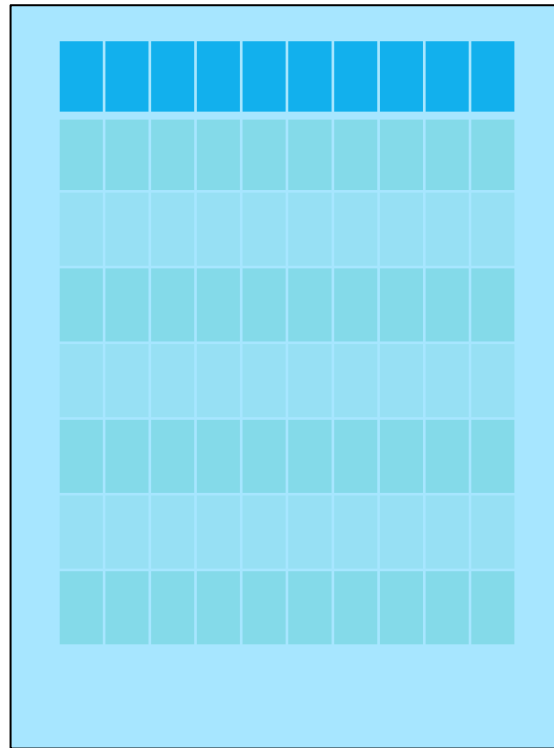
Design for Mobile

- What happens when our site is viewed on a small(er) screen?
  - shrink it?
  - make a special version for mobile?

- What kinds of content do we need to think about?

- What leads to your worst mobile experience?

- What kinds of designs do you think (know?) are challenging to get right for everyone?

Example

How would you design this site for mobile?

- https://weather.gc.ca/past_conditions/index_e.html?station=wgt

Tables

This might seem like an ok choice, but 2 direction scrolling is never a good idea

Tables

Likely hard to read anything

Tables

Better, only horizontal scroll

Solutions for large tables on mobile

Format the table to limit scrolling to one direction
- Make sure it is clear there is more data off screen
- Make it clear how to scroll
- Leave row headers sticky

Sticky column headers

Provide user with ways to limit the data shown:
- Filters
- Collapse sections (accordion view)

Create a pdf (last resort choice)

Solutions for image-heavy webpages

Remove unnecessary images

Reorganize layout specifically for mobile
- Crop images differently
- Layout for mobile

Be careful of text over image, contrast may not be sufficient if image position changes

Use smaller versions (actually reduce image size) for mobile

Images often increase need to scroll on mobile, so eliminate unneeded images

- Large header images

- Image/text combos

- Page load and bandwidth

A wide range of programs to fuel your passion

2,409

# of VIU students participating in 98 different outdoor rec activities, intramural leagues, fitness classes, and special events
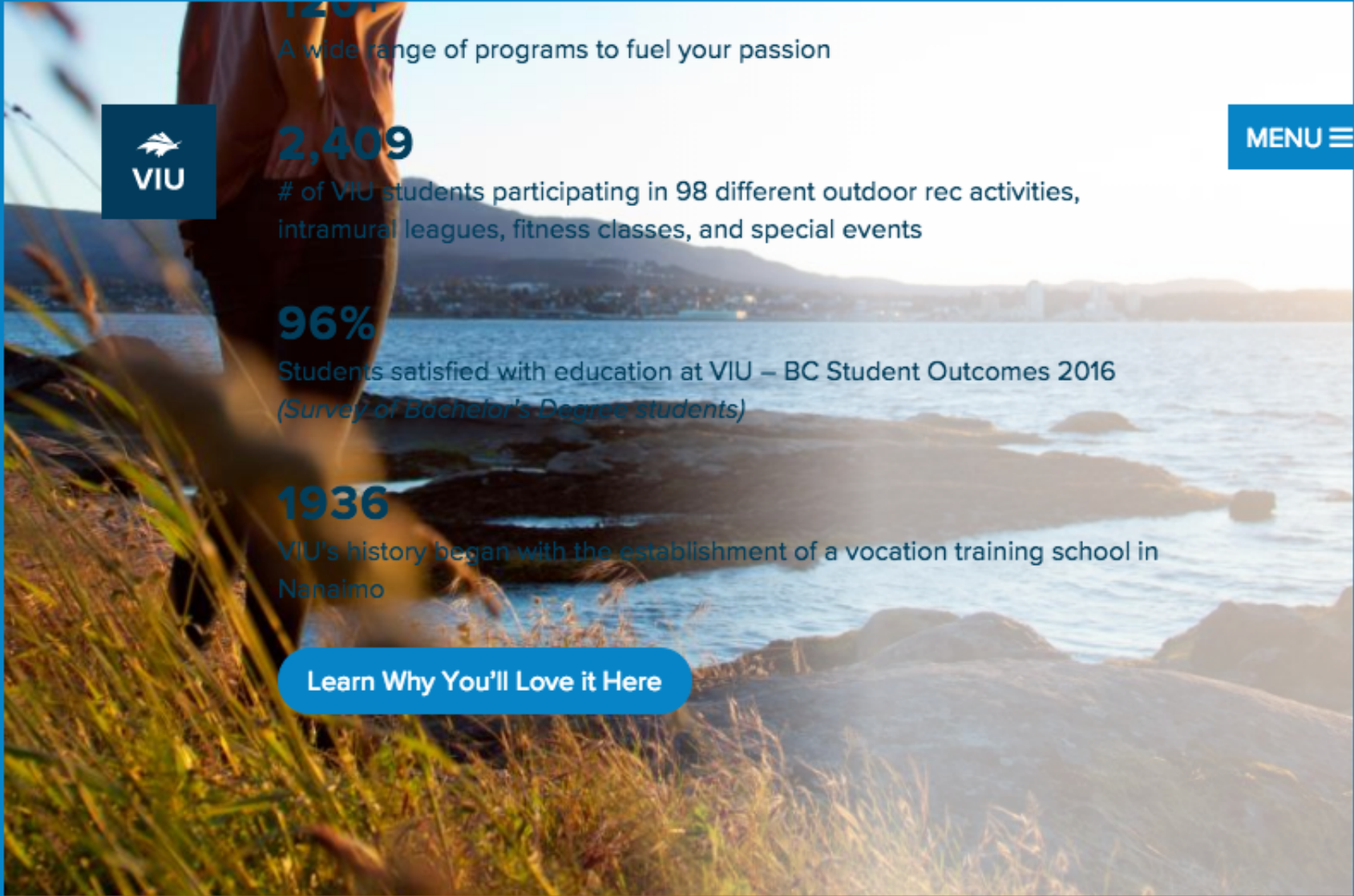
96%

Students satisfied with education at VIU – BC Student Outcomes 2016 (Survey of Bachelor's Degree students)

1936

VIU's history began with the establishment of a vocation training school in Nanaimo

Learn Why You'll Love it Here

VIU

MENU ≡

Shrink it

- Why not just make everything smaller?

Just shrink it

- Images
  - Too small, or off screen
- Tables
  - Field of view
  - Size of text
- Layout
  - End up scrolling horizontally and vertically
- Interactions:
  - Can I click it?

Responsive Design

- Technique to adapt web page to screen size

- Uses CSS
  - Media queries to apply different rules based on screen size and layout

Dealing with Images

- examples/notResponsive.html

- examples/responsiveImage.html

Responsive Image Size

A very simple change:
- Add css to limit the width of the image
- img{ max-width: 100%;}

Example of good design

- Site with:
  - Lots of images
  - Complex data
  - Complex navigation
- https://www.nasa.gov/
- Testing designs:
  - Resizing window
  - Using developer tools

Less-responsive Design

- http://www.amazon.ca/

- http://www.ebay.com/

- Why not?

What makes responsive design good?

- Images resize

- Page structure is flexible

- Navigation structure is flexible

- Clean organized design...

Responsive Design: The basics

- CSS media queries

- Fluid layout

- Flexible Images

Media Queries

Conditionally apply CSS based on @media and @import rules

- Syntax:
  - Optional **media type** (all, print, screen, speech)
  - Any number of **media feature expressions** (can be combined using and/or/not/only and ,

Use the media= attribute in specific html elements

Listen and respond to changes in media state using JS listeners and HTML watchers

Targeting media types

Specify one type:
- @media speech { … }

Target more than one:
- @media print, screen { … }

Media features

- Media features you can evaluate:
  - Width
  - Height
  - Device-width
  - Device-height
  - Orientation
  - Aspect-ratio
  - Color
  - Color-index
  - Monochrome
  - Resolution
  - Scan
  - grid

Targeting media features

Targeting a specific value:
◦ @media (max-width: 600px) { … }

Targeting any value (not zero)
◦ @media (orientation) { … }

Targeting a feature on a specific media:
◦ @media screen and (orientation: landscape) { … }

Targeting multiple features:
◦ @media (orientation: portrait) and (min-width: 680px) { … }

Viewport meta tag

Viewport:
- Area of window in which content can be seen
- Not necessarily the size of rendered page

Mobile devices
- Use *virtual window or viewport*
- Usually wider than screen
- Content shrunk down

Viewport tag:
- Lets you control the viewport size and scale
- Not actually part of the web standard

Setting the viewport

- `<meta name="viewport" content="width=device-width, initial-scale=1">`

- width (height) property
  - Controls size of viewport

- initial-scale
  - Controls zoom when page first loaded

- Also: maximum-scale, minimum-scale, user-scalable
  - Can be set to a ratio value like `minimum-scale=1`

- List of common mobile viewport sizes:
  - https://docs.adobe.com/content/help/en/target/using/experiences/vec/mobile-viewports.html

Fluid Layout

- Use the % width measurements

- Lets elements resize proportionally

- Create 2 or 3 different layouts for different screen sizes (phone, table, desktop)

- Let's take a look:
    - Jenware site: bake your own responsive…

Fluid Layout

- How does it work?
  - Media queries:
    - Let you deliver different styles based on media type:
      - Print, speech, handheld, braille, projections, screen, tty, tv
    - Evaluate specific media features:
      - min-width, min-height
      - max-width, max-height
      - orientation=portrait
      - orientation=landscape

- Can also specify which css to use based on media:

Media query example

- To have styles that only apply for a screen that is at least 480 pixels wide:

  - `@media screen and (min-width: 480px;){ … }`

- To have styles that only apply for a screen that is under 700 pixels wide, *and* in landscape position:

  - `@media screen and (max-width: 700px;) and (orientation: landscape;){ … }`

Media queries in html document head

- Previous examples assume media queries are in an external css file

- Can also go in the media attribute of the link element:

```
<head>
    <link rel="stylesheet" href="styles.css">
    <link rel="stylesheet" href="2column-styles.css"
media="screen and (min-width:780px)">
</head>
```

Downsides to Responsive Design

- Images:
  - Resize images to fit screens ☺
    - Still downloading big image, then resizing it ☹
      - Bandwidth, cpu, memory…
    - Still downloading non-viewable data ☹
  - Load-time for mobile sites

- More complicated code!

- Mobile design is different than desktop

Bootstrap

Bootstrap by Twitter provides a simple way to achieve responsive design

http://getbootstrap.com/

Grid layout system:
◦ https://getbootstrap.com/docs/4.4/examples/grid/

Lots of examples:
◦ https://getbootstrap.com/docs/4.4/examples/

Summary

- Mobile development introduces new challenges:
  - limited screen real estate
  - touch interaction
  - interrupted environment

- Design must be even more carefully considered
  - Use existing patterns
  - Keep it simple and clean
  - Follow UI guidelines

Good resources

https://developers.google.com/web/fundamentals/design-and-ux/responsive/

https://www.nngroup.com/articles/big-pictures-small-screens/

https://www.nngroup.com/articles/mobile-tables/