



Accessible Web Design

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- Introduction to Accessibility:
Who Does it Serve?
- Accessible images
- Accessible tables



Accessible Web Pages - Who benefits?

- People with disabilities
 - Blind or vision impaired
 - People who are color blind
 - Mobility impairments
 - Deaf or hearing impaired
 - Cognitive disabilities (reading difficulties)
- People using a wide array of technologies
 - People with slow Internet connection
 - People using PDAs, phones or other mobile devices, or older equipment to view the web
- People whose primary language is not English
- The elderly



ADA & Section 504 of the Rehabilitation Act – establishes the **rights** of individuals to equal access

- Right to an accommodation if needed to achieve equal access

Section 508 of the Rehabilitation Act – establishes **standards** for development, procurement, maintenance and use of accessible IT by federal agencies & their employees

How do People with Disabilities Access the Web?



- Blind and low vision
- Color blind
- Deaf and hard of hearing
- Mobility impairments
- Cognitive disabilities

Blindness



Users:

Do not use a mouse

May use a screen reader to listen to the content

May use a refreshable Braille display

Design considerations:

- ❖ Colors, images, photos and graphics are unusable unless transcribed into text or audio.
- ❖ Navigation may be difficult / confusing
- ❖ All content must be accessible from the keyboard



Blindness: Accessible Design Techniques

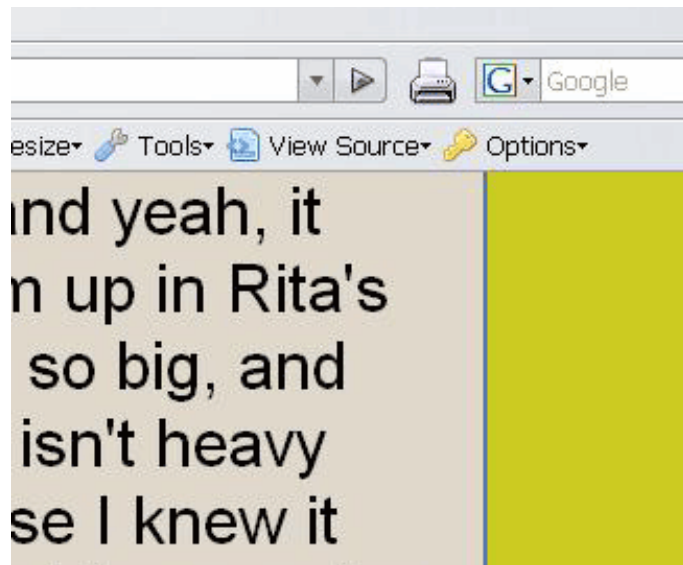
- Provide text description for all images & photos (“alt” tags)
- Provide an option to skip navigation
- Ensure keyboard accessibility
- Use meaningful links (“Class schedule” rather than “click here”)
- Use proper HTML (header tags, etc.)
- Don’t write scripts that require mouse usage



Low Vision

Users:

May use screen magnification software



Design Considerations:

- ❖ Images, photos and graphics may become unusable when enlarged
- ❖ Site navigation may be difficult / confusing





Low Vision: Common causes

Cataracts

(Low Visual Acuity)



My gift is my son
and this one's for
and you can tell
everybody that
this is your song
may be quite
simple, but now

Glaucoma

(Tunnel Vision)



The last thing
and all of the
at most of all
perhaps
and



Low Vision: Common causes

Macular Degeneration



Step is an over-
waste of time--
not of energy,
it's a... The
and other fine
oughts come
from Ben. My n

Retinopathy



ers see. n...
ife is not who
ou make it. I
; what life ma
of you that de
whether you c
im. I, Tyler, de
here to go

Magnified graphical text



Graphical Text

Low Vision: Accessible Design Techniques



- Limit or eliminate text within graphics
- Have plenty of contrast
- Use relative rather than absolute font sizes





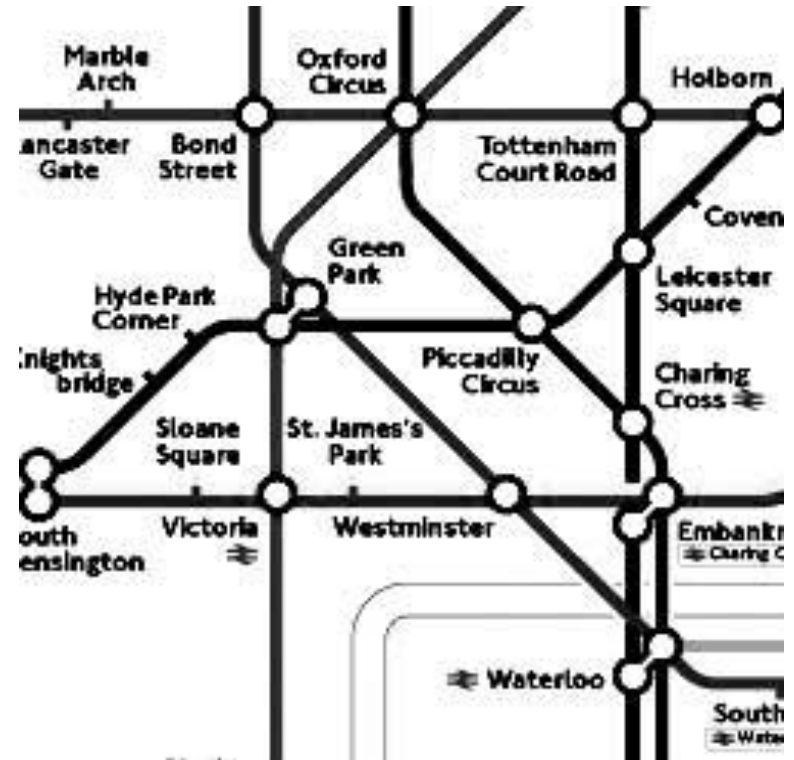
Users:

Approximately 8-10% of the male population and about 0.5% of the female population experiences some form of color deficiency

Design Considerations:

- ❖ Reds & greens or blues & yellows are often indistinguishable
- ❖ Other colors may be indistinguishable
- ❖ Contrast

Color Blindness: simulation





Do not use color alone to convey content

- Use additional cues or information to convey content

The flights listed below in **RED** have been cancelled. The flights in **GREEN** are departing on time.

Delta 1342

United 320

American Airlines 787

Southwest 2390

The flights listed below that have been cancelled are indicated in **RED** and by an asterisk. The flights in **GREEN** are departing on time.

Delta 1342 *

United 320

American Airlines 787

Southwest 2390 *



Users:

May use only the keyboard for navigation

May tire quickly

May not have fine motor control

Design Considerations:

- ❖ All content must be keyboard accessible
- ❖ Lengthy navigation may cause fatigue
- ❖ Time-limited response options may not be viable
- ❖ Small links are difficult to select
- ❖ Form navigation

Mobility Impairments: Accessible Design Techniques



1. Ensure that the page is keyboard accessible
2. Do not require fine motor control (free of moving links or very small links)
3. Provide a way to skip over long lists of links & other lengthy content (visible skip navigation link)



Users:

Do not use audio features

Design Considerations:

- ❖ Video clips that include audio-only are inaccessible without transcripts and/or captions
- ❖ Audio clips are inaccessible
- ❖ Using clear and simple language

Deafness: Accessible Design Techniques



Provide transcripts for all audio content

Provide synchronized captions for all video content
(MAGpie-free captioning tool)

Many people benefit

- Students in library w/o headset
- People with learning disabilities
- People for whom English is not their primary language
- People in a noisy environment
- Everyone (content is presented in >1 medium)



Users:

- May have difficulty focusing on or comprehending lengthy sections of text
- Complex layouts or inconsistent navigational schemes may be confusing
- May need content in more than form

Design Considerations:

- ❖ Animated images may be distracting
- ❖ Complex layouts may lead to confusion
- ❖ Text-only content may be limiting
- ❖ Using clear and simple language

Cognitive Disability: Accessible Design Techniques



1. Simplify the layout as much as possible
2. Provide clear and consistent site navigation
3. Organize information into manageable “chunks”
4. Logically organize your site and individual documents
5. Use icons, illustrations, arrows, audio, video or other multimedia to enhance understanding



Accessible Images and Visual Elements

Accessible Images and Visual Elements



- Using plain-text pages leads to unattractive and intimidating web sites – people like graphics!
- Using visual elements alone to convey information risks excluding some of your visitors
- Providing textual information only also excludes some visitors
- Providing information in alternative formats ensures all users can access at least one form of it



Why use images at all?

Web Site # 1

Don't Let This Happen to You!



Madame Sylvia's Skin Care Cream

ABOUT **INGREDIENTS** **FIND A STORE**

?  

Web Site # 2

**Madame Sylvia's
Skin Care Cream**

**About
Ingredients
Find a Store**

Which version of the page makes a more effective sales pitch?



Images can serve as shorthand



- Question marks can mean “About” or “FAQ” (Frequently Asked Questions)
- Magnifying glass can mean “Search”



What About the Images?

With the appropriate **alt attribute**, your images can convey meaningful information



Photo of elderly person's wrinkled eyes

Find a Store

Ingredients

About Madame Sylvia's



What About the Images?

Here's the HTML code for these images, with a descriptive **alt attribute** added to each **img element**



```

```

```

```

```

```

```

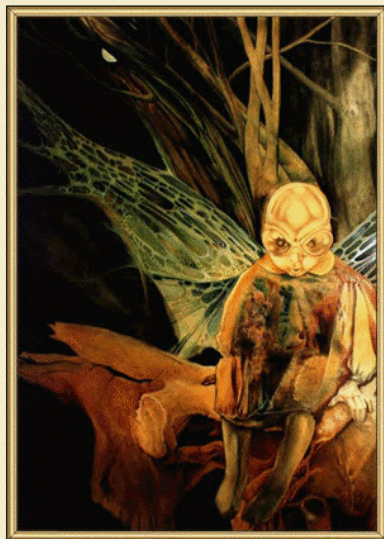
```

For More Complex Images ...



gallery

Always Take Off Into the Wind
by Noel Beebe



[Link to Text Description](#)

Always Take Off Into the Wind
by Noel Beebe

[About the Artist](#) | [Make Contact](#) | [HOME](#)

© 2004 Noel Beebe

LIKE:

Artwork

Pie Charts

Multi-Layered Bar Charts

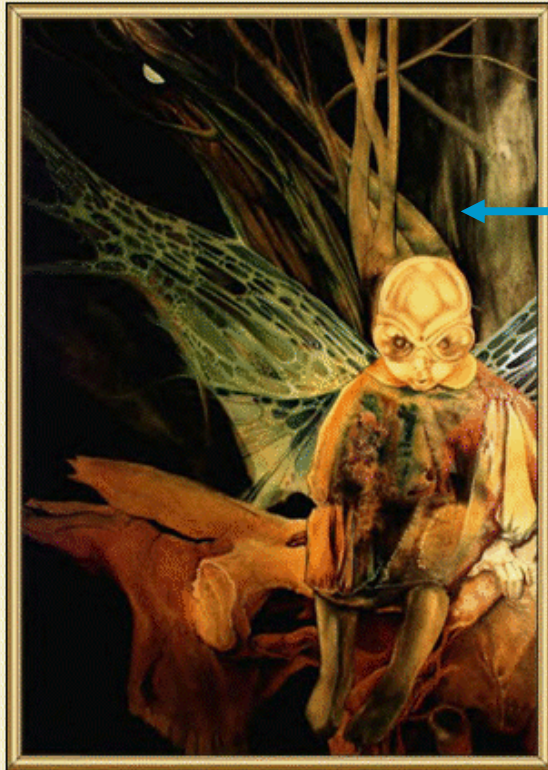
Line Charts

Maps

NOTE: *Always Take Off Into the Wind* was used with artist Noel Beebe's kind permission.



A Close-Up View



[Link to Text Description](#)

Always Take Off Into the Wind
by Noel Beebe

Image Code:

longdesc attribute's value is link to text file's path

```

```

Link Code:

Anchor links to the text file

```
<p><a href="alwaystakeoffintothewind.txt">Link to Text Description</a></p>
```




The Text File

“Always Take Off Into the Wind by Noel Beebe

“Our cover piece for the Spring 2004 issue of *flashquake* features a creature that is half-human, half-insect, in a fantasy landscape. The skull of the creature has ridges of bone that form a triangular pattern on the forehead. The same bony ridges encircle the eyes like a pair of aviator goggles. The creature seems to be wearing a jumper of the type worn by infants.

The creature’s transparent wings seem too delicate to lift the weight of the body. The creature takes the foreground with bright colors compared to the mysterious dark tangle of tree trunks that form the background.”



The longdesc Attribute



- Used with the **img** element
- Can link to a text or HTML file containing a description of the image
- Value is the path/filename of the description



When Less Is More

-  **This is Item 1.**
-  **This is Item 2.**
-  **This is Item 3.**

We wanted something a little jazzier than the standard round bullet, so we used an image of an attractive fleur-de-lis. But does this image add any information to this bulleted list (beyond proof of our obviously well-developed aesthetic sense)?



When Less Is More: What NOT To Describe

- Graphical bullets or images that do not impart information
- Images used as separators (e.g., graphic lines)
- “Spacer” images
- Can use space between or just beginning and ending quotation marks for “empty alt”

```

```



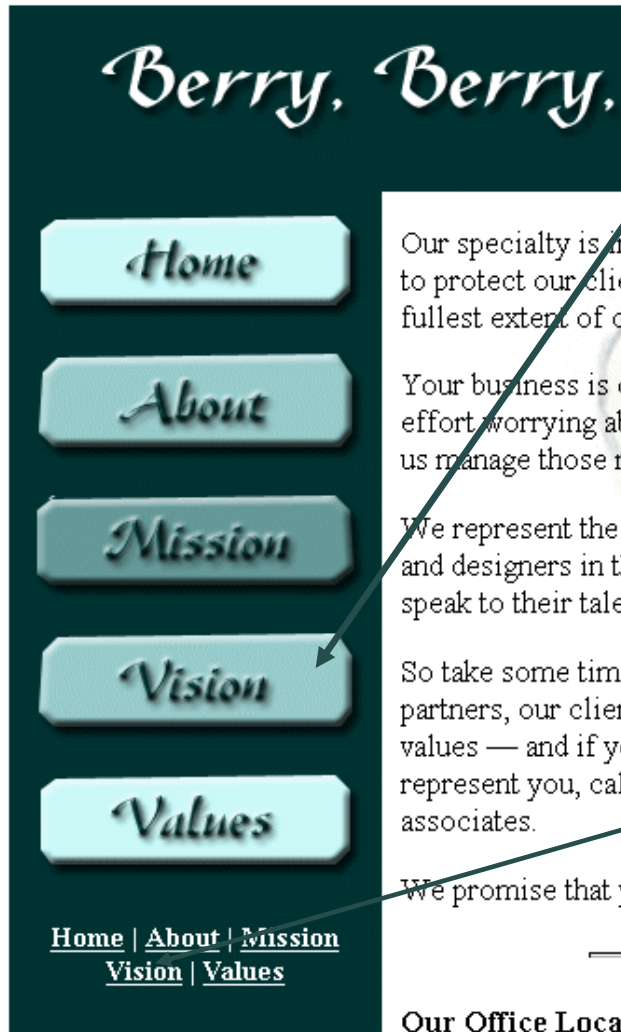
Using Images for Navigation



You sometimes see images used as web site navigation, such as in the example on the left.



Using Images for Navigation



```
<a href="vision.html" name="vision">  
  
</a>
```

*Two different ways of getting
to the same place!*

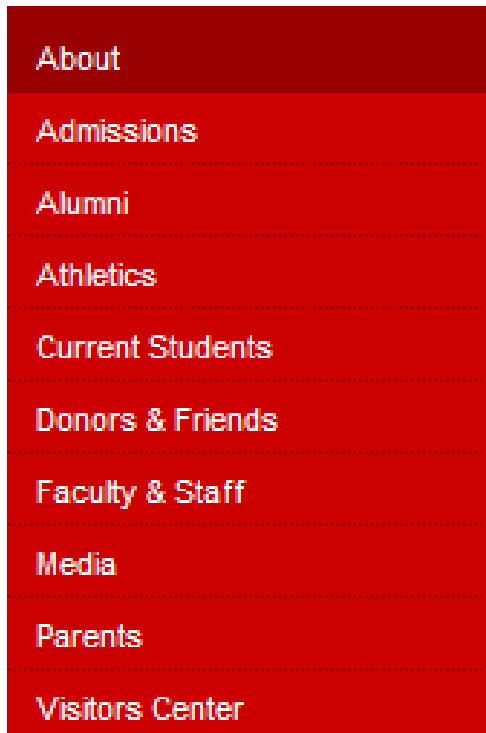
```
<a href="vision.html">Vision</a>
```



The Problems With Images

- Images add to overall page download/size.
- What if visitor has turned off images (as some do who use dial-up connections)?
- Can't set relative to page size

Better Option for Navigational Buttons



The navigational buttons illustrated above were created using plain text, styled using a Cascading Style Sheet (CSS).



Other Variations on CSS Theme

- Modify button borders to emulate raised button
- Change styling for button links (e. g., remove underlining)
- Add spacing between buttons
- Use the “:hover” event to change background / foreground colors



Accessible Tables



What Accessibility Problems do Tables Pose?

Failure to provide adequate context can make information meaningless

Improperly designed tables do not render information correctly when using screen reader

Using absolute values in table dimensions can make scrolling difficult for users with mobility impairments



What is a Table?

Co-opted by web developers for use as layout tool prior to adoption of Cascading Style Sheets (CSS)

Use for layout no longer necessary and strongly discouraged, but still used



Why Use HTML Tables?

Appropriate for:

- Data tables
- Spreadsheets
- Tabular Charts



table element

- Opens and closes table
- Sets some aspects of appearance (via **border**, **cellpadding**, **cellspacing**, **width** attributes)
- Provides summary of contents (not displayed, but used by screen readers) via **summary** attribute



Parts of an HTML Table

caption – between table declaration and first row, provides table’s displayed title

thead, tbody, tfoot – elements identifying different sections of larger tables – “macro” elements usually containing multiple rows



Parts of an HTML Table

tr – table row – identifies collection of adjacent cells that will appear on the same line

th – column/row heading – identifies the cell that describes a column's or row's contents

td – table data – identifies contents of single table cell



Table Cell Relationships

3.5

Table cells aren't useful without context

What does “3.5” mean in this context??



Table Cell Relationships

3.5

Table cells aren't useful without context

What does “3.5” mean in this context??

Coffee Recipe

To Make:	Tsps. Coffee	C. Water
3 cups	3.5	3



Table Cell Relationships

Screen readers ***LINEARIZE*** table data

How a Screen Reader processes a table:

- Top to bottom, left to right
 - *Row 1, Column 1*
 - *Row 1, Column 2*
 - *Row 1, Column 3*
 - *Row 2, Column 1*
 - *Etc....*



Caused when tables used to layout for appearance, not data relationships

The Spirit Times		
NEW in Today's Edition: Keeping the Lions from Eating the Lambs	Today's News: Man Opens Closet, Gets More than Bargained for SALEM, Massachussetts — When Gater Putney opened his closet door this morning he wasn't prepared for what he saw. "There I was, naked, right out of the shower. I opened up my closet to pull out a suit, and everything was covered in this odd green slime." Putney said he'd never seen anything like it.	Sections: <ul style="list-style-type: none">• Hauntings• ESP Incidents• Cold Spots• Things That Go "Bump"
Scores: Hill House v. Addams Family	A technician from exTerminex was called to the Putney home, and after testing the gook, said that it was "low-grade ectoplasm." It's from the Apparations, Inc. crew. I must have had a	Today's Weather: Temp — 45-50°F Sky — Cloudy,

Linearization Problems:

What you see isn't always what you get ...



The Spirit Times

NEW in Today's
Edition:

[Keeping the Lions
from Eating the
Lambs](#)

2.

Today's News:

**Man Opens Closet, Gets More
than Bargained for**

SALEM, Massachussetts — When Gater Putney opened his closet door this morning he wasn't prepared for what he saw.

3.

"There I was, naked, right out of the shower. I opened up my closet to pull out a suit, and everything was covered in this odd green slime." Putney said he'd never seen anything like it.

Sections:

- [Hauntings](#)
- [ESP Incidents](#)
- [Cold Spots](#)
- [Things That Go "Bump"](#)

4.

Scores:

[Hill House](#)
[Addams Family](#)

5.

A technician from exTerminex was called to the Putney home, and after testing the gook, said that it was "low-grade bioplasm." It's from the Apparations, Inc. crew. I must have had a

6.

Today's Weather:

Temp — 45/50°F
Sky — Cloudy,

7.



Help for Linearization

Several sites help you discover what your page reads like when linearized:

- Tablin (<http://www.w3.org/WAI/References/Tablin>)
- Lynxview (<http://www.delorie.com/web/lynxview.html>)
- Lynx – Text browser for Unix and Windows (<http://lynx.browser.org>)

Making Tables Accessible: Proportional v. Absolute Sizing



The problem starts with a developer that wants to optimize his table to fit his entire screen...

Table Width - 1000 px.



1024 px. wide

Making Tables Accessible: Proportional v. Absolute Sizing



The first person to visit the developer's site has an 800 X 600 display and doesn't see things quite the same way...

Table Width - 1000 px.



1024 px. wide



800 px. wide

Making Tables Accessible: Proportional v. Absolute Sizing



And the developer's customer has a 640 X 480 display ...

Table Width - 1000 px.



1024 px. wide



800 px. wide



640 px. wide

Making Tables Accessible: Proportional v. Absolute Sizing



If the developer had used a proportional table size, his table would have been optimized for EVERYONE'S monitor...

Table Width - 100%



1024 px. wide



800 px. wide



640 px. wide



Screen Readers and Tables

Coffee Recipe

To Make:	Tsps. Coffee	C. Water
3 cups	3.5	3

Highlighted cell in Screen Reader (without proper markup): “3.5” – 3.5 *what?*

Highlighted cell in Screen Reader (with proper markup): “To Make:, 3 cups, Tsps. Coffee, 3.5”

HOW?

Leverage Attributes to Provide Additional Context



```
<table border="1" width="100%" summary="Chart showing how much coffee and  
how much water to use to make coffee, organized by number of cups of coffee  
desired.">
```

```
<caption>Coffee Recipe</caption>
```

```
<tr>
```

```
  <th scope="column" id="c1">To Make:</th>
```

```
  <th scope="column" id="c2">Tsp. Coffee</th>
```

```
  <th scope="column" id="c3">C. Water</th>
```

```
</tr>
```

```
<tr>
```

```
  <th headers="c1" scope="row" id="r1">3 cups</th>
```

```
  <td headers="c1 r1 c2">3.5</td>
```

```
  <td headers="c1 r1 c3">3</td>
```

```
</tr>
```

```
</table>
```



Other Common Problems

Large tables load slowly for people with low-bandwidth connections

Large, complex tables difficult to decipher for those with low vision; can be impossible for those without vision

Inappropriate use of markup (e.g., using **th** because you want text bolded & centered)

Wrap up

