Innovative Distance Education: Accessibility and Usability Training
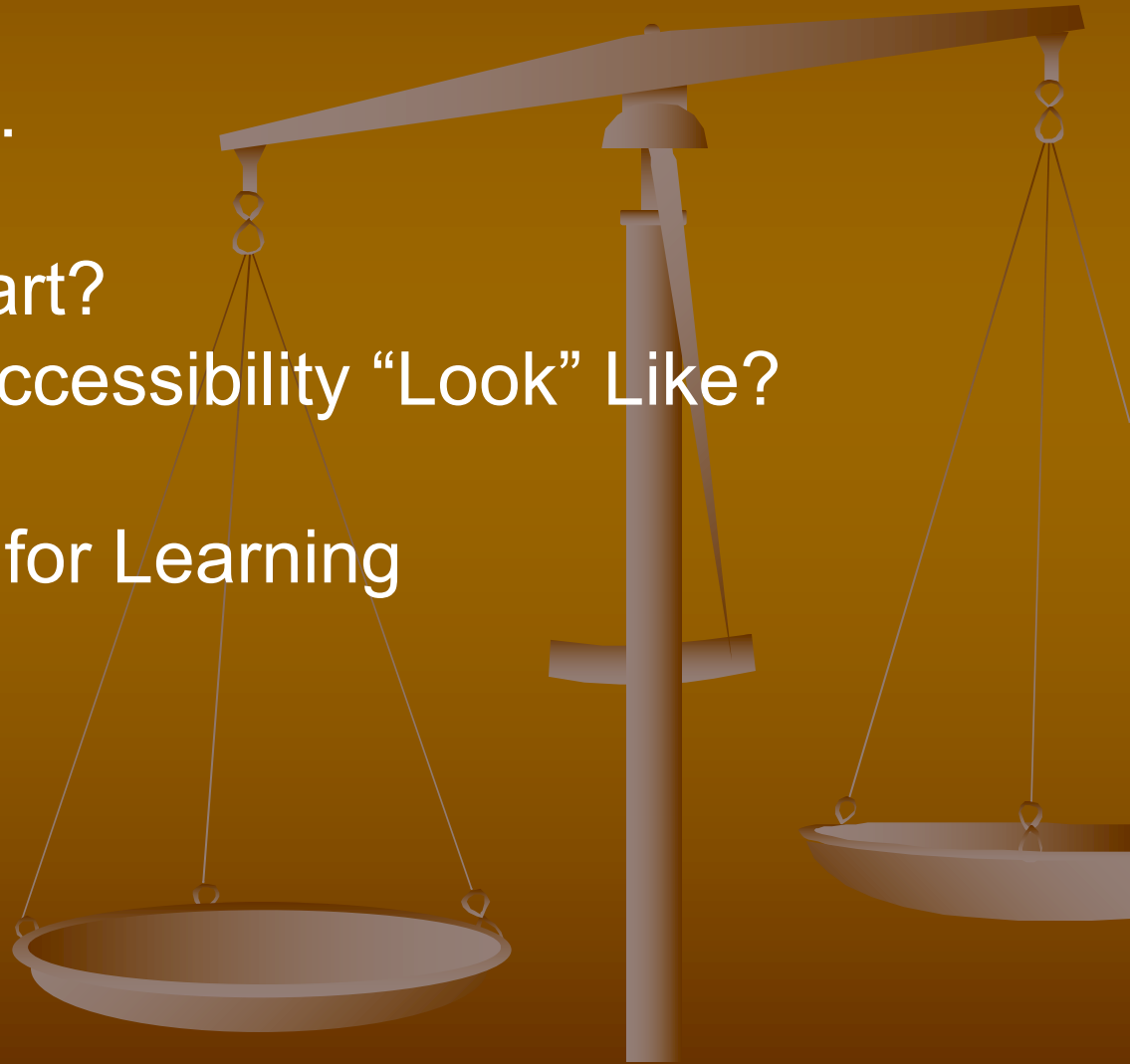
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Kara Zirkle, Accessible Technology Specialist, Miami University

Feb. 16, 2017

PSSHE Virtual Conference

Today's Agenda

- Introductions
- So Many Terms…
- What We Know…
- Where Do We Start?
- What Does EIT Accessibility "Look" Like?
- Universal Design
- Universal Design for Learning
- Testing
- Q&A

Accommodations, Accessibility, and Assistive Technology

SO MANY TERMS…

Accommodation vs. Accessibility

Accommodation	Accessibility
Students self disclose to receive academic accommodations in the classroom (e.g., notetaking support, extended time, real-time captioning, etc.)	**Course should be accessible out the box**. Inclusive practices like universal design encourage flexibility and designing for all students, not the *average* student.
Accommodations are provided on individual basis. In essence, the existing course is retrofitted to accommodate student with a disability.	Courses using online components (e.g., LMS), **should meet web accessibility standards and guidelines (i.e., Sect. 508, WCAG 2.0 AA)**.

Understanding *Accommodations* and *AT*

- *Assistive Technology (AT)* can be an accommodation, but not always (e.g., extended time on tests).

- Still imperative that the instructional resources implemented in the course are accessible to assistive technology users.
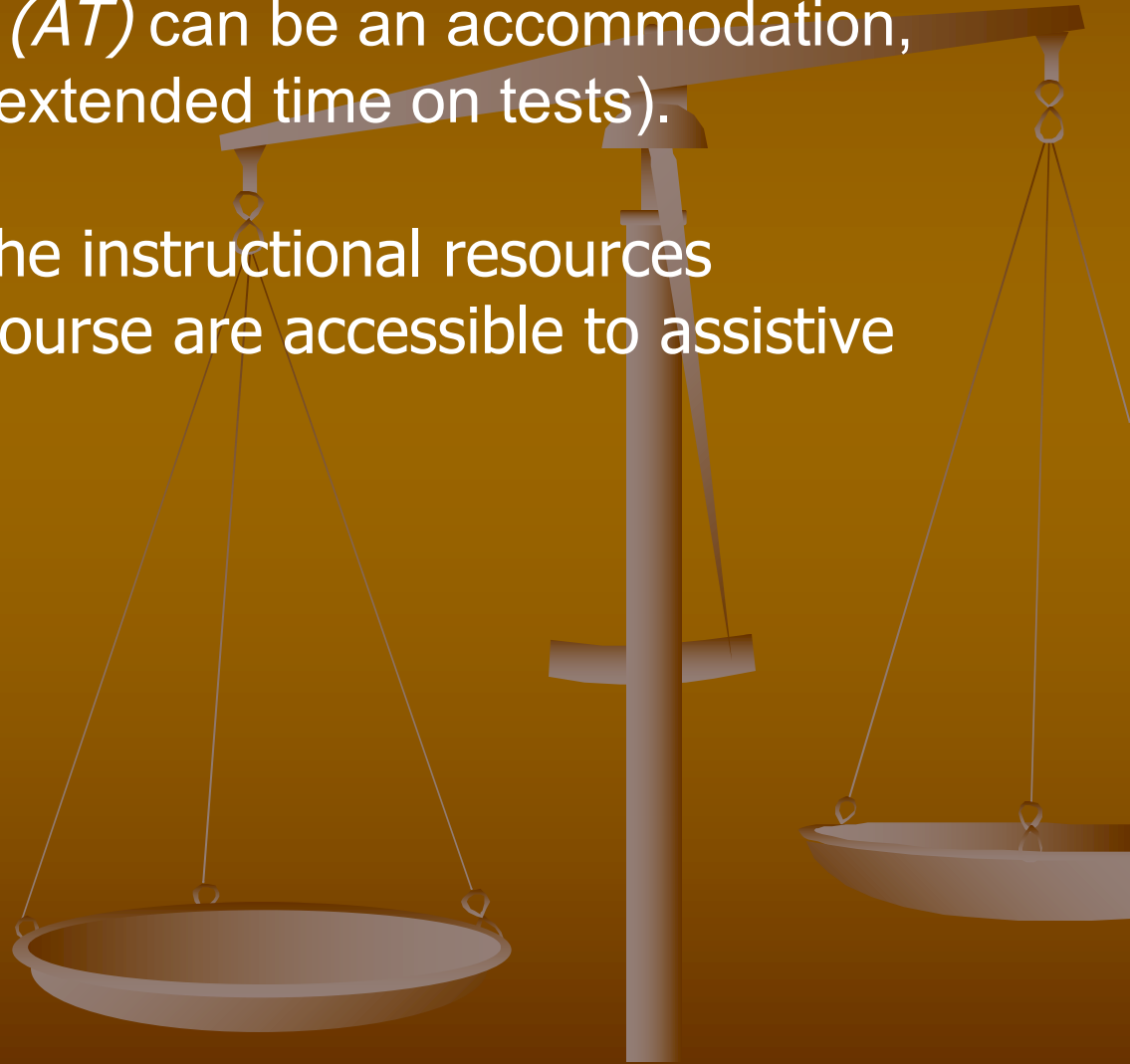
Types of Impairment and Assistive Technology

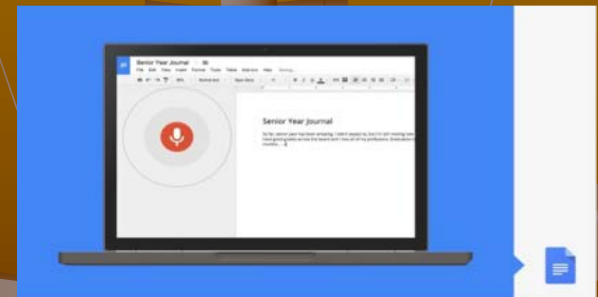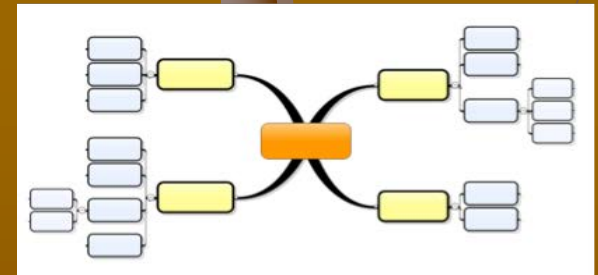- **Sensory (Loss of vision and/or hearing)**
  - Screen readers and refreshable braille devices for people who are blind or have other print disabilities
  - Open or closed captioning for people who are deaf

- **Learning/Cognitive**
  - Organizations, readability

- **Physical**
 - Alternatives input tools, such as speech-to-text software, for people who cannot use a computer mouse

Trends in HE, Recent litigation, EIT "In"-Accessibility

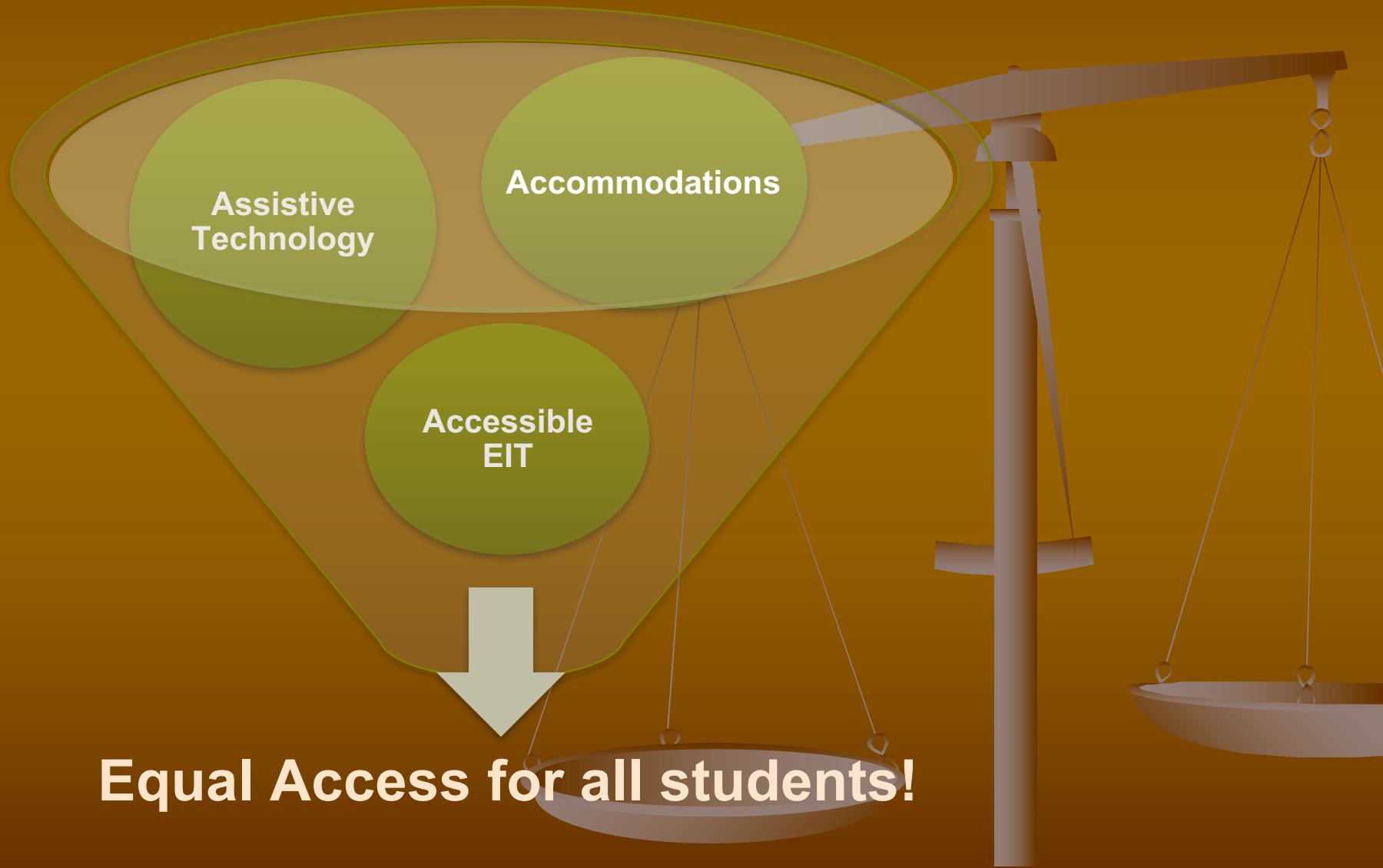# WHAT WE KNOW…

Trends in Higher Ed...

- Increasing numbers of students with disabilities entering IHE

- Greater implementation of online/e-learning technologies in higher education classrooms (online and F2F)

- Growth in distance education offerings by IHE

- Growing number of legal challenges/findings against IHE by individuals with sensory impairments (visual and/or hearing loss)
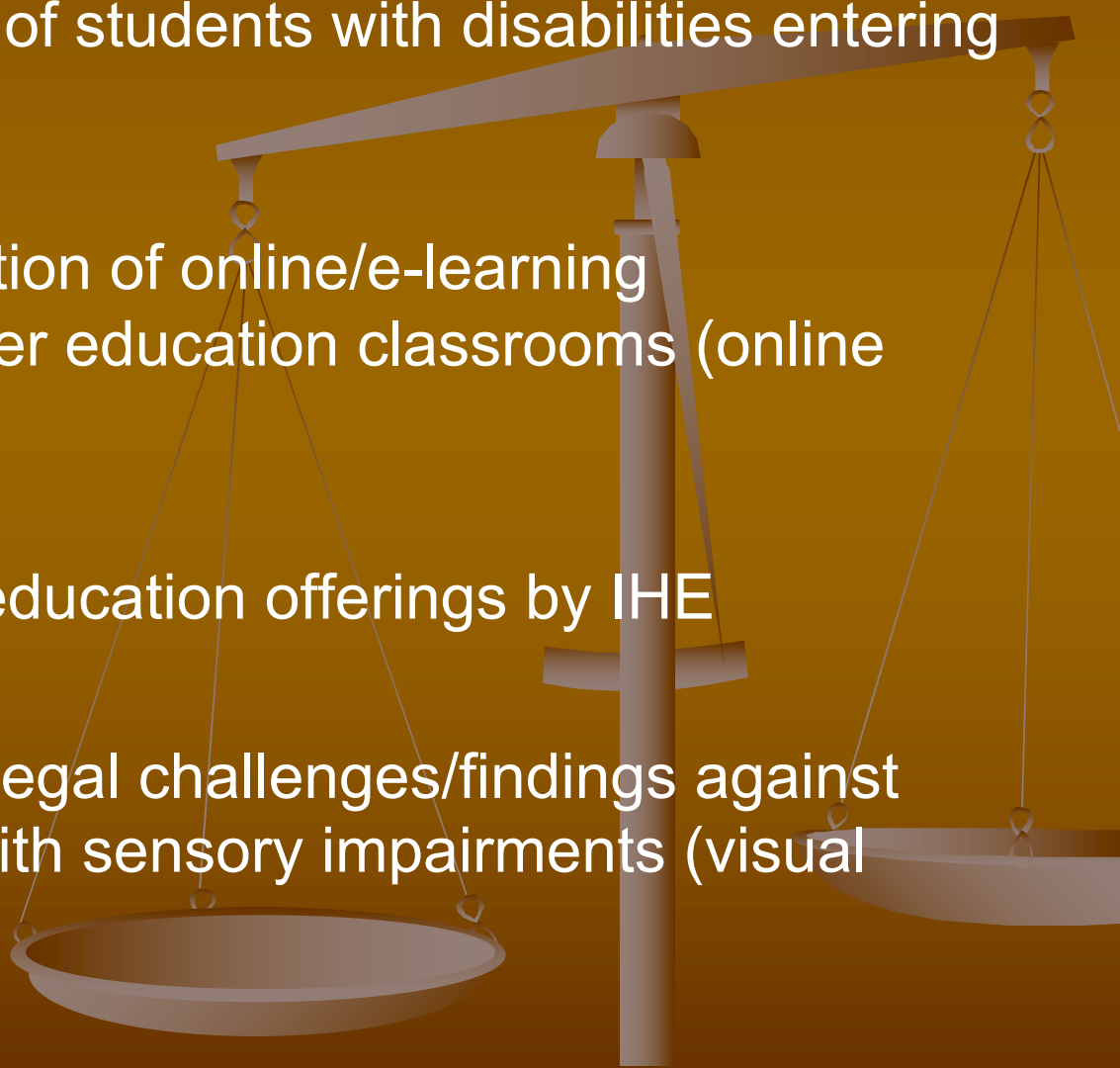
Recent Litigation…

- UC-Berkeley (again) 2016
  - Miami (OH) (2016)
  - CU-Boulder (2015)
- Harvard/MIT (2015)
  - EdX (2015)
  - Atlantic Cape CC (2015)
  - Univ. of Phoenix (2015)
  - Univ. of Cincinnati (2014)
  - Univ. of Montana (2014)

- Youngstown State (2014)
- Maricopa CC (2014)
- Florida St. Univ. (2014)
- Louisiana Tech (2013)
- SCTCS (2013)
- UC-Berkeley (2013)
- Penn St (2011)
- Ohio St. Univ. (2010)

How Does Everything Tie Together?

Assistive Technology

Accommodations

Accessible EIT

Equal Access for all students!

It doesn't matter where you start your focus, it is a continuous cycle that constantly helps meet the needs of all students.
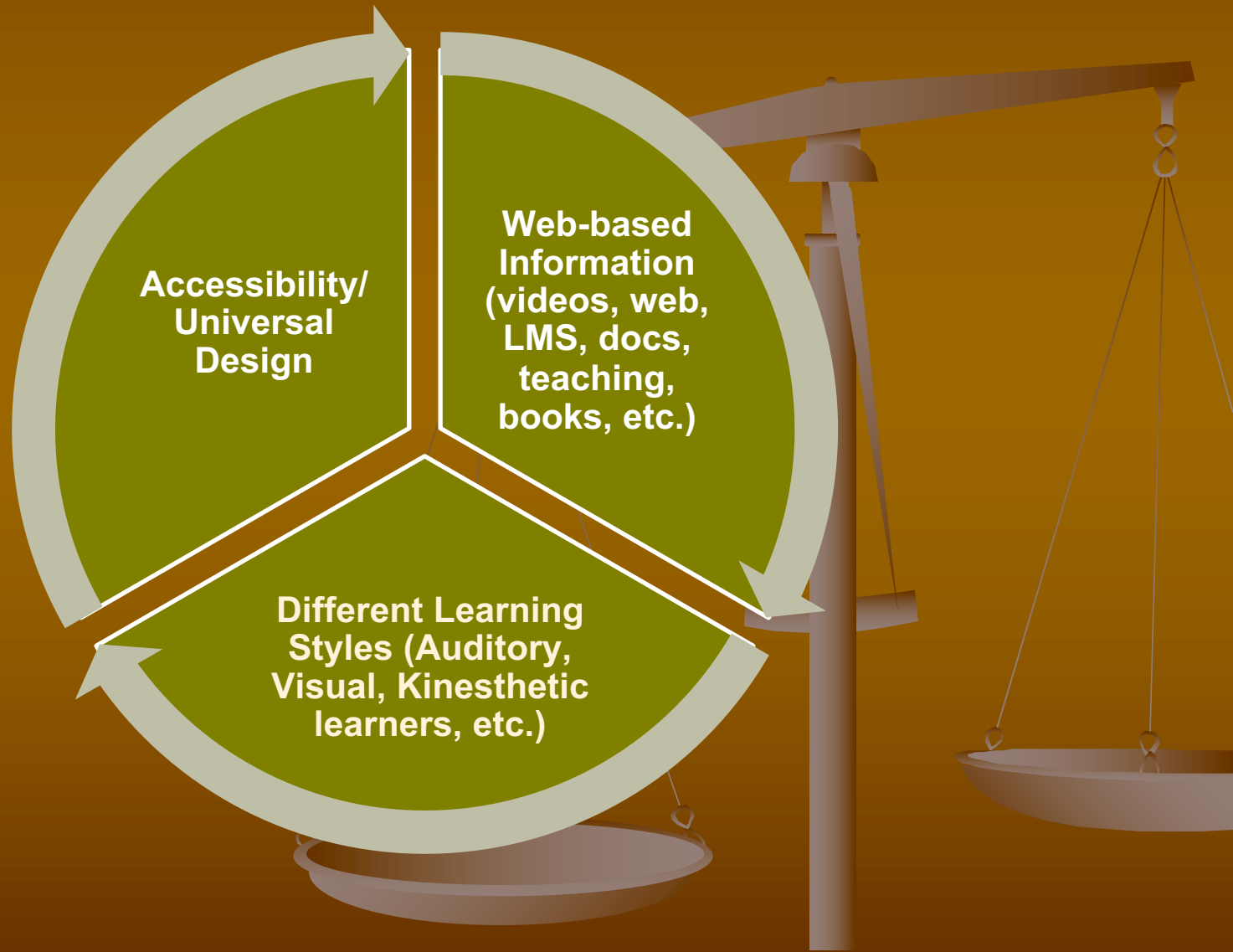
Roles and Responsibilities, Challenges, Textbook Selection and Procurement

WHERE DO WE START? ....
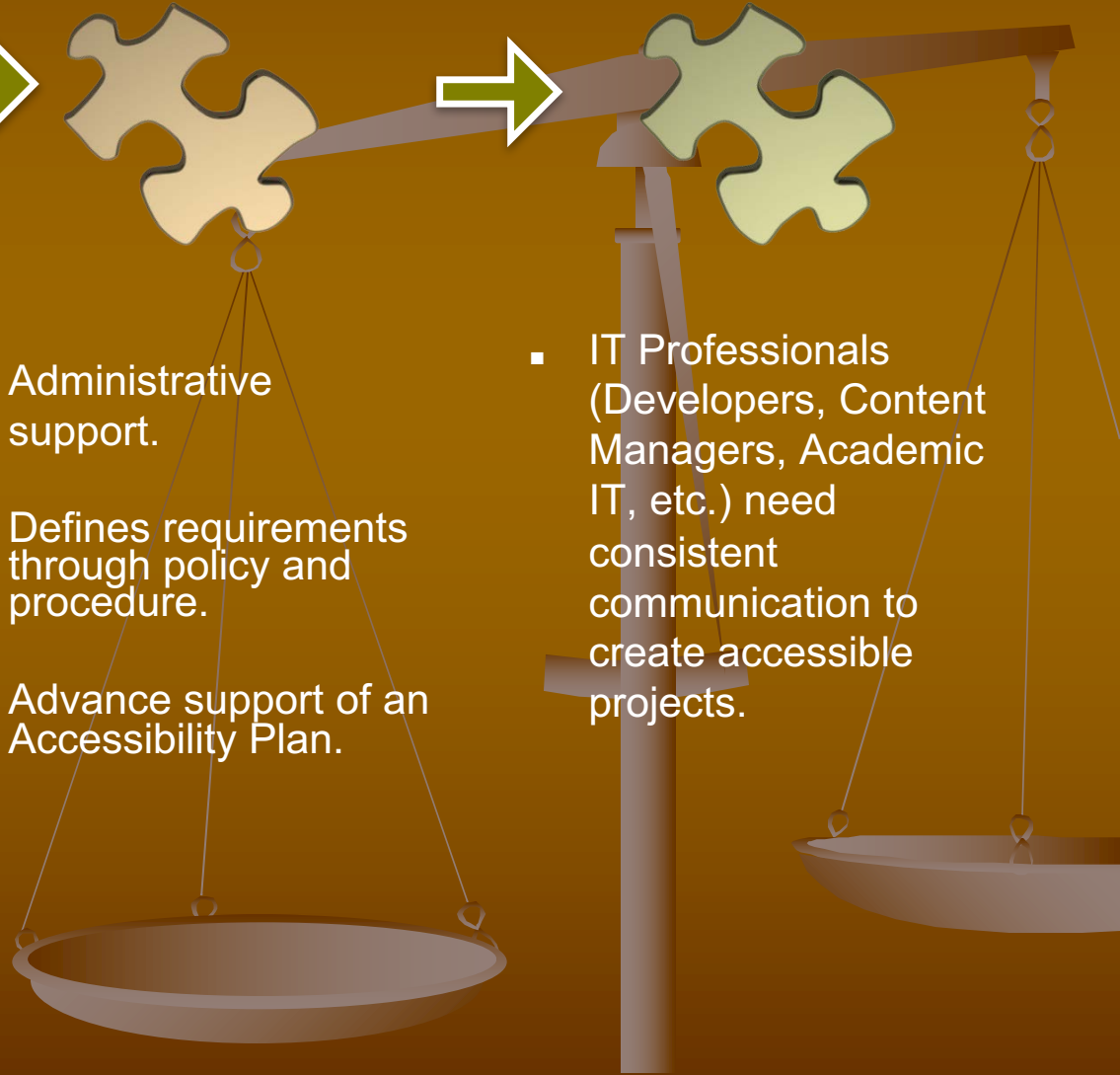
Roles and Responsibilities

Accessibility is a team effort!

- EIT accessibility staff assist with defining roles and responsibilities as it relates to accessibility

- E.g., EIT Accessibility Group, EITA Guidelines, Consistent Communication with Key Stakeholders, etc.

- Administrative support.

- Defines requirements through policy and procedure.

- Advance support of an Accessibility Plan.

- IT Professionals (Developers, Content Managers, Academic IT, etc.) need consistent communication to create accessible projects.

Roles and Responsibilities: How are you involved with accessibility?

Teaching Faculty and Staff

Do you use a Learning Management System (LMS)?

Do you use websites in class or for posting information?

Do you create or post documents or videos online for class?

Do you use technology (i.e., wikis, etc.) for your class assignments?

Do you use visuals or play audio/video in the classroom that give important info pertaining to the class?

Do you use webinars, or other classroom capture or conference technology or record your class for review?

Roles and Responsibilities: How are you involved with accessibility?

Administrative Staff

When overseeing or working on projects do you integrate accessibility into the planning process?

Do you train your staff on accessibility so it comes from a top-down approach?

Do you influence or decide on technology purchases, if so have you considered accessibility?

Do you oversee computer classroom settings, is it accessible?

Do you develop Policies, procedures or guidelines for you offices or employees? If so, have you included accessibility?

When creating committees, have you included someone from the ATI office to help with accessibility?

Roles and Responsibilities: How are you involved with accessibility?

IT Professionals

- Do you influence or decide on technology purchases?

- Do you develop websites, applications or documents?

- Do you oversee computer classroom settings?

- Do you manage others who may work on the above mentioned?

- Do you work in multimedia or telecommunications?

- Do you use or help faculty use webinars, other classroom capture or conference technology?

If you answered "Yes" to any of these questions, you may be …..

- Posting,
- Distributing,
- Creating/Developing,
- Using,
- Maintaining…<u>Inaccessible Information!</u>

- What can you do to make it accessible?
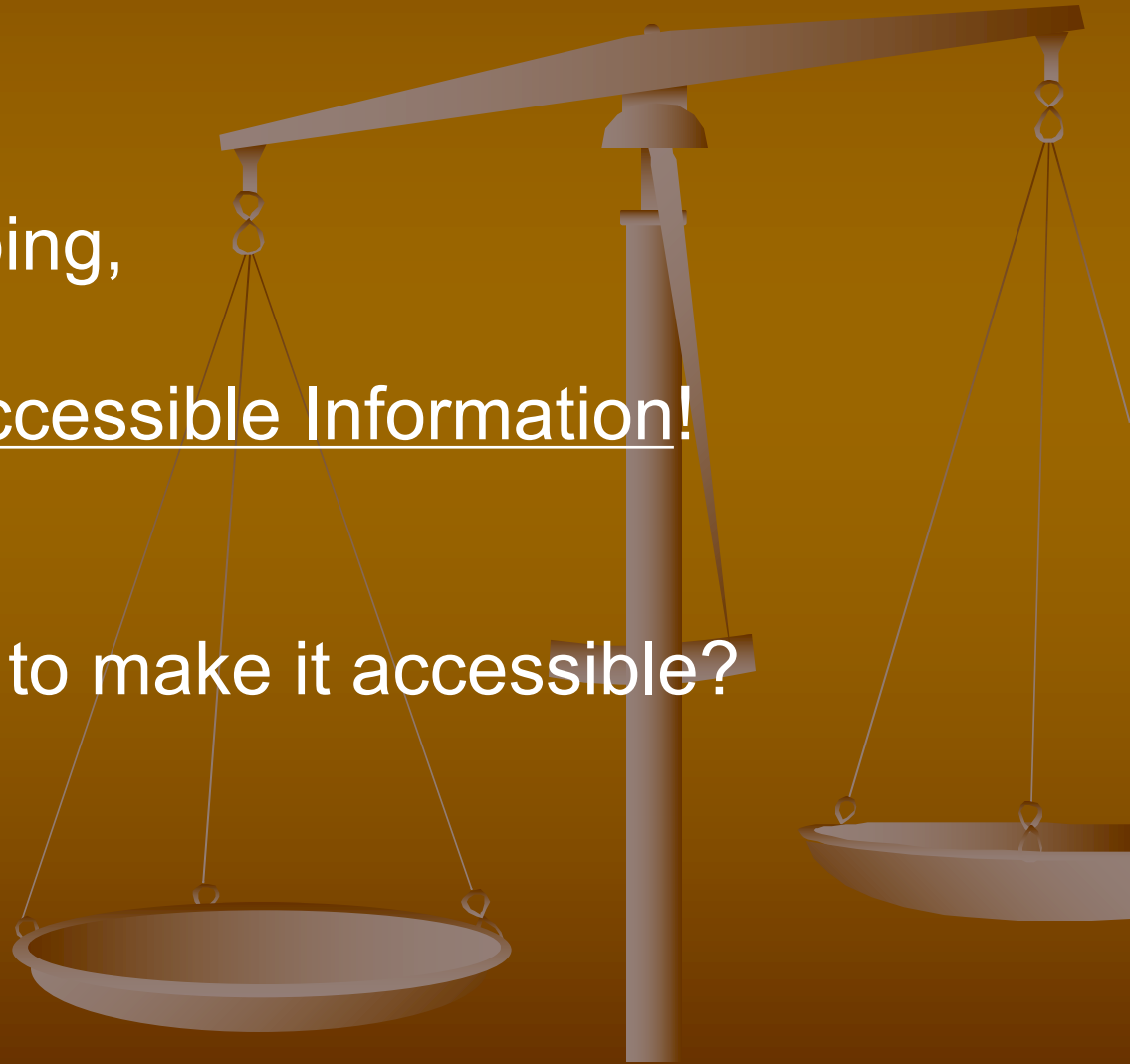
Challenges around Procurement

- Complexity of procurement related workflows (how many different ways can something be purchased? *Library vs. Departmental Purchase vs University-wide Purchase*

- Magnitude of purchase requests and authorized individuals to make purchases.

- Lack of awareness about accessibility and how it plays into procurement.

- Lack of resources for assessing accessibility of services and goods.

- Is it considering procuring an item if there is no cost? Textbook selections ….
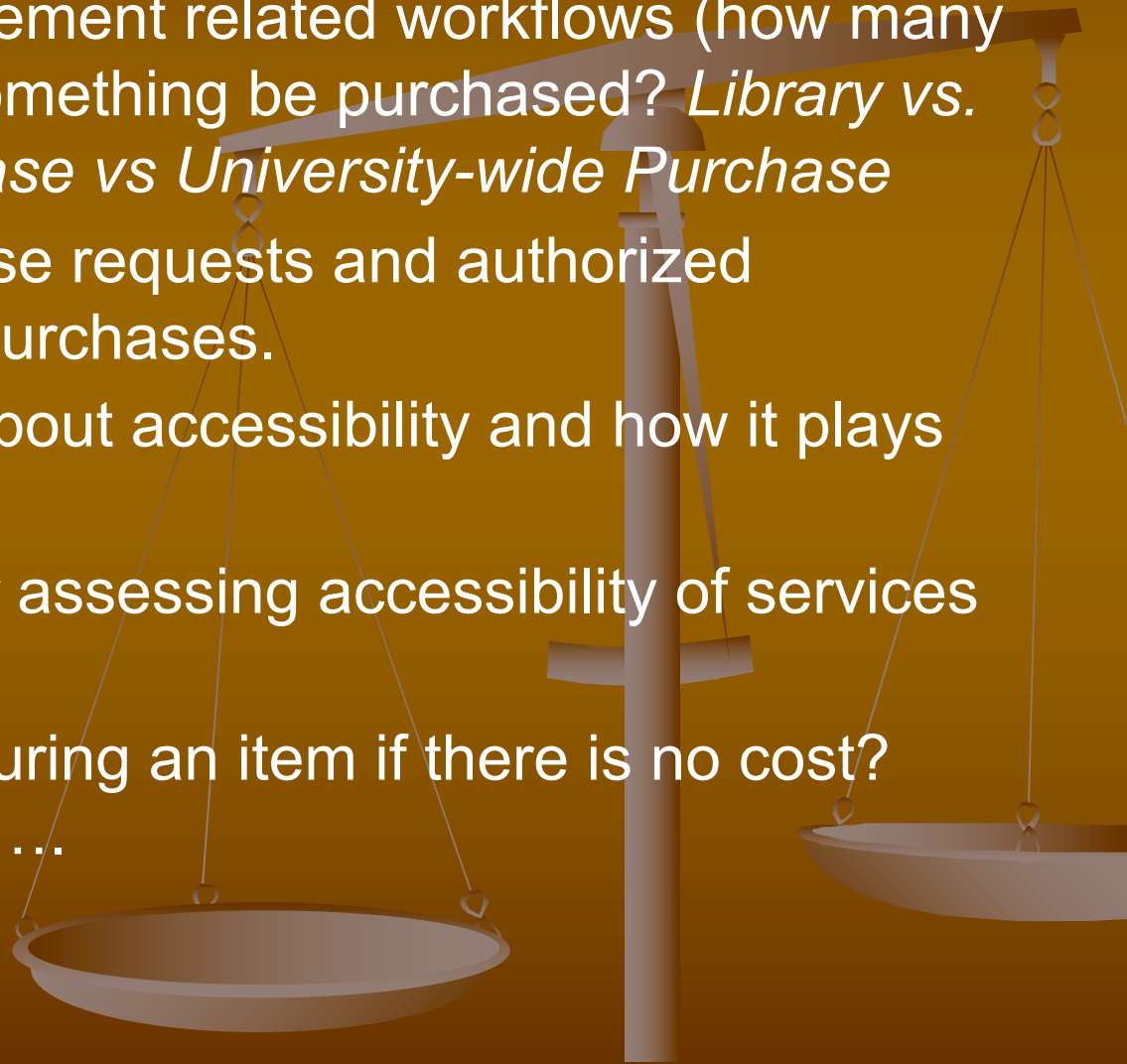
Common Issues of Accessibility

- Inaccessible LMS', University Wide Applications and teaching supplemental applications
- Alternative texts (textbooks)
- Document accessibility (Word, PPT, PDFs)
- Captioning for videos
- Inaccessible library resources (databases, search, print resources)
- Additional classroom resources (e.g., iClicker, podiums)
- Inaccessible university websites/web resources
- ATMs
- Access to auxiliary offices (financial aid, registrar)
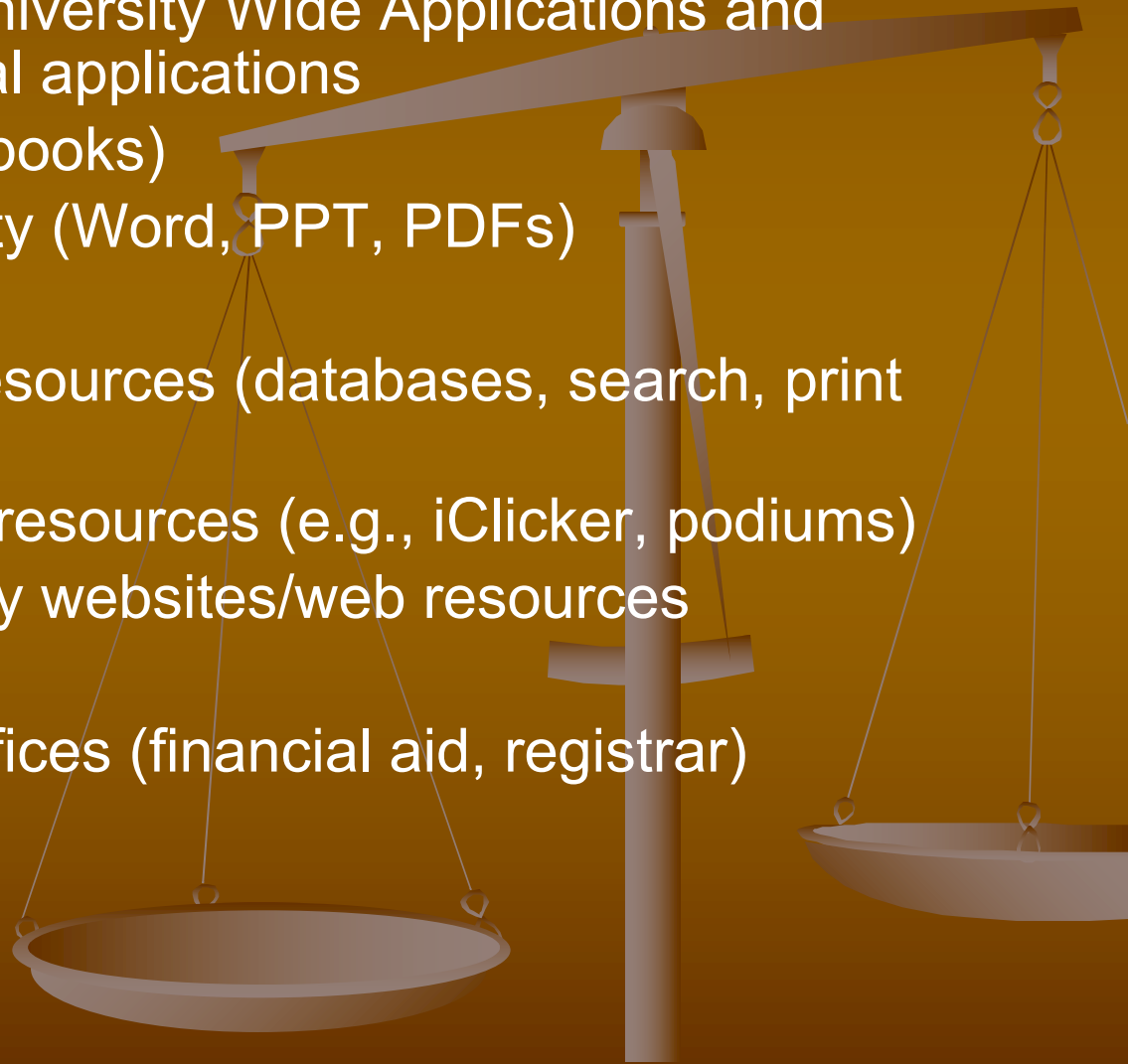
Looks like everyday technology…

But how do you know if your everyday technology meets accessibility standards or is working towards compliance?

You don't unless you ask!
- Is there University Policy about accessibility? *Know your guidelines!*
- Do vendors have a VPAT?
- Did you search for accessibility on their website?
- Do vendors have a roadmap showing accessibility updates?
- Do vendors have testing documentation?
- How are other institutions checking for accessibility?

Similarities of Face-to-Face and Online Learning

Teaching to enhance the students perspective and serve them by providing the best education possible

Software, Websites and Applications

LMS and content (videos, documents, library databases)

Textbooks and Supplemental Content (3rd Party)

Students are the Focus

Case Study Example

- A course is wanting to use an online human anatomy application for supplemental teaching. The course is designed in HTML5, recently updated from flash. Has some accessibility built-in, but not enough for someone who may be using a screen reader. What can you do?

POLL QUESTION:

What do you do?

1. Don't purchase the product
2. Ask the vendor to make the product accessible
3. Find an alternative teaching solution
4. All of the above
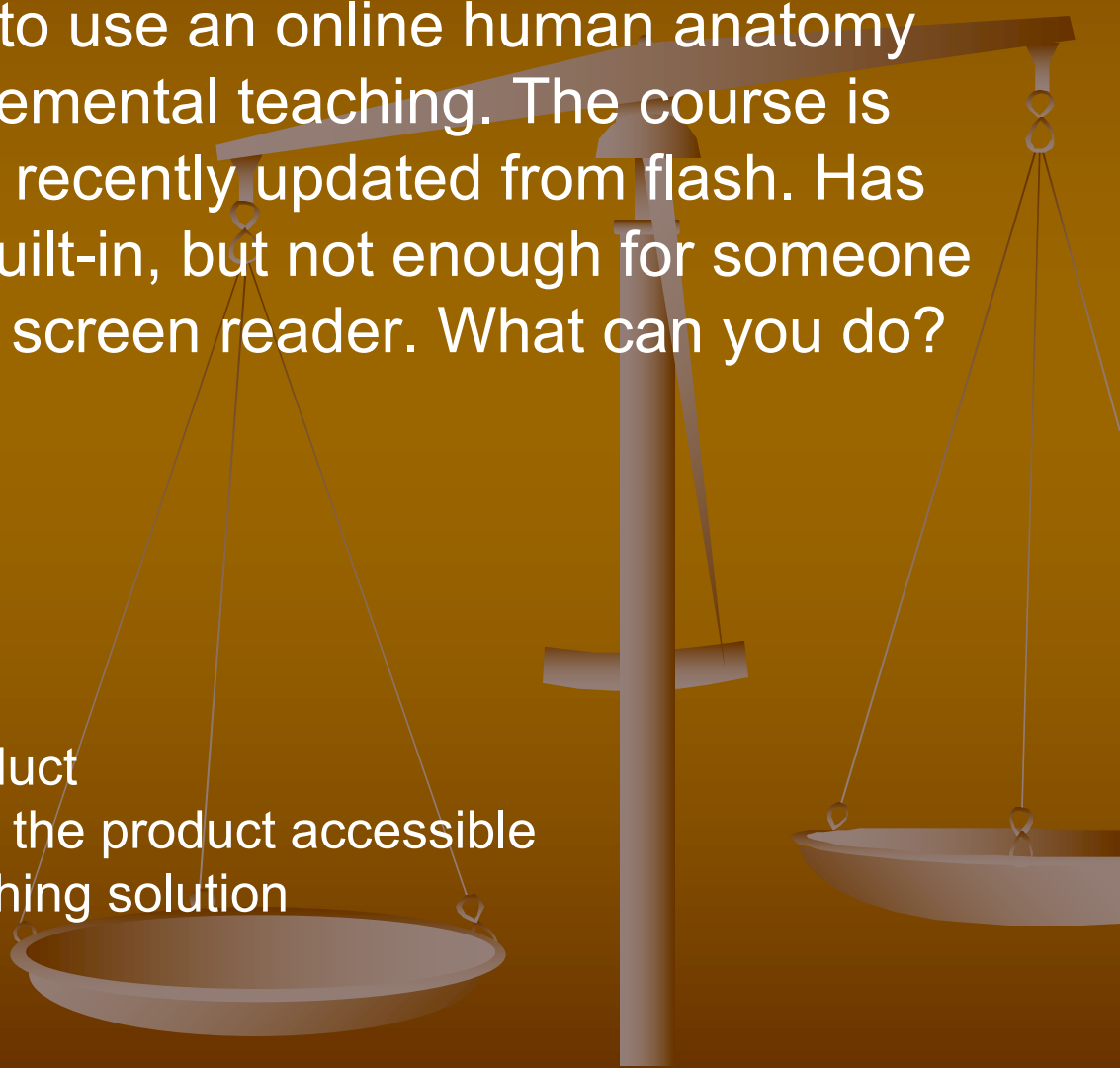
Potential Next Steps

You could try...

- Working with the vendor
- Testing the application
- Ask the vendor to agree to create a roadmap incorporating changes

- In the meantime, check to see if the images can be pulled directly from the application and added to a 3D printer.

- Work contract language into the purchase to ensure vendor is held to standard (include VPAT, Roadmap, Alternative Action plan, etc.).
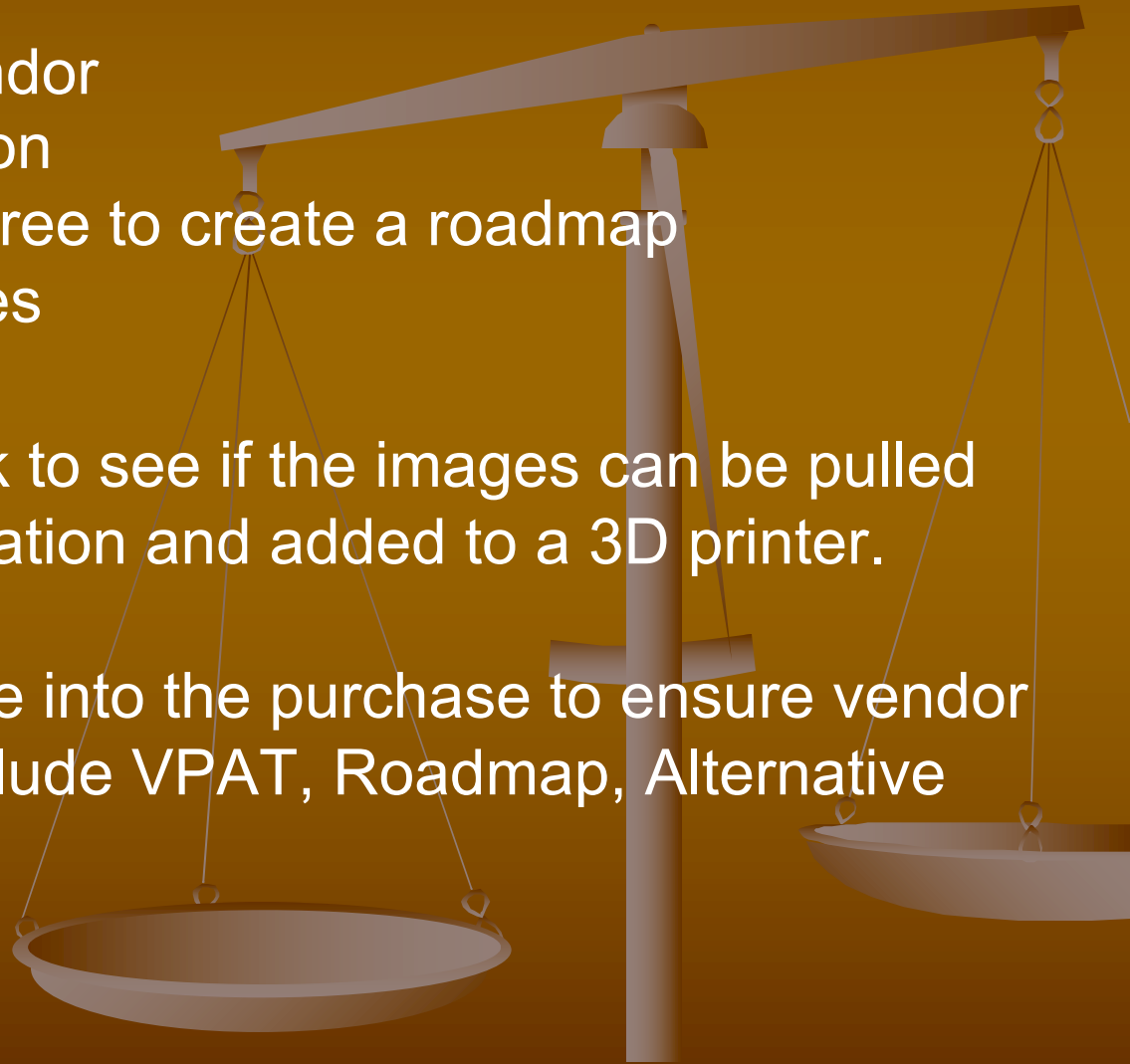
Examples, Design Considerations, Identifying Accessible Resources

WHAT DOES EIT ACCESSIBILITY "*LOOK*" LIKE?

E.g., Accessible Documents

E.g., Labeling Images

- Graphics should have meaningful labels:
    - Ex: "Photo of Secretary of Education Arne Duncan reading to children at Central Elementary School."
    - Not: "Photo.jpg"

- The labels can be visible to everyone, or they can be hidden in the programming of the web page. Designer's choice!

E.g., Accessible Forms

- E.g., Color Contrast

  - Meaningful information should be conveyed through more than just color.

  - For example, individuals unable to identify color would not know which fields were required. A simple fix would be to add an asterisk(*) next to the required fields.

E.g., Keyboard Navigation

- Users should be able to "tab" through an application and get to all information and functions.

- Pages should not require users to manipulate a mouse for navigation.

Designing for All in the Online Classroom

UNIVERSAL DESIGN…

Why Universal Design?

- Term borrowed from the movement in architecture and product development that calls for curb cuts, automatic doors, video captioning, speakerphones, and other features to accommodate a vast variety of users, including those with disabilities.

- Experience shows that all such flexible designs are less expensive and cumbersome than costly retrofits, and that, in fact, everyone benefits from universal design features (e.g., captions, curb cuts)
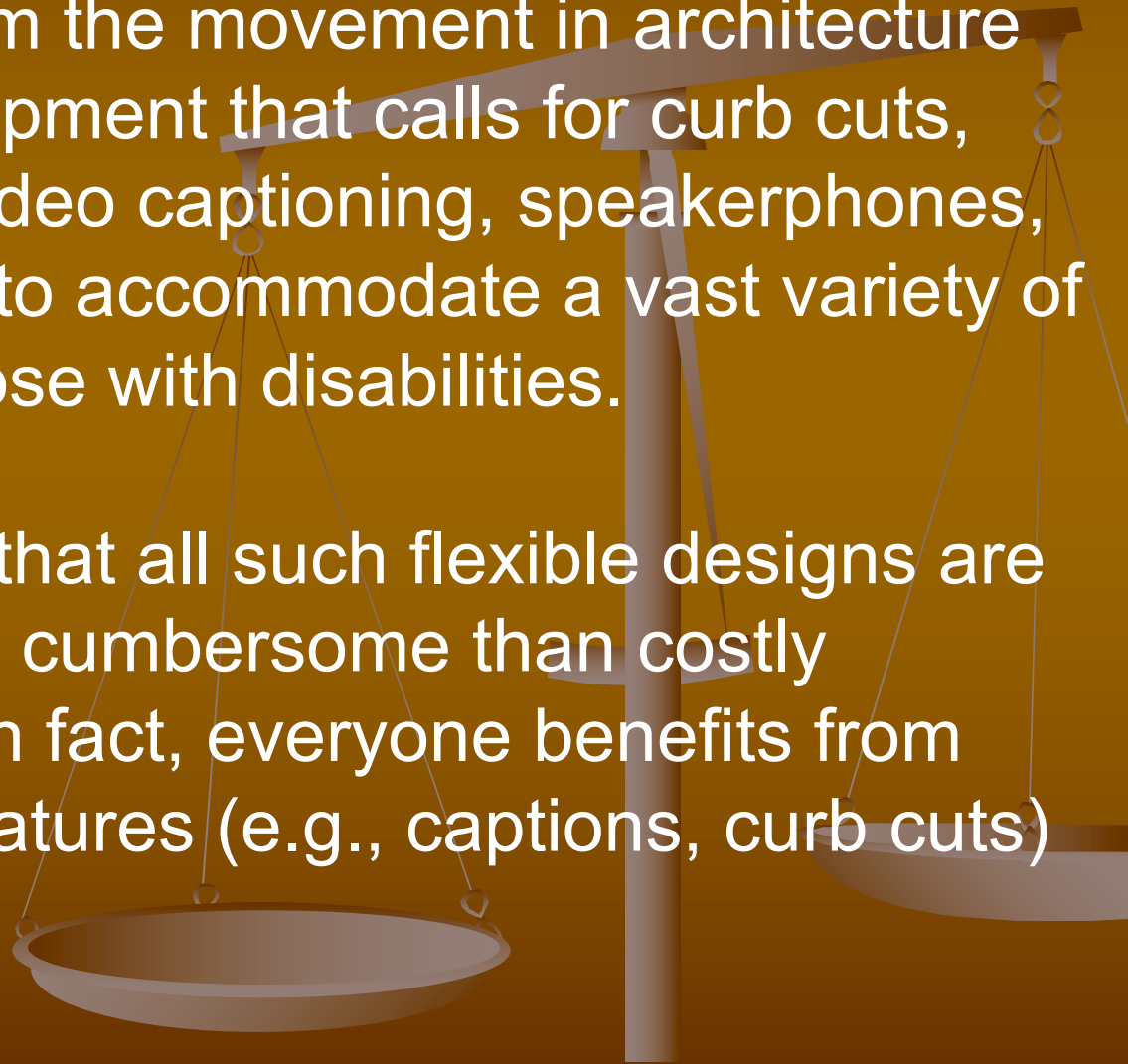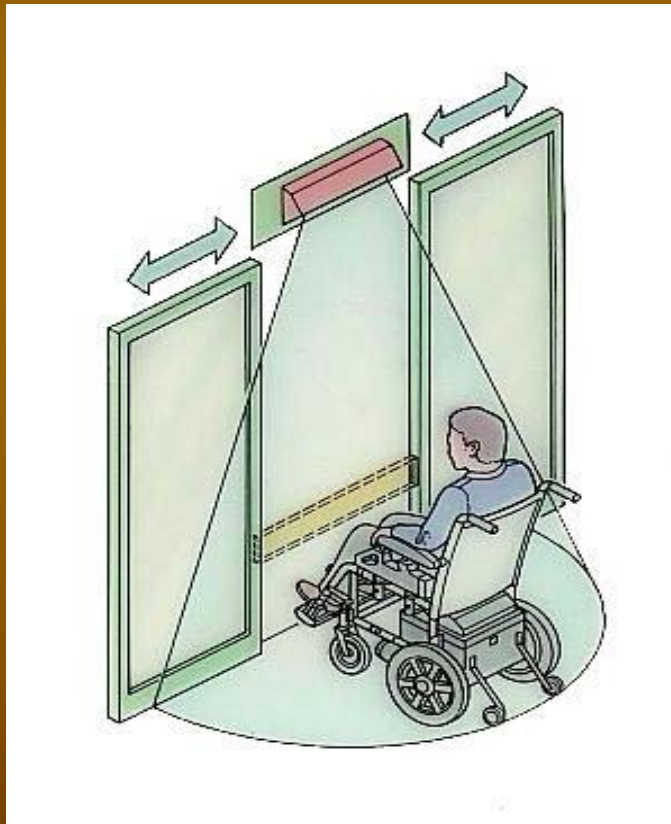
Think about your users...

	Permanent	Temporary	Situational
Touch	One arm	Arm injury	New parent
See	Blind	Cataract	Distracted driver
Hear	Deaf	Ear infection	Bartender
Speak	Non-verbal	Laryngitis	Heavy accent

Inclusive
A Microsoft Design Toolkit

Example #1:
Curb Cuts/Automatic Doors

Sliding Glass Doors

Curb Cuts w/ Bumps

Example #2:
Stairs/Ramps (GMU)
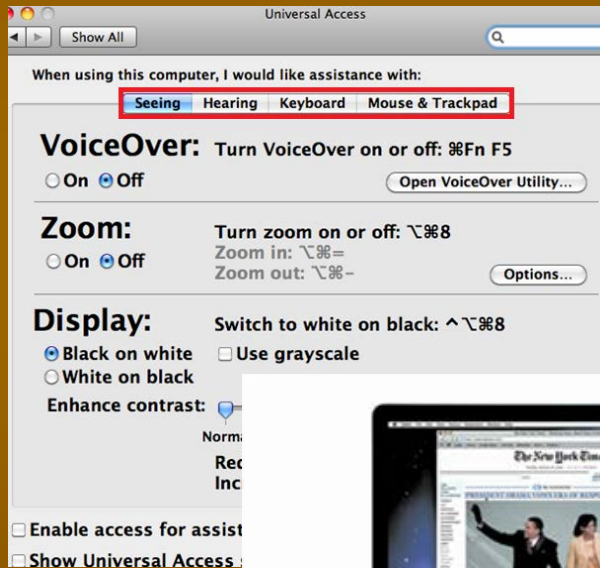
Front Entrance (Aquia Building)

Ramp Access between Aquia and SUB I

Example #3:
Computers/Mobile Devices

Mac OS X

Web-based Tools – *Library Databases (Full-text HTML, ReadSpeaker)*

Inglés/Português ▾ | Translate

Ability to translate text

Title: Providing Access to Engagement in Learning: The Potential of Universal Design for Learning in Museum Design. By: RAPPOLT-S...
Issue 3

Database: Education Research Complete

Providing Access to Engagement in Learning: The Potential of Universa...

Downloadable mp3 file

Also available as separate PDF

CONCEPT OF
DISABILITY

DESIGNED
ENVIRONMENTS
AND THE
CONCEPT OF
DISABILITY

WHAT IS
UNIVERSAL
DESIGN FOR
LEARNING?

📖 Listen ⏸ ⏹ American Accent ▾ ⚙ ⬇ «

Following pa... of the Americans with Disabilities Act of 1990 (ADA), many museums improved the accessibility of their fa...
in museum ex... Universal Design for Learning (UDL) provides an alternate model for the design of museum program...
not only physic... t also access to engagement in learning. In this article we argue that UDL ha... he potential to ...
examples, we de... DL design guidelines can be used to improve the probability that engageme...t will occur as i...

Built-in text-to-speech capability

ART...

The development of long-term, deep interest in topics of personal relevance is critically important to the s... of people wi...
and cultivating such interests. Following passage of the Americans with Disabilities Act of 1990 (ADA), ... useums mo...
reach of their programming and exhibit spaces to people with disabilities. The addition of wheelchair ra... red counter...
exhibit offerings like the handheld audio guide system developed and implemented by the New York ... ...nce in 20...
provided. While the addition of such accommodations has had a substantial and positive impact ...

Accessibility solutions provide for the improved physical presence of people with disabilities in m...
low vision). But accessibility does not, on its own, allow for the engagement of people with disabilities in the museum exp...

Text Highlighting

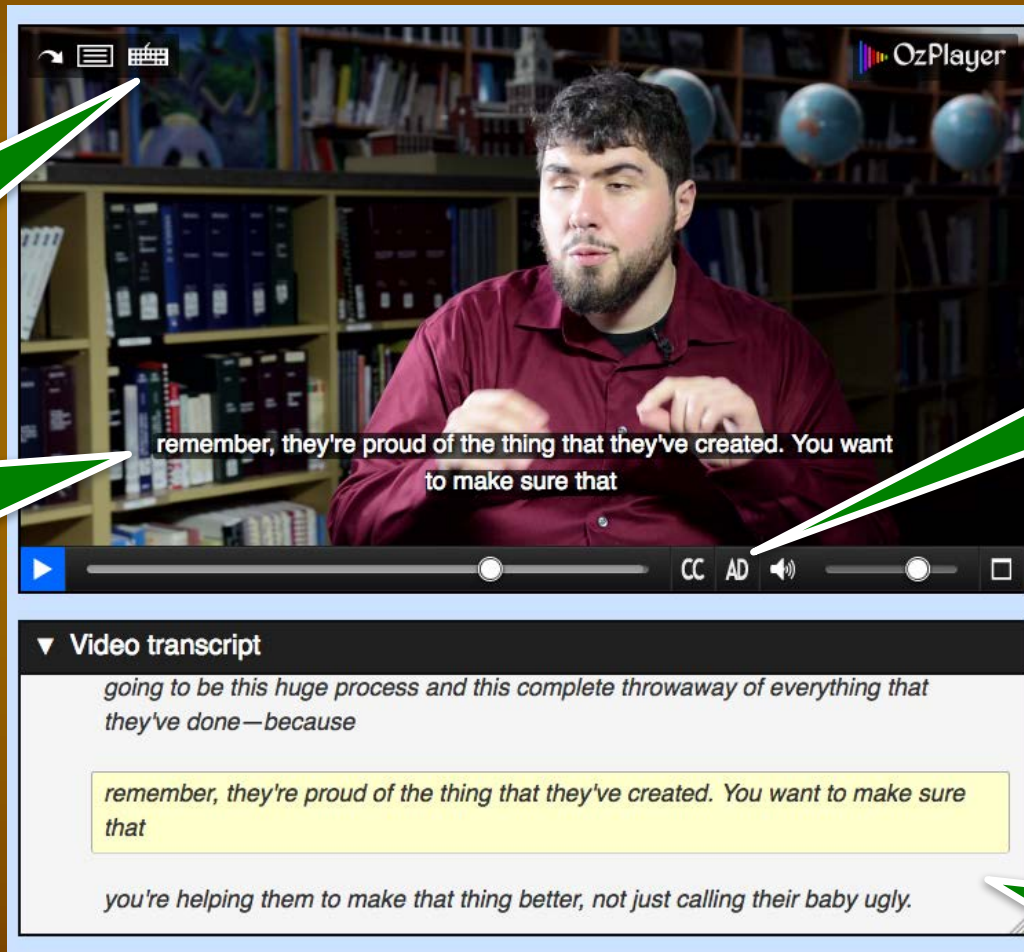# Web-based Tools – *Films on Demand (Captions and Transcripts)*

Accessible Video Player: *OzPlayer*

All controls accessible via keyboard

Accurate, synchronized Captions

Synchronized audio description

Interactive Video Transcript

OzPlayer

remember, they're proud of the thing that they've created. You want to make sure that

▼ Video transcript

going to be this huge process and this complete throwaway of everything that they've done—because

remember, they're proud of the thing that they've created. You want to make sure that

you're helping them to make that thing better, not just calling their baby ugly.

Considerations for the online classroom

Universal Design for Learning

Key Points

- Current instructional approaches have common activities that create access barriers

- *Universal Design for Learning* (UDL) is one strategy to remove these barriers

- When implemented consciously these approaches improve the experience for students with disabilities
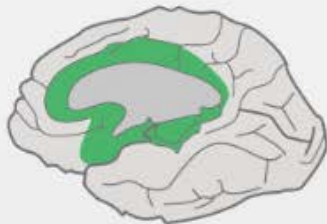
Image Credit: EcologyofEducation.net

About UDL

Universal Design for Learning Guidelines

GO TO THE UDL GUIDELINES

AFFECTIVE NETWORKS:
THE **WHY** OF LEARNING

RECOGNITION NETWORKS:
THE **WHAT** OF LEARNING

STRATEGIC NETWORKS:
THE **HOW** OF LEARNING

Engagement
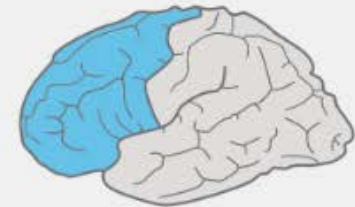For purposeful, motivated learners, stimulate interest and motivation for learning.

Representation
For resourceful, knowledgeable learners, present information and content in different ways.

Action & Expression
For strategic, goal-directed learners, differentiate the ways that students can express what they know.

UDL vs. Instructional Approach

Question:
Doesn't UDL conflict with current approaches?

**Instructional Approach**

- Active
- Blended
- Hybrid
- Fully Online
- Problem-based
- Project-Based
- Team-Based

UDL

- Representation
- Engagement
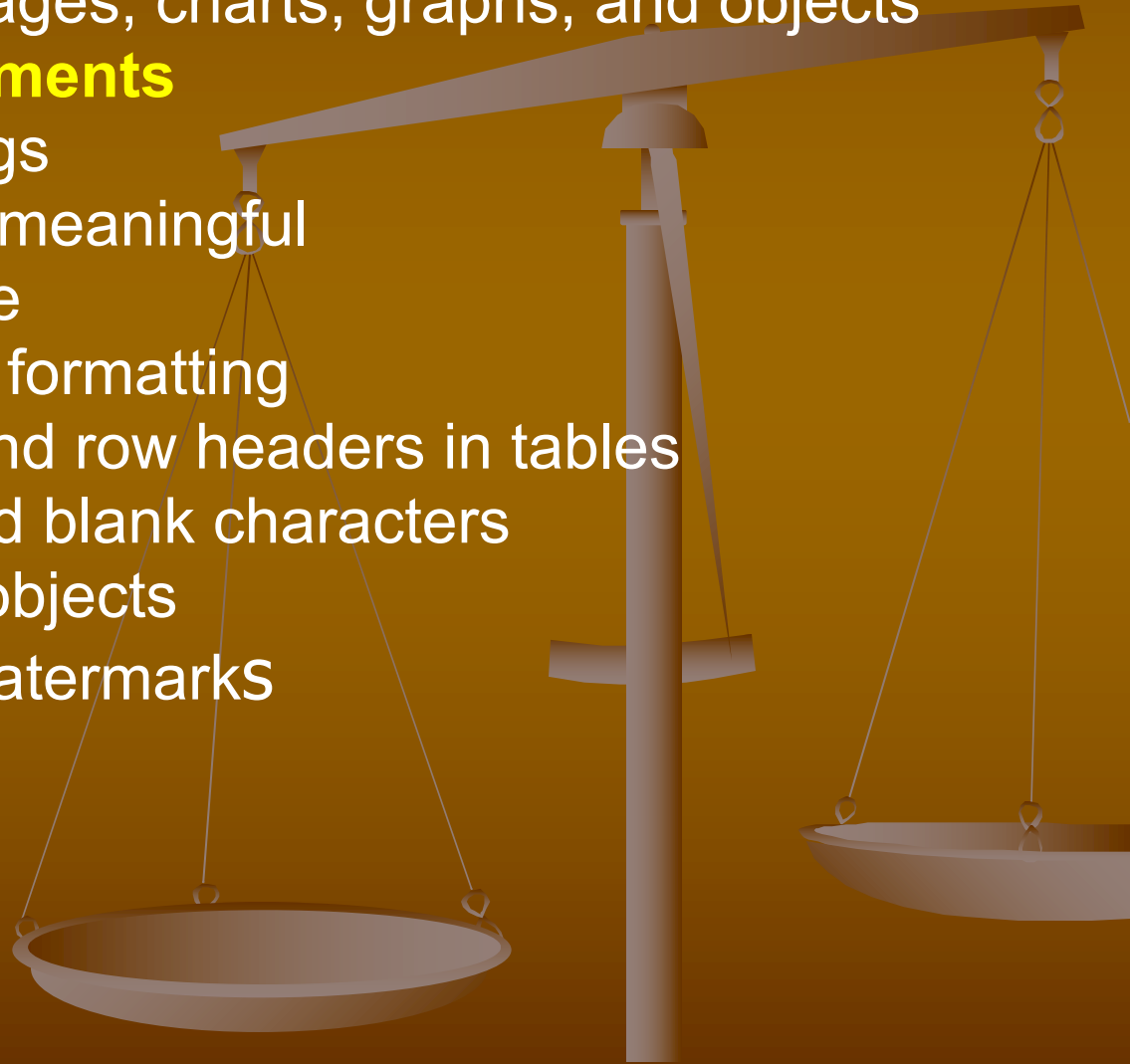- Action & Expression

Multiple Means of Representation

Principle I **examines how learners perceive and comprehend information**. Whether by disability, culture, or preference, learners learn and make connections to educational content in many different ways.
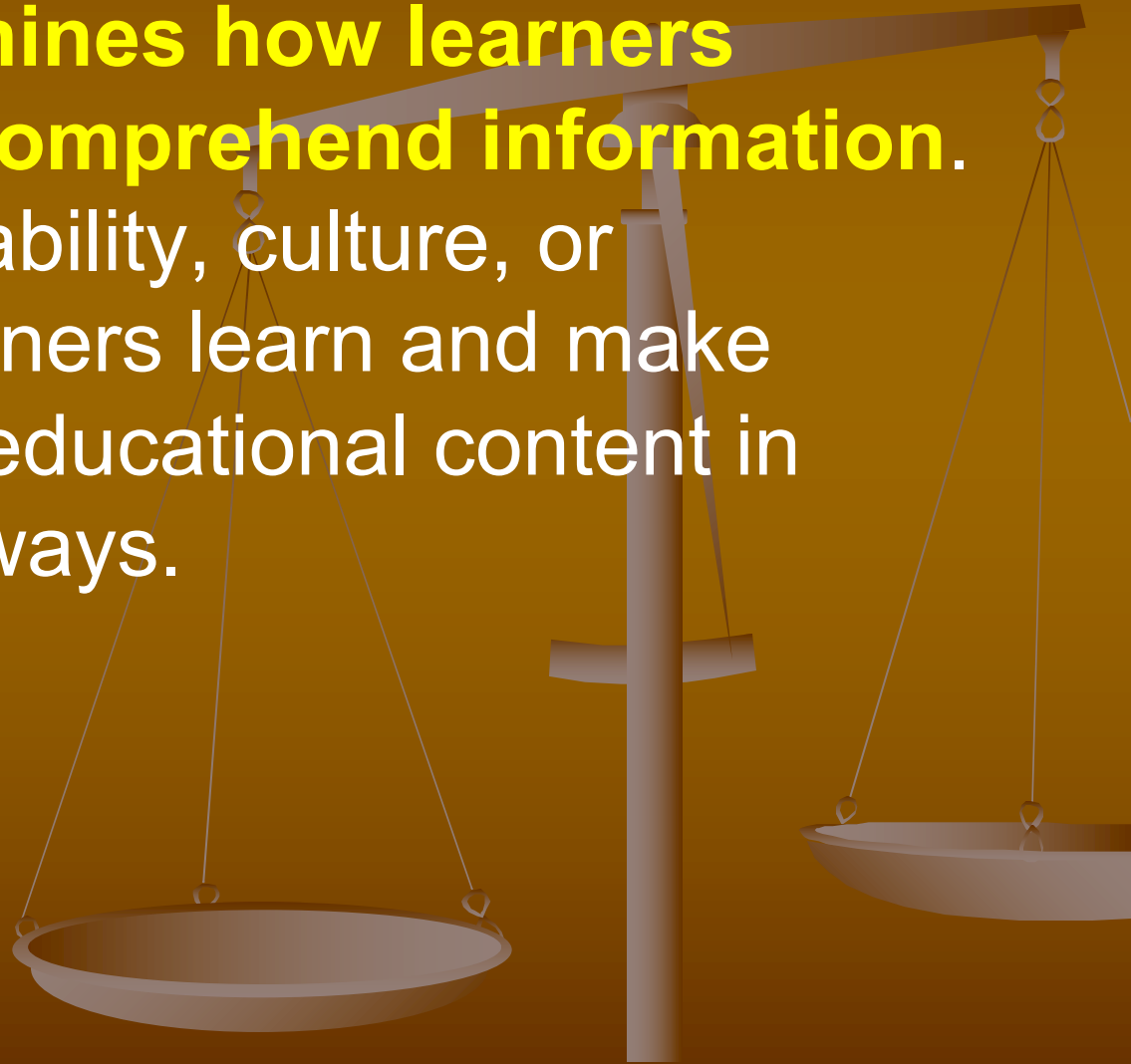
E.g., Document Accessibility (Word)

- Alternative text to images, charts, graphs, and objects
- **Styles in long documents**
- Short titles in headings
- Hyperlink text that is meaningful
- Simple table structure
  - No blank cells for formatting
  - Specify column and row headers in tables
- Avoid use of repeated blank characters
- Avoid using floating objects
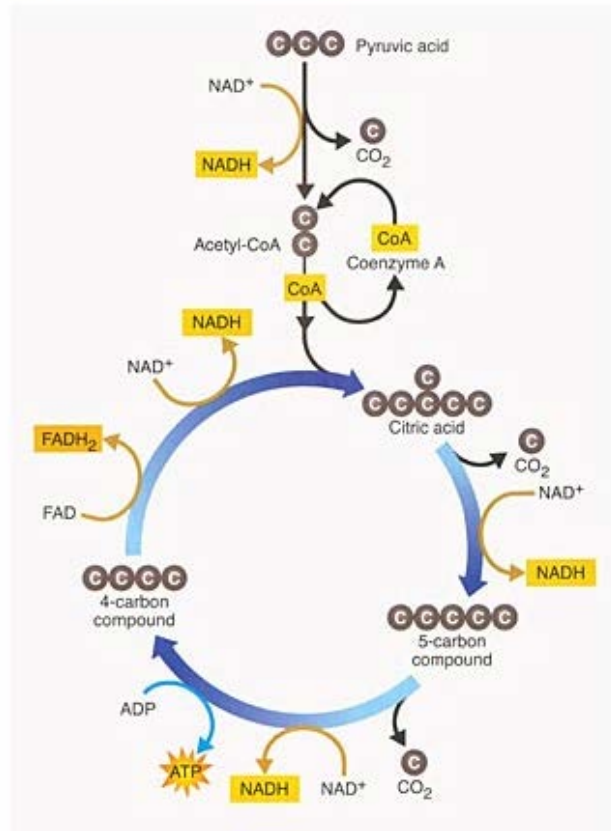- Avoid using image watermarks

E.g., Using Styles in Long Docs (Word)

E.g., Alternative text descriptions for complex images

Process Diagram as Flow Chart

Pyruvic acid

NAD⁺

NADH

CO₂

Acetyl-CoA   CoA   Coenzyme A

CoA

NADH

NAD⁺

Citric acid

FADH₂

CO₂

FAD

NAD⁺

NADH

4-carbon compound

5-carbon compound

ADP

ATP

NADH   NAD⁺   CO₂

Description:

The Krebs Cycle is depicted as a linear reaction which leads downward into a cyclical reaction. Here, the steps of the reactions are presented as lists.
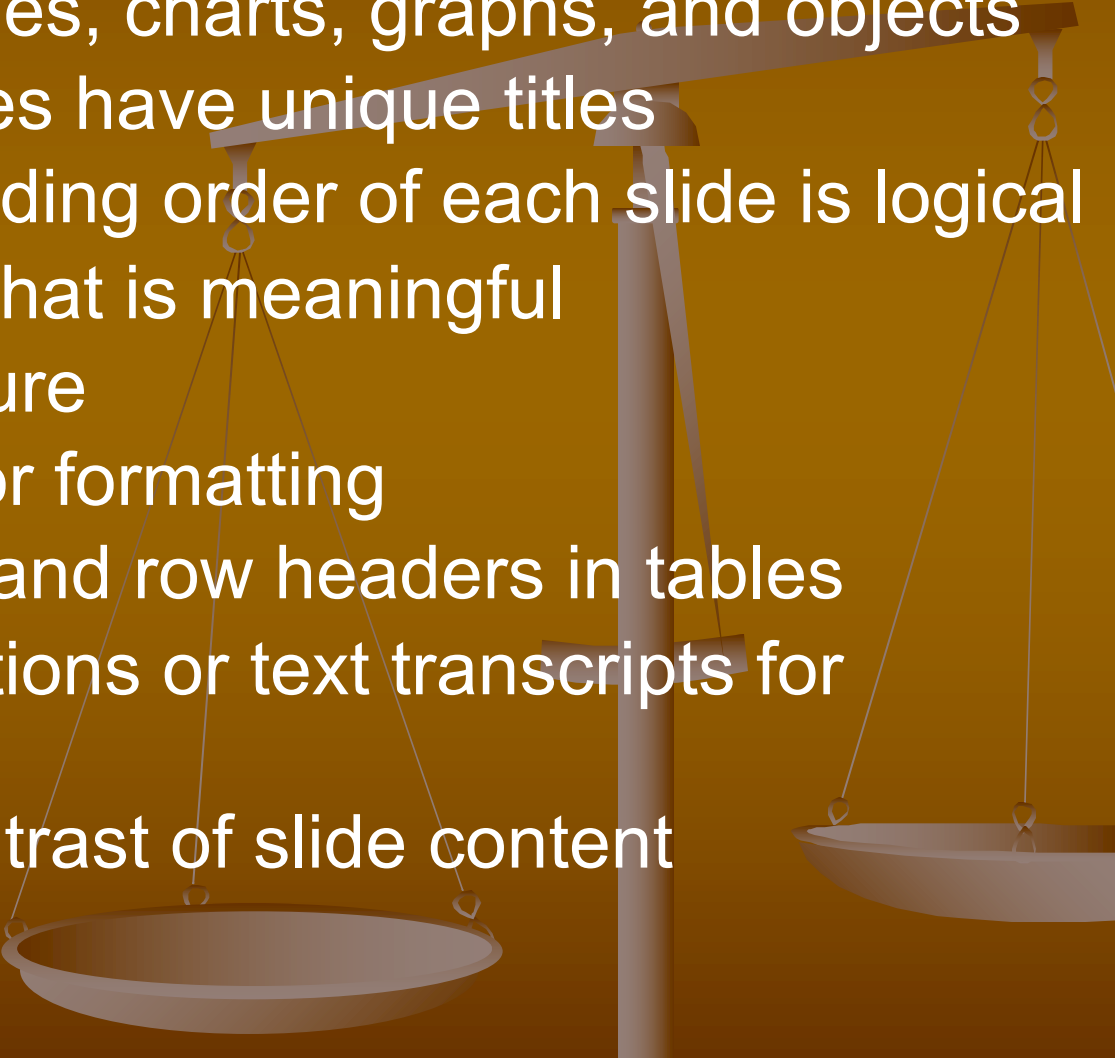
1. Linear Reaction
   - Pyruvic acid, a 3-carbon compound.
   - One carbon molecule is lost as part of a CO2 molecule.
   - An NAD-positive molecule enters the reaction, then leaves as NADH.
   - A 2-carbon acetyl group remains.
   - Coenzyme A, or CoA, joins the 2-carbon acetyl group to form Acetyl CoA.
   - CoA leaves the reaction as it delivers the acetyl group to the circular reaction.

2. Circular Reaction
   - The two-carbon acetyl group joins a four-carbon compound to form a 6-carbon compound, citric acid.
   - A carbon is lost as CO2.
   - NAD-positive enters, then leaves as NADH.
   - A 5-carbon compound remains.
   - another carbon is lost as CO2.
   - NAD-positive comes in and leaves as NADH.
   - ADP comes in and leaves as ATP.
   - A four-carbon compound remains.
   - FAD comes in and leaves as FADH2.
   - NAD-positive comes in and leaves as NADH.
   - Back again at the top of the circular reaction, a two-carbon acetyl group from the linear reaction enters, forming the 6-carbon citric acid at the beginning of the cycle.

E.g., Document Accessibility (PPT)

- Add alt text to images, charts, graphs, and objects
- Ensure that all slides have unique titles
- Ensure that the reading order of each slide is logical
- Use hyperlink text that is meaningful
- Simple table structure
  - No blank cells for formatting
  - Specify column and row headers in tables
- Include closed captions or text transcripts for audio/video
- Increase visual contrast of slide content

E.g., Adding Captions to slides with audio (PPT)

E.g., STEM Content

- STEM can be particularly challenging
- Tactile graphics (more common), 3D printing (possible)
- Whenever possible:
  - Provide **_LaTex or MathML_** *(do not use Equation Editor in Word)*
  - Avoid handwritten content

$$\int_{-\infty}^{\infty} e^{-x^2} dx = \sqrt{\pi}$$

$$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi x}{L} + b_n \sin \frac{n\pi x}{L} \right)$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Multiple Means of Action & Expression

Principle II **examines how learners interact with the learning environment and express their comprehension** of the educational content.
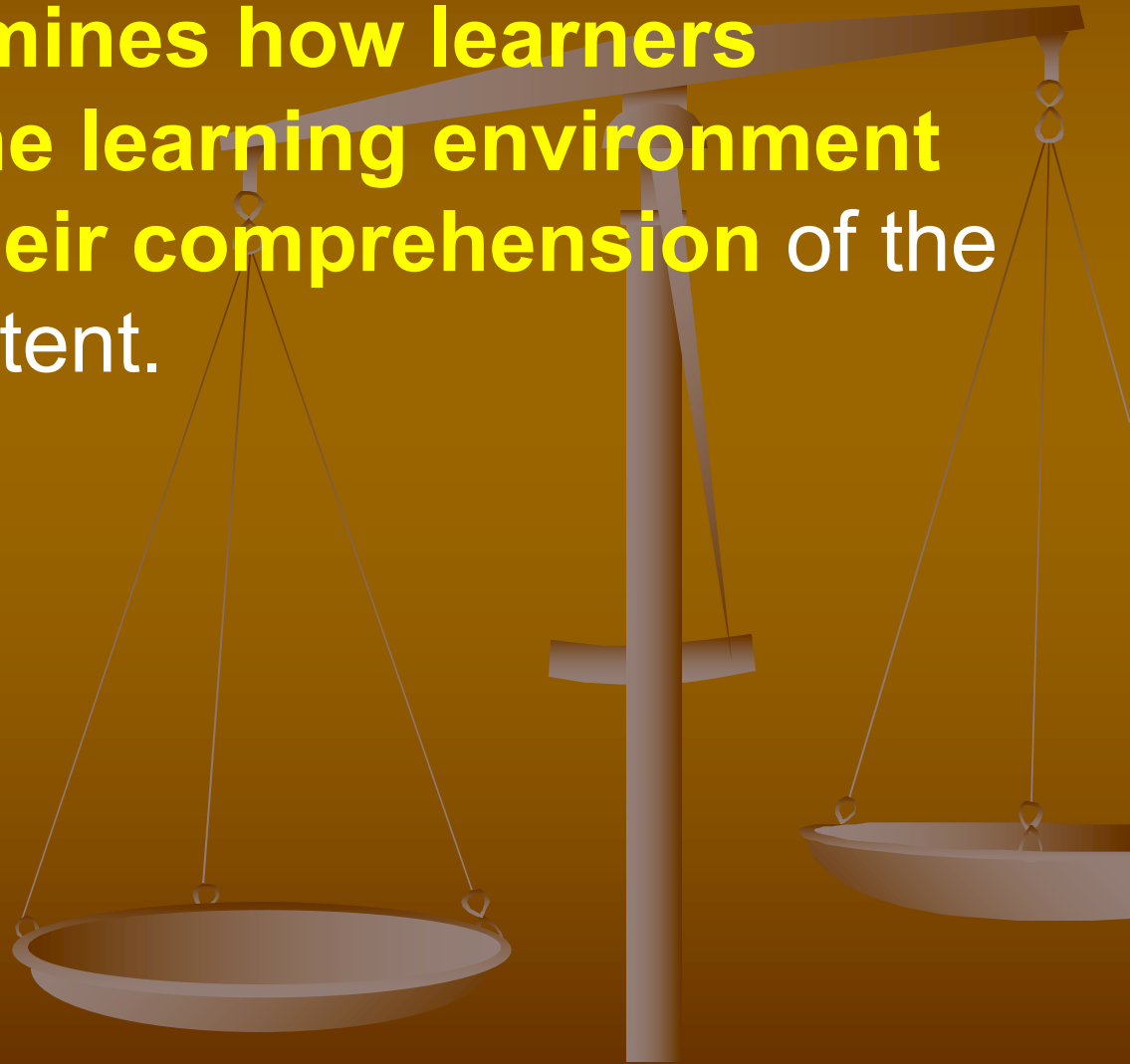
E.g., Assessments
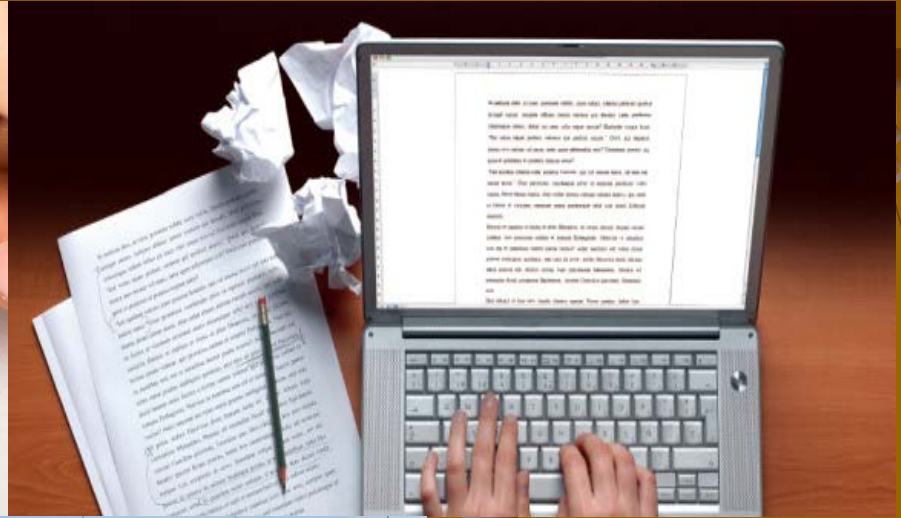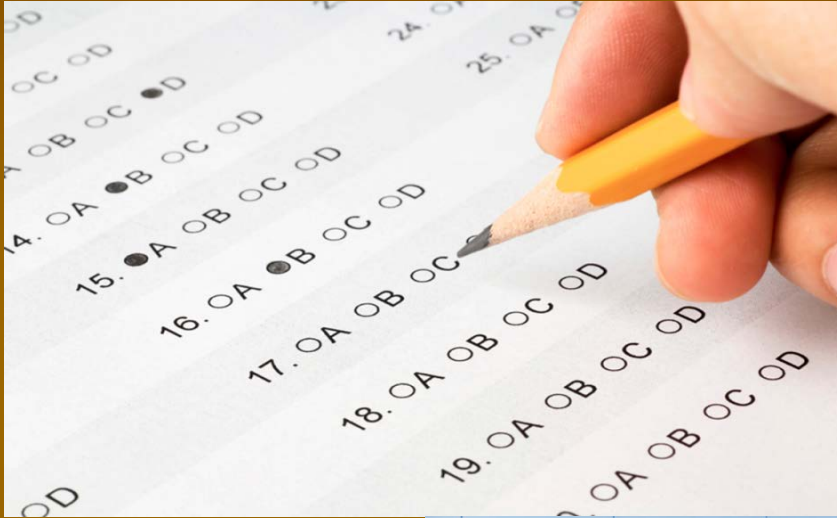
Multiple Means of Engagement

Principle III **focuses on the regulation of emotion to support cognition**.

For that reason, it **examines how learners are engaged or motivated to learn**.

E.g., Group work, reflections, etc.

- Heighten interest and monitor progress by:
    - Engaging students with simple welcome emails/announcements
    - Have students run small group activities/discussions
    - Journals/Personal reflections after each class
    - Tie in real-life examples/activities/discussions
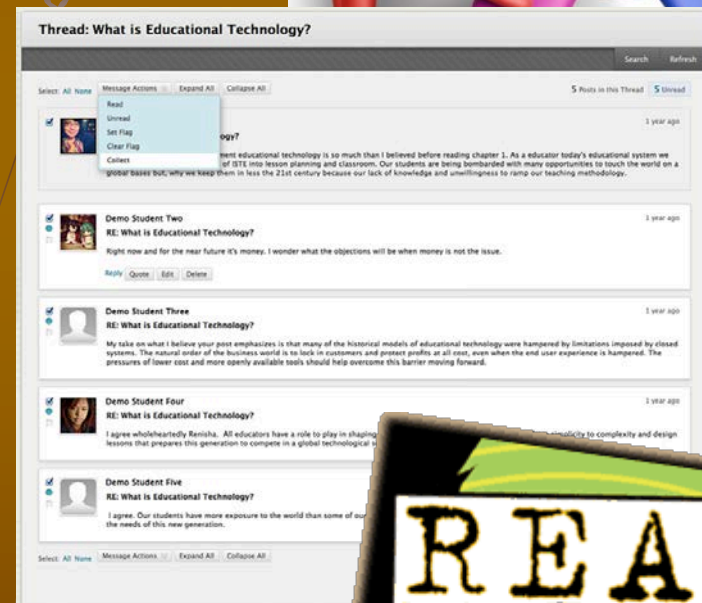
Baseline Design Considerations

Additional Considerations

Baseline Design Considerations
for Accessible Electronic & IT Resources

- **Visual:**
  - Provide descriptions for all <u>meaningful</u> graphics (images, charts, graphs, SmartArt, objects)
  - Provide descriptions for videos <u>where visual content is important</u> to understanding subject matter.
  - Use styles in long documents and on websites (i.e., heading tags)
  - Choose applications that support keyboard navigation and are compatible with screen readers

- **Hearing:**
  - Provide captions all videos
  - Provide transcripts for audio only

- **Cognitive, Neurological:**
  - Use consistent navigation, tab order, appropriate language level
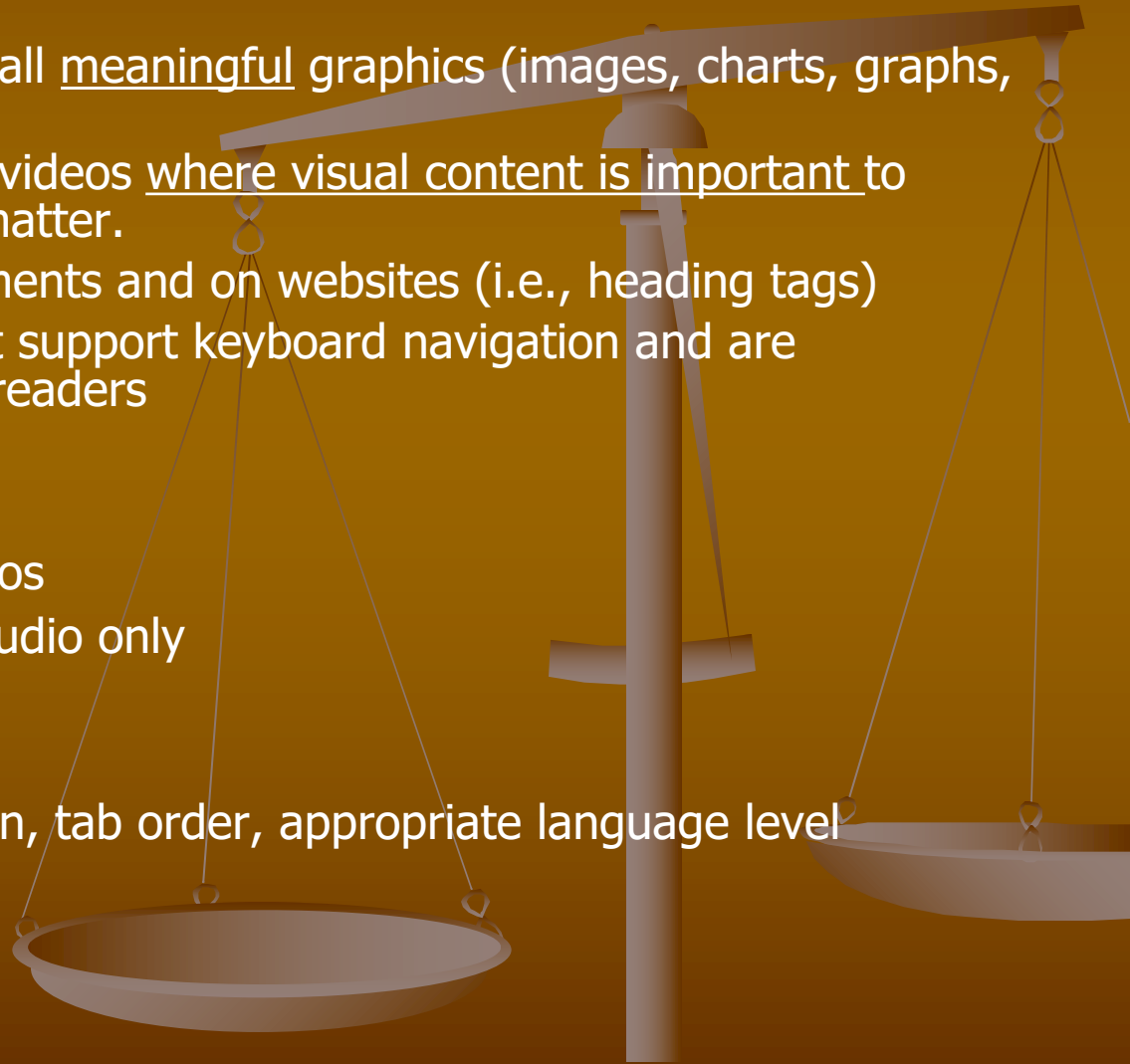
Manual and Automated (Examples)

Testing for Accessibility & Usability

Microsoft Office Built-In Accessibility Checker

- Click Review Tab/Check Accessibility
- Accessibility Checker Rules: *Errors*, *Warnings*, and *Tips*
- Additional Info:
  - [Rules used by the Accessibility Checker](#)
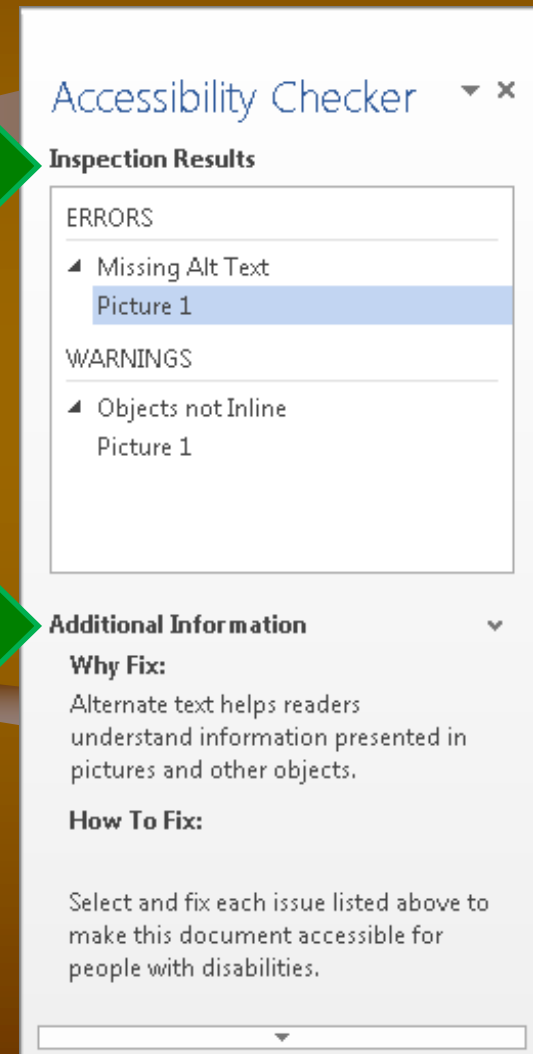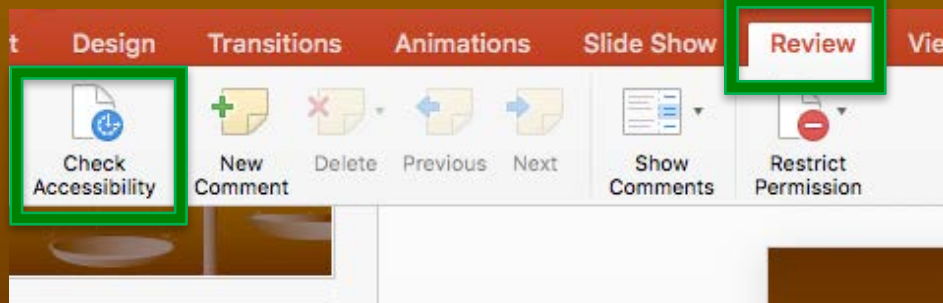
CommonLook Office Professional
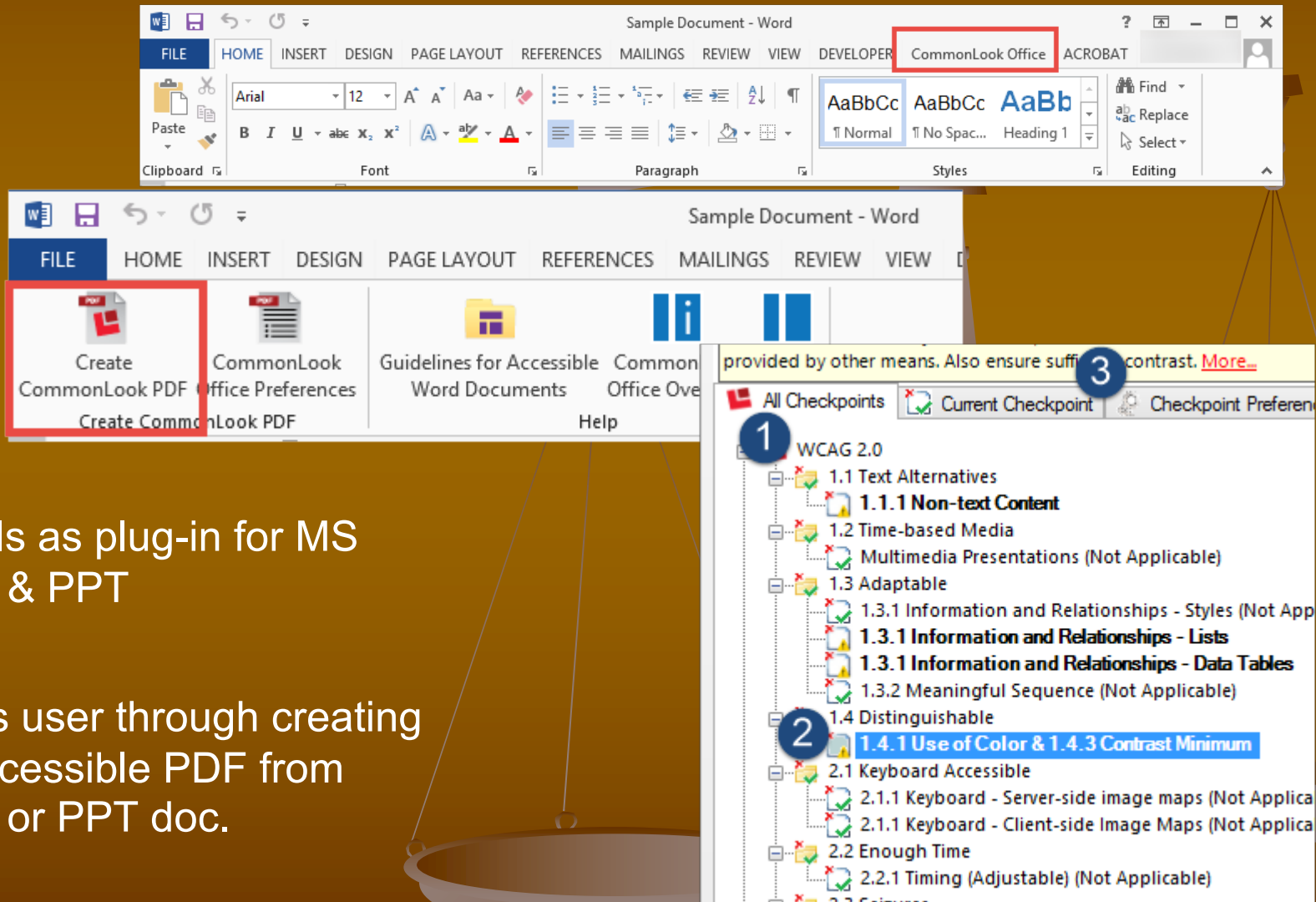
- Installs as plug-in for MS Word & PPT

- Walks user through creating an accessible PDF from Word or PPT doc.

Ally (Blackboard)

- Alternative accessible formats (checks and produces)

- Provides instructor feedback on accessibility considerations

- Institutional reporting

- Coming soon...
  - Brightspace, Moodle, Canvas support

UDOIT (Canvas)

- **U**niversal **D**esign **O**nline content **I**nspection **T**ool

- Identifies "errors" and provides "suggestions"

- Checks for appropriate use of:
  - Headings
  - Alternative text for images
  - Table headers
  - Color contrast
  - Video captions

- Free/Open-source

Summary/Questions

Contact Us

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   Phone: 513-529-9006

Additional Resources

- Free PDF checker, auto repair and wizard: PAVE
- Free PDF checker (Doesn't require Adobe Pro): Access for All PDF Accessibility Checker (PAC)
- Free PDF checker (Does require Adobe Pro): Commonlook PDF Validator
- Free PDF to HTML tool, great for students use (Does require Adobe Pro): Callas Software – pdfGoHTML
- If you want to check websites a free resources that allows Section 508 or WCAG 2.0: Achecker
- Another web accessibility checker for those starting out in accessibility: WAVE
- Microsoft Office Built In tools: Making Documents Accessible

- Document Accessibility Toolbar:
    - Visit VisionAustralia.org
    - In the search field: DAT
    - The first link is for Document Accessibility Toolbar.
    - Follow the instructions on the page to download.

- Portland Community College Accessibility Handbook
- Microsoft Office Accessibility Checker
- CommonLook Office Global Access
- UDOIT
- Blackboard Ally