

SKILLSCOMMONS ACCESSIBILITY CHECKPOINTS

METHODS FOR EVALUATING THE ACCESSIBILITY OF
PDF DOCUMENTS
(ASSISTIVE TECHNOLOGIES)

Methodology

- Designed by
 - CUDA and CSU-MERLOT
 - In partnership with CAST
- Applied by
 - The California State University on the California Open Online Library Project (www.cool4ed.org)

Assistive Technologies Evaluation

Addresses specialized tools such as Kurzweil and NVDA which are not typically available to the general public. Assistive Technologies includes but is not limited to the following:

- Accessibility features of desktop operating systems (e.g. high-contrast display themes, settings from the Keyboard and Mouse control panels)
- Accessibility-related software included with desktop operating systems (e.g. VoiceOver, Microsoft Narrator)
- Third-party accessibility software and hardware:
 - Screen readers (e.g. JAWS, Window Eyes)
 - Magnification software (e.g. ZoomText Magnifier/Reader, MAGIC Pro with Speech)
 - Reading software for users with learning disabilities (e.g. Read and Write Gold, Kurzweil 3000)
 - Refreshable Braille displays

Accessibility Checkpoints

1. Accessibility Documentation
2. Text Access
3. Text Adjustment
4. Reading Layout
5. Reading Order
6. Structural Markup/Navigation
7. Tables
8. Hyperlinks
9. Color and Contrast
10. Language
11. Images
12. Multimedia
13. Flickering
14. STEM
15. Interactive Elements

Accessing PDF documents

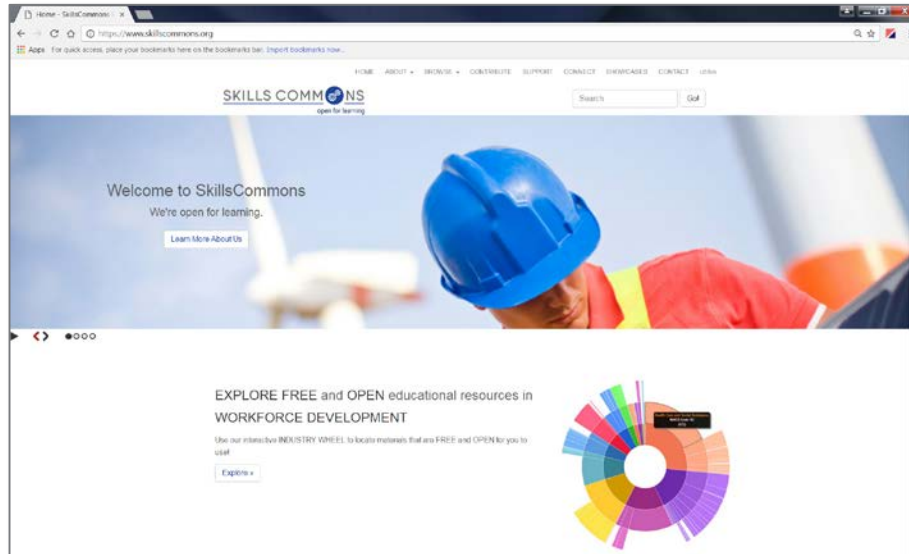
STEPS:

1. Visit SkillsCommons site at www.skillscommons.org
2. Search for and download desired PDF document

Accessing PDF documents

STEPS:

1. Visit SkillsCommons site at www.skillscommons.org



Accessing PDFdocuments

STEPS:

2. Search for and download desired PDFdocument



Click on PDF document
to download.

The screenshot shows the Skills Commons website interface. At the top, there is a navigation bar with links: SKILLS COMMONS, ABOUT, BROWSE, CONTRIBUTE, SUPPORT, CONNECT, SHOWCASES, CONTACT, and LOGIN. Below the navigation bar, the breadcrumb trail reads: Home > Massachusetts Community College and Workforce Development Transformation Agenda (MCCWDTA) > Learning Resources Collection > View Item. The main content area displays the title 'Engineering Product Design Course Syllabus - MBCC' by Lienard, Paul. Below the title, it says 'Engineering Product Design (MN-271) Course Syllabus'. A blue box highlights a PDF document link: 'Engineering (Project Design) Course Outcomes pdf (123 KB)'. Below this link is a feedback prompt: 'Did you download this item? We value your feedback, and it'll only take a minute'. To the right of the main content, there are two sections: 'Browse all of SkillsCommons' with a list of categories (Grant Projects, Material Type, Credential Type, Institution, Industry, Industry (Wheel)) and 'Browse this Collection' with a similar list. At the bottom right, there is a 'Statistics' section with 'Most Popular Items' and 'Most Popular Material Types'. The bottom left of the page shows metadata: Date: 2012, Primary Material Type: Syllabus, Institution: Massachusetts Bay Community College, Project Name: Transformation Agenda, and TAAACCCT Round: 1.

Skills Commons Accessibility Checkpoints

All information obtained from the PDF document evaluation will be entered into the SkillsCommons Accessibility Checkpoints document:

3. *Text Adjustment*

PASS/FAIL: _____ Ranking: _____

- A. Text is compatible with assistive technology.
- B. The resource allows the user to adjust the font size and font/background color (or is rendered by an application such as a browser, media player, or reader) that offers this functionality).

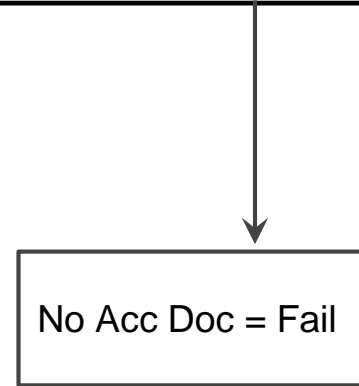
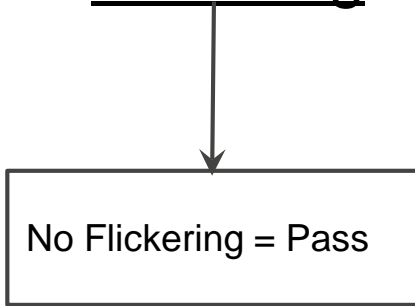
Additional Information: Please describe the technologies (hardware and software versions) and methodologies you used to evaluate the accessibility of the resource for this feature.

Enter info such as the pages you evaluated here as well.



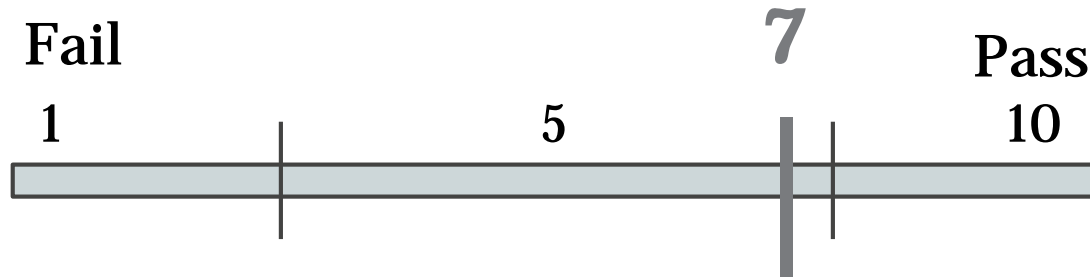
Pass, Fail, or N/A?

- Evaluate material based on the amount of material included in the checklist.
- If there is no related materials, mark N/A for that checkpoint. The only exception are Acc Documentation and Flickering.



Ratings

- Ratings are on a scale of 1-10



- Failure to meet a checkpoint (Fail) should not be rated above a 7
- Meeting a checkpoint (Pass) should not be rated below a 7

Evaluating Accessibility of PDF documents

PDF Evaluation Requirements

OS

- Windows OS (XP or above)

Require Downloading

- NVDA ([Download](#))
- Color Contrast Analyzer- CCA ([Download](#))
- Adobe Acrobat Reader DC ([Download](#))

OR

- Adobe Acrobat XI Pro or DC (DC: [Download](#), \$449)

** Pro/complete version is suggested, versions older than XI should not be used

** Following screenshots are done with Adobe Acrobat XI Pro

NVDA

Keep in mind when using NVDA:

- Make sure that NumLock is off.
- Try using only the keyboard.
- For more keyboard shortcut ([Click here](#))



Note

The **NVDA** key is set to the **Insert** key by default, but it can be changed to the **Caps lock** key when installing NVDA for the first time. If you want to change your NVDA key preference later, press **Ctrl** + **NVDA** + **K**.

1. Accessibility Documentation

For the documents' organizations, find the following:

- ☑ URL to formal Accessibility Policy
- ☑ URL to accessibility statements
- ☑ URL to Accessibility Evaluation Report

2. Text Access

- ☑ The text of the digital resource is available to assistive technology that allows the user to enable text-to-speech (TTS) functionality

Text Access

STEPS:

1. Download NVDA
2. Open the document with Adobe Acrobat
3. Activate NVDA
(Ctrl + Alt + N)
4. Use NVDA to read from top of the page (Numpad +)
Use Ctrl to stop

Note: make sure your speaker is on!

3. Text Adjustment (Size)

- The text allows the user to adjust the font size

3. Text Adjustment (Size)

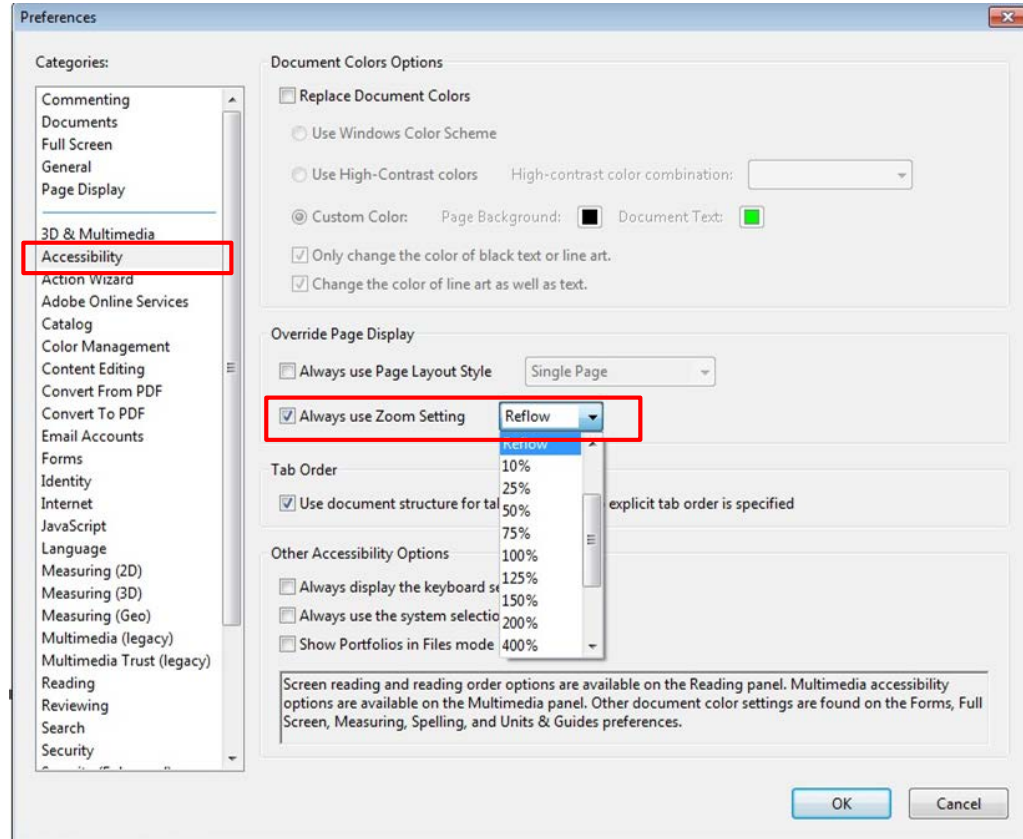
STEPS:

1. Open file with Adobe Acrobat XI Pro
2. Edit > Preference > Accessibility
3. Select Always use Zoom Setting > Reflow (drop down)
4. Click OK
5. CLOSE Adobe Acrobat Pro
6. Open the file with Adobe Acrobat Pro again
7. Zoom in and out to see if the text adjust its size to fit the screen
8. Remember to deselect Always use Zoom Setting > click ok > close and reopen the file (to keep everything in original format for the rest of the evaluation)

3. Text Adjustment (Size)

- Amount of Material to Be Evaluated

*** Sample 5 pages ***



3. Text Adjustment (Color)

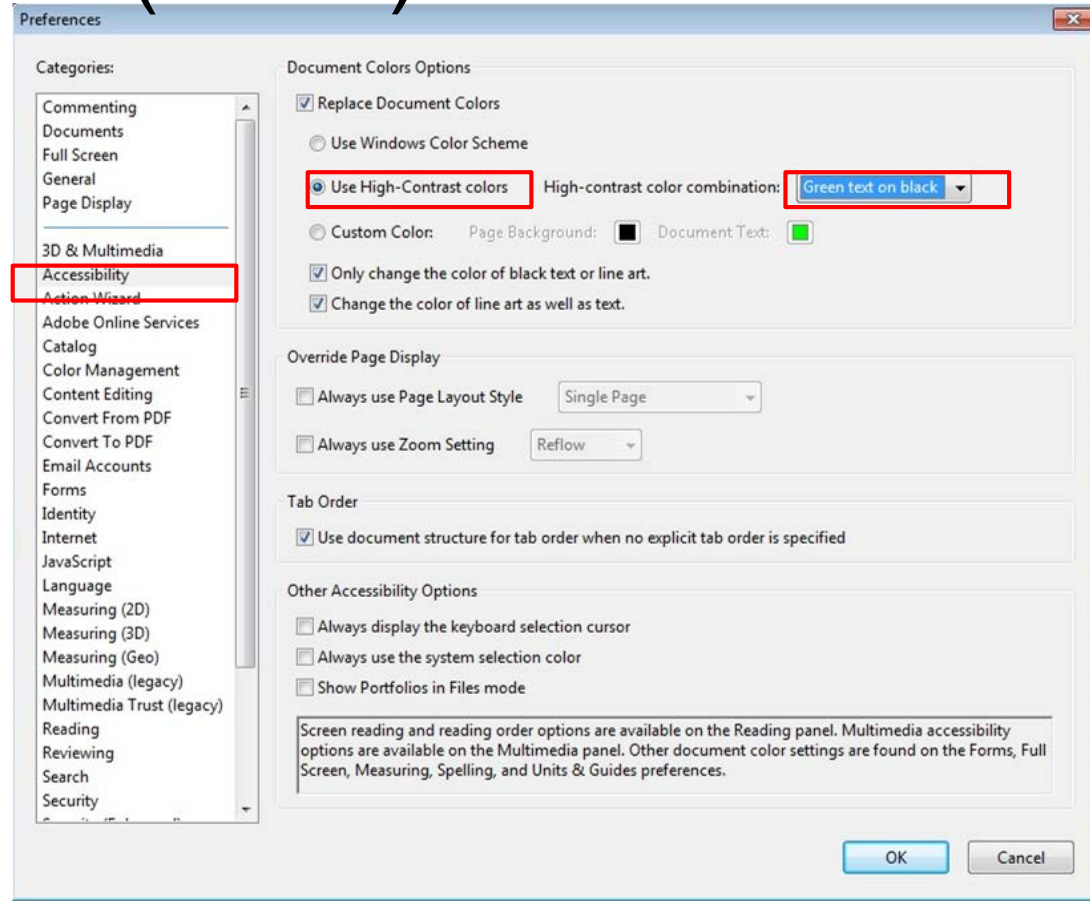
- The text allows the user to adjust the font/background color

3. Text Adjustment (Color)

STEPS:

1. Open file with Adobe Acrobat XI Pro
2. Edit > Preference > Accessibility
3. Select Replace Document Colors > Green text on Black
(drop down)
4. Click OK
5. Remember to deselect Replace Document Colors > click
OK > close and reopen the file (to keep everything in original format for
the rest of the evaluation)

3. Text Adjustment (Color)



- Amount of Material to Be Evaluated

*** Sample 5 pages ***

4. Reading Layout (reflow)

☑ Text of the digital resource is compatible with assistive technology that allows the user to reflow the text by specifying the margins and line spacing

⦿ Amount of Material to Be Evaluated

*** Sample 5 pages ***

4. Reading Layout (reflow)

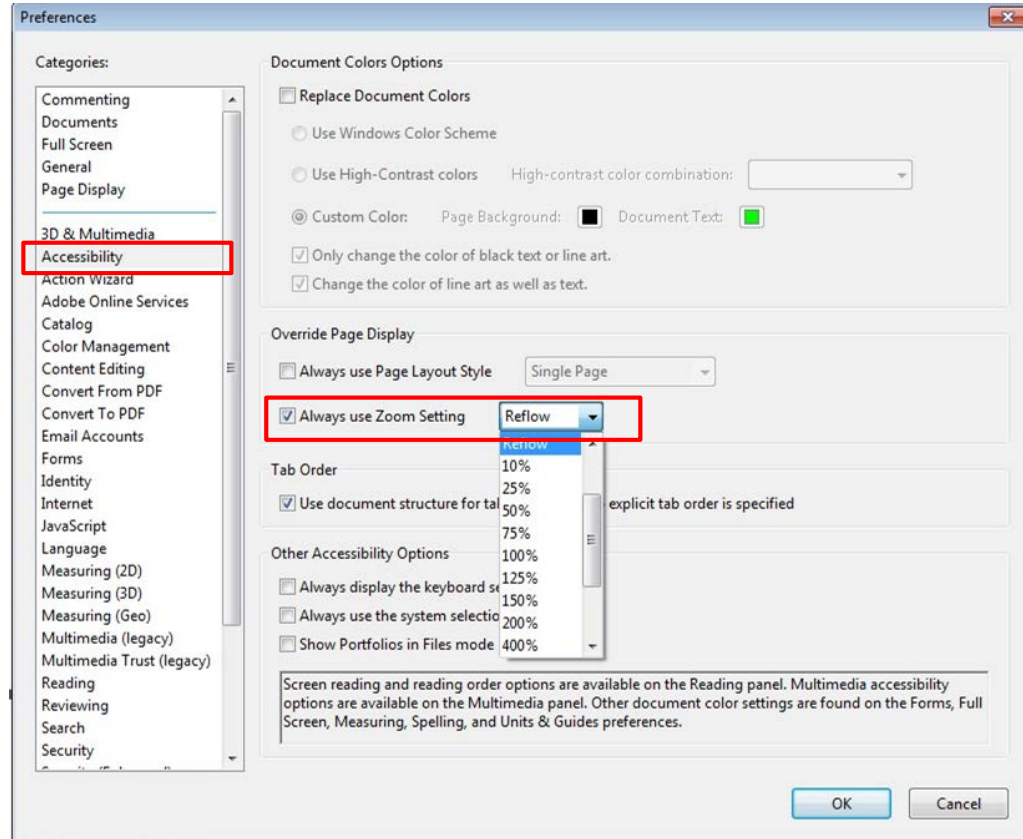
STEPS:

1. Open file with Adobe Acrobat XI Pro
2. Edit > Preference > Accessibility
3. Select Always use Zoom Setting > Reflow (drop down)
4. Click OK
5. CLOSE Adobe Acrobat Pro
6. Open the file with Adobe Acrobat Pro again
7. Zoom in and out to see if the text reflows
8. Remember to deselect Always use Zoom Setting > click ok > close and reopen the file (to keep everything in original format for the rest of the evaluation)

4. Reading Layout (reflow)

- Amount of Material to Be Evaluated

*** Sample 5 pages ***



4. Reading Layout (# of pages)

- ☑ If the digital resource is an electronic alternative to printed materials, the page numbers correspond to the printed material

Skip this subsection: We don't have the printed version

5. Reading Order

- ☑ Reading order for digital resource content logically corresponds to the visual layout of the page when rendered by assistive technology

- ⦿ Amount of Material to Be Evaluated

*** Sample 5 pages ***

5. Reading Order

STEPS:

1. Open the document with Adobe Acrobat
2. Locate 5 pages (include page # in the reports) that contains a more complicated layout
3. Use the NVDA to read from top of the page (Numpad +) and check if the reading order is logical

6. Structural Markup / Navigation

- ☑ The text of the digital resource includes markup (e.g. tags or styles) that allows for navigation by key structural elements (chapters, headings, pages) using assistive technology

STEPS:

1. Open the document with Adobe Acrobat and activate NVDA
1. Use heading quick keys (H & 1-6) to check for all heading levels

Headings and Lists

Command	Description
H	Headings Quick Key
1-6	Headings Level 1-6
L	List Quick Key
I	List Item Quick Key

Structural Markup / Navigation

- ☑ The text of the digital resource includes markup for bullets and numbered lists that is compatible with assistive technology

STEPS:

1. Open the document with Adobe Acrobat **Headings and Lists** and activate NVDA
1. Locate a list
2. Use List quick keys (L) to check if the program can recognize it as a list.

Command	Description
H	Headings Quick Key
1-6	Headings level 1-6
L	List Quick Key
I	List Item Quick Key

Repeat the steps for 10 lists

Structural Markup / Navigation

- ☑ If the text of the digital resource is delivered within an ebook reader application, a method is provided that allows users to bypass the reader interface and move directly to the text content that is compatible with assistive technology

Not using reader application, mark N/A on the reports

7. Tables

- ☑ Data tables include markup (e.g. tags or styles) that identifies row and column headers in a manner that is compatible with assistive technology

STEPS:

1. Open the document with Adobe Acrobat **Tables**

and activate NVDA

1. Locate a table
2. Use Table quick keys (T) to check if the program can recognize it as a table, then use other quick keys to check for all cells.

Repeat the steps for 10 tables

Command	Description
T	Table Quick Key
Ctrl + Alt + →	Cell to Right
Ctrl + Alt + ←	Cell to Left
Ctrl + Alt + ↓	Cell Below
Ctrl + Alt + ↑	Cell Above

8. Hyperlinks

- ☑ Functionality: Links (e.g. website or email addresses) within the text of the digital resource are rendered as active hyperlinks in a manner that allows them to be detected and activated with assistive technology.
- ☑ Descriptive: The link is descriptive enough for the users to know where the link will take them. If the link appears as an URL = fail this sub-category.

E.g. CSULB homepage



www.csulb.edu



- ☑ Checking for both in-document and live hyperlinks

Hyperlinks

1. Open the document with Adobe Acrobat and activate NVDA
 2. Locate a few hyperlinks
 3. Use Links quick keys (TAB or Shift TAB) to check if the program can recognize it as a link, then press enter to see if the link function correctly (take you to the right location)
 4. Tab through a total of 50 links (30 in-document, 20 live) from different section of the document to check for both functionality and descriptive name.
- *** If nothing happens then the link doesn't work

9. Color & Contrast (Color Redundancy)

- ☑ Color redundancy (information is not conveyed by color alone) needs to be checked manually

Changes in classrooms has several other effects. One, for example, is that it can tempt teachers to think that what is taught is equivalent to what is learned—even if they are different. If I assign a reading to my students about the Russian Revolution, it would be nice to assume not only that they have read the same words, but also learned and understood all of what I assigned; others may have read everything but misunderstood the material or remembered only some of it; and still others, unfortunately, may not even read this picture, if asked confidentially. There are ways, of course, to deal helpfully with such diversity of outcomes; for suggestions, see especially [Section 10.1](#) on instructional strategies I adopt, they cannot include assuming that what I teach is the same as what students understand or retain of what I teach.

as dependent on sequencing and readiness

Even teaching and learning creates a secondary issue for teachers, that of educational **readiness**. Traditionally the concept referred to students' preparedness to **start school**, for example, if he or she was in good health, showed moderately good social skills, could take care of personal physical needs (like eating lunch or using the bathroom). [Table 2.6](#) shows a similar set of criteria for determining whether a child is "ready" to learn to read (Copple & Bredekamp, 2006). At older ages (such as in high school), to take a course in physics, for example, a student must first have certain prerequisite experiences, such as studying advanced algebra or calculus. To begin work in a new area, it is also important to mention also studying educational psychology!).

E.g.
Links are presented
with color (blue) and
underline.

9. Color & Contrast (Contrast Ratio)

- ☑ The visual presentation of text and images of text in the digital resource has a contrast ratio of at least 4.5:1 (AA)
- ☑ Large text (18 point +) has a contrast ratio of at least 3:1 (AA)

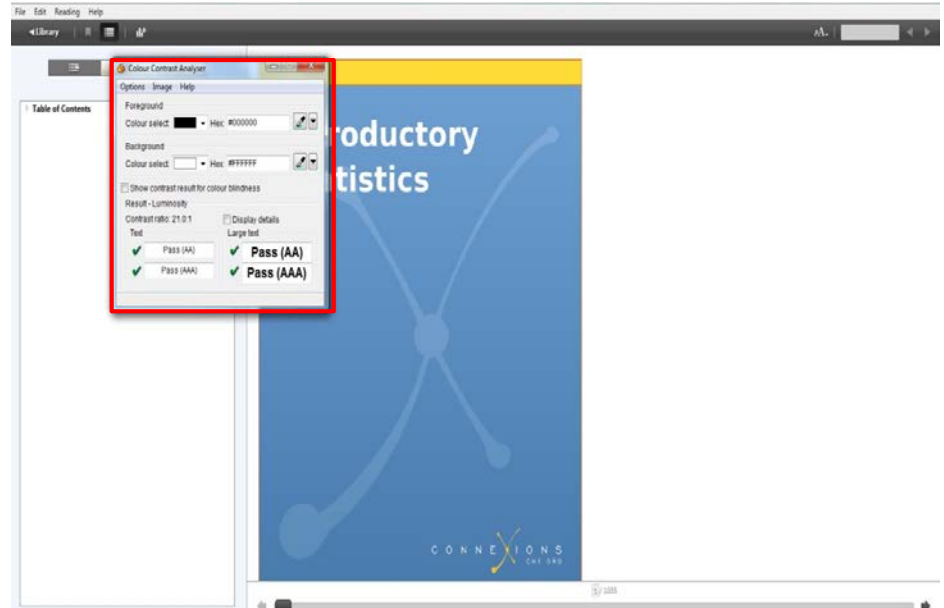
Normal text

Large text

Color & Contrast (Contrast Ratio)

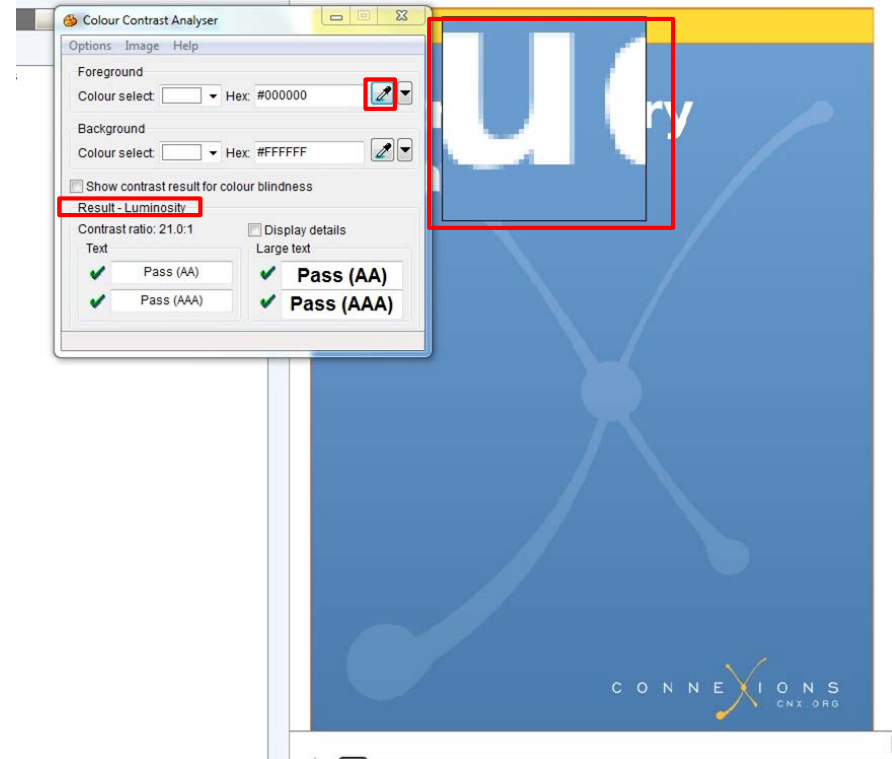
Colour Contrast Analyzer (CCA)

1. [Download Colour Contrast Analyzer Tool](#)
2. Open the document you want to evaluate with Adobe Acrobat
3. Open the CCA application



Color & Contrast (Contrast Ratio)

4. Make sure you are in the **Result -- Luminosity** mode.
5. Click the **Foreground eye dropper** tool, hover over and click the foreground color to select it.

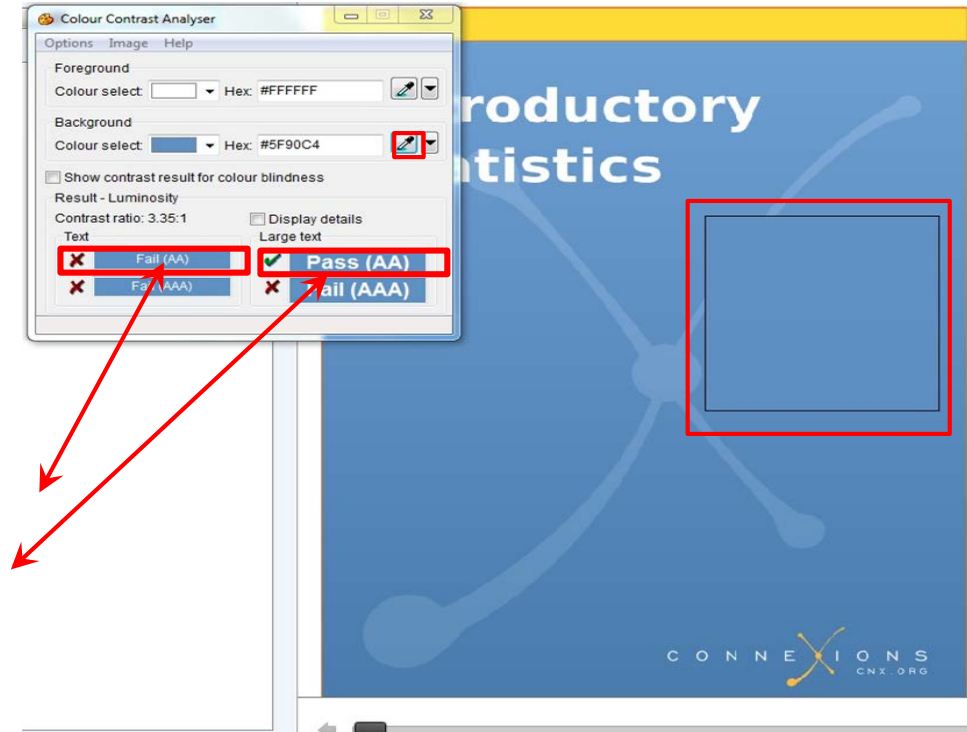


Color & Contrast (Contrast Ratio)

6. Click the **Background eye dropper** tool, hover over and click the background color.
7. Determine if the text is greater than 18 points (e.g. Header).

Small text: Check under "Text" (AA)

Large text (18+): Check under "Large text" (AA)



10. Language

- ☑ The text of the digital resource includes markup that declares the language of the content in a manner that is compatible with assistive technology
- ☑ If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a manner that is compatible with assistive technology

*** Can only be checked if you have the Pro version,
mark N/A for this checkpoint if you don't have Pro/ Complete version

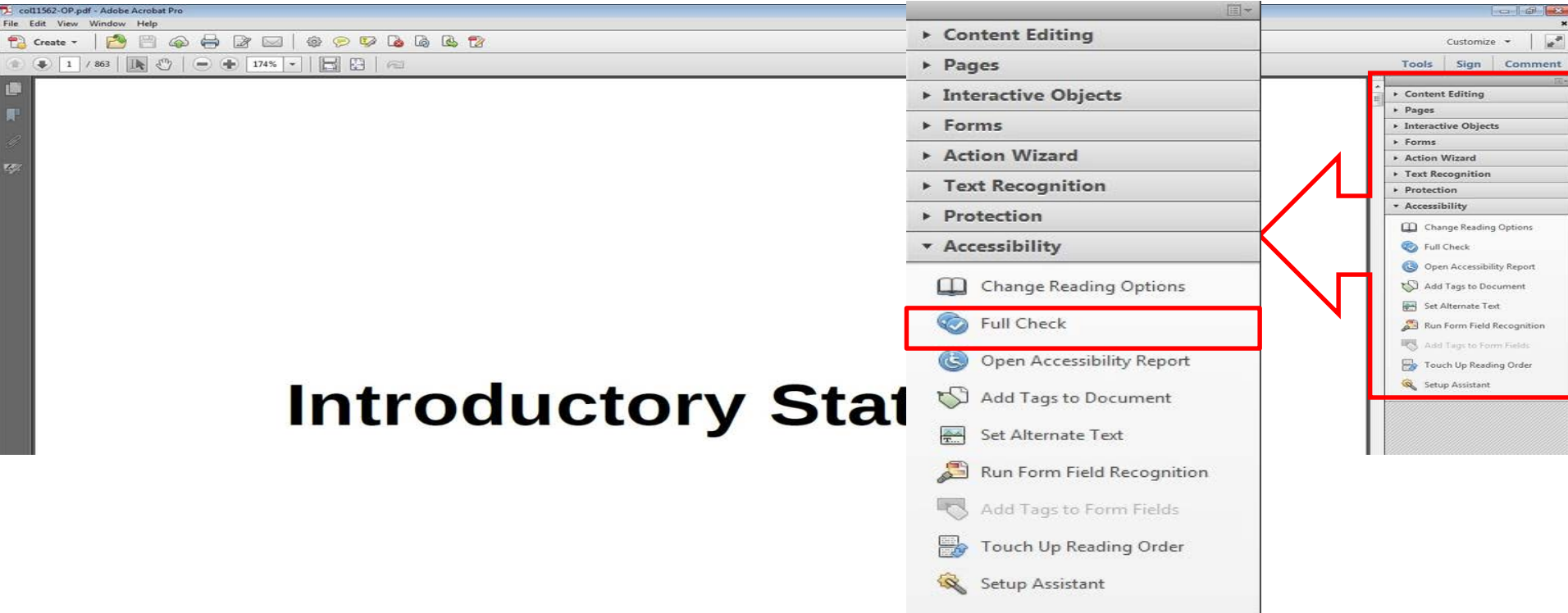
10. Language

- Adobe Acrobat Pro: Accessibility Checker
 1. Open the file in Adobe Acrobat Pro XI
 2. Select Accessibility Tools



10. Language

3. Select Full Check.

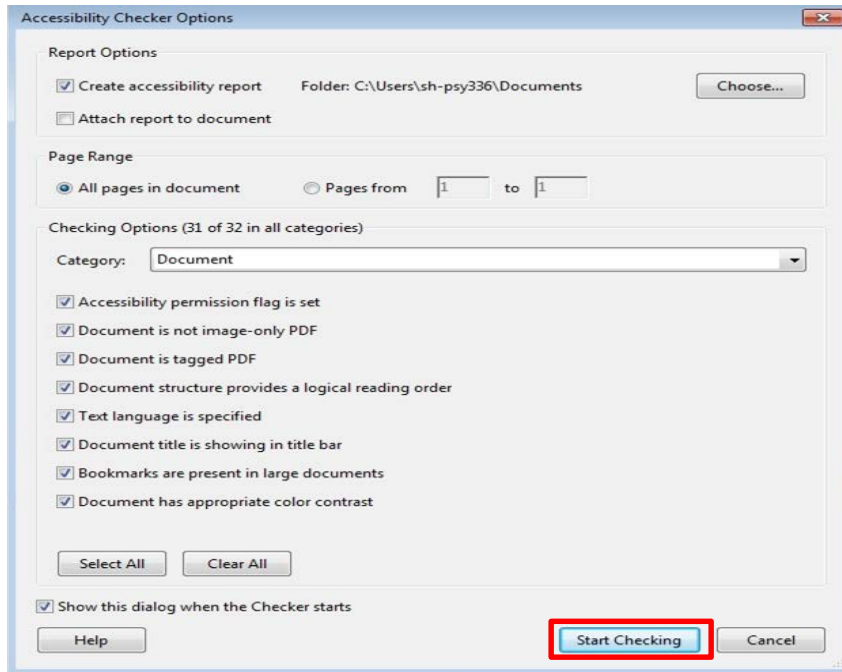


The screenshot displays the Adobe Acrobat Pro interface. The top menu bar includes 'File', 'Edit', 'View', 'Window', and 'Help'. Below the menu bar is a toolbar with various icons. The main content area is mostly blank. On the right side, the 'Tools' panel is open, showing a list of tool categories: Content Editing, Pages, Interactive Objects, Forms, Action Wizard, Text Recognition, Protection, and Accessibility. The 'Accessibility' category is expanded, revealing a list of tools: Change Reading Options, Full Check, Open Accessibility Report, Add Tags to Document, Set Alternate Text, Run Form Field Recognition, Add Tags to Form Fields, Touch Up Reading Order, and Setup Assistant. A red box highlights the 'Full Check' tool. A red arrow points from the 'Full Check' tool in the 'Tools' panel to the 'Full Check' tool in the 'Accessibility' category of the 'Tools' panel.

Introductory Stat

10. Language

4. Select the Start Checking button to begin the full check.



10. Language Results

The screenshot displays the Adobe Acrobat Pro interface with the Accessibility Checker tool open. The left pane shows a tree view of accessibility issues, with 'Primary language - Failed' highlighted by a red box. A red arrow points from this box to the right pane, which shows a detailed list of the document's accessibility issues. In the right pane, 'Primary language - Failed' is also highlighted with a red box. Other issues listed include 'Tagged PDF - Failed', 'Logical Reading Order - Needs manual check', and 'Title - Failed'. The right pane also shows a 'Statistics' section, which is partially visible and contains the word 'Statistics' in large text.

Document (5 issues)

- Accessibility permission flag - Passed
- Image-only PDF - Passed
- Tagged PDF - Failed
- Logical Reading Order - Needs manual check
- Primary language - Failed**
- Title - Failed
- Bookmarks - Passed
- Color contrast - Needs manual check

Page Content (3 issues)

Forms

Alternate Text (5 issues)

- Figures alternate text - Failed
- Nested alternate text - Failed
- Associated with content - Failed
- Hides annotation - Failed
- Other elements alternate text - Failed

Tables (4 issues)

Lists (2 issues)

Headings (1 issue)

Statistics

11. Images

- ☑ Non-decorative images have alternative text that is compatible with assistive technology (or is rendered by an application such as a browser, media player, or reader that offers this functionality)
- ☑ Decorative images are marked with null alternate text or contain markup that allows them to be ignored by assistive technology
- ☑ Complex images, charts, and graphs have longer text descriptions that are compatible with assistive technology

Images

STEPS:

1. Open the document with Adobe Acrobat and activate NVDA
2. Locate an image
3. Use Image quick key (G) or Link quick key (TAB) to check if the program recognize it as an image or link.
4. Check if the image have alternative text

Practice and examples

Images (Additional Manual Check)

- ◉ Check manually: Make sure the descriptions for the images are descriptive enough for both non-decorative images and complex images.
- ◉ Rule of thumb: if the image cannot be described in one sentence, it's complex!

12. Multimedia

- ☑ A synchronized text track (e.g., open or closed captions) is provided with all video content
- ☑ A transcript is provided with all audio content

STEPS:

1. Search the entire document for multimedia content
2. Search for synchronized text tracks or transcripts

***If there's no multimedia, mark N/A in the reports

12. Multimedia

- ☑ Audio/video content is delivered via a media player that is compatible with assistive technology

Not using additional assistive tech to open audio/video content, mark N/A in all reports for this sub-category.

12. Multimedia (Synchronized Text)

1. Find multimedia
2. Search for availability of a text track (e.g., CC)

ALL CONTENT IN "FIRST THINGS FIRST"

First things first

New to art? This is a good place to start. Art gives us access to the way people at different moments in history have understood the world. Jump in and explore!

- Cave painting, contemporary art and everything in between
- ▶ Why look at art?
- A brief history of Western culture
- Common questions about dates
- A brief history of representing of the body in Western sculpture
- A brief history of representing the body in Western painting
- What made art valuable—then and now
- What maps tell us
- ▶ The skill of describing



Why look at art?
Total energy points 162


But maybe sometimes art is everywhere, in the street,

0:52 / 1:55

12. Multimedia (Transcript)

1. Find multimedia
2. Search for availability of a transcript

Why look at art?
Total energy points **266**



0:54 / 0:00

Why look at art? This was the question we posed to several of our colleagues at a conference for museum professionals. Special thanks to Laura Mann, Anna Velez, an anonymous professional, and David Torgersen whose voices and insights are included here.

Options Share Info



Options Share

1/4x 1/2x 1x 1 1/2x 2x

Interactive transcript

Embedded questions

12. Multimedia (Transcript)

Why look at art? This was the question we posed to several of our colleagues at a conference for museum professionals. Special thanks to Laura Mann, Anna Velez, an anonymous professional, and David Torgersen whose voices and insights are included here.

 Options ▾  Share ▾  Info

0:00 [MUSIC PLAYING]

0:05 SPEAKER 1: I think it's important

0:07 that people look at art because we live in a visual world.

0:11 And understanding, and looking at,

0:14 and thinking about the way images

0:16 communicate in all kinds of ways is important to being alive

0:21 today.

0:22 SPEAKER 2: If one has heightened visual acumen, which

0:26 you get from spending time looking at things, whether it's

13. Flickering

- ☑ Resources should not contain anything that flashes more than three times in any one-second period

Note: No examples have been found for this format

If there is no flickering = Pass this checkpoint

14. STEM

STEM: Science, Technology, Engineering, and Math

- ☑ STEM content is marked up in a manner that is compatible with assistive technology
- ☑ The resource conveys both the notation (presentation) and meaning (semantics) of the STEM content
- ☑ Including but not limited to:
 - Figures
 - Graphs
 - Tables
 - Equations

13. STEM

STEPS:

1. Open up the document with Adobe Acrobat
2. Locate a STEM content
3. Select the sentence right before the content
4. Use Numpad + to start reading at current location
5. Check if the reader reads the content correctly

Reading Text

Command	Description
← or Numpad 1	Say Prior Character
→ or Numpad 3	Say Next Character
Numpad 2	Say Current Character
Numpad 5	Say Word
Numpad 5 twice quickly	Spell Word
Ctrl + ← or Numpad 4	Say Prior Word
Ctrl + → or Numpad 6	Say Next Word
↑ or Numpad 7	Say Prior Line
↓ or Numpad 9	Say Next Line
NVDA + ↑ or Numpad 8	Say Current Line
NVDA + ↑ twice quickly	Spell Current Line
NVDA + ↓ or Numpad +	Read all starting at current position
Shift + Numpad 7	Top line
Shift + Numpad 9	Bottom Line
Shift + Numpad 1	Start of Line
Shift + Numpad 3	End of Line

STEM

If the image itself does not contain an Alt tag but the content/text around it does have a notation (presentation) and meaning (semantics) of the STEM content with good description then we may PASS it with a note included.



Figure 1.15 Biologists may choose to study *Escherichia coli* (*E. coli*), a bacterium that is a normal resident of our digestive tracts but which is also sometimes responsible for disease outbreaks. In this micrograph, the bacterium is visualized using a scanning electron microscope and digital colorization. (credit: Eric Erbe; digital colorization by Christopher Pooley, USDA-ARS)

STEM

Successive Ionization Energies (kJ/mol)

	Na	Mg	Al	Si	P	S	Cl	Ar
IE ₁	496	738	578	787	1012	1000	1251	1520
IE ₂	4562	1451	1817	1577	1903	2251	2297	2665
IE ₃	6912	7733	2745	3231	2912	3361	3822	3931
IE ₄	9543	10540	11575	4356	4956	4564	5158	5770
IE ₅	13353	13630	14830	16091	6273	7013	6542	7238
IE ₆	16610	17995	18376	19784	22233	8495	9458	8781
IE ₇	20114	21703	23293	23783	25397	27106	11020	11995

Table 4.1

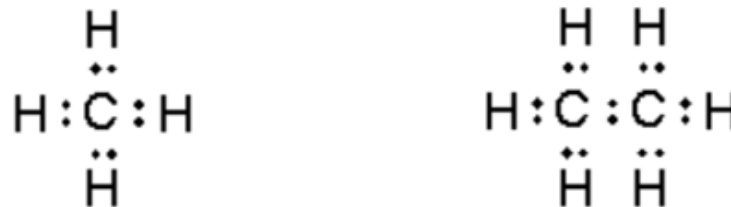


Figure 6.2

Labels, descriptions, or tags should be descriptive

STEM

- ◉ Amount of Material to Be Evaluated

For BOTH Markup and Notation, find:

10 figures

10 graphs

10 equations

10 tables

***As Applicable:

If there is no STEM content, mark N/A on the report***

15. Interactive Elements

☑ Keyboard

Interactive elements allow for keyboard-only operation
WITH and WITHOUT assistive tech

STEPS:

1. Use the TAB key to navigate the menu
2. Items that are selected will have a box around the link
3. Use the ENTER key to select a link or other item

***As Applicable:

If there is no Interactive Elements, mark N/A on the report***

Interactive Elements

- Markup

Each interactive element conveys information to assistive technology regarding the element's

- name

- type

- status

***As Applicable:

If there is no Interactive Elements, mark N/A on the report***

Interactive Elements

- ☑ Text prompts

The following are conveyed with assistive technology:

- ☑ Instructions
- ☑ Prompts
- ☑ Error messages

***As Applicable:

If there is no Interactive Elements, mark N/A on the report***

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This work is licensed under a Creative Commons Attribution 4.0 International License.
This workforce solution was created through a cooperative agreement between the U.S. Department of Labor's Employment and Training Administration and the California State University-Multimedia Educational Resource for Learning and Online Teaching (MERLOT).