Universal Design for Learning Guidelines

What is Universal Design for Learning?	**Creating Accessible STEM Materials**	**Testing Tools**
Access Vs. Accommodation	**Video and Audio Closed Captions, Transcripts and Audio Descriptions**	**Technology Tools**
How to Make Accessible Word Documents		**Accessibility and Social Media Tools**
How to Make Accessible PowerPoints	**Operating Systems Accessibility Features**	
How to Make Accessible PDF's	**Web Accessibility Guidelines**	**Accessibility and Mobile Technology**
How to Make Accessible Desire2Learn Content	**Buying Accessible**	**Resources**

Access Vs. Accommodation

ACCESS

- Works for everyone
- Available to everyone
- Example:
  - Automatic door opener
  - Curb Cuts
  - Ramps
  - Closed captions

ACCOMODATION

- Tailored to an individual
- Example:
  - Extra time to take a test
  - Note taker
  - Recorded sounds to add audio to a printed test

NOTE: An accommodation plan is written by Disability Services. Plans are written each semester. If there is any question about accommodations, follow the plan as written and contact the DS Staff person who wrote the plan.

Universal Design for Learning

WHAT?

- A set of principles for content development that gives all learners equal opportunities to learn
- Not a single, one-size-fits-all solution
- Flexible approaches that can be customized and adjusted for individual needs

WHY?

- Learners bring a huge variety of skills, needs and interests to learning
- Increase and maintain learner engagement

HOW?

- Specific guidelines for designing learning content that reduces barriers to achievement for all learners
- Educator Checklist Version 2

Principles of Universal Design for Learning

Multiple Means of Representation	Multiple Means of Action and Expression	Multiple Means of Engagement
Use a variety of methods to present information, a range of means to support	Provide alternative ways to act skillfully and demonstrate learner knowledge	Follow learner interests Offer choices of content and tools Offer adjustable levels of challenge

Brain Networks and Universal Design for Learning

Recognition Networks

The "what" of learning

How facts are gathered

Strategic Networks

The "how" of learning

Planning and performing tasks

Organization and expression of ideas

Affective Networks

The "why" of learning

Engagement and motivation

Examples of Universal Design

Curb Cuts

You may have to look for one, and you notice when it isn't there

Works for objects on wheels

Automatic Door Openers

When your hands are full

Do you even think about it?

Works for objects on wheels

Ramps

Used by anyone to get from one floor to another

Works for objects on wheels

Universal Design and Accessibility Pellissippi Policies

Tennessee Senate Bill SB 1692

Tennessee Board of Regents (TBR) Web Accessibility

- Selection of Instructional Materials Policy
- **Accessibility of all course content**
- **Request sales representatives and publishers provide accessible alternate formats for textbooks**

- Universal Design for Learning Policy 00:04:00
- **Provide Multiple means of representation**
- **Provide multiple means of expression**
- **Provide multiple means of engagement**
- **Accessible informational materials**
- **Equally effective delivery manner**

- College-Related Web and Social Media Development and Use Policy 08:13:04
- **Adhere to Section 508 of the Rehabilitation Act of 1973, the Americans with Disabilities Act and Pellissippi State's Equal Opportunity and Non-Discrimination in Education and Employment Policy**
- **Adhere to current WCAG 2.0 A and AA guidelines**

Buying Accessible

What to ask

1. Are videos and audio recordings transcribed?

2. Is there any documentation (VPAT or White Paper) on the product that confirms accessibility testing?

3. What alternate format is used for textbooks and related materials?

4. Are images described and the descriptions embedded in the electronic version?

5. Is the accompanying web environment accessible?

6. Can all interactive items be completed by keyboard alone?

7. Are scientific symbols coded for reading with screen reading software?

What to test

1. How accurate is the transcription?

2. What does the documentation say? If there is any item "with exceptions" it is not fully accessible.

3. Even if the text is available in electronic format, that does not mean the file is accessible. Files need to be tested as well.

4. Descriptions need to be within the book file, not in a separate document. Test with screen reading software.

5. Use a web accessibility test to determine if any issues are present. Test with screen reading software or ask for assistance from Disability Services.

6. Try tabbing through files or websites from the keyboard to view focus and access to all areas

7. Test scientific symbols and notations with screen reading and text to speech software

How to Make Accessible Word Documents

Why start with Word?	→	**Sets the stage for creating accessible materials** **If the Word document is accessible, the format will transfer to other formats such as PDF and HTML. It will still need to be checked again after saving it.**

Headings	Lists	Tables	Alternate Text for Images	Descriptions, Captions and Transcriptions	Color

Standard Word Style Ribbon-WIN/MAC **Texas Productivity/Accessibility Ribbon-WIN** **Berman Accessibility Ribbon for Word-WIN**	Standard Ribbon comes within Office and includes all Style options, but each must be selected individually when creating Productivity/Accessibility Ribbon and Berman Accessibility must be installed as add-ons and place all Style options into one ribbon

Note: Word for Macintosh 2011 Service Pack 1 is needed to ad Alt Text to Images. The Mac version of Word does not create accessible PDF's. Word documents can be opened in OpenOffice, LibreOffice and NeoOffice for export to a tagged PDF.

Make Accessible Word Documents
Tip Sheet

Headings	Properly format headings	• Select the text • Select the Home tab • Choose the heading level from the Styles Group
	Use headings in correct order (1-6) Have a heading every few pages	The Heading 1 should only be used once in a document • Do not skip heading levels
	Try to chunk information and use headings 1-3	Create a separate document if using headings 4-6
Images	Add alternate (Alt) text to images	• Right-click on the image, select Format Picture • Select Alt Text (Word 2013 image of square with width and length lines)
	Keep the description to under 200 characters	Enter image description in Description field
Lists	Format a list using Numbering or Bullets	Select the text From Home, Select number or bullets
Links	Create a meaningful link that describes the destination	Type text for the link [ex. Disability Services (opens in new window)] Select text, right-click and select Hyperlink Enter a complete URL address in the Address Field
Color	Use sufficient color contrast Do not use color alone to convey meaning	Be sure there is contrast between fonts and background colors Choose colors using the Automatic setting Turn on High Contrast Mode to visually check against a printed copy

Creating Accessible Word Documents

Tables	Specify column header rows in tables Use tables for data only, not layout Make sure there are no blank rows or cells Check the Reading Order	•Use Table Tools Design Tab •Select the Row tab •Check Repeat as Header Row Merged, nested and split cells may change the reading order
	Use Alt Text to describe the tables	Right-click on the table Select Table Properties Select Alt Text, Type in Description
	Add text to describe additional complex information as a caption to	Add text to describe additional complex information as a caption to
	Do not use Word for complex tables with headings in both rows and columns.	Use HTML to create complex tables
Math and Science	Use MathType to write equations (an Office plug in) Use D2L's equation editor to write equations	• Test equations with MathPlayer from Design Science for adding text-to-speech
Forms	Label form fields and buttons Check the reading order of forms by pressing the tab key to replicate the order a screen reader would navigate. If it doesn't land on the form fields in the correct order, the form will need to be edited.	Use a form template to create a form Use real text labels or alternative text when creating buttons and form fields
Text	Use sufficient color contrast Do not use color alone to convey meaning	Be sure there is contrast between fonts and background colors Choose colors using the Automatic setting Turn on High Contrast Mode to visually check against a printed copy

How to Make Accessible Word Documents: Macintosh

- Update to Microsoft Office 2011 Service Pack 1 to add Alt Text to images
- Other ways to create documents
  - Help>Check for Updates
  - List> All Styles to add additional styles to the ribbon
  - Right-click the desired styles group. Left-click to Modify
  - Use styles to create headings
  - Use lists in the ribbon to create numbered or bulleted lists
  - Use the Layout Ribbon and select Columns from the Test Layout group

- **NOTE**: The Mac version of Word does not create accessible PDF's.
- Word documents can be opened in OpenOffice, LibreOffice and NeoOffice for export to a tagged PDF.

How to make Accessible PowerPoints
Tip Sheet

Use templates as a starting point when creating new files. Select New and choose from templates available

Compose in outline view, then move to slide view. Click on View>Normal> Outline View

Insert slide layouts provided on the Home Tab to keep reading order intact. From Home, select New Slide

Make sure each slide has a title. Select Home>Layout, select layout with a title

When adding a picture that includes text, type the text in the slide title.   The picture may also need to be placed outside of the text box. Right click on the image and select Format Picture

INCLUDE:

- Images and graphics need to be described, including ones used from publisher image banks or slides

- Format lists as lists

- Hyperlinks need meaningful links to indicate their destination.

- Label buttons and make sure they can be activated through keyboard options

- Use MathType 6.9 to create equations, formulas and notations.

Note: Refer to items related to creating accessible Word documents for additional considerations for tables, audio and video, hyperlinks, color and other components

How to Make Accessible PowerPoints

Follow Guidelines for creating accessible Word and PDF documents for creating handouts and additional materials as notes for students

AVOID

- Animations- keep them brief and do not distract from important content
- Slide transitions that are complex
- Blank cells for formatting
- Use of Equation Editor in Word to format mathematical equations

CHECK

- Check Reading order for each slide. Tab through the slide. On Selection Pane, reading order begins at the bottom and moves to the top. Rearrange as needed
- Check for accessible tables, charts, images and shapes
- [Creating Accessible Microsoft PowerPoint 2010 Presentations](#)

How to Make Accessible PDF's
Tip Sheet

In Adobe Reader:	From the menu, select View> ReadOutLoud > Activate	If the text cannot be selected, or copied and pasted to another document, it is a scanned image and cannot be read aloud.
Can the text be selected? Does the document have a navigation structure?	From the menu, select Edit>Accessibility> Next	
Can the text be reflowed when it is enlarged?	Select each option to determine how Adobe Reader will present material	

How to Make Accessible PDF's

- Microsoft Word (Win)

Create an accessible Word document

Save As PDF

Click on Options at the lower right corner

Make sure the document structure tags for accessibility box is checked.

Click OK and Publish

Open with Adobe Reader and do a Quick Check

Use Adobe Acrobat to do a full check

- Adobe Acrobat

Request installation from the Help Desk

Open document

Select:
View>Tools>Accessibility>Full Check

Errors will be reported on the right. Right-Click to determine how to fix them. Some will have a "fix" item, others will need to be reviewed under the "Explain" option.

- Macintosh

The current version of Office for Mac 2011 can't produce a fully accessible PDF.

Use LibreOffice instead (see Portland Community College web site)

Document Testing Tools

Office 2010-Windows
Tutorial

Office 2013-Windows
Tutorial

Adobe Acrobat-Win/Mac Accessibility Check
Advanced>Accessibility>Full Check

Adobe Reader-Mac
Edit>Accessibility>
Quick Check

Without Adobe Acrobat

Can you highlight the text?
If not, it's an image and not accessible Magnify it? Test by View>Zoom> Reflow
Does it have headings?
Test by Edit>Accessibility> Quick Check

Contact Educational Technology Services (ETS) for Assistance with Transcription and locating accessible audiovisual materials

Closed Captions

Transcripts

Video Description

[YouTube](#):

- Select Caption Language

Click options

Click Translate Captions

Select a language

- Change Default settings

Go to Account Settings

Select Playback

Check/uncheck Always show captions

[Amara](#) is a free tool that will caption the video. Enter the video URL from YouTube or Vimeo, or a variety of formats. Choose to share or keep the video private.

[Showing in YouTube](#):

Click More underneath the player

Select the transcript icon.

[Editing captions](#)

Tip: Having a script prior to recording assists in the editing process.

Audio description gives information about actions to someone who cannot see the video.

[YouDescribe](#) for YouTube videos

Register for a free account

A training video on the Do's and Don'ts of Video Description is available to help start the process

Upload the completed video to the library

An embed code is provided for use on web sites

Creating Accessible STEM Materials Mathematics

MathML
- Stands for Math Markup Language, which is the standard for creating accessible math materials.

Tools
- Desire2Learn (D2L) Equation Editor- renders equations in MathML
- MathType (Design Science)- renders equations in MathML
- Math Hear (gh accessibility- self contained software with MathML and text to speech
- MathMLCloud (Benetech) (Chrome)- output math expressions as text descriptions, PNG, images, Scalable vector graphics (SVG) MathML or a combination, to be inserted into a source file
- MathPlayer (Design Science)- adds text to speech to converted equations as MathML, does not read text associated with equations or problems
- Kurzweil 3000 combined with MathPlayer- use of image capture tool to read text combined with equation reading by MathPlayer (contact Disability Services)
- InftyReader
- Orion Talking Graphing Calculator
- Braille Embosser
- Picture in a Flash tactile printer
- 3d printers

Creating Accessible STEM Materials: Resources

Perkins Accessible Science

[Independence Science](#)

DIAGRAM Center Accessible Image Sample Book

University of Washington DO-IT

Reynaga-Peña, C. (2015). A microscopic world at the touch: Learning biology with novel 2.5D and 3D tactile models. Journal of Blindness Innovation and Research, 5 (1).

How to Make Accessible Desire2Learn Content

The D2L environment is already accessible, however content that is to be uploaded will need to be checked prior to adding, using previously described guidelines and checking tools.

[Consult the tip sheet](#)

Pay attention to headings, images, links, lists, videos

Use accessible templates built into D2L

Use equation editor to create Mathml for accessible content

Use HTML to create content otherwise presented in PowerPoint format

Include a disability statement for accommodations through the home institution	Use the D2L tools for email, discussions and other activities. Tools used outside of D2L may not be accessible.

Resources for How to Make Accessible Desire2Learn Content

- Educational Technology Services (ETS)

ETS is on the 2nd floor of Goins Building on the Pellissippi Campus.

(865) 694-6593

- ROCC for information on additional accessible templates

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Web Accessibility Guidelines at PSCC

College-Related Web and Social Media Development and Use Policy 08:13:04

Web page developers should be sure that pages provide access to all users by following current Web Content Accessibility Guidelines A and AA guidelines (WCAG 2.0)

Part E: Strive to adhere to Section 508 of the Rehabilitation Act of 1973, the Americans with Disabilities Act and Pellissippi State's Equal Opportunity and Non-Discrimination in Education and Employment Policy

Required of all college websites

Creating Accessible Web Content

WCAG 2.0 Checklist for HTML is a stable, technical standard.

It has 12 guidelines that are organized under [4 principles: perceivable, operable, understandable, and robust](#).

For each guideline, there are testable *success criteria*, which are at [three levels: A, AA, and AAA](#).

Web Accessibility Guidelines

- **Perceivable**

Sight

Hearing

Touch

Transformability

Content vs. Style and Presentation

- **Operable**

Input methods

Interaction methods

User control over timing and time limits

Error recovery

- **Understandable**

Meaning:

Language

Alternative or supplemental representations

Functionality

- **Robust**

Functionality Across Current and Future Technologies

Using Technologies According to Specification

Items: Alt text

Descriptions for images

Captions

Audio description

Tables

Reading and Navigation Order

Do not rely on shape, size, visual location or sound

Color and Contrast

Resizing

Items:

Keyboard accessible

Keyboard focus

Page availability

Timing

Interruptions

Flashing

Links

Headings and Labels

Navigation

Items:

Identified language

Different language is marked

Text is readable and understandable

Alternative or supplemental representations

Error identification

Predictability

Help avoid and correct mistakes

Items:

Parsing errors are avoided

Markup is used to facilitate accessibility

Maximize compatibility with current and future technologies

Web Testing Tools

[Colour Contrast Analyzer](#)

[Web Accessibility Toolbar](#)

[WAVE](#)

[CSS Validation Service](#)

Note: These tools provide a starting point for testing web sites for accessibility. Automated tools cannot detect everything. They must be followed by manual testing with additional assistive technology, preferably by individuals fluent in their use to determine ease of use and navigation to content.

What if the site has errors? If there is author control over the site, make the corrections required for accessibility. If not, contact the web author to work with them in order to make the required changes to create an accessible web site. If this is not possible, search for similar content in accessible web sites or cite the information without linking to the site.

Technology Tools

Text To Speech

Users: Able to select and highlight text

Need to hear only pieces of text, not entire screen

Free Tools:
Natural Reader, Balabolka, Zabboware, Text Edit (Mac)

Voice Recognition

Users: Some ability to speak

Learn multiple commands

Get thoughts onto paper

May or may not have good use of hands

Free Tools:

Voice Recognition built into operating system

Free Tools:
Built into Operating Systems

Screen Reader

Users: Unable to see the screen

Need to hear everything on the screen for navigation

Use of keyboard for input

Free Tools:
NVDA (Win), Window Eyes (Win), VoiceOver (Mac)

Magnification

Users: Need enlarged print, may also need text to speech

Text needs to enlarge without distortion

Free Tools:
Virtual Magnifying Glass 3.7(Win/Mac), Built into operating systems

Operating Systems Accessibility Features

- [Windows 7](#)
- [Windows 8](#)

Start> Control Panel> Ease of Access Center

- [iOS/Mac/Apple Watch](#)

iOS:

Settings> General>

Accessibility

iTunes Shortcut:

Select device, from Summary pane click>configure Universal Access, then select feature

Mac:

Apple>System Preferences>Accessibility

- [Google](#)

Android OS

Chrome Browser

Chrome OS

Gmail

Google Docs

Google Drive

Google Forms

Google Groups

Google Hangouts

Accessibility and Social Media Tools

- Resource: Federal Social Media Accessibility Toolkit
  - Developed by Office of Disability Employment Policy (ODEP) with others

Facebook Accessibility Guidelines

Twitter and EasyChirp

YouTube

Vine

Blogs

Podcasts

Other Social Media Platforms: Instagram, LinkedIn, Pinterest, etc.

Accessibility and Mobile Technology

W3C definition: "Mobile accessibility" generally refers to making websites and applications more accessible to people with disabilities when they are using mobile phones. Includes people using a broad range of devices to interact with the web: phones, tablets, TVs, and more.

- Follow WCAG 2.0 A and AA standards for POUR
- Follow W3C Mobile Web Best Practices

[Mobile Accessibility](#)

- Follow testing procedures for accessibility

Resources for Training and Support

- **Pellissippi State Disability Services**
  - (865) 694-6411
  - (865(694-6751
- **Pellissippi State Educational Technology Services**
  - (865) 694-6593
- **Regional Online Course Collaborative (ROCC)**
  - (888) 223-0023
  - Philip Voorhees, TBR
  - Alice Wershing, East TN

Resources

Portland Community College

EASI

AMAC

Diagram Center

3PlayMedia

RESNA

ATIA

National Center on Accessible Instructional Materials

ADA Online

WebAIM