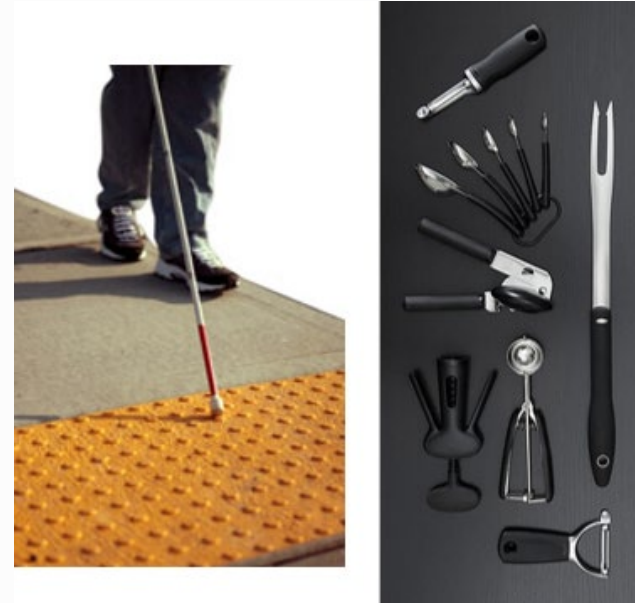# Creating Universally Accessible Content – Why and How

Celine Greene
Instructional Technologist
Center for Teaching and Learning

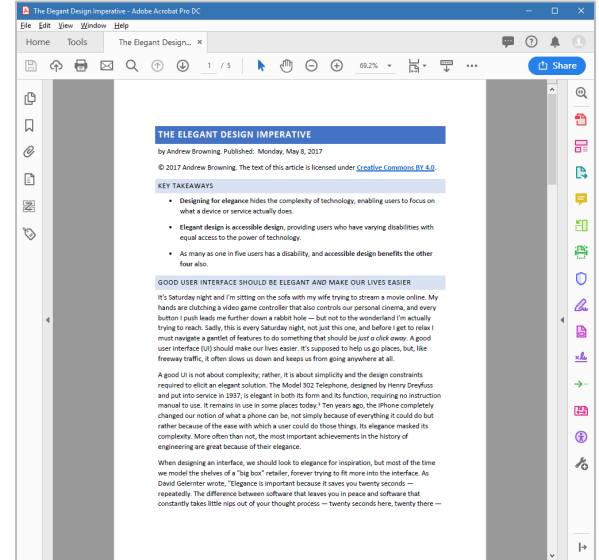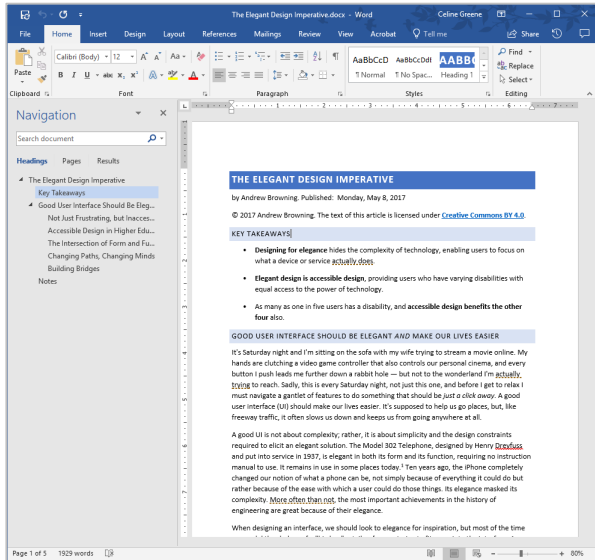What is Universally Accessible Content?

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

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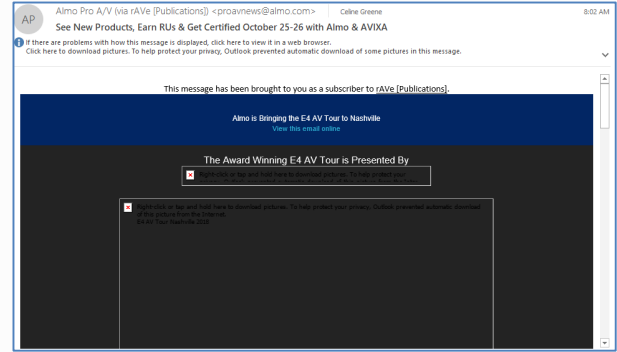
Enrollment Category	Maryland	Nation
% Undergraduate	80.9	85.2
% African American	26.6	12.6
% Hispanic	8	15.7
% Asian	6.8	5.9
% White		51.7
% All Minorities	41.7	38.3
% Foreign	5.4	4.9

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."[1]

► 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

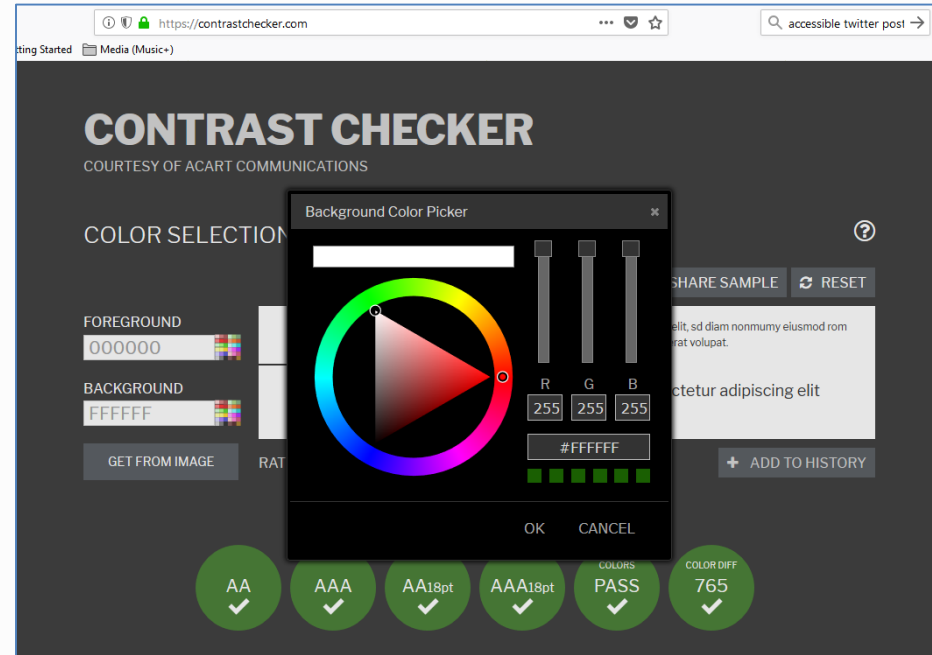# Alt Text in Microsoft Office
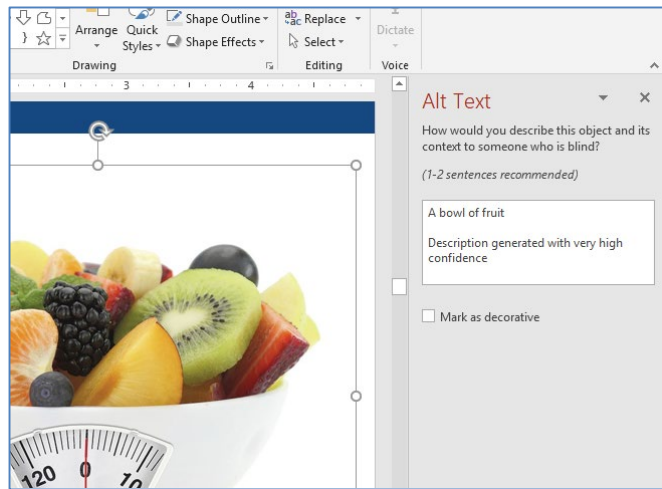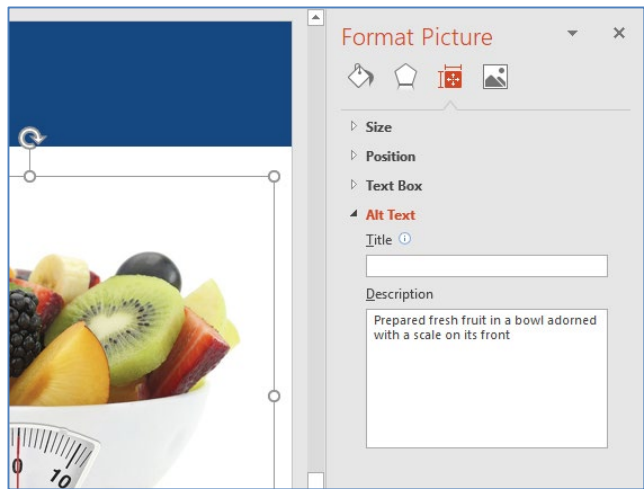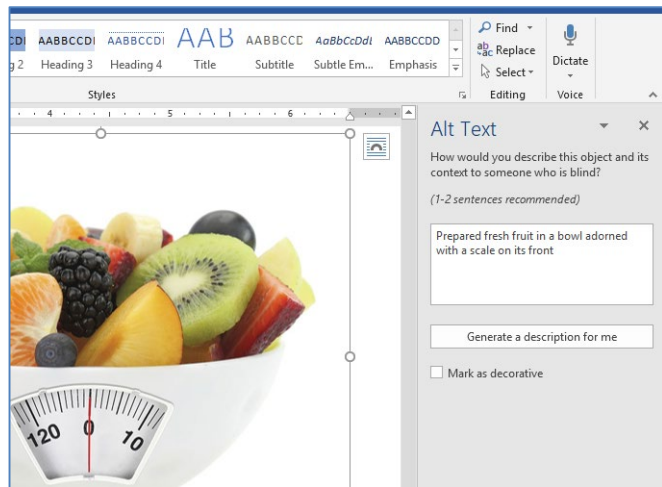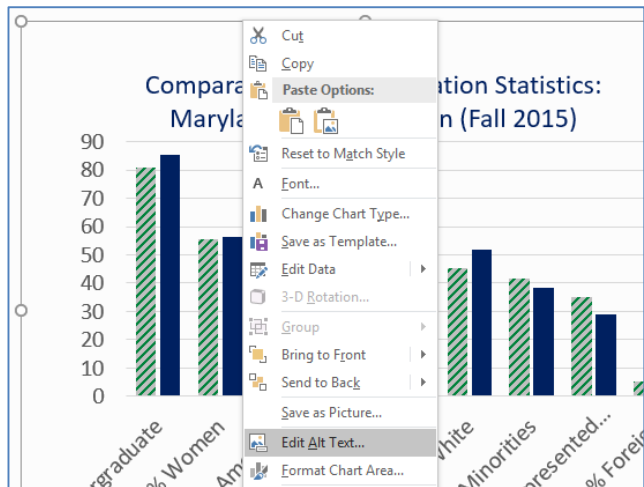
Best Practices – All Documents: Color

► 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

Scatter Graph with Smooth Lines and Markers
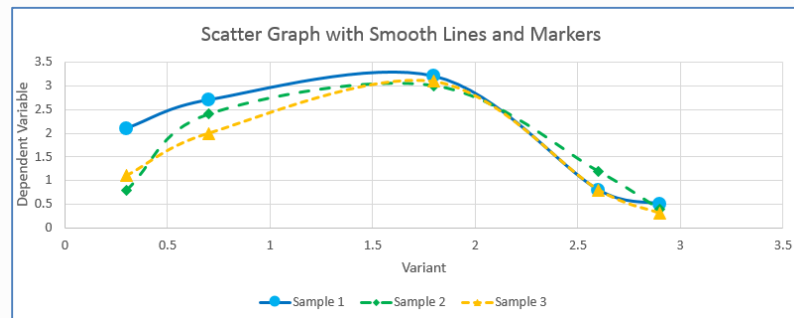
Heading 1	Heading 2
Item 1	Item 2
Item 3	Item 4

Checking Contrast using an External Tool

► Contrast Checker:
http://contrastchecker.com

► Allows RGB and hexadecimal values

► Aim to pass with WCAG AA 2.0 success criterion

Checking Contrast in Microsoft Office

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
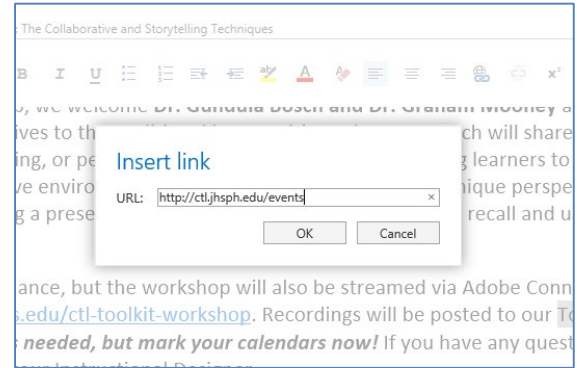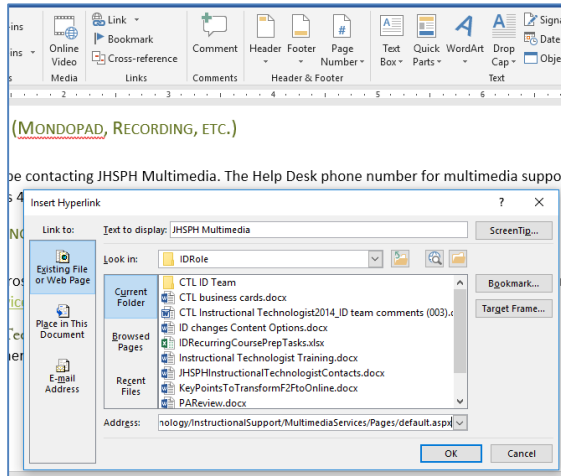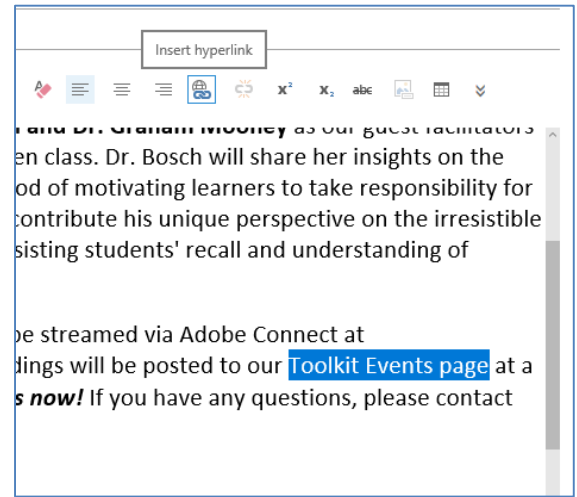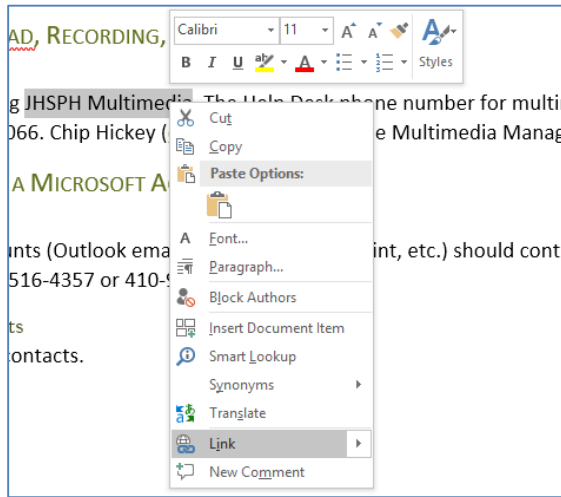
Best Practices – All Documents: Reading Order

► 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
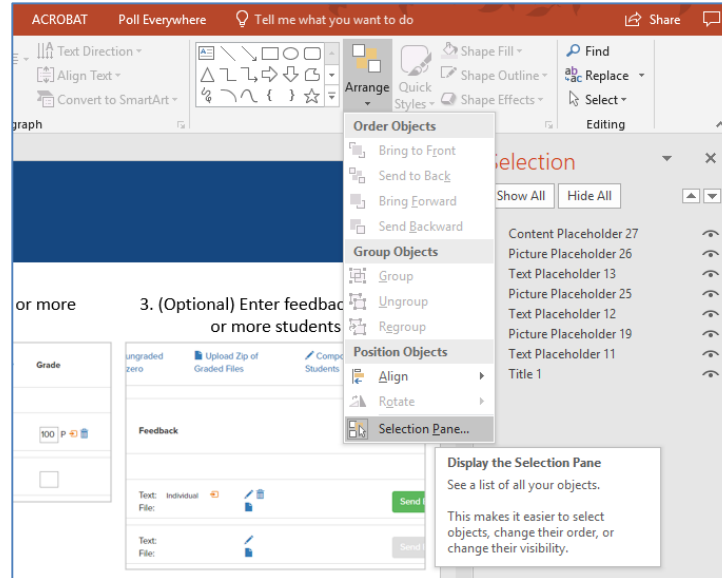
http://www.w3.org/TR/wcag2ict

Reading Order in Microsoft Office

- ► Word, Outlook:
 - ► Avoid text wrapping
  - ► Use "In-line" elements
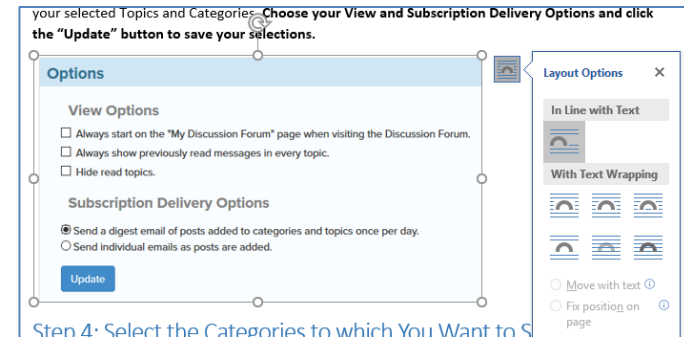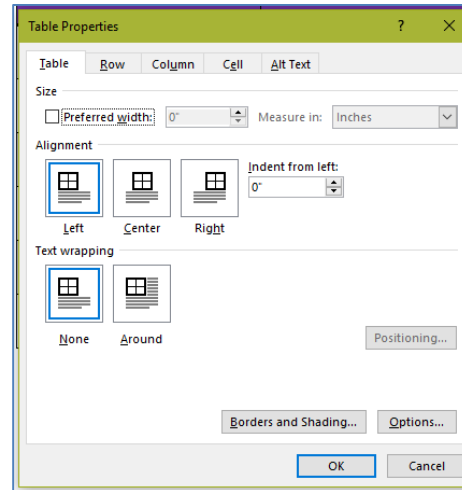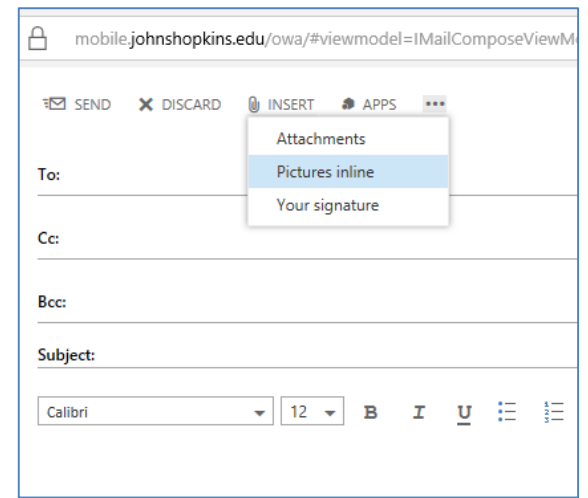
Reading Order in Microsoft Office, cont.

▶ 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
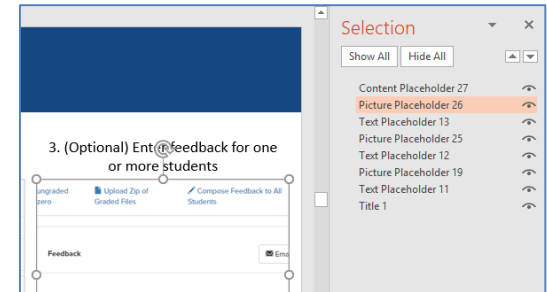
Best Practices – All Documents: Tables

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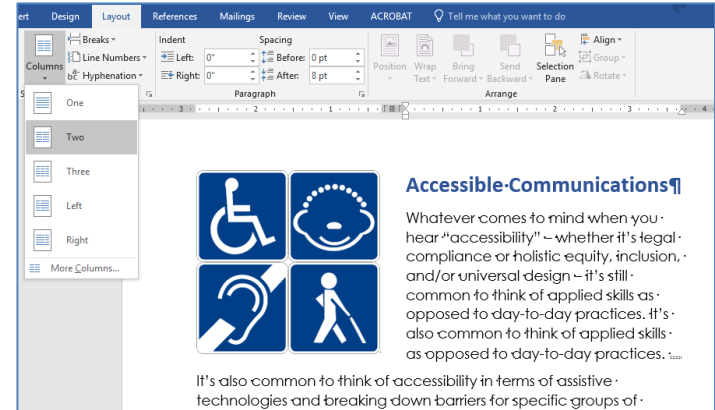
| Enrollment Category	Maryland	Nation
% Undergraduate	80.9	85.2
% African American	26.6	12.6
% Hispanic	8	15.7
% Asian	6.8	5.9
% White	45.2	51.7
% All Minorities	41.7	38.3
% Foreign	5.4	4.9

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.*


Comparative Higher Education Statistics: Maryland and the Nation (Fall 2015)

Maryland   Nation
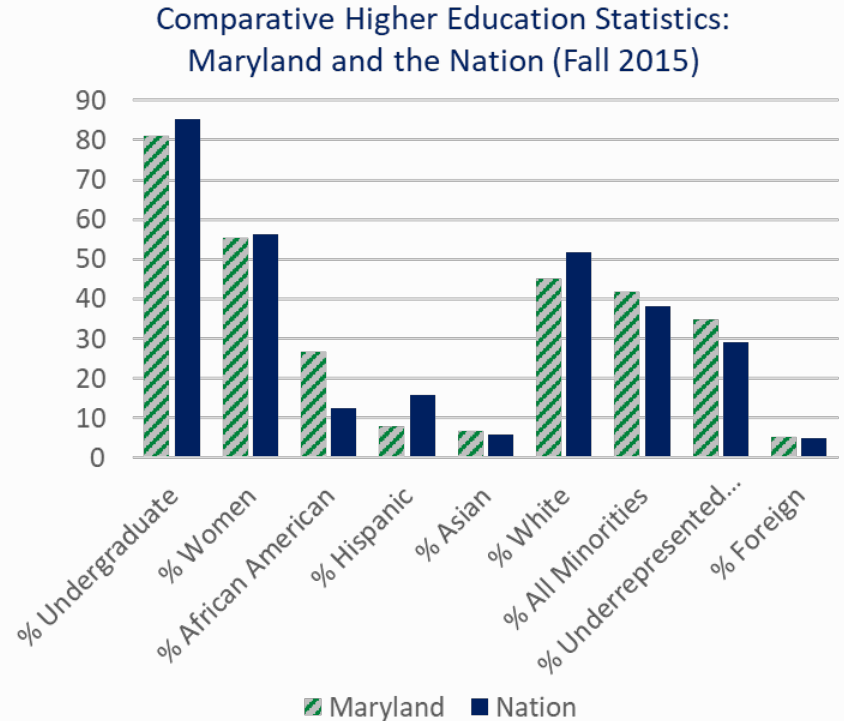
Tables & Data Elements in Microsoft Office

▶ 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
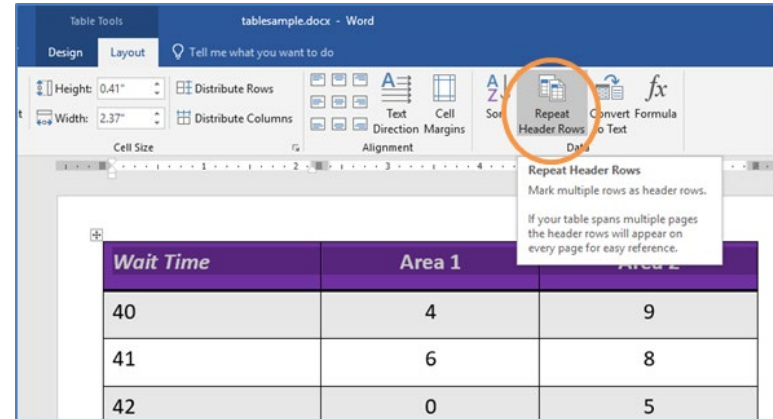
▶ Edit alt text

▶ Consider caption
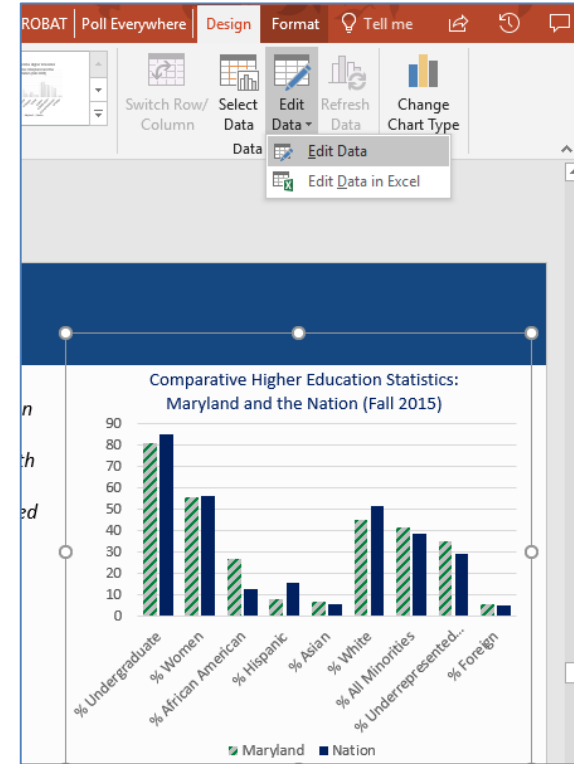
Tables: Header Rows in Microsoft Office

▶ PowerPoint: Tables
  ▶ Table Tools → Design: Header Row
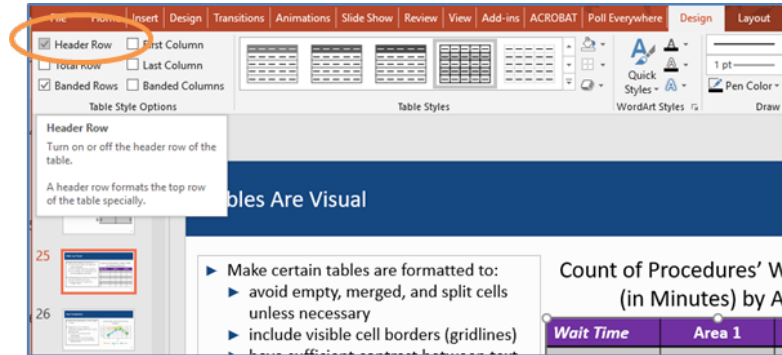
▶ Word: Tables
  ▶ Table Tools → Design: Header Row
  ▶ Table Tools → Layout: Repeat Header Rows
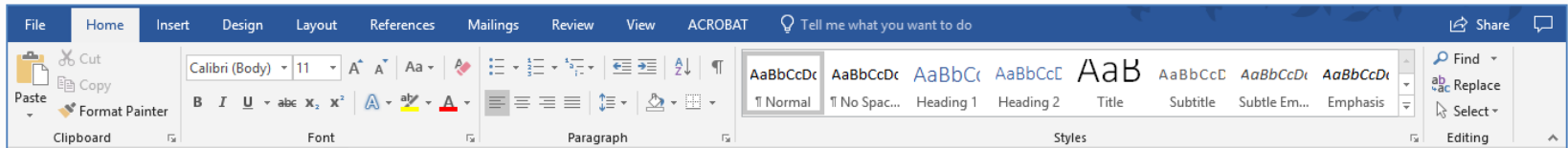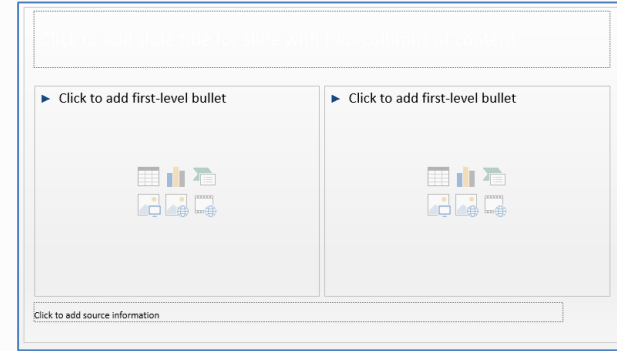
Best Practices – All Documents: Document Structure

► 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

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

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**
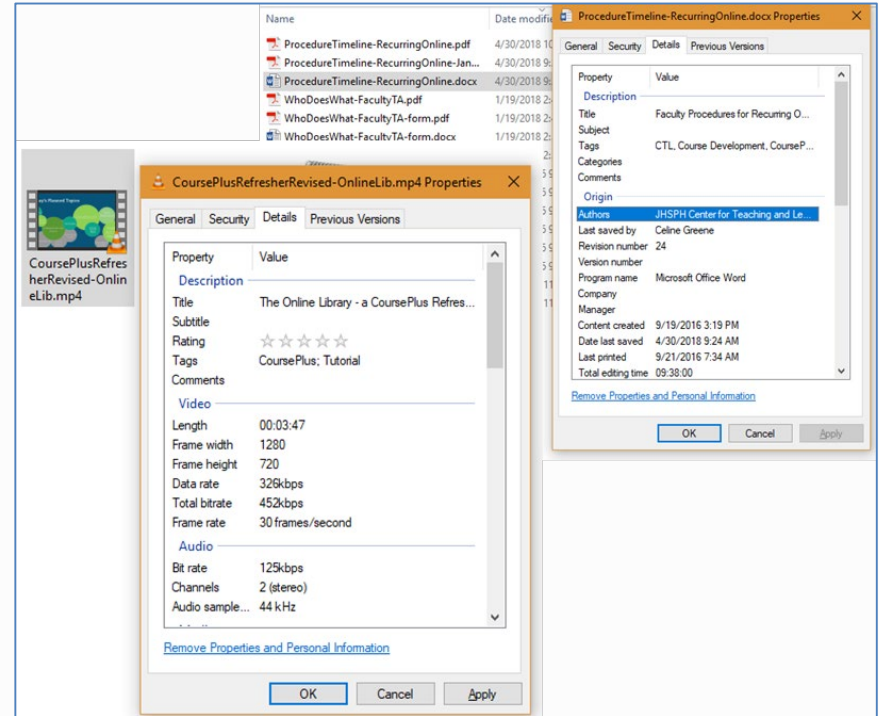
Properties (Meta Data) in Microsoft Office

► 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
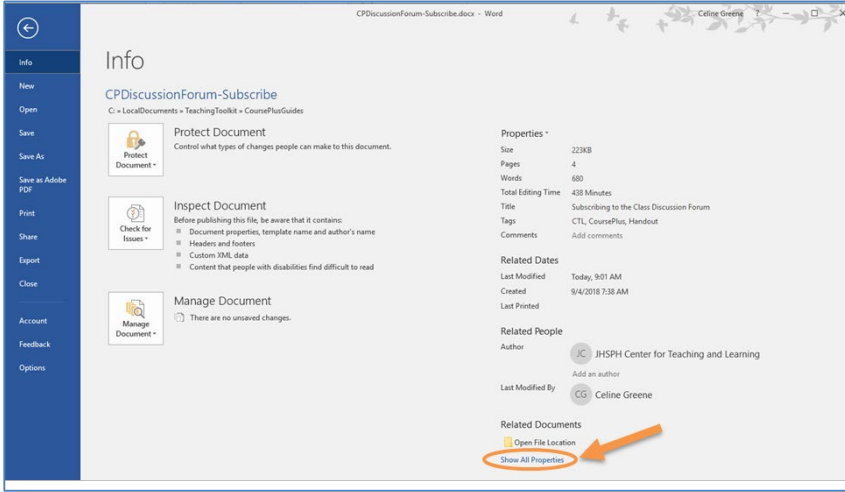
The Microsoft Office Accessibility Checker

Microsoft "How to"

"Use the Accessibility Checker to find accessibility issues"

https://bit.ly/2LIOKUJ
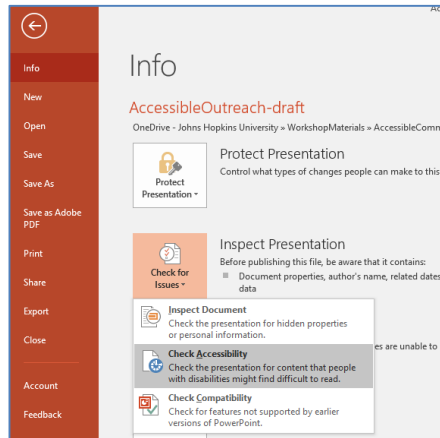
MS Accessibility Checker

▶ 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.