



# Creating Universally Accessible Content – Why and How

Celine Greene Instructional Technologist Center for Teaching and Learning

#### What is Universally Accessible Content?

#### Universally Accessible Content – 1

- Is part of the Universal Design ecosystem that is possible for everyone:
  - To reach
  - To understand
  - To use
- Aims to:
  - eliminate required adaptations or special modifications
  - simplify experiences, i.e. lessen the "work"
  - meet the needs of individuals of all ages, sizes, and abilities



#### Universally Accessible Content – 2

#### Is robust (transferable and stable) across platforms and devices

B 5 0 =	The Elegant Design Imperative.docx - Word Celine Greene 🖬 – 🔲 🗙
File Home Insert Design Lay	out References Mailings Review View Acrobat 🖓 Tellime 🛛 🖄 Share 🕥 🖵
A         Calibri (Body)         12         A         A         A           Paste         A         I         U         value         X;         A         ×         A           Ipboard         S         I         U         value         X;         A         ×         Paste	a · ∲ ⊞ · ⊟ · ⅓ · ⅔ · ⅔ · ⅔ · ⅓ · ℜ · ▲ · ■ = = ≡ ↓ □ · ☆ · ⊕ · n Rungaph s Spies s tetts ABBC
Navigation X Sarch document D Headings Pays Reubs - The Depart Debys Impensive Markings Payse Reubs - Social User Interface Shauld Bellings- Net Land Trucking Bellings- Net Land Tru	<section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header></section-header>
Page 1 of 5 1929 words []8	前 圖 屍





#### Universally Accessible Content – 3

- Is optimized for all individuals, regardless of abilities and limitations physical, cognitive, communicative and digital
- Meets one of the core principles of Universal Design for Learning (UDL):
  - Multiple means of representation
- Meets several principles of Universal Design for Instruction (UDI):
  - Equitable use
  - Flexibility in use
  - Simple and intuitive
  - Perceptible
  - Low physical effort

Is considered "good design" and is better for everyone

#### Why

#### Why Be Concerned? -1

- Routinely employing practices that consider universal accessibility puts your best foot forward
  - Professional
  - Conscientious
  - Considers sustainability
    - Hides "the complexity of technology"
  - Reaches a larger audience



Enrollment Category	Maryland	Nation
% Undergraduate	80.9	85.2
% African American	26.6	12.6
% Hispanic	8	15.7
% Asian	6.8	5.9
% White		51.7
% All Minorities	41.7	38.3
% Foreign	5.4	4.9

Poorly formatted table compares higher ed enrollment in Maryland vs. the Nation across demographic categories. See source for details. Source: Maryland Higher Education Commission. 2018 Data Book. "Comparative Higher Education Statistics: Maryland and the Nation".

#### Why Be Concerned? – 2

*"Every member of the Johns Hopkins University community deserves equal access to the abundant educational and employment opportunities we offer."*<sup>1</sup>

- Accessibility is part of Inclusivity
  - Can everyone participate equally and independently?
  - Are potential barriers removed?
- Accessible environments are enhanced environments
  - Is this the best we can offer to the widest range of people?
  - Is this sustainable?

We all have an ethical and moral responsibility



#### Why Be Concerned? – 3

Universally accessible content meets legal obligations

- ► ADA (1990)
- Rehabilitation Act of 1973
  - Section 504 (1973)
  - Section 508 (1998)



#### Best Practices toward Universal, Accessible Content

#### **Best Practices**

Combine and employ both Accessibility and Universal Design principles

- Consider levels of effort (human and technical)
  - Potential barriers to sensory, physical, cognition and neurological experiences
  - Ease of translation (integrity and robustness) across platforms, programs, and assistive technologies (AT) such as screen readers, speech recognition software, and alternative input devices
- Employ tools toward efficiency and precision

#### Practices Built Upon...

Principles of Accessibility:

- Perceivable (available)
- Operable (easy to navigate)
- ► Understandable
- Robust (sustainable across technologies and time)

- Principles of UDI/UDL:
  - ► Equitable use
  - ► Flexibility in use
  - Simple and intuitive
  - Perceptible
  - Low physical effort
  - Multiple means of representation

#### Best Practices Using Built-in Tools

#### Best Practices – All Documents: Alternative Text

- Simple, succinct text to
  - summarize any complex element (table, chart, embedded multimedia, etc.)
  - describe any non-decorative image
- Alt text should convey the meaning of the object
  - Images should avoid including text if possible; if not, mention it in alt text
  - Do not state the obvious
  - Use appropriate language

#### Alt Text in Microsoft Office



#### Best Practices – All Documents: Color

- Do not use color alone to convey meaning
  - Alternatives: shapes, line types, emphasis (underline, bold, italics), etc.
- The contrast (light to dark) of objects next to or overlaying each other must be sufficient (at least 4.5 to 1, in most cases)
  - Text over background images
  - Text inside a table with cell shading
  - Color-coded maps



Heading 1	Heading 2
Item 1	Item 2
Item 3	Item 4

#### Checking Contrast using an External Tool

- Contrast Checker: <u>http://contrastchecker.com</u>
- Allows RGB and hexadecimal values
- Aim to pass with WCAG AA 2.0 success criterion



### Checking Contrast in Microsoft Office



New feature – not available in all versions of Microsoft Office 365, 2016

#### Best Practices – All Documents: Hyperlinks

- Use "Meaningful" text
  - Inform users where link navigates them
  - Indicate purpose of linked resource
  - Consider [PIC], [VIDEO], or [AUDIO] alongside the link if format isn't obvious
  - The exception is when the URL is the meaningful text
- Screen reader might read a hyperlink text followed by the actual URL
  - Consider a URL shortener when sharing websites
- Distinguish from the surrounding text by something other than color, e.g. make certain hyperlinks are underlined

#### Hyperlinks in Microsoft Office





#### (MONDOPAD, RECORDING, ETC.)

e contacting JHSPH Multimedia. The Help Desk phone number for multimedia suppor



			Inse	ert hype	rlink						
8	=	$\equiv$	$\equiv$	<b>e</b>	ŝ	X²	X2	abe	<u>.</u>	⇒	
-											

en class. Dr. Bosch will share her insights on the od of motivating learners to take responsibility for contribute his unique perspective on the irresistible sisting students' recall and understanding of

be streamed via Adobe Connect at lings will be posted to our <mark>Toolkit Events page</mark> at a **s now!** If you have any questions, please contact

в	I U	E		-	扫	<u>a</u> Z	A	P.				8		$\chi^2$
٥, ١		come	ы.	Jui	iuu	ia v	USUI	an	чы	. ui	ana	11 141	oon	cy c
ve	s to th											ch v	/ill sl	hare
ng	, or p€	Ins	ert l	ink								g lea	rner	s to
/e	enviro	URI:	http	://ctl.il	nsph.e	du/ev	ents			_	×	niqu	e pe	rspe
g a	prese	01121							-			rec	all ai	nd u
							OK		Ca	ancel	-			

needed, but mark your calendars now! If you have any quest

#### Best Practices – All Documents: Reading Order

- Intended sequence that objects should be read/observed
  - Reading order can effect context/meaning
  - Tables are usually read left to right; top to bottom
    - Identify header row/column headers
  - Background content (Headers, Footers, Watermarks, Slide Master content, etc.) should be repeated in main content a single time or otherwise tagged for reading
  - Using "In-line" elements (instead of wrapping text) maintains reading order in Word documents and Email messages
  - Using the "Selection Pane" in PowerPoint presentations sets the reading order

#### Reading Order in Microsoft Office

- ► Word, Outlook:
  - Avoid text wrapping
  - Use "In-line" elements

Table	<u>R</u> ow Col <u>u</u> mr	n C <u>e</u> ll <u>A</u> lt Text			
Size					
Pref	erred width: 0"	Measure in:	Inches		$\sim$
Alignmer	t				
Left	Center	Right	eft:		
Text wrap	ping				
<u>N</u> on	<u>A</u> round		Po	sitionin	g
		Borders and Sha	ding	Option	s

mobile.johnshopkins.edu/owa/#viewmodel=IMailComposeViewM							
END SEND	X DISCARD	INSERT	APPS				
		Attachr	nents				
То:		Picture	s inline				
		Your sig	gnature				
Cc:							
Bcc:							
Calibri		▼ 12 ·	▼ B	I	U	:=	1 2 3

your selected Topics and Categories Choose your	View and Subscription Delivery Options and click
the "Update" button to save your selections.	



### Reading Order in Microsoft Office, cont.

- PowerPoint:
  - Use the "Selection Pane" in to set the reading order
  - Reading order is "bottom up"
    - Title should be bottom-most so it's read first
  - Avoid overlapping objects

ACROBAT Text Direct [*] Align Text Convert t	Poll tverywhere ¥ lell me what yo ttion * t * to SmartArt *	Arrange Styles - Quick Styles - Shap	be Fill × P Find be Outline × be Effects × Select ×	hare ہے			
graph	G.	Order Objects Bring to Front Send to Back Bring Forward Send Backward	Editing Editing Show All Hide All Content Placeholder 27	* × * ×		Selection Show All Hide All Content Placeholder 27 Picture Placeholder 23 Text Placeholder 13	•
Or MORE	3. (Optional) Enter feedbac or more students ingraded B Usland Zp of Comp Graded Files Students	Group Objects I관 Group I관 Ungroup I관 Regroup Position Objects I문 Align →	Picture Placeholder 26 Text Placeholder 13 Picture Placeholder 25 Text Placeholder 12 Picture Placeholder 19 Text Placeholder 11 Title 1	666666	3. (Optional) Ent@feedback for one or more students Ingrated Uplicat Zp of Compose Feedback to All Feedback Enter Feedback Enter	Picture Placeholder 25 Text Placeholder 12 Picture Placeholder 19 Text Placeholder 11 Title 1	
100 P Đ	Feedback	Send Character C	y the Selection Pane st of all your objects. akes it easier to select c, change their order, or their visibility.		Υ		

#### Best Practices – All Documents: Tables

- Do <u>not</u> use tables for controlling layout!
  - Use formatting: Paragraph, Column, Line spacing
- Make certain tables are formatted to:
  - include Table Header Row
  - avoid empty, merged, and split cells unless necessary
  - include visible cell borders (gridlines)
  - have sufficient contrast between text and any background fill colors
  - include a caption for complex tables



It's also common to think of accessibility in terms of assistive technologies and breaking down barriers for specific groups of

Enrollment Category	Maryland	Nation
% Undergraduate	80.9	85.2
% African American	26.6	12.6
% Hispanic	8	15.7
% Asian	6.8	5.9
% White	45.2	51.7
% All Minorities	41.7	38.3
% Foreign	5.4	4.9

# Best Practices – All Documents: Use Alternative and Adjacent Text to Summarize Complex Elements

CAPTION: A clustered column chart displays the comparison of higher education enrollment in Maryland and the Nation across 9 demographic categories, with Maryland exceeding the Nation in the African American, Asian, All Minorities, Underrepresented Minority and Foreign categories.

ALT TEXT: Clustered column chart comparing higher ed enrollment in Maryland vs. the Nation across demographic categories. See source data for details.



Tables & Data Elements in Microsoft Office

- Avoid using only images of a chart, graph, or table
  - Original data sets linked or otherwise attached to a visual representation can be accessed by AT
  - DOI (Digital Object Identifier) in source citation is helpful
- Always opt to *insert* a table or chart or use a placeholder
- Edit alt text
- Consider caption



### Tables: Header Rows in Microsoft Office

 PowerPoint: Tables
 Table Tools → Design: Header Row

• Word: Tables

- ► Table Tools → Design: Header Row
- ► Table Tools → Layout: Repeat Header Rows



Table	Tools	tablesample	e.docx - Word		
Design	Layout	V Tell me what you wan		$\sim$	
) Height:	0.41" 0 2.37" 0 Cell Size	Distribute Rows     Distribute Columns	Text Cell Direction Margins Alignment	fx Repeat formula Header Rows Text Data Repeat Header Rows Mark multiple rows as header rows. If your table spans multiple pages the header rows will appear on	
	Wait	Time	Area 1	every page for easy reference.	
	40		4	9	
	41		6	8	
	42		0	5	

#### Best Practices – All Documents: Document Structure

- Document structure is the way the parts of a document are programmatically organized in relation to each other
- Use STYLES (Headings, Lists, Tables, Paragraphs, Column breaks, etc.) to
  - Control appearance/layout and reading order
  - Serve as a navigation aid
  - Ensure "robustness" across formats and platforms

Heading Level 1			
Heading Level 2	WE		
Content	Title in a top Level Hea	der	
List List item 1 List item 2 List item 3 Heading Level 3 Content	Sector Control that an 2nd Leven Head Generic control that not requeskilly formalize list in the impain door at a net, constrained and alloyane et al. effort workputs. At work the door that the impaint of the impaint of the list is a sector of the impaint of the impaint the impaint of the impaint of the impaint block of the impaint of the impaint block of the impaint of the impaint block of the impaint of the impaint of the block of the impaint of the impaint block of the impaint block of the impaint of the impaint block of the impaint block of the impaint block o	Title in a top L Sector Title in a 200 - Sector Title	Construction     Construction
Heading Level 2		nonumy eirmod tempor invidunt ut l aliquyam erat, sed diam voluptua. Second Section with 2nd L	Back to generic text. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod tempor inviduant ut labore et dolore magna aliquyam erat, sed diam voluptua. A 3 rd Lovel Header separates more text.
Content		Lorem ipsum dolor sit amet, conseter nonumy eirmod tempor invidunt ut l alliquyam erat, sed diam voluptua.	E comis journ lodor it amer, consertent safglecing effit, sed ilum norumy eimod tempor invide ut blore et didor magna aligyam era et, et diam voluptua. Second Section with 2 <sup>nd</sup> Level Header Leven issum lodor it amer, consertent safglecing effit, sed ilum norumy eimod tempor invide ut blore et didore magna aligyam era, sed ilum voluptua.



#### Structure in Microsoft Office

- ► Word, Outlook:
  - Use Styles and document parts (e.g. Footer)
  - Use Page Setup and Formatting for controlling layout
- PowerPoint
  - Use templates and only rely on a slide master layout's placeholders

<ul> <li>Click to add first-level bullet</li> </ul>	Click to add first-level bullet

File	Home	Inser	t Design La	yout Referer	ces Ma	ailings Review	View	ACROBA	T Q Tel	l me what you	want to do						🖻 Share	$\Box$
Ê	Cut		Calibri (Body) 💌 11	· A A A	a 🗸 🔌	= + <sup>1</sup> / <sub>2</sub> + <sup>1</sup> / <sub>2</sub> +	€≣ →≣	₽↓ ¶	AaBbCcDc	AaBbCcDc	AaBbCo	AaBbCcE	АаВ	AaBbCcD	AaBbCcDı	AaBbCcDt	P Find ▼ ab Replace	
Paste	🕈 💉 Format Paint	er	B I <u>U</u> → ab∈ >	$({}_2 \times^2) \land = {}_2^{ab}$	· <u>A</u> ·		]≡ •   <u>&amp;</u> •	· 🛄 👻	¶ Normal	¶ No Spac	Heading 1	Heading 2	Title	Subtitle	Subtle Em	Emphasis 🖵	Select -	
	Clipboard	Fail	F	Font	- G	Paragr	raph	E.				Sty	les			5	Editing	~

#### Best Practices – All Documents: Style Font Attributes

- Clear, easy to read typeface
  - Preference: sans serif (no decorative lines), e.g. Arial, Tahoma, Trebuchet, Verdana
- Text size no lower than 11 point for most fonts
- Sufficient contrast ratio of font color to its background
- If text must be included as a part of an image (e.g., logos), it must be clear so it retains quality when customized; e.g. resized by zoom level or filtered by color

#### Best Practices – All Documents: Properties/Attributes

- Document Properties (meta data) assist users and technologies to search, navigate, and comprehend a file without having to open it
  - Complete title, key words ("tags"), & author
- Save files with no restrictions



#### Properties (Meta Data) in Microsoft Office

▶ File → Info
 ▶ Show All Properties

Properties *	
Size	223KB
Pages	4
Words	680
Total Editing Time	440 Minutes
Title	Subscribing to the Class Discussion Forum
Tags	CTL, CoursePlus, Handout
Comments	Add comments
Template	CTLStudentHandoutTemplate.dotx
Status	Add text
Categories	CoursePlus Guides
Subject	CP Discussion Forum - Subscribing
Hyperlink Base	Add text
Company	Johns Hopkins Bloomberg School of Public Health



#### The Microsoft Office Accessibility Checker

#### Microsoft "How to"

## "Use the Accessibility Checker to find accessibility issues"

# https://bit.ly/2LIOKUJ



#### **MS Accessibility Checker**

#### Classifies:

- Errors
- Warnings
- Tips

#### Errors:

- Images alt text
- Slides unique titles
- Tables headers
- Structure Styles, Table of Contents

#### Warnings:

- Meaningful hyperlinks
- Tables no split, empty cells
- Meaningful sheet names/links (Excel)
- Blank characters
- Color contrast

"The democratization of information will only occur when everyone has equal access to information. For that to happen, we must cast out messy and unwieldy designs in favor of elegant and refined ones."

Browning, Andrew. "The Elegant Design Imperative." EDUCAUSE Review, 8 May 2017, er.educause.edu/articles/2017/5/the-elegant-design-imperative.