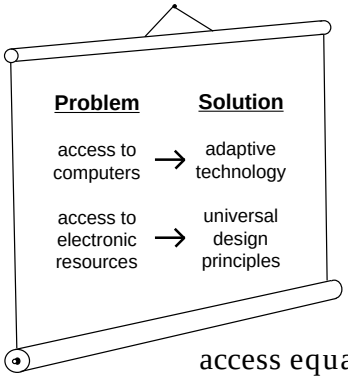
developing a more accessible library?

6. What funding options does the library have for acquiring adaptive technology?

After ten minutes, have each group summarize their discussion.

To move forward with the ideas you've brainstormed, you may want to locate someone outside the library who has adaptive technology expertise to answer specific questions and provide professional advice regarding appropriate adaptive technology. You may also want to designate staff to assess current services and research equipment and funding.

This section of the program has addressed adaptive technology. We viewed the videotape presentation, *Working Together: People with Disabilities and Computer Technology*, and saw how adaptive technology can assist people with low vision, blindness, hearing impairments, speech impairments, specific learning disabilities, mobility impairments and health impairments. We applied this new information to planning for the library by reviewing a list of recommended adaptive technology and a brainstorming exercise. I encourage you to use the resources listed as you continue your planning.



Put up overhead transparency.

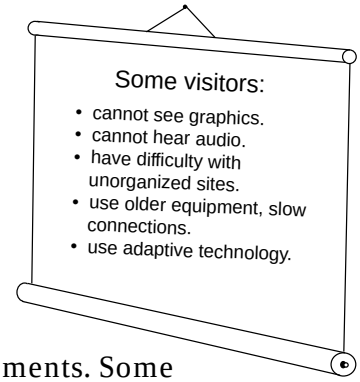
The next portion of the program will address the second part of the access equation that we looked at earlier: using universal design principles to ensure that electronic resources are accessible.

You may want to insert a break at this point in the program.

Electronic Resources

Historically, libraries have been committed to providing equal access to information to their constituents, whether they be the general public, the students and faculty of a college, or the employees of a business. The rapid development of electronic information resources has changed the physical and service features of our libraries. Throughout this change, many libraries have embraced a goal of making their resources easier to access. The development of sophisticated multimedia electronic and World Wide Web resources are seen as methods of extending the reach of the library. Increasingly, however, these resources are not fully accessible to people with some types of disabilities. For example, screen reader software with a speech synthesizer used by a patron who is blind cannot interpret tables, graphics, or video clips.

Put up overhead transparency.



Some visitors cannot see graphics because of visual impairments or cannot hear audio because of hearing impairments. Some users have difficulty when screens are unorganized, inconsistent and cluttered and when descriptions and instructions are unclear. These difficulties may occur because they have learning disabilities, speak English as a second language, or are younger than the average user. Other visitors use older equipment or slow connections or modems that limit their access to multimedia features. And

some visitors use adaptive technology with their computer to access the Web.

As more information is delivered using computer and network technologies, libraries play an increasingly important role in ensuring access for all people to Internet and electronic information resources.

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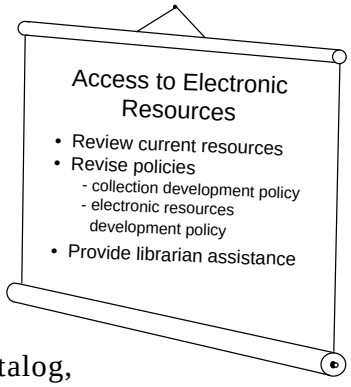


When evaluating accessibility of electronic resources, remember to consider the library's online catalog, electronic indexes and full text resources such as encyclopedias, available through stand-alone stations or networked terminals, and Internet resources including Web pages.

Accessibility should also be considered when purchasing new electronic resources for the library. Ask the vendor if the product has been tested for accessibility and, specifically, if the product is compatible with screen reading software. Include a section in you library's collection development policy stating that electronic products should be reviewed for accessibility before purchase.

Electronic resources designed or developed in-house, such as Web pages, online catalogs, and local digital library projects, should be developed with accessibility as a major goal. Accessibility guidelines should be incorporated into Web page publication guidelines or standards.

As a backup, librarians should be prepared to assist patrons with electronic resources that they cannot access by providing research consultations and materials in other formats.

Universal Design Principles

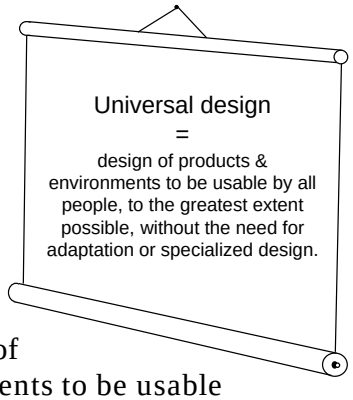
In making electronic resources accessible, principles of universal design should be employed. Following universal design principles can help ensure that all users will be able to independently utilize your electronic resources regardless of their disability or the limitations of their equipment and software.

Put up overhead transparency.

Typically, organizations design their electronic services for the average user. Universal design means that you design them for people with a broad range of abilities and disabilities.

Let's consider the concept of universal design in a little more depth.

Put up overhead transparency.



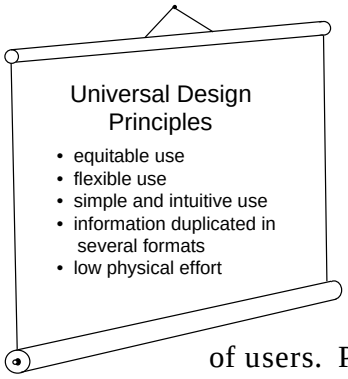
The Trace Research and Development Center has defined universal design as: "The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." [8]

Universal design principles can be applied to

[8] Connell, Bettye Rose, Mike Jones, Ron Mace, et al. "The Principles of Universal Design" Version 1.1 - 12/7/95 Available: *http://www.trace.wisc.edu/text/univdesn/ud_princ/ud_princ.html*

facilities or tools. They are especially appropriate to consider when designing electronic resources including online catalogs and indexes and electronic reference sources in CD-ROM or other formats, or on the Internet.

Adapted from a listing by Trace, here are some general guidelines to consider in designing these resources.[9]



Put up overhead transparency.

Design resources so that they promote equitable use. The design should be useful by any group of users. Provide the same means of use for all users—identical when possible; equivalent when not. Avoid segregating or stigmatizing any potential users.

Resources should be flexible in the ways that they can be used, accommodating a wide range of individual preferences and abilities. Provide choice in methods of use, for example accommodate right- or left-handed access.

The design should be simple, allowing the resource to be used with minimal training. The resource should be easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. Anticipate user expectations and intuition.

Information should be provided redundantly. The variety of formats included should accommodate people with visual, hearing, and other impairments. Use different modes (e.g., pictorial, textual) for redundant presentation of essential information. Computing resources should be compatible with current adaptive computer technologies.

Consider the amount of physical effort required to operate a resource. Design the resource so that minimal physical effort is required.

Accessible Web Design

Let's look at a practical application of universal design principles, designing accessible Web pages. The World Wide Web has rapidly become the most popular Internet resource, combining hypertext and multimedia to provide a huge network of educational, governmental and commercial resources. And, as you know, many libraries maintain their own Web site. Yet because of the multimedia nature of the medium, many Internet surfers cannot access some of these materials.

In the following videotape presentation, called *World Wide Access*, a librarian and patron with disabilities share access issues and solutions for people with disabilities. At the end of the video, design features for making Web pages accessible are listed. These recommendations are covered in your handout titled *World Wide Access: Accessible Web Design*. We will discuss these principles in more depth after the videotape presentation. The handout titled *Meet the Speakers: World Wide Access* provides information about the people featured in the videotape.

Show videotape presentation: World Wide Access.

General Page Design

Let's consider in more depth the principles described in the videotape. If you have not created a Web page before, you may be confused by some of the technical jargon I will

[9] Ibid.

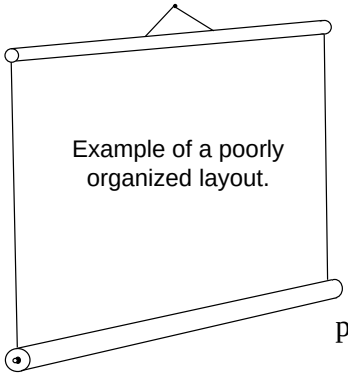
use. If so, don't be discouraged. Focus on the basic principles and pass the information in the handout on to the staff responsible for Web page development at the library. We'll start out with principles related to general page design.

The first principle to remember is maintain a simple, consistent page layout throughout your site.

The Web has mushroomed in popularity because it is such a powerful and versatile medium. Much of its power comes from the fact that it presents information in a variety of formats while also organizing that information through hypertext links. Designing a well organized site is essential to helping visitors navigate through your information.

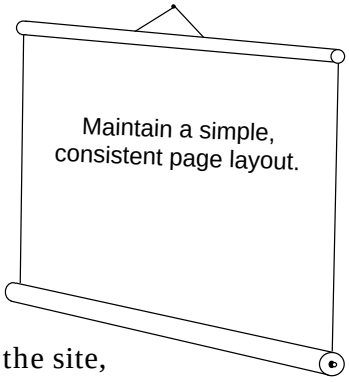
A consistent design and look makes it easier for visitors to navigate through the hypertext and find the information they need. A clear, consistent organizational plan will especially assist people with learning disabilities who have difficulty following disorganized presentations.

Some have advocated the use of alternative text versions of their pages. However, this adds a great deal of maintenance time and complexity as two versions must be updated. Instead, create the original version in an accessible format. Remember that the first principle of universal access is equitable use, so avoid segregating users of your electronic resources based on their ability, connection speed, or type of hardware and software they use.



Put up overhead transparency.

This first Web page example is poorly organized. The home page is cluttered with four different navigation menus and a frame. A visitor to this page will likely have difficulty knowing where to start. Within the site, different menus are used on each page. Headings and menus are not consistently placed on the pages, sometimes showing up at the top of the page, sometimes at the bottom, and sometimes at the side.

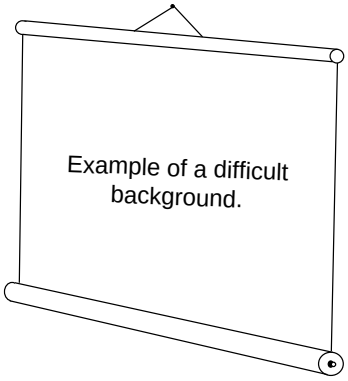


Put up overhead transparency.

This example shows a more carefully organized site. Features presented on every page, such as a logo for the site, appear in the same place throughout the site. A standard navigation menu for the entire site is duplicated on each page in the same location. The universal design principle of simple and intuitive use operates in this guideline. Make it easy for people to follow the navigation paths at your site. Being consistent will help them do this.

Remember also that small buttons marking links can be a difficult target for visitors with mobility impairments that result in restricted hand movements. Larger buttons can make it easier for all visitors to select the links on your page. Think about the physical effort needed to use your site.

Along with a consistent page layout, it is important to keep backgrounds simple and make sure there is enough contrast.

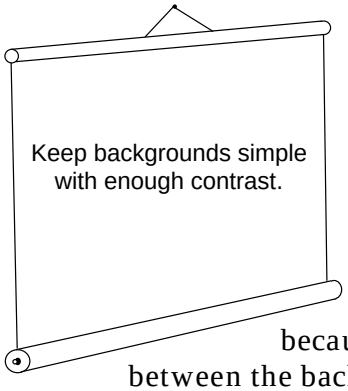


Put up overhead transparency.

People with low vision or color blindness, or those using black and

white monitors can have difficulty reading information at sites with busy backgrounds and dark colors. Many background images and colors obscure text and make reading difficult. Make sure that there is enough contrast between your text and the background of the page. Choose background, text and link colors carefully, and always test your site with both black and white and color monitors. Following this guideline will aid visitors with low vision and those with learning disabilities who can find busy backgrounds and moving features on pages confusing.

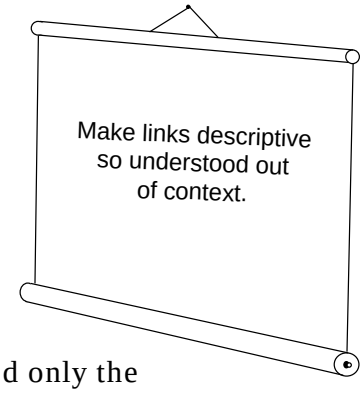
A visitor with low vision might have difficulty reading the text at this site because of the darkness of the color and the distraction of the pattern.



Put up overhead transparency.

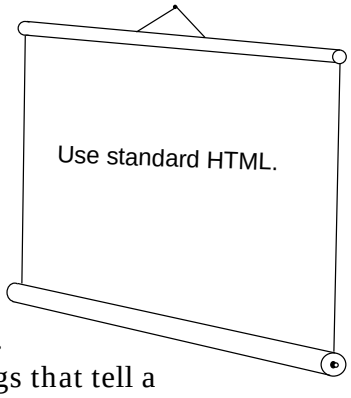
DO-IT's home page shows an example of a page that is easy to read because of the high contrast between the background and text.

Put up overhead transparency.



Visitors who use screen reading software can adjust their software to read only the links on a page. For this reason, links should provide enough information when read out of context. For example, never use "click here" as a link, or next to a graphic used as a link. Make links descriptive so that they are understood out of context. And, as mentioned before, make images or buttons used for links large enough so people with limited fine motor control can select them.

Put up overhead transparency.

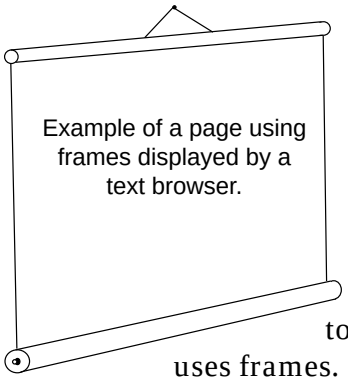


Hypertext Markup Language (HTML) is the standardized code used to create Web sites. The code works with tags that tell a Web browser where to find and how to display your information. HTML was designed to be a universal format outside the bounds of proprietary software and computer languages. The World Wide Web Consortium (W3C) specifies what is standard HTML with the intent of maintaining a language compatible with many platforms and browsers. There are many validator programs available that will test your Web site for adherence to the standard.

The universal format of the World Wide Web meets the equitable and flexible use principles of universal design. However, many people like to add new and non-standard features to add flash to their Web pages. This obstructs the original purpose of a world-wide standard and the open communication that it allows and encourages.

While non-standard tags exist, using standard HTML tags will ensure that your content can be accessed by all browsers used by visitors to your site. Avoid tags, such as <BLINK> that are not supported by all Web browsers. Another example of a non-standard tag are the frame tags. Frames often present logistical nightmares to text-based screen reading software. Evaluate whether frames are truly

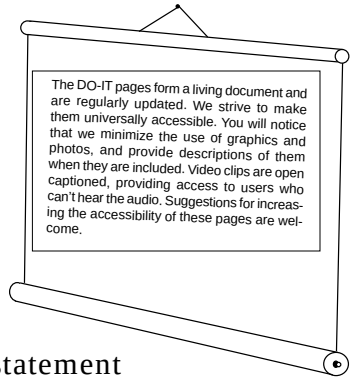
necessary at your site. When you use non-standard tags, you are likely blocking someone from your information as this example shows.



Put up overhead transparency.

As you can see, this page is not accessible to some users because it uses frames. Some Web server software can list out the addresses for all of the frames so that the visitor can look at the information in each frame. However, not all server software has this capability.

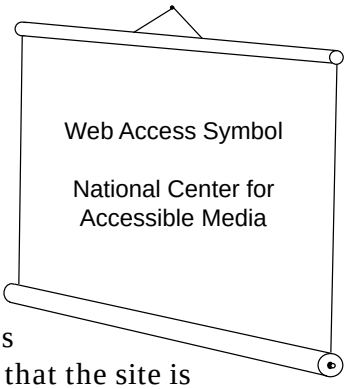
Put up overhead transparency.



Notify your users that you are concerned about accessibility by including a statement about accessibility on your page. Encourage your users to notify you with their accessibility concerns. For example, the DO-IT home page includes this statement:

> The DO-IT pages form a living document and are regularly updated. We strive to make them universally accessible. You will notice that we minimize the use of graphics and photos, and provide descriptions of them when they are included. Video clips are open captioned, providing access to users who can't hear the audio. Suggestions for increasing the accessibility of these pages are welcome.

Put up overhead transparency.



The National Center for Accessible Media (NCAM) promotes the use of a Web Access symbol to notify users that the site is universally accessible. The symbol can be downloaded from the NCAM Web site.

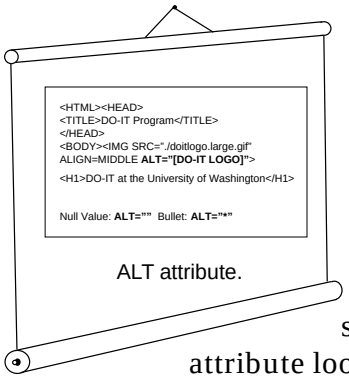
Graphical Features

People who are blind cannot view the graphical features of your Web site. Many people with visual impairments use voice output programs with text-based browsers (such as Lynx) or graphical browsers with the feature that loads images turned off. Include text alternatives to make the content in these graphical features accessible. This addresses the universal design principle of redundant presentation of information in different modes.

In fact, some have advocated the use of alternative text versions of Web sites that are graphic-intensive. However, this adds a great deal of maintenance time and complexity as two versions must be updated. The maintenance time increases exponentially for organizations that are required, or that choose to provide their sites in multiple language versions. Make every effort to create the original version in an accessible format. Remember, the first principle of universal access is equitable use, so avoid segregating users of your electronic resources based on their ability, connection speed, or type of hardware and software they use.

Here are guidelines for providing alternative text for various types of visual features.

To start out, always include short, descriptive ALT attributes for graphical features on your page. What is an ALT attribute? An ALT attribute is an HTML code used with the IMG tag that is used to give alternative text information for graphical features. The alternative text helps the visitor understand what is on the page even if they are using a text browser or if they have image loading turned off in their graphical browser.



Put up overhead transparency.

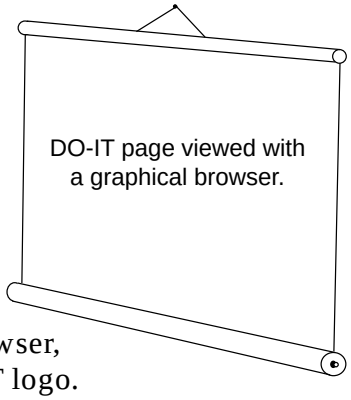
The bolded text in this example of HTML code shows what an ALT attribute looks like. An ALT attribute always works within an image or graphical HTML tag.

```
<HTML>
<HEAD>
<TITLE>DO-IT Program</TITLE></HEAD>
<BODY><IMG SRC="./doitlogo.large.gif"
ALIGN=MIDDLE ALT="[DO-IT LOGO]">
<H1>DO-IT at the University of Washington</
H1>
```

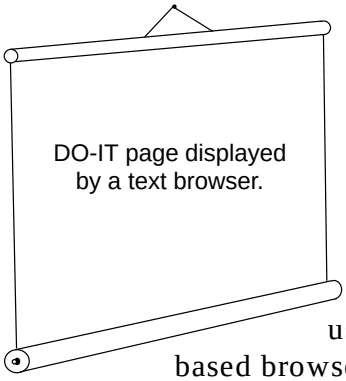
In some cases where a graphic provides no additional information, the ALT attribute can be used with a null value ("") to eliminate clutter. ALT attributes for graphical bullets can simply be asterisks.

```
<IMG SRC="./dec.gif" ALIGN=MIDDLE
ALT="">
<IMG SRC="./bullet.gif" ALIGN=MIDDLE
ALT="*">
```

Put up overhead transparency.



When a sighted visitor views the DO-IT home page with a graphical browser, he will see the DO-IT logo.

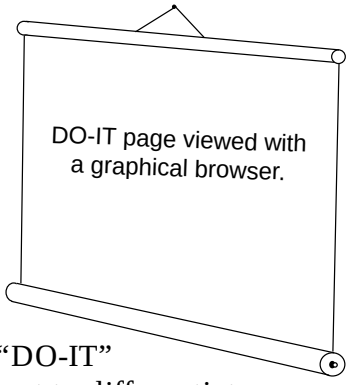


Put up overhead transparency.

This is what the DO-IT page looks like using Lynx, a text-based browser. When a user who is blind visits, his voice output program will read [DO-IT LOGO]. This gives him a clear idea of what is on the page. In addition, any visitor coming to the site using a text-based browser will understand that there is a logo there instead of the more ambiguous "image" that is the default result when no ALT attribute is used. ALT attributes should be short and simple (less than 5 words) as browsers sometimes have difficulty with long ALT attributes.

This example also helps explain the difference between text and words embedded in a graphic.

Put up overhead transparency.

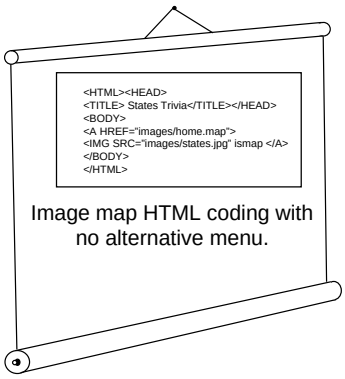


Let's take a look at the DO-IT page again as displayed by a graphical browser. The word "DO-IT" is a picture. It is important to differentiate

between text, which screen readers can access, and words that are images. Web designers sometimes use pictures of words so that they can incorporate color, fancy fonts, and other design elements into the display. An ALT attribute is needed with these word-pictures, or else the DO-IT name is as invisible as the rest of the logo when displayed by a text browser.

The next principle is to include menu alternatives for image maps (also called ISMAPS) to ensure that the embedded links are accessible.

An image map is a picture on which parts of the picture can be clicked to find a link to another page. For example, a site with information on state trivia presents a map of the United States. A visitor can click on Washington State to find out the state bird, song, insect, flower and other facts. But if the Web page developer has not included an alternative menu, visitors using text-based browsers can be totally blocked from the site, or sent on a wild goose chase clicking unlabelled links that lead them in circles.

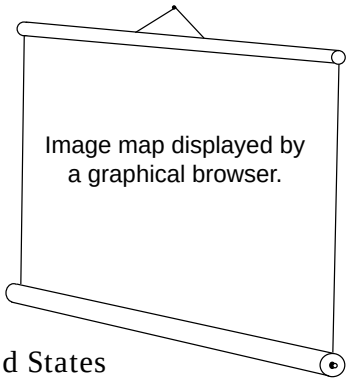


Put up overhead transparency.

The HTML coding in this example does not include an alternative menu for the image map.

```
<HTML>
<HEAD>
<TITLE>States Trivia</TITLE>
</HEAD>
<BODY>
<A HREF=”images/home.map”>
<IMG SRC=”images/states.jpg” ismap></A>
</BODY>
</HTML>
```

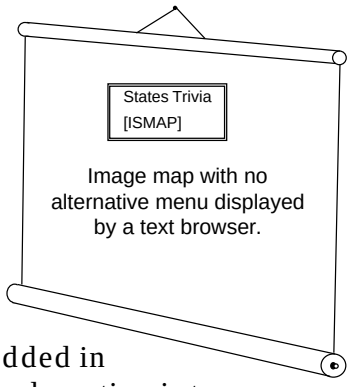
Put up overhead transparency.



When viewed through a graphical browser, such as Netscape, a picture of a map of the United States appears.

The visitor can choose information by state. But, when a visitor using a text-based browser visits the site, what he sees is this:

Put up overhead transparency.

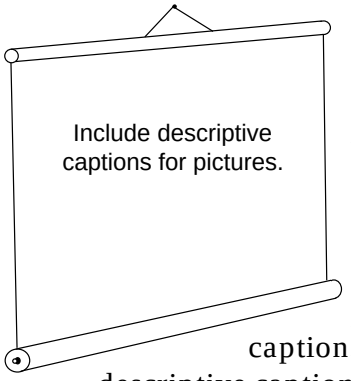


At this point the visitor is stuck as text-based browsers will not interpret the hypertext links embedded in the image map. His only option is to back out of the site. A visitor who uses a text-based browser, perhaps because she is blind, can't get to your information.

The accessibility of image maps is dependent on the server software used at a Web page site. If ALT attributes are included for every hyperlink in an image map, some server programs can pull the hyperlink information from the image map and present it in a menu format for text-based browsers. However, many Web servers do not have this capability. Talk with your system administrator or Web developer to explore the best methods of providing accessible image maps. If this support is not available to you, you can always make the hyperlinks in the image map accessible by adding a separate navigation menu, or listing of hypertext links, above or below the image map.

Using the ALT attribute and alternative menus help all of your visitors navigate through your site. The next principles we will discuss will help your visitors understand the content in the non-text, graphical features of your page.

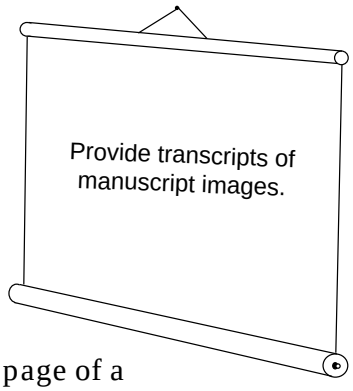
What information do your pictures and images provide to the viewer? Always provide an ALT attribute for an image. This is sufficient for logos and graphics that that are not critical to the information content of the page. But if the graphics provide information beyond this, adding captions and transcriptions is important for those who cannot see your page because they are using a text-based browser, including those who are blind. If you're not sure how critical a particular image is to the content of a page, temporarily remove it and consider its impact.



Put up overhead transparency.

Here is an example of photograph with a caption. Remember to include descriptive captions for photos and pictures. Describe the picture with enough detail so that a visitor who cannot see the picture will understand the content that it adds to the page.

Some organizations caption images by adding a hyperlink immediately before or after the image to another page with image descriptions. They suggest that the hyperlink text be a simple "D". At the end of the description is another hyperlink — "Return". Selecting Return will take you back to the image. While this is one option, consider including the caption as part of the page in which the image resides.

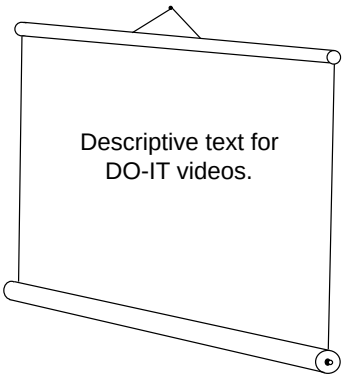


Put up overhead transparency.

If you present information in an image format, such as a scanned-in image of a page of a manuscript, be sure to also provide a transcription of the manuscript in a straight text format. Remember, words embedded in an image are not accessible to someone using a voice output system. This aids a wide variety of visitors including those with visual impairments, users who speak English as a second language, and those with learning disabilities who may have difficulty reading the original document. This manuscript at the Library of Congress is provided as both a picture of the manuscript and a text transcript. Again, think redundancy.

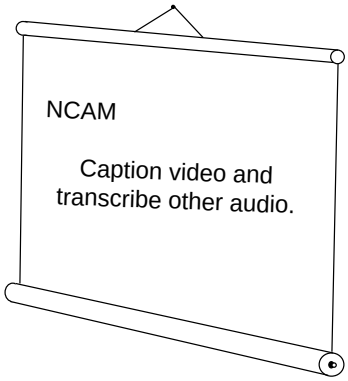
Multi-media and audio formats can present barriers to people with hearing impairments as well as for people with less sophisticated computer systems. Provide captioning and transcriptions for spoken materials so these visitors have an alternative method of accessing this information. DO-IT provides descriptive text for its video clips.

Put up overhead transparency.

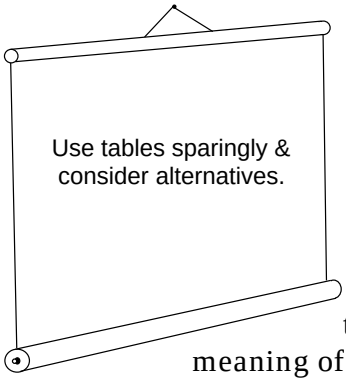


The National Center for Accessible Media is experimenting with methods of captioning video on the Web.

Put up overhead transparency.



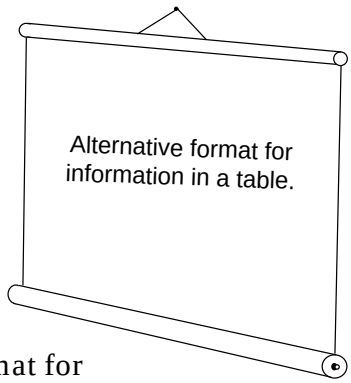
Special Features



Put up overhead transparency.

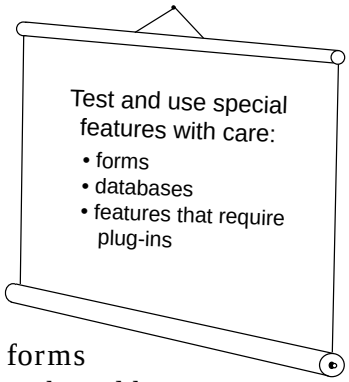
Most screen reader programs read from left to right, jumbling the meaning of information in tables. Some adaptive technology can deal with format issues such as this, but it's best to look for other ways to present the information so that visitors with visual impairments can read your data.

Put up overhead transparency.



This is an example of an alternative format for information that might be included in a table. Each course in the bulleted list is hyperlinked to a description. Many Web designers would immediately consider a table for information like this that includes standard information for every entry. However, this format is more accessible.

Put up overhead transparency.

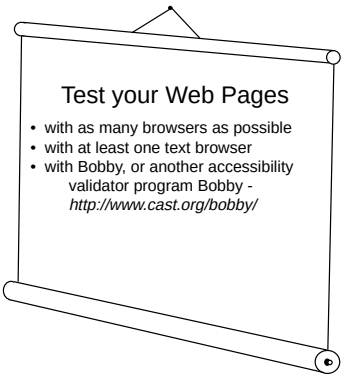


Use special features such as forms, databases and plug-ins with care. Always test forms and databases with a text-based browser. Include an electronic mail address and other contact information for those who cannot use the form or database.

Use features that require plug-ins, mini programs run within a browser, with care. Not all people have the high-end equipment needed to download and run many of the plug-ins. In addition, many of the features run with plug-ins are not accessible through that text-based Web browsers. As the software is developed, applets (such as programs created with JAVA) and plug-ins (such as Adobe Acrobat) may provide accessibility features. Adobe Acrobat Reader is an example of a plug-in that has developed an accessibility option (see Resources for Universal Design and Accessible Web Design). However, to ensure that people with visual and hearing impairments can access your information, provide the content from these programs in other, text-based formats. This is in accordance with the universal design principles of providing your information redundantly in different modes and being compatible with adaptive technology.

Web Pages Test

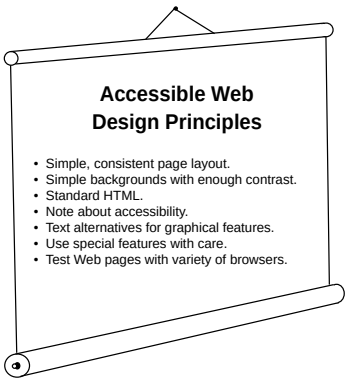
Put up overhead transparency.



The most important and final guideline is to test your Web page with as many Web browsers as you can, and always test your Web page with at least one text-based browser. This way, you will see your Web resources from the many perspectives of your users.

Part of testing your Web site includes running it against an HTML validator program. These programs compare the HTML at your site with the rules of standard HTML. They then provide a report listing errors and non-standard tags. Some validators check specifically for accessibility. You may want to try out an accessibility validation site which performs a diagnostic on your pages and points out parts that could be inaccessible. For example, Bobby is an easy to use program to find HTML compatibility problems that prevent pages from displaying correctly on different web browsers. Bobby also specifically highlights accessibility problems. Bobby was created at CAST (Center for Applied Special Technology). Its URL is *http://www.cast.org/bobby*.

Testing your site is especially important if you use HTML editor software to write your pages. Some HTML editor programs do not automatically include ALT attributes and other accessibility features. Many of them rely heavily on graphical features, even to the point of converting text to an image of words. You may need to revise the HTML of pages designed with these programs to include the accessibility guidelines covered in your handout.



Put up overhead transparency.

To summarize, consider these principles when developing the library's Web page.

Accessible Design Principles

- Maintain a simple, consistent page layout.
- Keep backgrounds simple. Make sure there is enough contrast.
- Use standard HTML.
- Include a note about accessibility.
- Provide text alternatives (ALT attributes, captions, alternative menus, transcriptions) for graphical features.
- Test and use special features with care.
- Test your Web pages with a variety of browsers.

Let's review these principles by evaluating a Web site.

If you are doing your presentation with an Internet connection or offline demonstration, display your Web site and repeat each principle. Consider creating overheads from your site if you are not using a computer display in your presentation. Invite comments from the audience on the accessibility of the page and how inaccessible sections might be improved. Display your site with both a graphical and text-based browser, and test the site with Bobby, or one of the other validator programs.

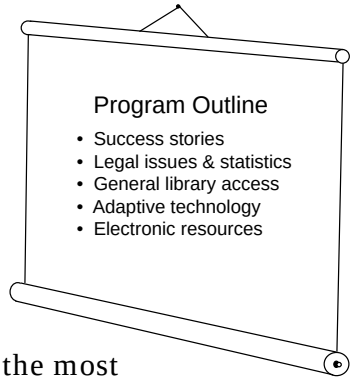
When evaluating and designing your Web page, remember to focus on the content and purpose, and make sure your features support those goals. Then make sure that you have provided text alternatives for everything that might not be accessible.

The World Wide Web is just one example of an electronic resource that people with disabilities want and need to access. When purchas-

ing and designing other electronic resources for the library, including online catalogs, encyclopedias, and indexes, consider the principles of universal design and whether these resources will be accessible to people utilizing adaptive computer technology.

Summary

Put up overhead transparency.



As our program comes to an end, I'd like to ask what was the most significant insight you had today? Please feel free to stand and share with the group if you have a brief comment.

I hope this program has given you a clear and inspiring understanding of the impact that the combination of computers, adaptive technology and electronic resources can have on the lives of people with disabilities. As we discovered through a brief review of relevant laws and statistics, libraries have a legal responsibility, and a responsibility to the increasing constituency of people with disabilities to plan for accessible buildings, resources and services. The information from this program should have provided you with tools to begin assessing the library's accessiblity, and to implement adaptive technology and universal design principles. Applying some of the guidelines will help level the playing field for patrons with disabilities.

Thank you for your time today and your interest in finding ways to ensure that all patrons have equal opportunities to learn, explore interests, and express ideas in the library.