<table>
<thead>
<tr>
<th>What is Universal Design for Learning?</th>
<th>Creating Accessible STEM Materials</th>
<th>Testing Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Vs. Accommodation</td>
<td>Video and Audio Closed Captions, Transcripts and Audio Descriptions</td>
<td>Technology Tools</td>
</tr>
<tr>
<td>How to Make Accessible Word Documents</td>
<td>Operating Systems Accessibility Features</td>
<td>Accessibility and Social Media Tools</td>
</tr>
<tr>
<td>How to Make Accessible PowerPoints</td>
<td>Web Accessibility Guidelines</td>
<td>Accessibility and Mobile Technology</td>
</tr>
<tr>
<td>How to Make Accessible PDF’s</td>
<td>Buying Accessible</td>
<td>Resources</td>
</tr>
<tr>
<td>How to Make Accessible Desire2Learn Content</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Access Vs. Accommodation

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

**ACCOMMODATION**
- 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](#)
<table>
<thead>
<tr>
<th>Principles of Universal Design for Learning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multiple Means of Representation</strong></td>
<td><strong>Multiple Means of Action and Expression</strong></td>
</tr>
</tbody>
</table>
| 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 |
<table>
<thead>
<tr>
<th>Recognition Networks</th>
<th>Strategic Networks</th>
<th>Affective Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td>The “what” of learning&lt;br&gt;How facts are gathered</td>
<td>The “how” of learning&lt;br&gt;Planning and performing tasks&lt;br&gt;Organization and expression of ideas</td>
<td>The “why” of learning&lt;br&gt;Engagement and motivation</td>
</tr>
</tbody>
</table>
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
Pelissippi Policies

- **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 AA guidelines

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**Tennessee Senate Bill SB 1692**

**Tennessee Board of Regents (TBR) Web Accessibility**
## 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.
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.

Standard Word Style Ribbon-WIN/MAC
Texas Productivity/Accessibility Ribbon-WIN
Berman Accessibility Ribbon for Word-WIN

Sets the stage for creating accessible materials

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

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

- Use a form template to create a form
- Use real text labels or alternative text when creating buttons and form fields

## 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.

## 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

<table>
<thead>
<tr>
<th>AVOID</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Animations- keep them brief and do not distract from important content</td>
<td>• 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</td>
</tr>
<tr>
<td>• Slide transitions that are complex</td>
<td>• Check for accessible tables, charts, images and shapes</td>
</tr>
<tr>
<td>• Blank cells for formatting</td>
<td>• <a href="#">Creating Accessible Microsoft PowerPoint 2010 Presentations</a></td>
</tr>
<tr>
<td>• Use of Equation Editor in Word to format mathematical equations</td>
<td></td>
</tr>
</tbody>
</table>
### How to Make Accessible PDF’s

#### Tip Sheet

<table>
<thead>
<tr>
<th>In Adobe Reader:</th>
<th>From the menu, select View&gt; ReadOutLoud &gt; Activate</th>
<th>From the menu, select Edit&gt;Accessibility&gt; Next</th>
<th>If the text cannot be selected, or copied and pasted to another document, it is a scanned image and cannot be read aloud.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can the text be selected? Does the document have a navigation structure?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can the text be reflowed when it is enlarged?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the menu, select View> ReadOutLoud > Activate

From the menu, select Edit>Accessibility> Next

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

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
Accessible Video and Audio Tip Sheet

### Closed Captions
- **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

### Transcripts
- **Showing in YouTube:**
  - Click More underneath the player
  - Select the transcript icon.

### Video Description
- **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

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**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.

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

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
Philip Voorhees philip.voorhees@tbr.edu and Todd Blankenbeckler
tblankenbeck@southwest.tn.edu
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.
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

#### 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

#### 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:
- Natural Reader, Balabolka, Zabboware, Text Edit (Mac)
- Built into Operating Systems
- 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.
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

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