A Principles-Based Approach to Web Accessibility

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Introductions

• What is your name and where are you from?

• Are you a ‘web content creator’, a ‘web developer’, or something else?

• Rate your web development knowledge (1-5)

• Rate your web accessibility knowledge (1-5)

• What do you hope to gain?
Test Questions

1. True, False, or I don’t know
   My web content is currently accessible.
2. The five main categories of disabilities affected by Internet accessibility barriers are...
3. Web accessibility is easiest to implement
A. As the culminating step after user tests
B. As an integral part of the design process
C. By creating an alternative version
D. After receiving a complaint by a person with a disability
4. Which of the following is cited most regarding inaccessible web sites?

A. I wasn’t aware of the problem
B. Accessibility will hinder the look/feel/functionality
C. I didn’t know how to make it accessible
D. We don’t have the budget to make it accessible
5. True or False

Accessible web design benefits only a small percentage of the population.
Accessibility

“Development of information systems flexible enough to accommodate the needs of the broadest range of users... regardless of age or disability”

8.5% of the population has a disability that affects computer use
The Evolution of Web Accessibility Guidelines

• WCAG 1.0 (1999)
• Section 508 of the Rehabilitation Act (2001)
• WCAG 2.0 (2008)
WCAG 1.0

• Finalized in 1999
• Checkpoint driven
• Priority 1, 2, and 3 (Level A, AA, and AAA)
• Specific to HTML
Section 508

• Legalistic - easy to verify compliance
• Applies to federal government
• Very limited in scope. The de facto standard.
• Many states have adopted the guidelines.
• VPAT - Voluntary Product Accessibility Template
• Currently being updated
WCAG 2.0

- Finalized December 2008
- Principles Based
- Technology Agnostic
- Maintains Levels (A, AA, and AAA)
Americans with Disabilities Act

- Pre-dates the web
- Title II vs. Title III
- “Places of public accommodation”
- Current proposal to define ADA accessibility standards
“There is no doubt that the Internet sites of state and local government entities are covered by Title II of the ADA. Similarly, there is no doubt that the websites of recipients of federal financial assistance are covered by Section 504 of the Rehabilitation Act.”

- US Department of Justice
Your site can be compliant, yet inaccessible
Your site can be technically accessible, yet functionally inaccessible
accessibility > compliance
Web Accessibility

... it’s not rocket surgery!
Perceivable
Operable
Understandable
Robust
Ensure POUR content across disability types

- Vision - blind, low-vision, color-blind
- Deaf and Hard-of-hearing
- Motor
- Cognitive
- Seizure
Perceivable
Operable
Understandable
Robust
Perceivable
Perceivable - Auditory Disabilities

- Captions for video & live audio
- Text transcripts for all audio content
Perceivable - Visual Disabilities

- Web pages are linear
- Alternative text for non-text elements
- Associate text labels with form elements
- Associate data cells to row/column headers
Provide meaningful link text

<a href="foo">Click here</a>

<a href="foo">Click here</a> to login

<a href="foo">Click here to login</a>

<a href="foo">Login</a>
Perceivable - Visual Disabilities

- Sufficient contrast - http://webaim.org/resources/contrastchecker/
common sense is vital when considering color contrast
pass
pass
pass
pass
fail
fail
fail
fail
Perceivable - Visual Disabilities

• Sufficient contrast - http://webaim.org/resources/contrastchecker/
• Ensure that meaning is not conveyed with color alone
You’ve won the lottery! Press the GREEN button to accept your prize and the RED button to decline.
You’ve won the lottery! Press the GREEN button to accept your prize and the RED button to decline.
The green mushrooms listed here are OK to eat. The red mushrooms will kill you.

- Amanita
- Chanterelle
- Porcini
- Shitake
- Tyloplilus

http://colorfilter.wickline.org/
The green mushrooms listed here are OK to eat. The red mushrooms will kill you.

- Amanita
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http://colorfilter.wickline.org/
Perceivable
Operable
Understandable
Robust
Operable
Who does this affect?

- Motor disabilities
- Fine motor control and use of a mouse
- Repetition and fatigue
- Control over timing or moving elements
Be careful with flashing/strobing images

- More than 3 times in any one-second period
- Size, brightness, and red threshold
- Annoying rule
Operable

- Ensuring keyboard accessibility
- Don’t remove focus indicators
- Ensure links are clearly distinguishable
- Logical reading/navigation order
- Consistent navigation elements
Operable

- Allow user to skip over repetitive and/or lengthy lists of links
- Error-prevention and recovery mechanisms
- Give users control over time-sensitive changes
Secret of Everlasting Happiness
Secret of Everlasting Happiness

Please finish reading this text – it will give you the secret to everlasting happiness. The secret is simple, all you need to do is to stop worrying about the key to everlasting happiness and enjoy the moment.
Secret of Everlasting Happiness

Sorry! Time’s up!
Better luck next time!
Perceivable
Operable
Understandable
Robust
Who does this affect?

- Cognitive disabilities
- Largest disability group. Larger than all the others put together.
- Everyone!
- Because users vary greatly, we’ll focus on generic recommendations
Understandable

• Be careful with movement and other distracters

• Semantic organization (headings, lists, etc.)

• Be consistent.

• Strive for brevity. Use the simplest language appropriate to the content.
Understandable

• Focus the user’s attention
• “Chunk” and/or simplify content
• Balance cognitive load vs. functionality
Understandable
Perceivable
Operable
Understandable
Robust
Robust
Robust
Robust
Robust
Perceivable
Operable
Understandable
Robust
Web Accessibility for Designers
Design Considerations

- Design reading, navigation, and heading order
- Page is readable and functional when text is enlarged
- Use visually appealing, consistent font faces
- Avoid small font sizes
- Limit the use of font variations such as bold, italics, and ALL CAPITAL LETTERS
Design Considerations

• Use whitespace and design to focus attention.

• Consider short and long line lengths

• Use true text when reasonable to do so

• Design a “skip” link

• Ensure links are readily recognizable
Accessible Images

WebAIM
web accessibility in mind
Images can enhance accessibility
Images can enhance accessibility
Color within images
Color within images

Provide plenty of contrast
Be careful with text in images
Vitally Important Text vs. Vitally Important Text
Alternative Text

• Read by screen readers
• Alternative to image when images are disabled or not supported
• Provides semantic meaning and description to images.
• Used by search engines.
What is equivalent alt text?
What is equivalent alt text?

CONTENT and FUNCTION. VERY RARELY Description.
Alternative Text

can be presented two ways...

• In the alt attribute of the img element.
  
  <img alt="I am alt text">

• In the context or surroundings of the image itself.
Alternative Text should...

• Be accurate and equivalent.
• Be succinct.
• NOT be redundant.
• NOT use the phrases "image of ..." or "graphic of ..." to describe the image.
A. "Minivan"
B. An empty alt attribute (alt="") will suffice
C. "Image of blue vehicle"
D. "Link to minivans"
E. The image does not need an alt attribute
Images that are the only thing within a link must **ALWAYS** have alternative text

...and image map hot-spots and image buttons too.
A. "Products"
B. "Link to Products"
C. The image doesn't convey content, so alt="" will suffice
Download the Employment Application

A. "Employment Application"
B. "PDF File"
C. "PDF icon"
D. The content of the image is presented in context, so alt="" is appropriate
Images Sprites and Background Images

Download the Employment Application

- CSS is intended for styles, not content.
- You can’t add alternative text to background images.
- Use image text replacement...
  
  `<a href="...">... Application<span class="pdficon"> PDF</span></a>`
Icon Fonts

• If the font character/icon is decorative, simply hide it with `aria-hidden="true"`

• If the font character presents content (it probably shouldn’t), hide the character with `aria-hidden="true"` and add off-screen text that presents the content.

  Facebook `<span class="iconfont" aria-hidden="true">F</span>`

  Download `<span class="iconfont" aria-hidden="true">P</span>`

  `<span class="hidden">PDF</span>`
alt="smiling lady"???
Advanced Images

Form Image Buttons

Image Maps

Logos

HOME
Products
Services
Contact us
Index
Complex Images

Provide the alternative in context

OR

Provide a link to a page that contains the longer description

(you can additionally use the longdesc attribute, though support is poor)

(The main image should still have some alt text!)
Headings

• Usually one <h1> per page. Should be similar to page title.

• Do not skip heading levels (e.g., <h2> to <h4>). Can skip backward (e.g., <h4> to <h2>).

• Should never be empty.

• WCAG does not require correct levels. Any heading is better than no heading at all.
Form Labels

<label for="firstname">First Name:</label>
<input type="text" id="firstname" name="firstname" />

Text boxes, text areas, select menus, checkboxes, and radio buttons.
Implicit Form Labels

<label>Name:
<input type="text"></label>
Fieldsets and Legends

```html
<fieldset>
<legend>Choose a shipping method:</legend>
<input id="overnight" type="radio" name="shipping" value="overnight" />
<label for="overnight">Overnight</label><br />
...
</fieldset>
```

Choose a shipping method:
- Overnight
- Two-day
- Ground

Use for all groups of checkboxes and radio buttons
Other Form Issues

• Avoid JavaScript “jump” menus and autofocus

• Avoid multiple select menus and “Reset” buttons

• Ensure image buttons have alt text
  <input type="image" src="submit.jpg" alt="Search">

• Ensure standard buttons have a value
  <input type="submit" value="Search">
  <button>Search</button>
Form validation and error recovery

• Make the form as simple as possible
• Only collect necessary information
• Don’t force users to provide formatting unless necessary
• Direct users directly to errors
• Provide quick access to the problematic elements
• Allow resubmission of the form
Form Labels

If a visible text label is not available, provide the description in the title attribute:

```html
<input title=""search terms">`
```
Visually hiding content

• `display: none` AND `visibility: hidden` hides from everyone

• Avoid 0 pixels, same color as background, etc.

• Position off-screen left with CSS for screen readers

• Use judiciously
Visually hiding content

.hidden {
    position:absolute;
    left:-10000px;
    top:auto;
    width:1px;
    height:1px;
    overflow:hidden;
}

CSS clip can also be used.
Form Labels

Provide a hidden label

<label for="s" class="hidden">Search terms</label>
<input id="s" type="text">

Search
Title attribute

- Advisory information only
- Ignored by screen readers, except...
  - form elements missing labels
  - `<frame title="navigation">`
  - `<acronym>/*<abbr>...usually.</abbr>`
Acronyms & Abbreviations

- Expand unknown acronyms/abbreviations at first instance.
- Don’t worry about pronunciation.
- Use `<acronym>` and/or `<abbr>` on one instance, if you want.
- `<acronym>` is not part of HTML5.
Tables

• Data tables vs Layout tables
• Check reading order
• Don’t use table summary
<table>
<thead>
<tr>
<th>Class Name</th>
<th>Course Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Website Development</td>
<td>BIS 5650</td>
<td>B105</td>
</tr>
<tr>
<td>Database Management</td>
<td>BIS 3330</td>
<td>B220</td>
</tr>
</tbody>
</table>
<table>
  <caption>Class Schedule</caption>
  <tr>
    <th scope="col">Class Name</th>
    <th scope="col">Course Number</th>
    <th scope="col">Location</th>
  </tr>
  <tr>
    <th scope="row">Advanced Website Development</th>
    <td>BIS 5650</td>
    <td>B105</td>
  </tr>
  ......
</table>
<table>
<thead>
<tr>
<th>Class Name</th>
<th>Course Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
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<td>B105</td>
</tr>
<tr>
<td>Database Management</td>
<td>BIS 3330</td>
<td>B220</td>
</tr>
</tbody>
</table>
Tables

• Use data table markup only for data tables

• Avoid empty `<th>`

• `<thead>`, `<tfoot>`, and `<tbody>` provide no accessibility functionality

• `headers` and `id` available for very complex tables where scope is not sufficient.
Lists

• Use lists appropriately
  • `<ol>` for ordered, hierarchical lists.
  • `<ul>` for unordered, bulleted lists.
  • `<dl>` for definition list (name/value pairs in HTML5).
Page Titles

<title>WebAIM.org</title>

- Often the first thing read
- Should be succinct and descriptive
- Should usually match or be similar to the <h1>
<frame title="navigation">
<frame title="main content">
<iframe title="advertisement">
Fonts

• Absolute (px, pt, etc.) or relative sizes (%, em, etc.)

• Web fonts and embedded fonts

• Font faces
“Skip” links

“Skip to main content” or “Skip navigation”???

```
<a href="#maincontent">Skip to main content</a>
```

or

```
<a name="maincontent" id="maincontent"></a>
```

or

```
<div id="maincontent">...
```
Hidden “Skip” links

```css
a#skip {
  position: absolute;
  left: -10000px;
  top: auto;
  width: 1px;
  height: 1px;
  overflow: hidden;
}

a#skip:focus {
  position: static;
  width: auto;
  height: auto;
}
```

Don't display: none the 'skip' link.
CSS3 to enhance “Skip” link visibility

```css
a#skip {
  position: absolute;
  top: -42px;
  left: 0px;
  background: transparent;
  transition: top .7s .5s ease-out,
              background .7s linear;
}

a#skip:focus {
  top: 0px;
  background: #860000;
  transition: top .1s ease-in,
              background .25s linear;
}
```
Accesskey

- Allows authors to define a shortcut key for links and form controls.
- There’s no standard set of keys.
- Activation of accesskey varies by browser.
- Impossible to avoid conflicts with screen readers.
HTML has much more accessibility support than Word, PPT, Excel, PDF, etc.
Microsoft Word and PowerPoint

- Add alternative text to images
- Use styles instead of text formatting (headings, etc.)
- PowerPoint controls are inaccessible on many browsers
- Save Word documents as HTML filtered (still quite messy)
Adobe PDF

- PDF is a format. Acrobat is one of many tools for creating PDF.
- Start with a well formatted document
- PDF tags hold accessibility information.
- Tags can be edited in Acrobat Professional.
Section 508
§1194.22 (a) - Non-text Content

A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).
§1194.22 (b) - Captioning

Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
§1194.22 (c) - Color

Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
§1194.22 (d) - Style Sheets

Documents shall be organized so they are readable without requiring an associated style sheet.
§1194.22 (e) and (f) - Image Maps

(e) Redundant text links shall be provided for each active region of a server-side image map.

(f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
§1194.22 (g) and (h) - Data Tables

(g) Row and column headers shall be identified for data tables.

(h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
Frames shall be titled with text that facilitates frame identification and navigation.

§1194.22 (i) - Frames
§1194.22 (j) - Flashing

Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
§1194.22 (k) - Text-only Alternatives

A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
§1194.22 (l) - Scripting

When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.
§1194.22 (m) - Links to Plugins

When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).
§1194.22 (n) - Forms

When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
§1194.22 (o) - "Skip" links

A method shall be provided that permits users to skip repetitive navigation links.
§1194.22 (p) - Timed Responses

When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.
WCAG 2.0

• Principles (POUR) > Guidelines > Success Criteria

• Conformance is based on success criteria

• Supporting materials
  • Understanding...
  • How to Meet...
  • Sufficient Techniques, Advisory Techniques, and Failures
Notable WCAG 2.0 Success Criteria
SC 1.1.1 - Non-text Content

All non-text content that is presented to the user has a text alternative that serves the equivalent purpose... (Level A)
Guideline 1.2 - Multimedia

Time-based Media: Provide alternatives for time-based media
Media Alternative for Text:

Media that presents no more information than is already presented in text (directly or via text alternatives)

Example: A video of a news story, but the entire news story (e.g., transcript) is presented on the same page.
Alternative for Time-based Media:

Document including correctly sequenced text descriptions of time-based visual and auditory information and providing a means for achieving the outcomes of any time-based interaction

In English: A descriptive transcript.
Transcripts & Audio Description

• Audio description OR a descriptive transcript is required at Level A (if needed).
• Audio description is required at Level AA (if needed).
• Avoid costly audio descriptions by presenting all important visual content audibly.
• For such media, descriptive transcripts are not required until Level AAA. Provide them anyway.
• Optimally, descriptive transcripts might be Level AA and audio description Level AAA.
SC 1.3.1 - Info and Relationships

Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text.
Programmatically Determined:

Determined by software from author-supplied data provided in a way that different user agents, including assistive technologies, can extract and present this information to users in different modalities.

“Can be programmatically determined” does not mean “is programmatically determined”.

Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, size, visual location, orientation, or sound. (Level A)
Sensory Characteristics

• "Click the square icon to continue."

• "Instructions are in the right-hand column."

• "A beeping sound indicates you may continue."

• You can use sensory characteristics, just don’t rely solely on them.
SC 1.4.1 - Use of Color

Don’t rely on color alone to convey content or to distinguish links. (Level A)
Requirements for non-underlined links

- A 3:1 contrast ratio between link text and non-link text.
- Link must present “non-color designator” (typically underline) on mouse hover AND keyboard focus.
SC 1.4.2 - Audio Control

If any audio on a Web page plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level. (Level A)
SC 1.3.2 - Meaningful Sequence

When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined. (Level A)
SC 1.4.4 - Resize Text

Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality. (Level AA)
Concerns with 1.4.4

• Zoom support passes. Zooming is nearly impossible to fail. This neglects users that increase text size.

• Users that require 200% text are not using text sizing.

• 200% text sizing is VERY difficult.

• We recommend ~130% - 150% text sizing and 200% zoom.
Guideline 2.1

Keyboard Accessible: Make all functionality available from a keyboard
SC 2.2.2 - Pause, Stop, Hide

For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it.

For any auto-updating information... there is a mechanism for the user to pause, stop, or hide it.
SC 2.4.7 - Focus Visible

Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible. (Level AA)
Do not remove the focus indicators from links

```css
a {
    outline: 0;
}
```
a:hover {...}

a:hover, a:focus {...}
Enhance the default focus indicators

```
a:focus, a:hover {
    outline: 1px;
    background-color: #ff0;
    text-decoration: underline;
}
```

Non-underlined links must become underlined on hover and focus.

`:focus styles should typically be the same as :hover styles`
SC 3.1.1 - Language of Page

The default human language of each Web page can be programmatically determined. (Level A)

<html lang="en">
SC 3.1.2 - Language of Parts

The human language of each passage or phrase in the content can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text. (Level AA)
Evaluating web accessibility

• Use a checklist
• Check reading/navigation order
• Check alternative text
• Check colors and contrast
• Test content scaling
• Check keyboard/form accessibility and usability
• Check in a screen reader
• Use automated tools
wave.webaim.org
Quick Tips and Evaluation
Quick References

webaim.org/resources
Thank You!

http://webaim.org
E-mail discussion list
Newsletter
Tutorials, articles, and resources
Blog

WebAIM
web accessibility in mind