SKILLSCOMMONS ACCESSIBILITY CHECKPOINTS

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

SKILLS COMMONS
open for learning

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)

Non-Assistive Technologies Evaluation

The “Non-Assistive Technologies (NAT) Evaluations” address readily available tools such as the keyboard and navigation typically found on our devices and are typically available to the general public

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

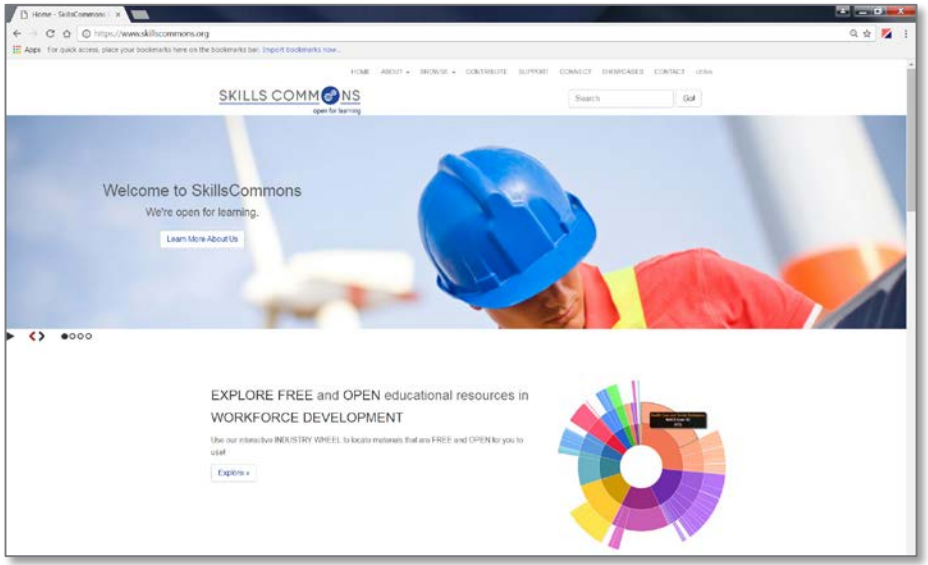
STEPS:

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

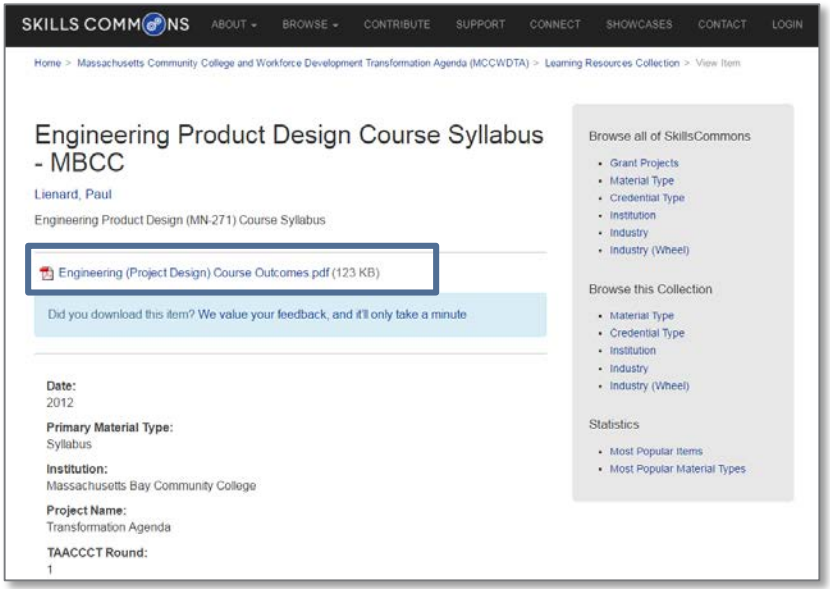


Accessing PDF documents

STEPS:

2. Search for and download desired PDFdocument

Click on PDF document to download.



Skills Commons Accessibility Checkpoints

All information obtained from the WORD 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.

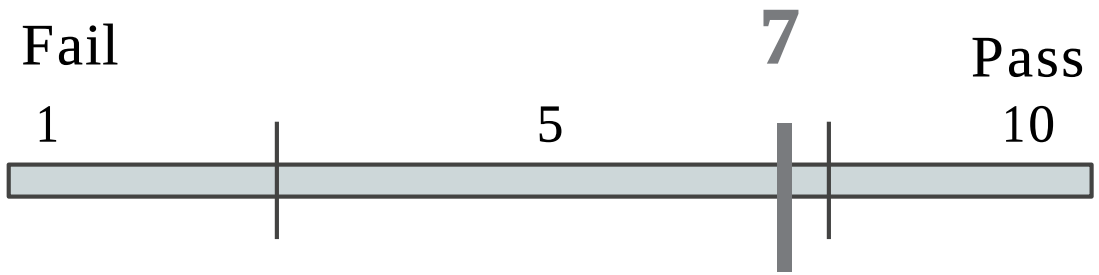
Pass, Fail, or N/A?

- Evaluate material based on the amount of material included in the checklist

- Example: Evaluate 10 links for flickering
  7 / 10 links - PASS
  6/10 links - FAIL
  N/A cannot be used here!

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

- Adobe Acrobat Pro XI or DC (DC: Download, $449)
- Color Contrast Analyzer- CCA (Download)

** Following screenshots are done with Adobe Acrobat Pro XI

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

- Amount of Material to Be Evaluated

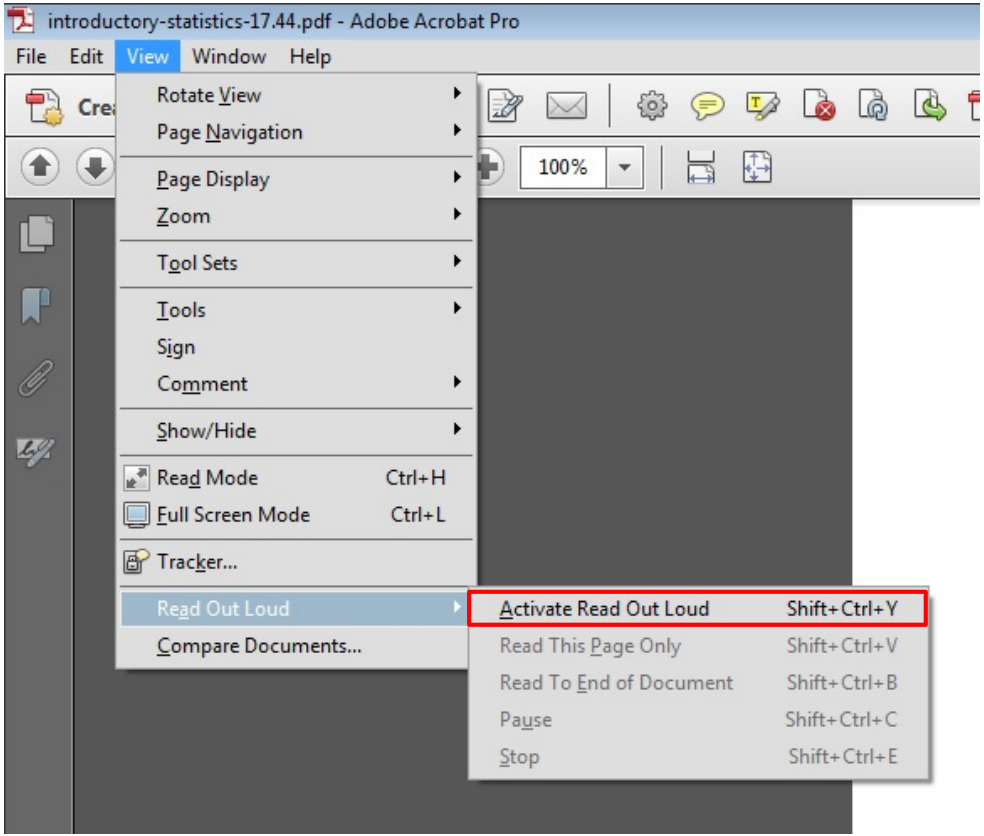
  *** Sample 5 pages ***

2. Text Access

STEPS:

1. Open file with Adobe Acrobat XI Pro
2. View > Read Out Loud > Activate
3. Select Read This Page Only when you are on the page you would like to evaluate.
   - Amount of Material to Be Evaluated
     *** Sample 5 pages ***

2. Text Access



3. Text Adjustment (Size)

☑ The text allows the user to adjust the font size

3. Text Adjustment (Size)

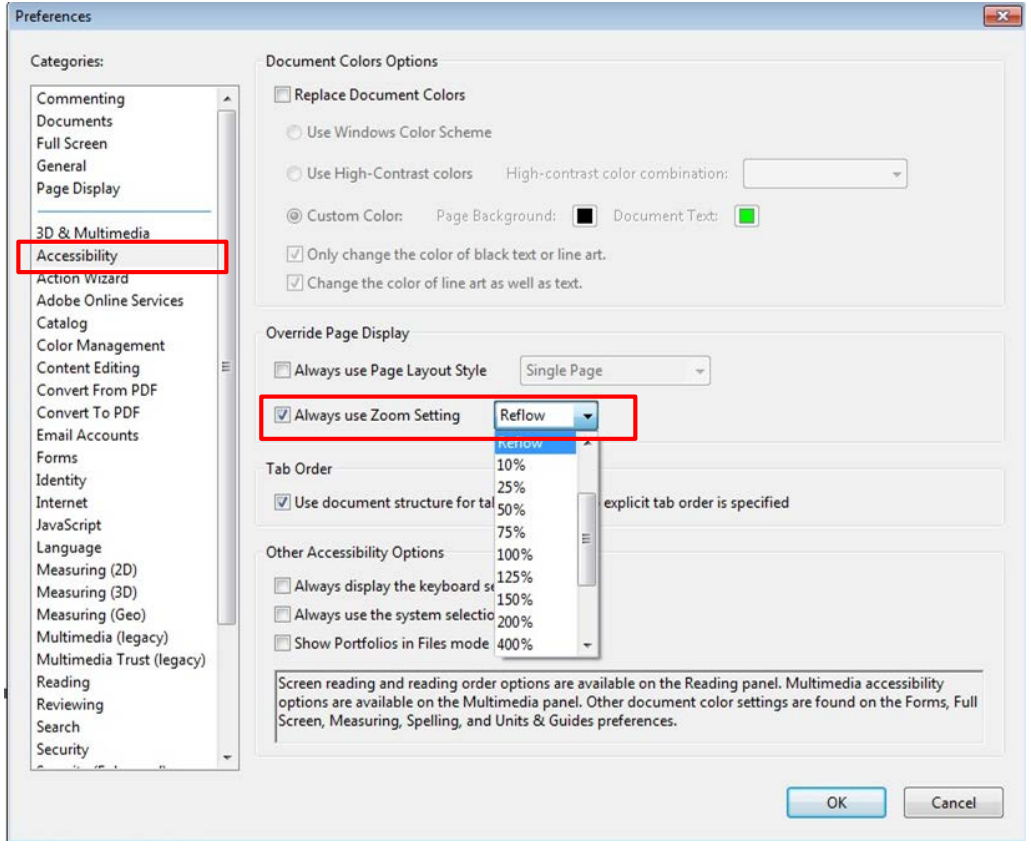
STEPS:

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)

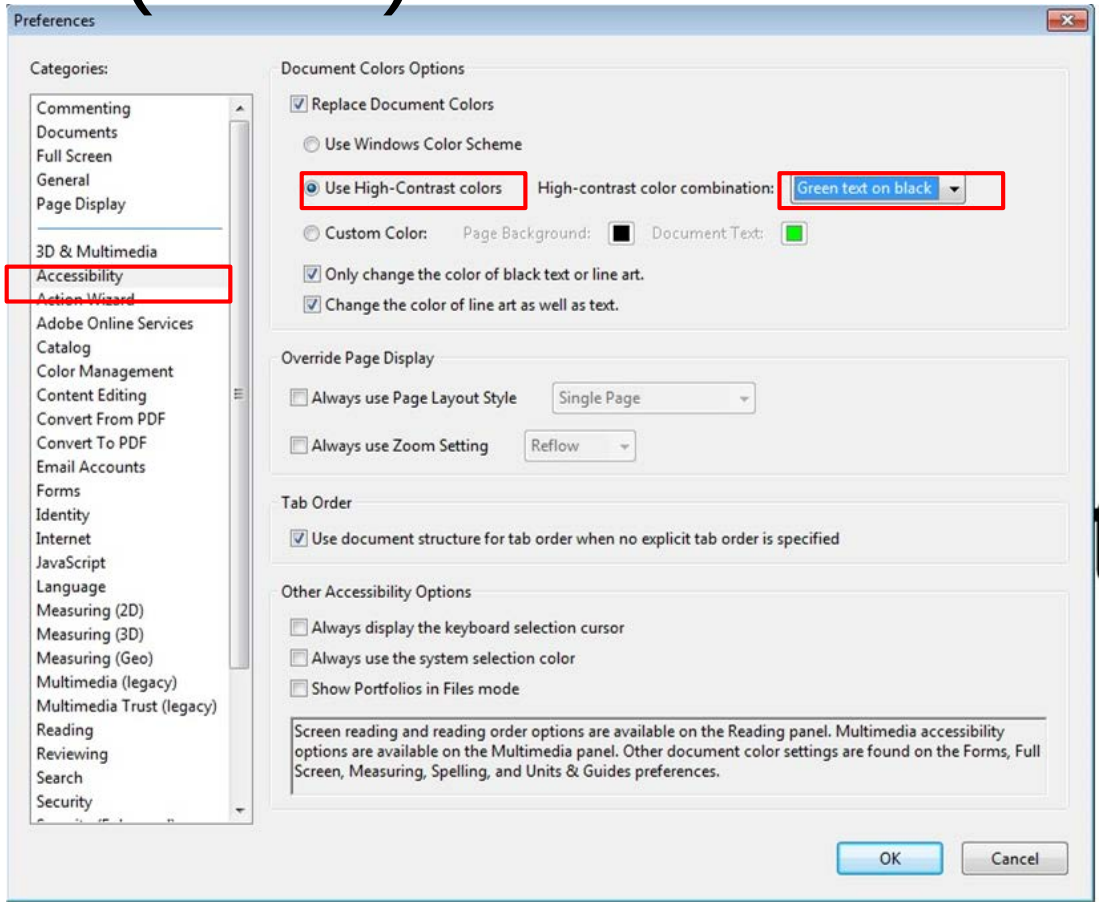
STEPS:

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)

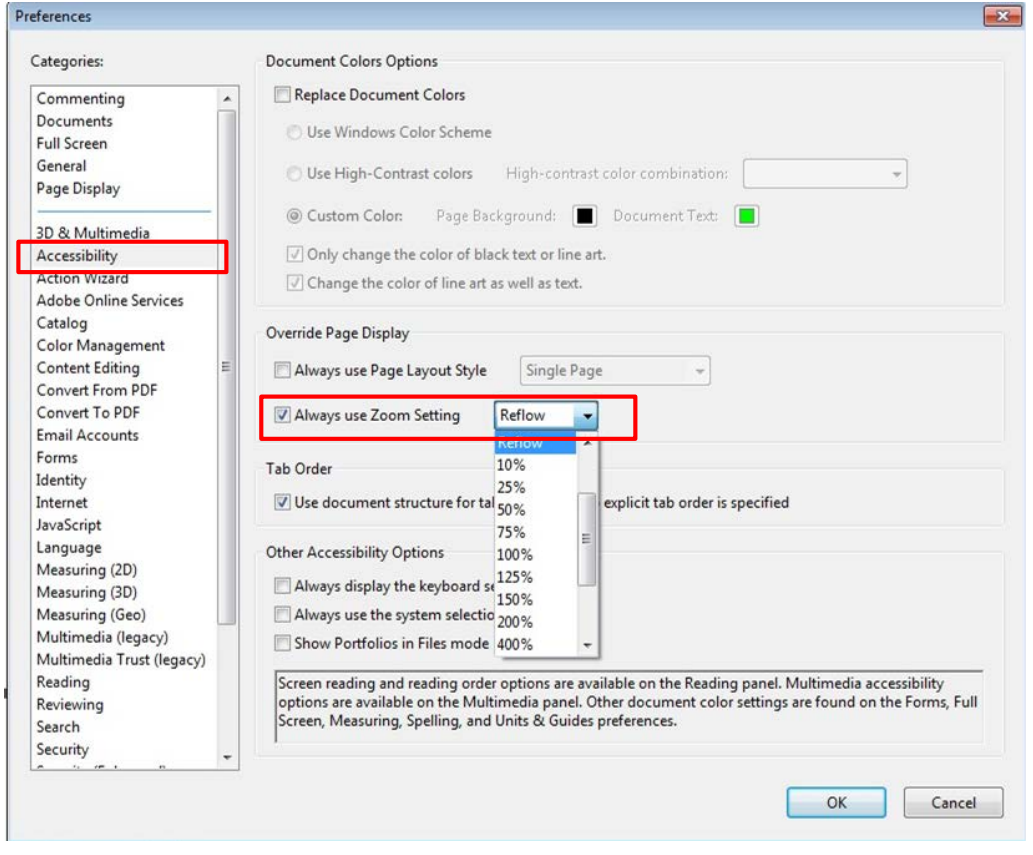
STEPS:

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 file with Adobe Acrobat XI Pro
2. Locate 5 pages (include page # in the reports) that contains a more complicated layout
3. Use the Read Out Loud function to check if the reading order is logical (please refer to checkpoint #2 for instructions on Read Out Loud)

    - Amount of Material to Be Evaluated

    *** Sample 5 pages ***

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

6. Structural Markup / Navigation

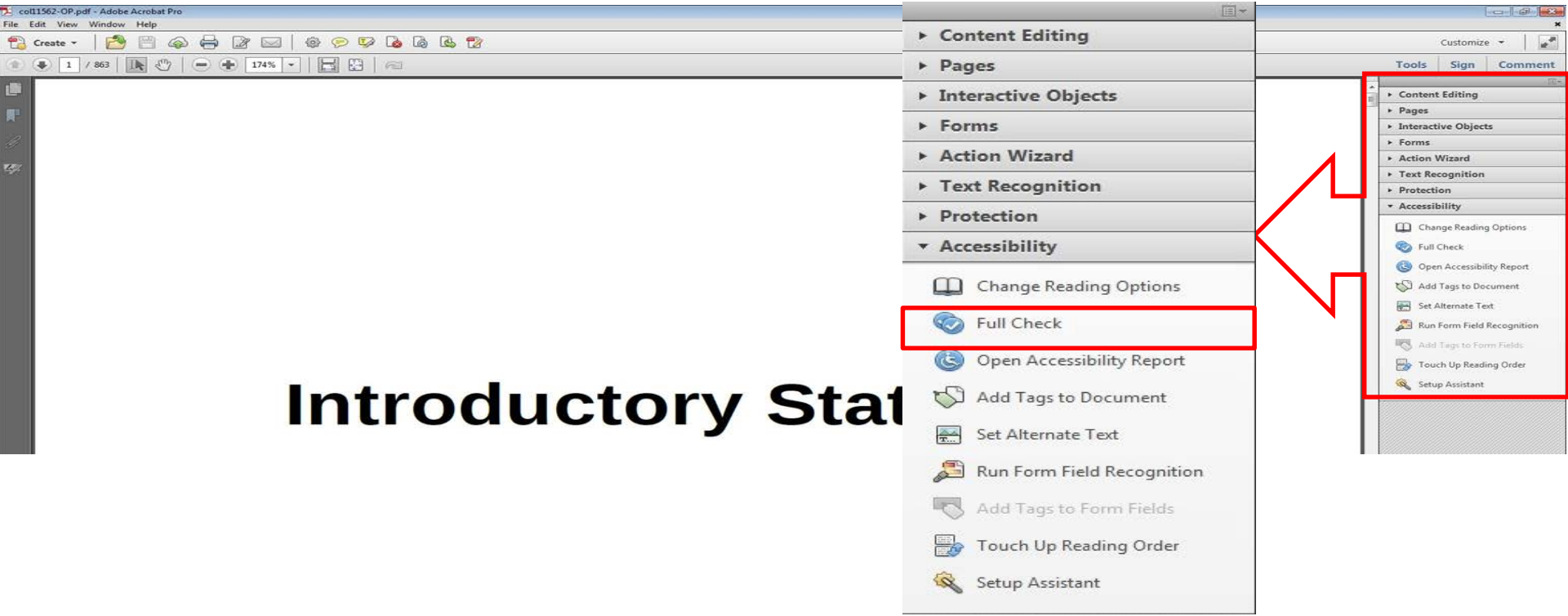
- ☑ If the text of the digital resource is delivered within an ebook reader application, a method is provided that allows users to bypass the reader interface and move directly to the text content that is compatible with assistive technology

6. Structural Markup / Navigation

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

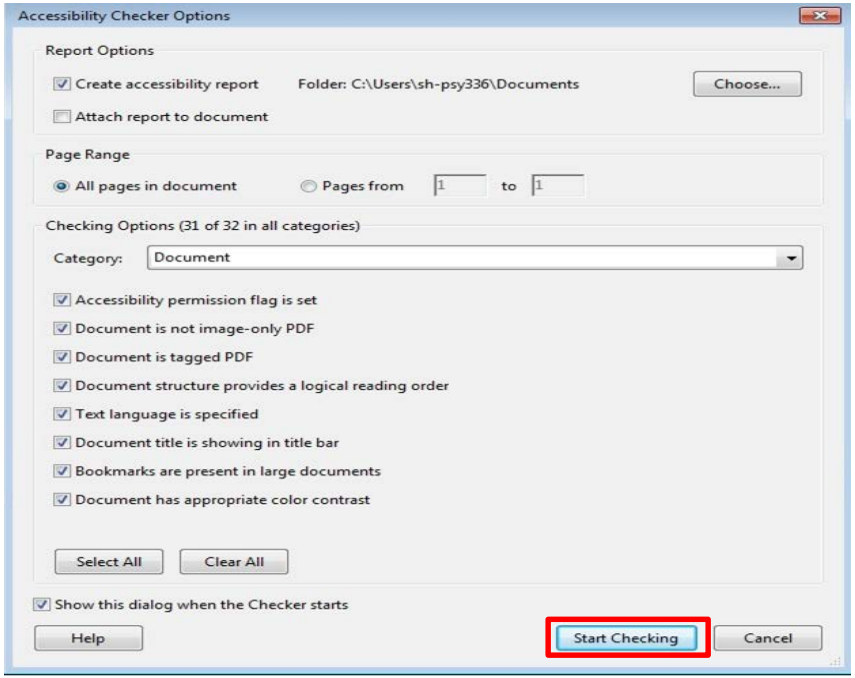
6. Structural Markup / Navigation

3. Select Full Check.



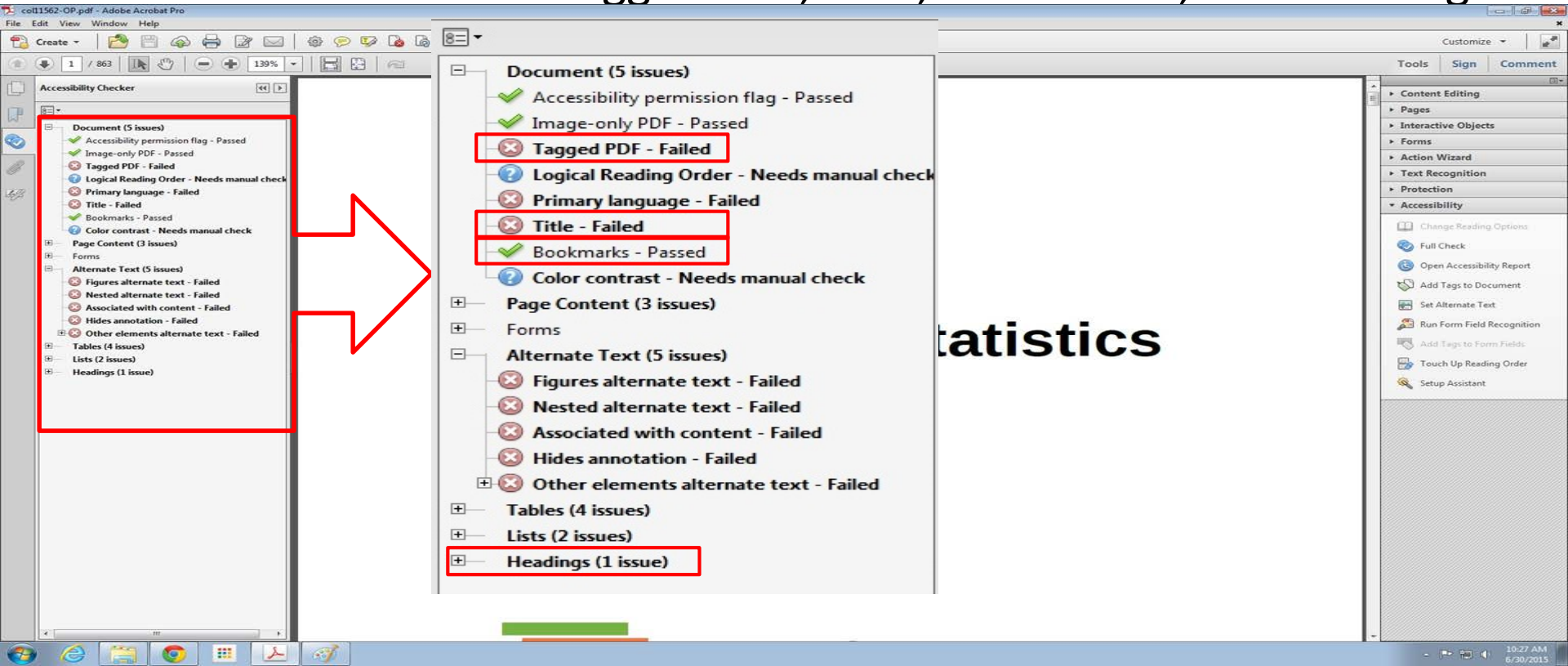
6. Structural Markup / Navigation

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



6. Structural Markup / Navigation

Results: Check for Tagged PDF, Title, Bookmarks, and Headings



7. Tables

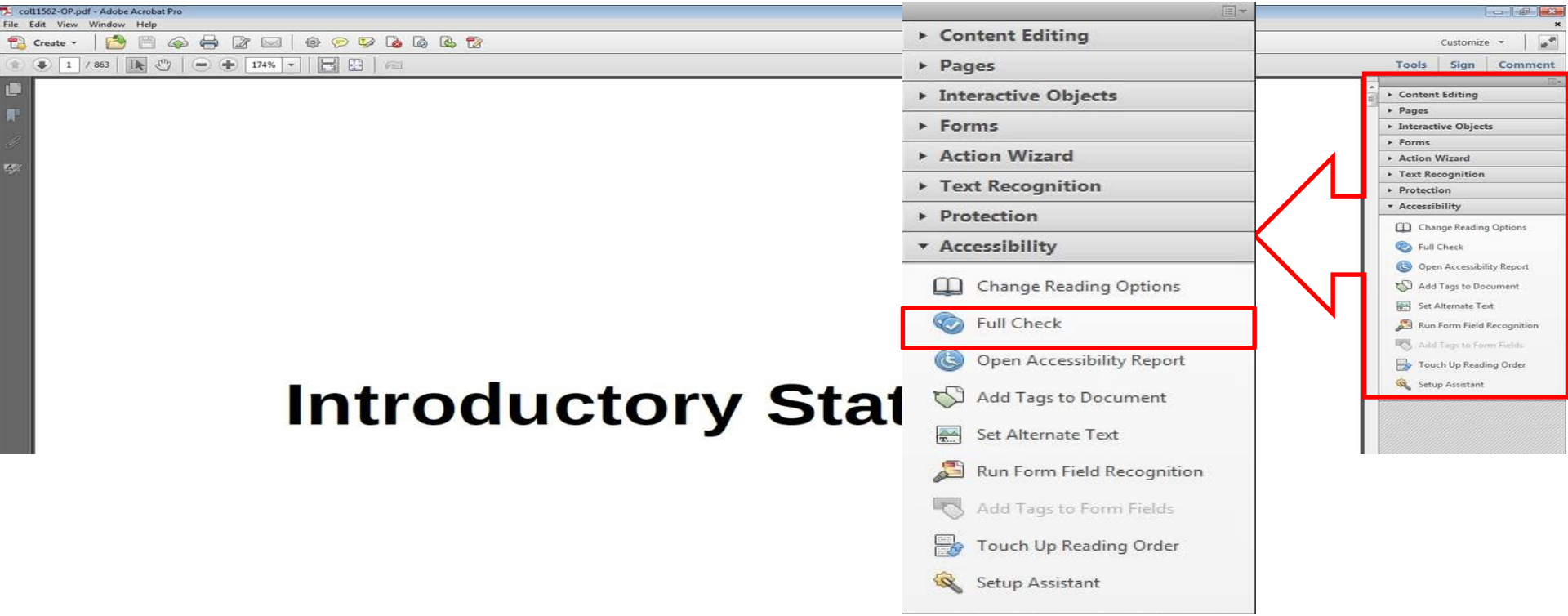
- ☑ Data tables include markup (e.g. tags or styles) that identifies row and column headers in a manner that is compatible with assistive technology

7. Tables

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

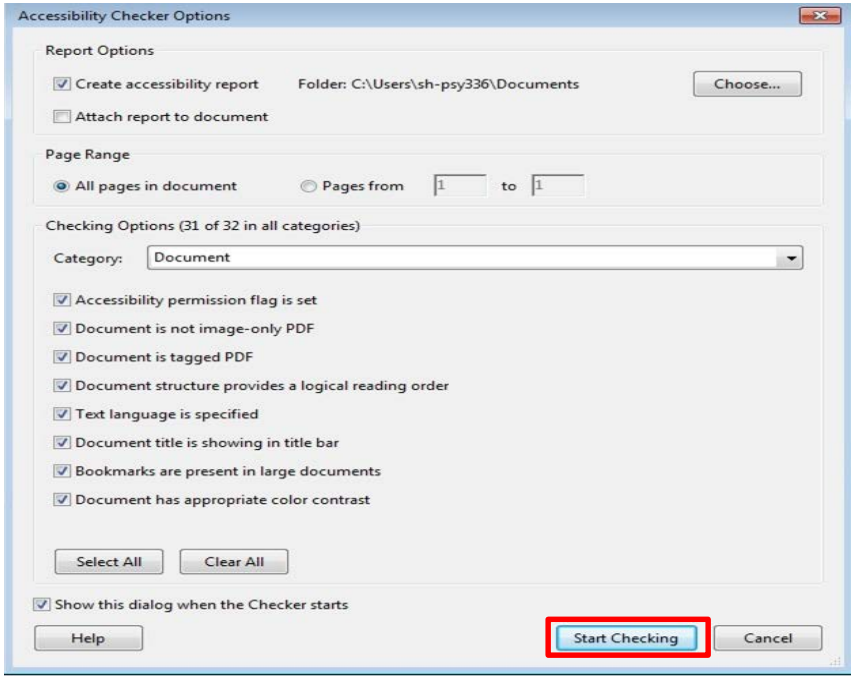
7. Tables

3. Select Full Check.

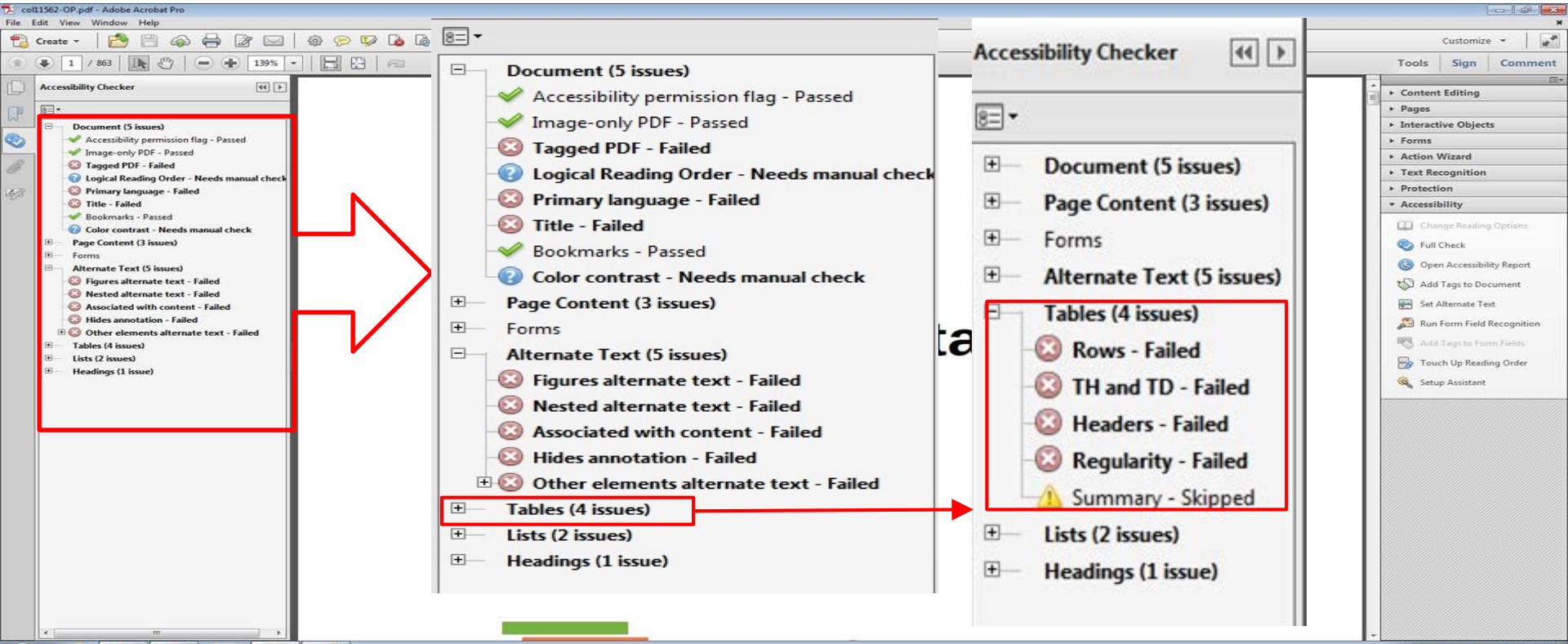


7. Tables

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



7. Tables
Results



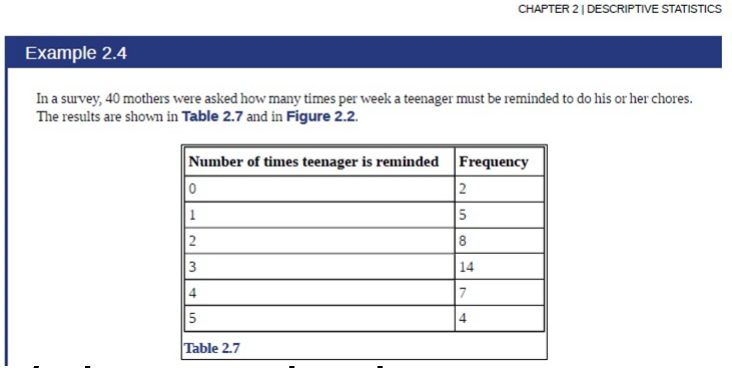
7. Tables

- Additional Manual Check

STEPS:

1. Select a table in the text
2. Activate the read-out-loud function (please refer to Checkpoint #2)
3. Use the read-out-loud function to read the current page (Shift + Ctrl + V)
4. Repeat the steps to check for 5 tables

*** Sample 5 tables ***



Example 2.4

In a survey, 40 mothers were asked how many times per week a teenager must be reminded to do his or her chores. The results are shown in **Table 2.7** and in **Figure 2.2**.

Number of times teenager is reminded	Frequency
0	2
1	5
2	8
3	14
4	7
5	4

Table 2.7

8. Hyperlinks

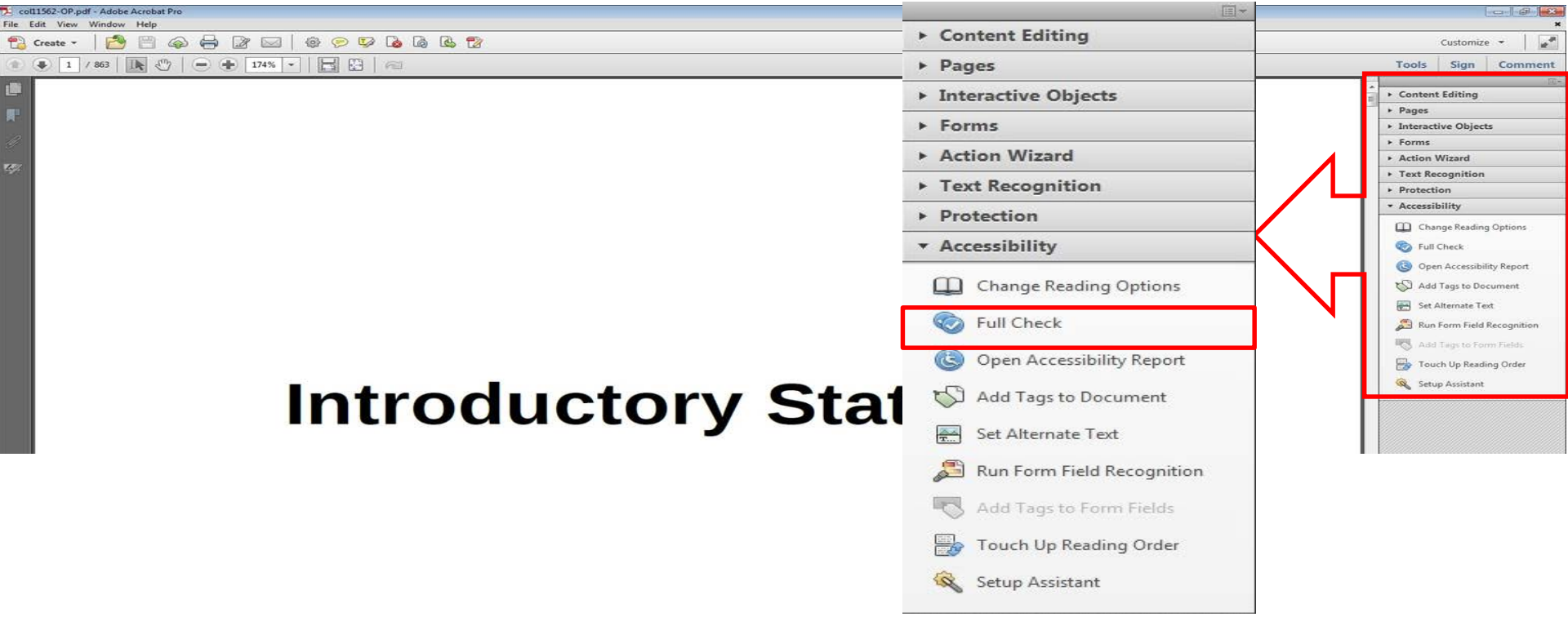
- ☑ Functionality: Links (e.g. website or email addresses) within the text of the digital resource are rendered as active hyperlinks in a manner that allows them to be detected and activated with assistive technology
- ☑ Descriptive: The link is descriptive enough for the users to know where the link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

8. Hyperlinks (in-document)

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

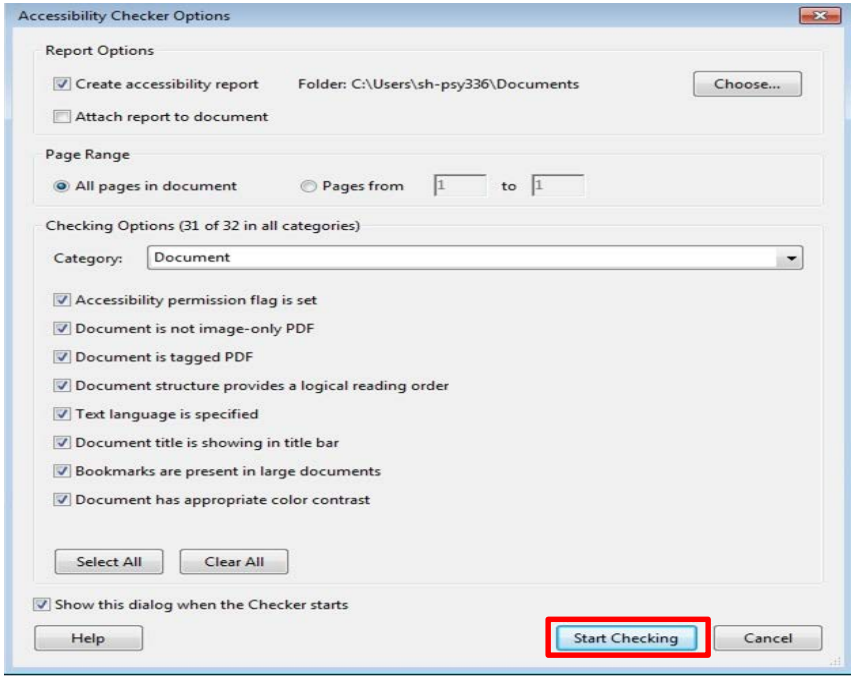
8. Hyperlinks (in-document)

3. Select Full Check.



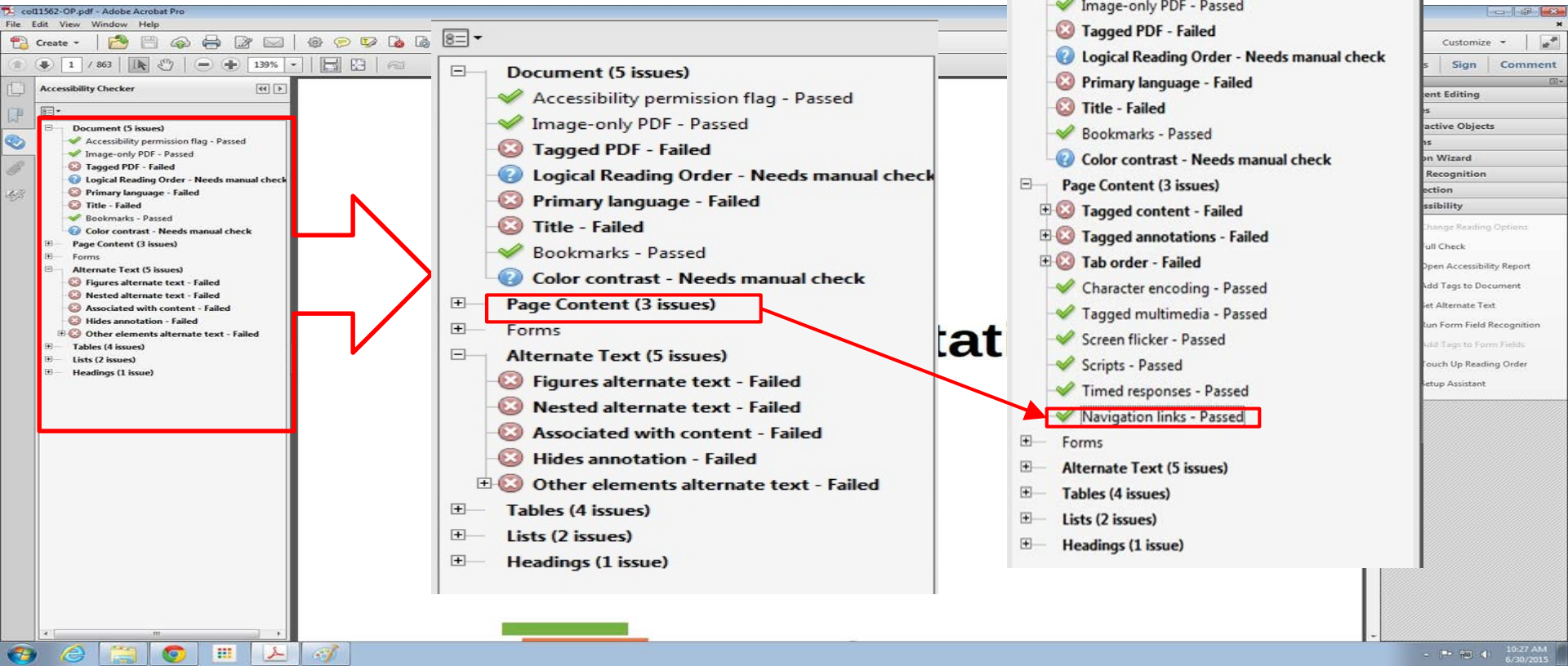
8. Hyperlinks (in-document)

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



8. Hyperlinks (in-documen

Results



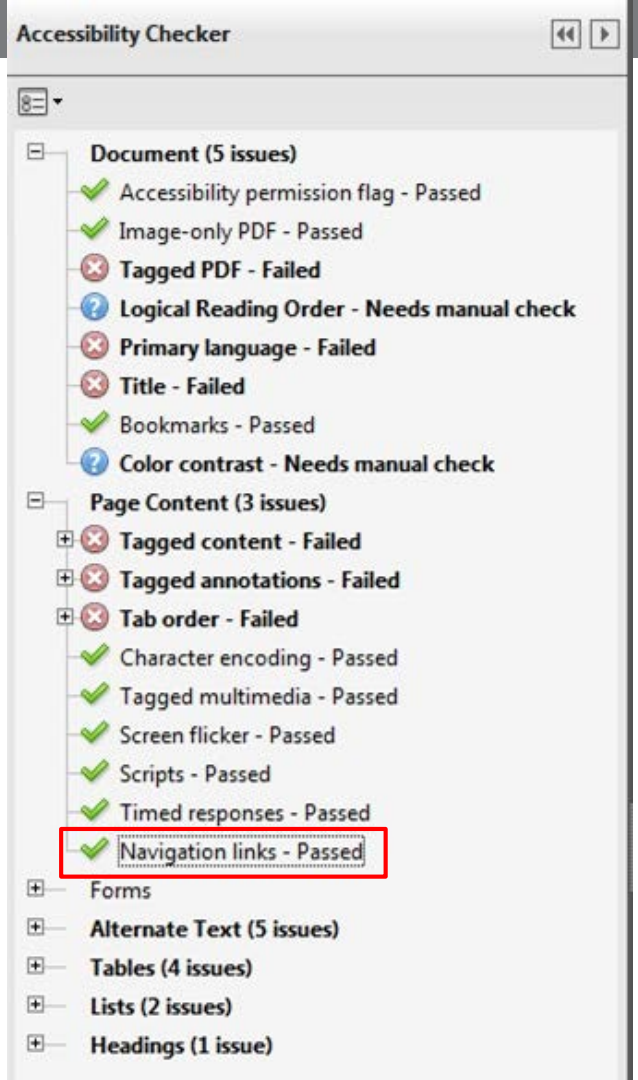
8. Hyperlinks (in-document)

1. *Check for Navigation links in Results*
2. *Manual check*

- Amount of Material to Be Evaluated
  *** Sample 30 in-book links ***
  10 from the beginning of the document
  10 from the middle of the document
  10 from the end of the document

Ex. Links that takes you to a certain chapter

Check for descriptive links when going through each link manually.



8. Hyperlinks (Live)

Hyperlink that takes you somewhere outside of the document

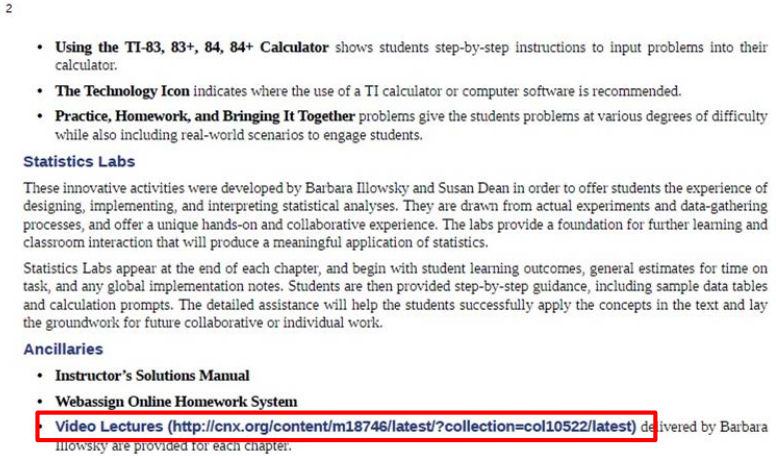
Ex. Links to a live website

STEPS:

Use Tab key to navigate through links > Press enter when you find a live hyperlink (Check for functionality and descriptive link at the same time)

- Amount of Material to Be Evaluated

*** Sample 20 website hyperlinks ***



2

- **Using the TI-83, 83+, 84, 84+ Calculator** shows students step-by-step instructions to input problems into their calculator.
- **The Technology Icon** indicates where the use of a TI calculator or computer software is recommended.
- **Practice, Homework, and Bringing It Together** problems give the students problems at various degrees of difficulty while also including real-world scenarios to engage students.

Statistics Labs

These innovative activities were developed by Barbara Illowsky and Susan Dean in order to offer students the experience of designing, implementing, and interpreting statistical analyses. They are drawn from actual experiments and data-gathering processes, and offer a unique hands-on and collaborative experience. The labs provide a foundation for further learning and classroom interaction that will produce a meaningful application of statistics.

Statistics Labs appear at the end of each chapter, and begin with student learning outcomes, general estimates for time on task, and any global implementation notes. Students are then provided step-by-step guidance, including sample data tables and calculation prompts. The detailed assistance will help the students successfully apply the concepts in the text and lay the groundwork for future collaborative or individual work.

Ancillaries

- **Instructor's Solutions Manual**
- **Webassign Online Homework System**
- **Video Lectures (http://cnx.org/content/m18746/latest/?collection=col10522/latest)** delivered by Barbara Illowsky are provided for each chapter.

9. Color & Contrast (Color Redundancy)

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

- Amount of Material to Be Evaluated

  *** Sample 5% of the pages ***

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

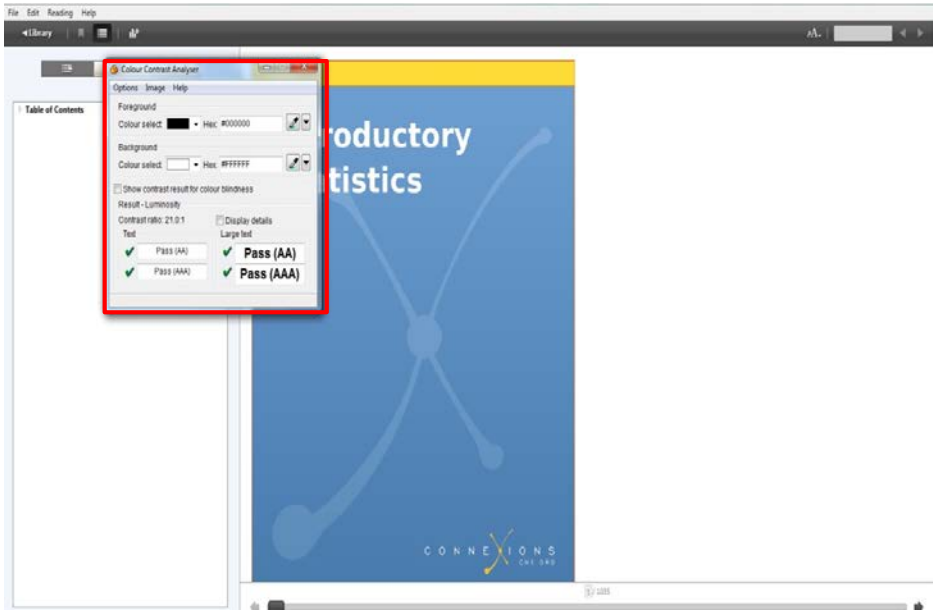
STEPS:

1. Download Colour Contrast Analyzer Tool
2. Open the document you want to evaluate
3. Open the application
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.
6. Click the **Background eye dropper** tool, hover over and click the background color.
7. Check and compare the ratio to 4:5:1

Color & Contrast (Contrast Ratio)

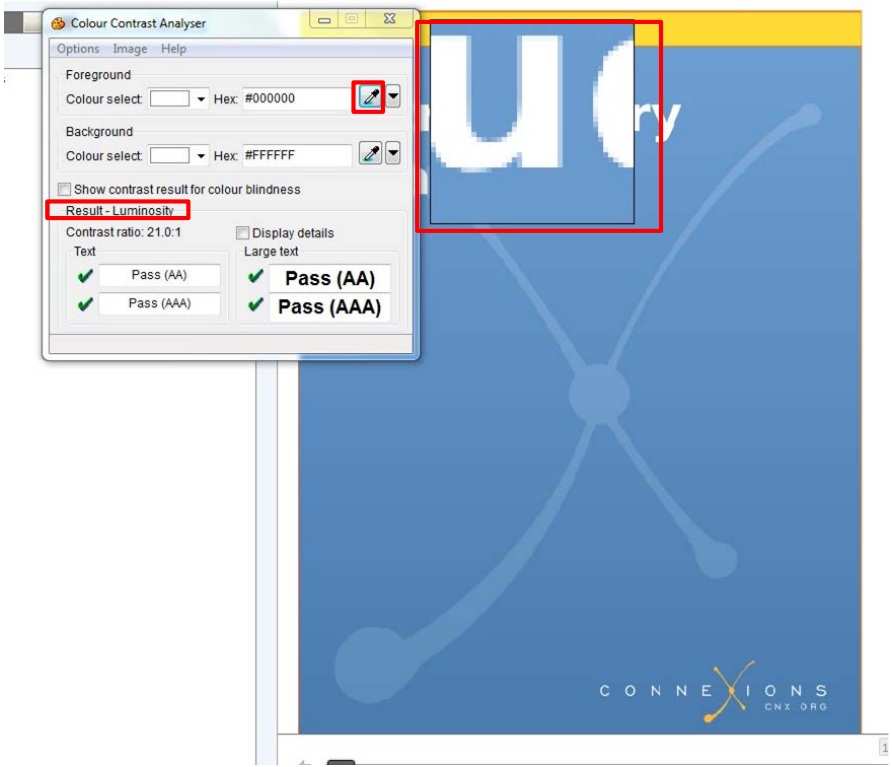
Colour Contrast Analyzer (CCA)

1. Download Colour Contrast Analyzer Tool
2. Open the document you want to evaluate
3. Open the 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.

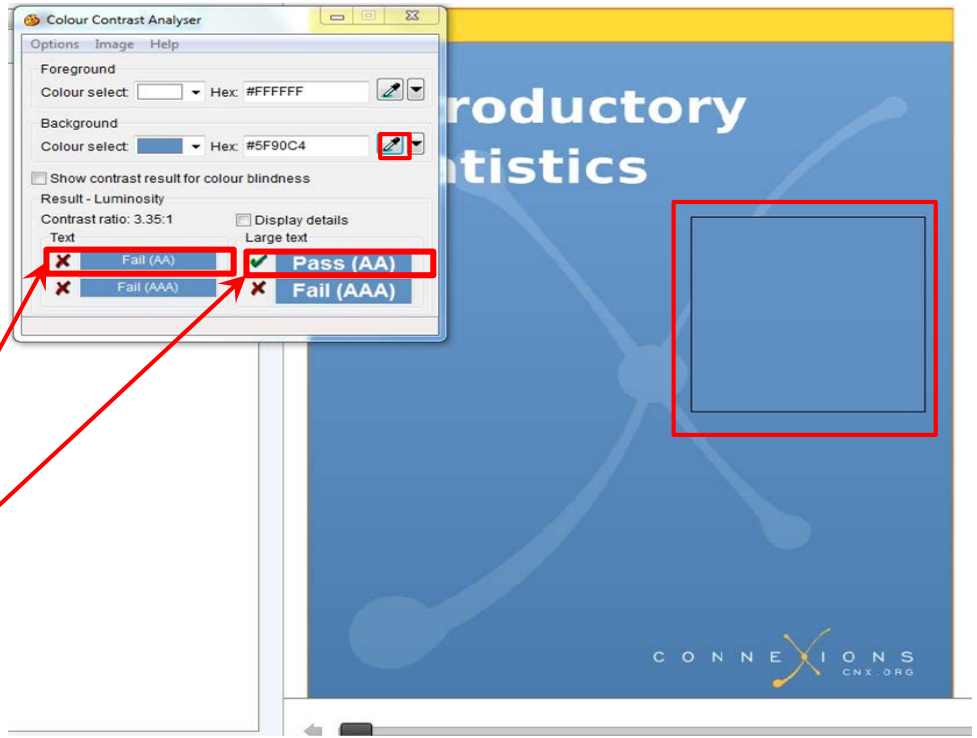


Color & Contrast (Contrast Ratio)

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”

   Large text (18+): Check under “Large text”



Color & Contrast (Contrast Ratio)

- Amount of Material to Be Evaluated

  Contrast Ratio

  *** Sample 5% of the pages ***

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

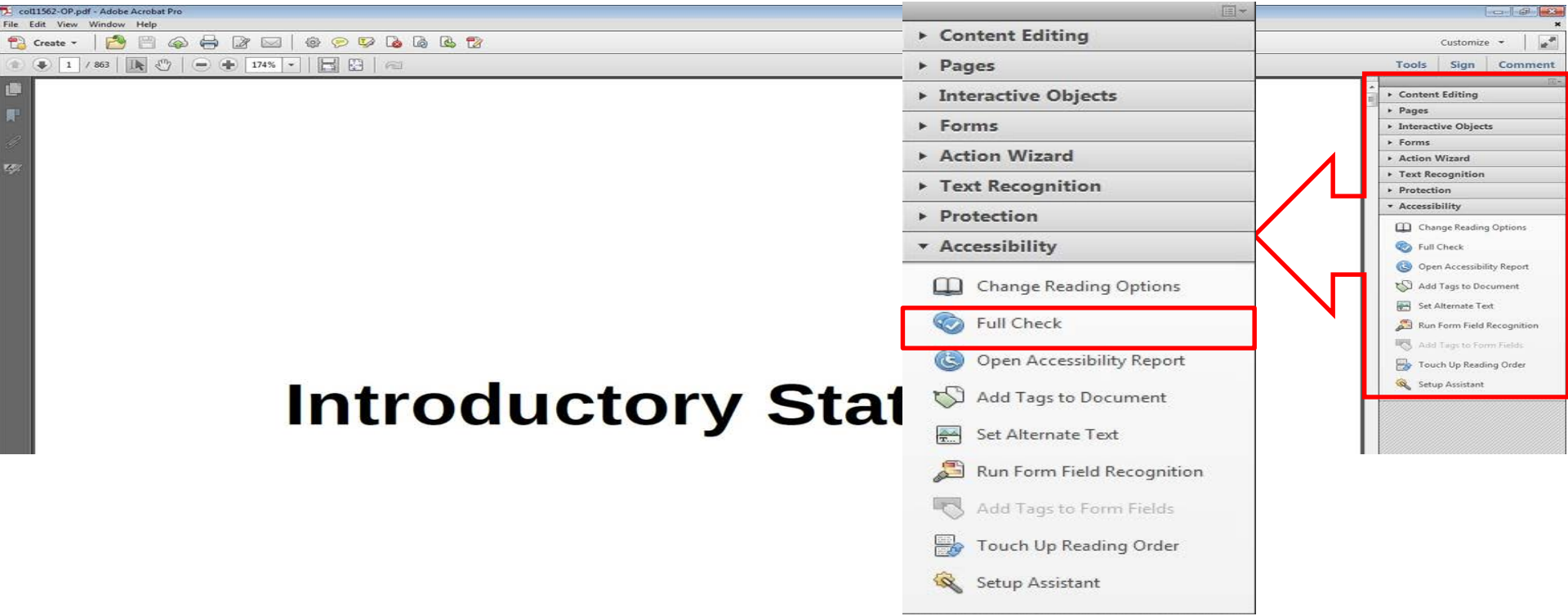
- ☑ If the digital resource includes passages in a foreign language, these passages include markup that declares the language in a manner that is compatible with assistive technology

10. Language

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

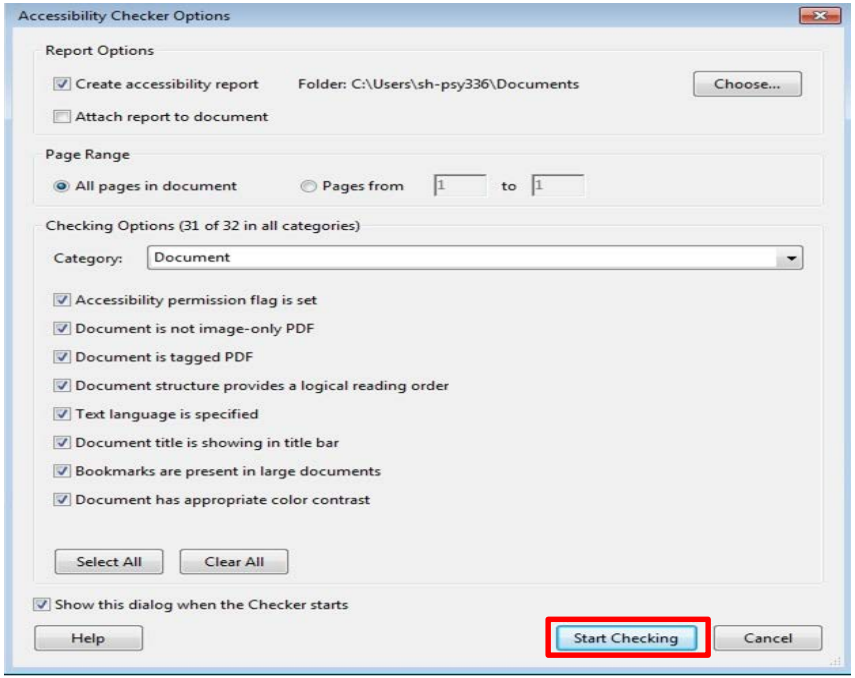
10. Language

3. Select Full Check.



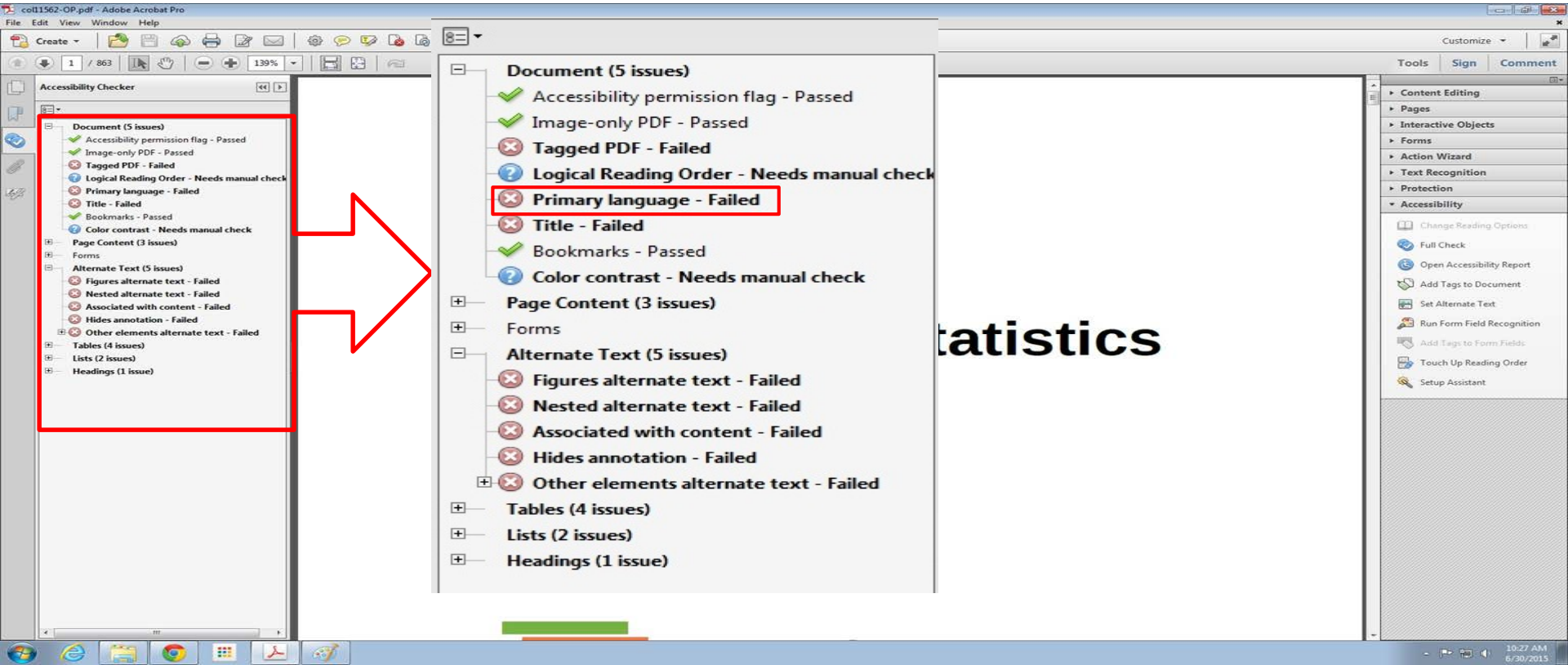
10. Language

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



10. Language

Results



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

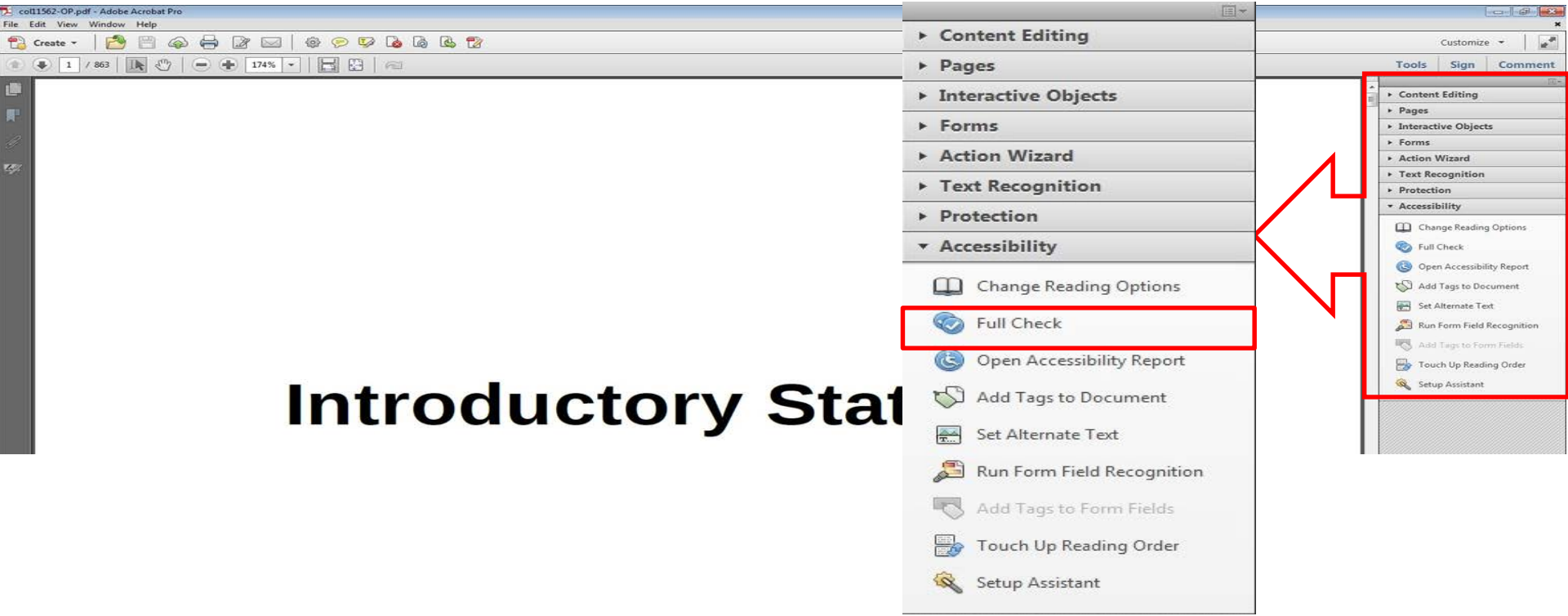
- ☑ Complex images, charts, and graphs have longer text descriptions that are compatible with assistive technology

11. Images

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

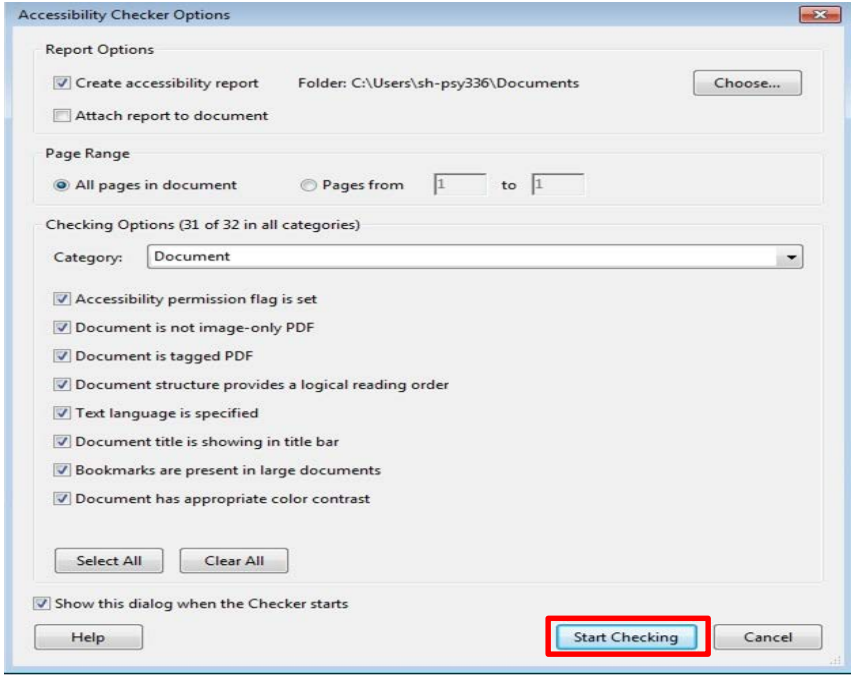
11. Images

3. Select Full Check.



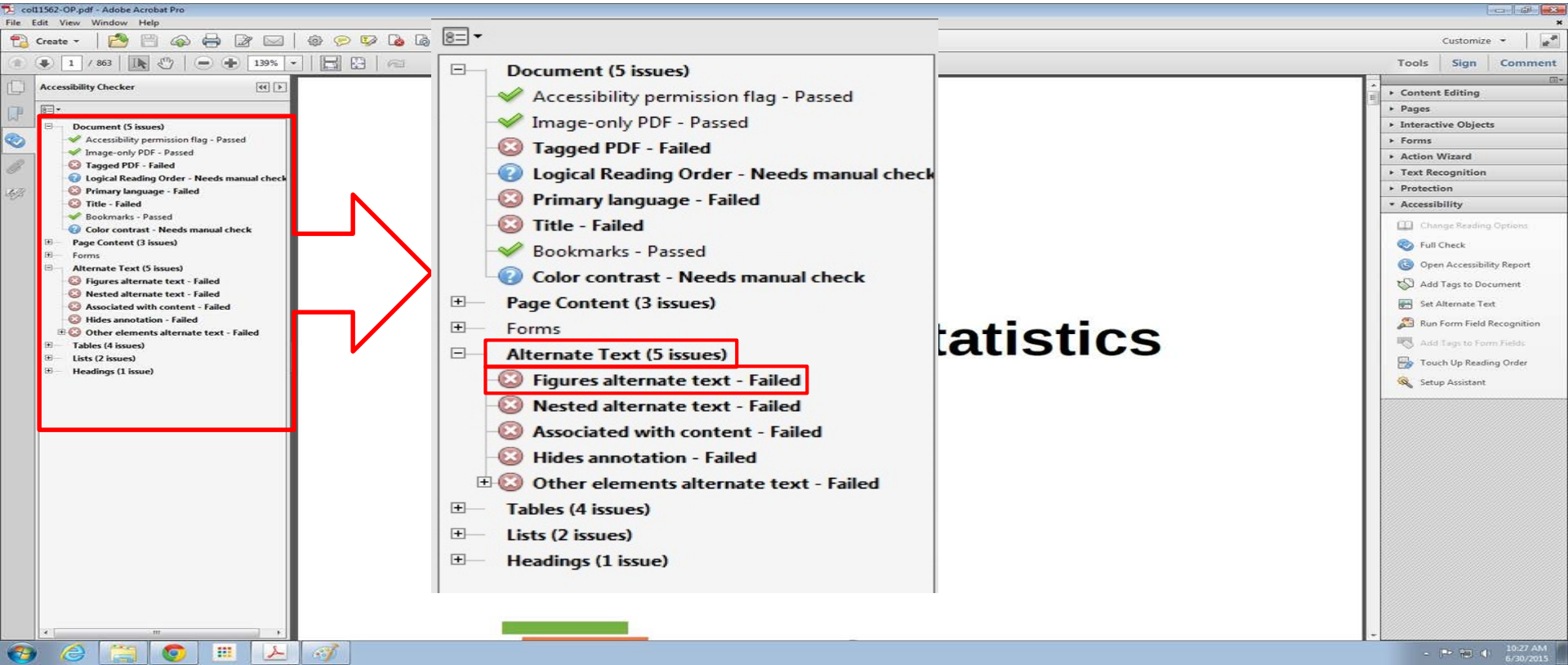
11. Images

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



11. Images

Results



11. Images (Additional Manual Check)

- Check manually: Make sure the descriptions for the images are descriptive enough for both non-decorative images and complex images.

- Amount of Material to Be Evaluated for non-decorative and complex images:
  *** Sample 10 images each***

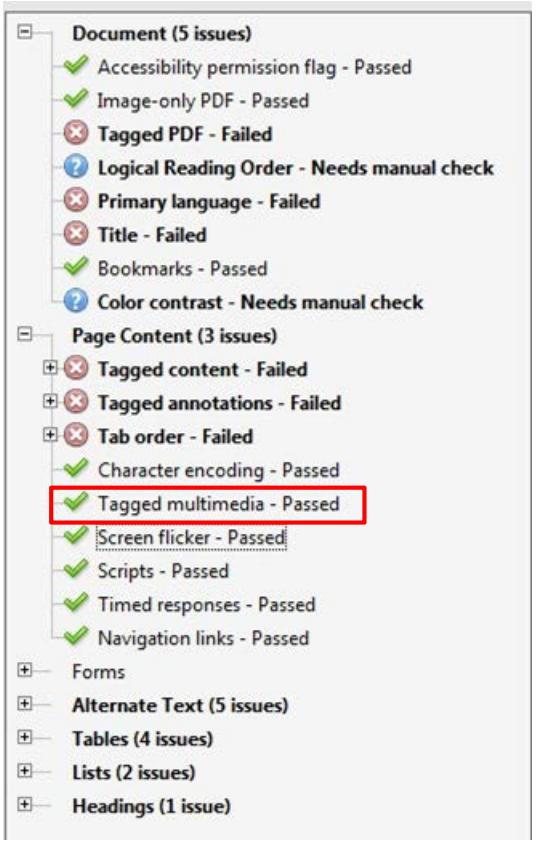
- Rule of thumb: if the image cannot be described in one sentence, it’s complex!

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

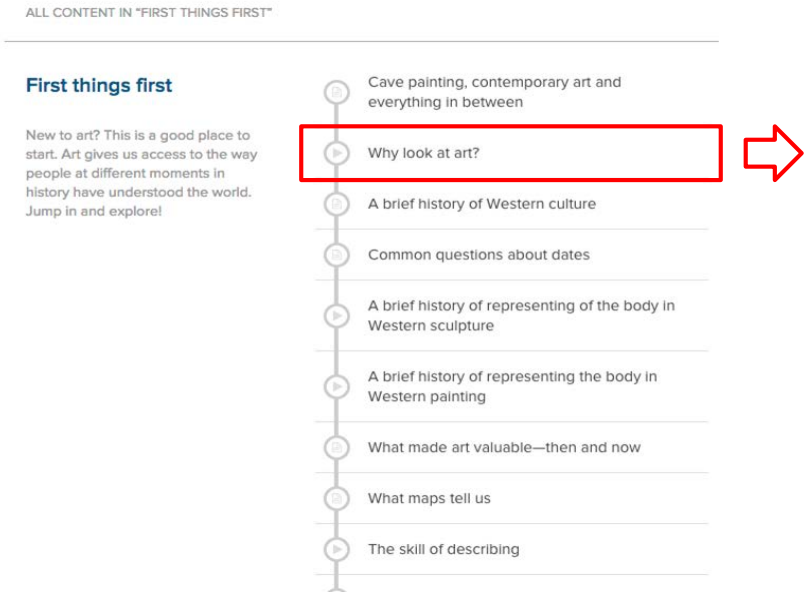
12. Multimedia

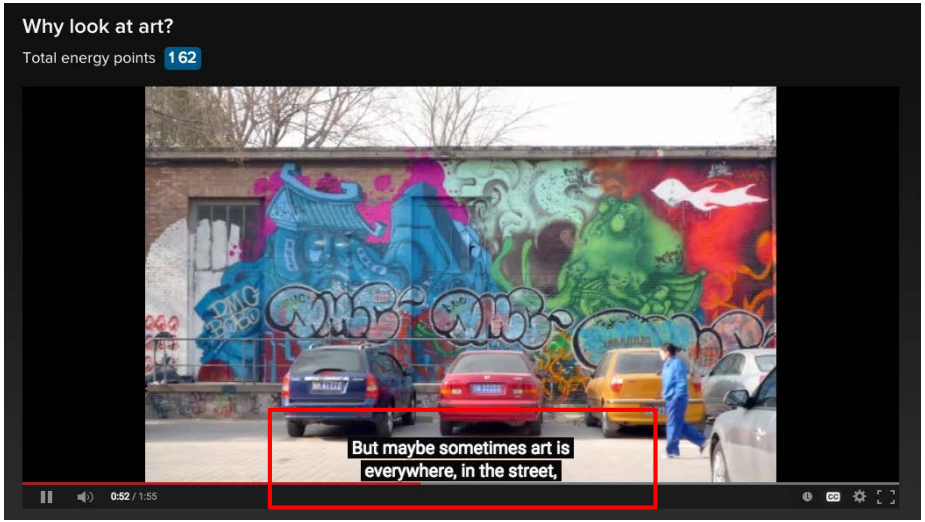
1. *Check for Tagged Multimedia in Results*
2. *Manual Check for synchronized text and transcript.*



12. Multimedia (Synchronized Text)

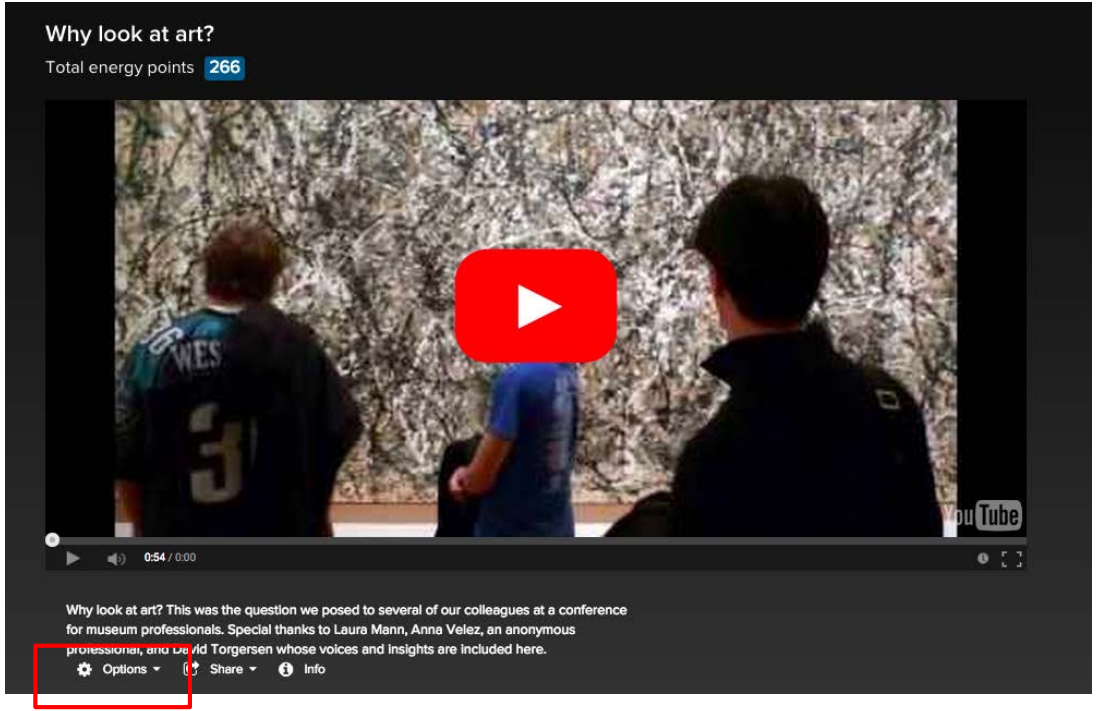
1. Find multimedia
2. Search for availability of a text track (e.g., CC)

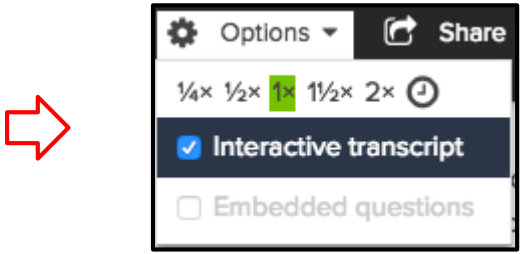




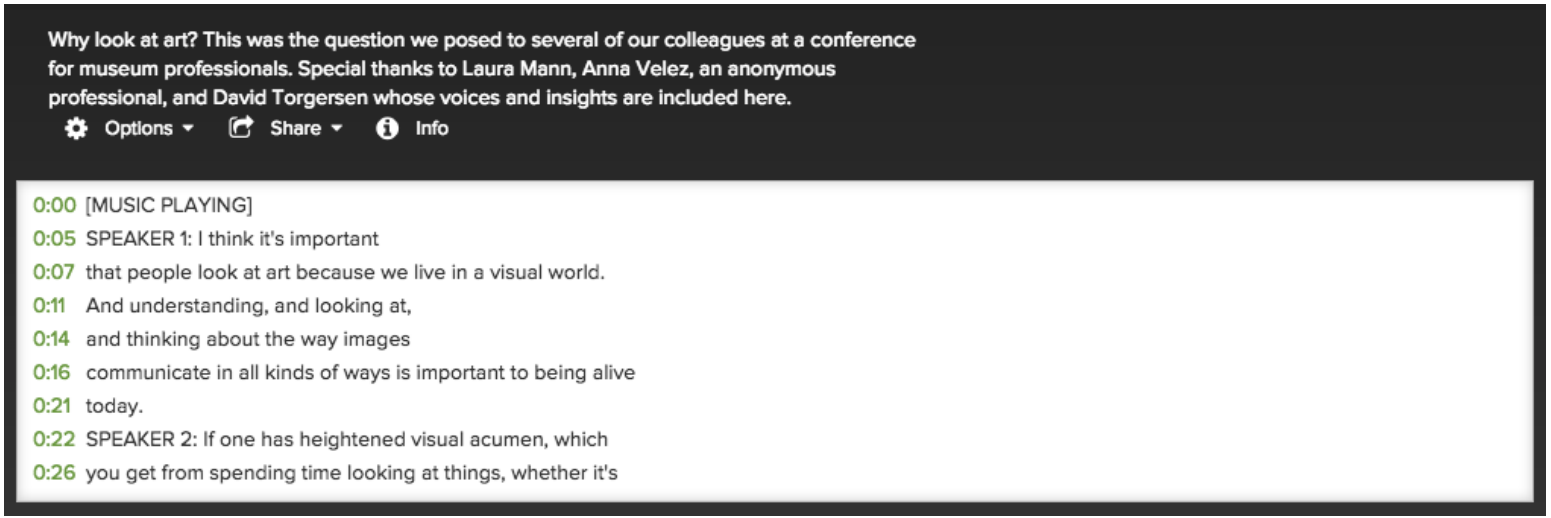
12. Multimedia (Transcript)

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





12. Multimedia (Transcript)



12. Multimedia

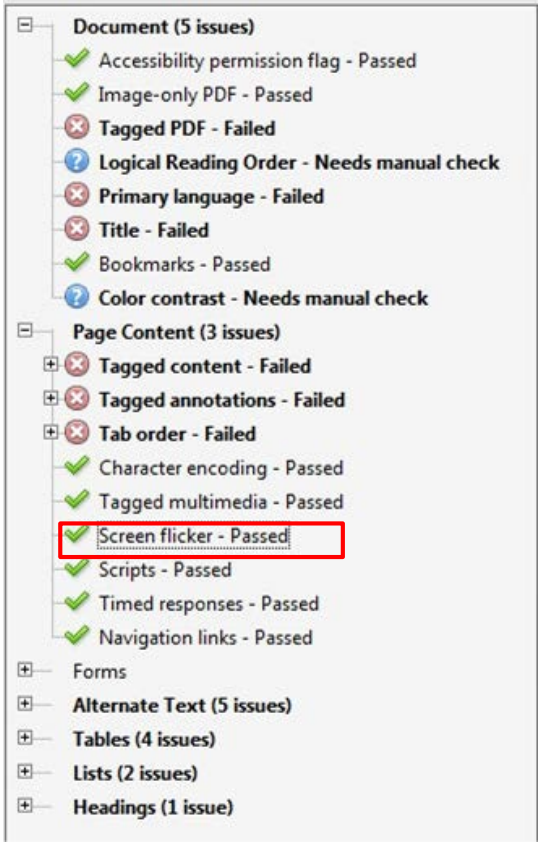
- Amount of Material to Be Evaluated

*** Sample a minimum of three videos, if applicable***

13. Flickering

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

****Check for Screen Flicker in Results*



14. STEM

STEM: Science, Technology, Engineering, and Math

☑ STEM content is marked up in a manner that is compatible with assistive technology

14. STEM

☑ The resource conveys both the notation (presentation) and meaning (semantics) of the STEM content

STEPS:

1. Manually check that the following have a description that conveys notation and meaning
   - Figures
   - Graphs
   - Equations/Tables

14. STEM

Manually check that all figures, graphs, and tables have a description that conveys notation and meaning

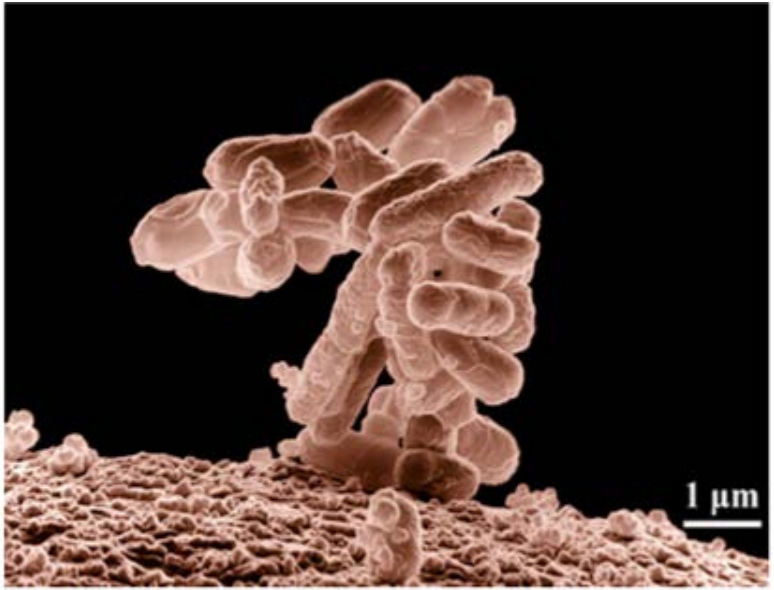


Figure 1.15 Biologists may choose to study *Escherichia coli* (*E. coli*), a bacterium that is a normal resident of our digestive tracts but which is also sometimes responsible for disease outbreaks. In this micrograph, the bacterium is visualized using a scanning electron microscope and digital colorization.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

14. 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

14. STEM

For BOTH Markup and Notation:

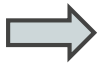
1. Select a STEM content in the text
2. Activate the read-out-loud function (please refer to Checkpoint #2)
3. Use the read-out-loud function to read the current page (Shift + Ctrl + V)
4. Repeat the steps to check for 10 STEM content in each sub-section

The Greek letter μ (pronounced "mew") represents the **population mean**. One of the requirements for the **sample mean** to be a good estimate of the **population mean** is for the sample taken to be truly random.

To see that both ways of calculating the mean are the same, consider the sample:
1; 1; 1; 2; 2; 3; 4; 4; 4; 4; 4

$$\bar{x} = \frac{1+1+1+2+2+3+4+4+4+4+4}{11} = 2.7$$

$$\bar{x} = \frac{3(1)+2(2)+1(3)+5(4)}{11} = 2.7$$



Did read-out-loud read this correctly?

In the second example, the frequencies are 3(1) + 2(2) + 1(3) + 5(4).

You can quickly find the location of the median by using the expression $\frac{n+1}{2}$.

15. Interactive Elements

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

Mark N/A in the accessibility checkpoint (.xsls) and Skills Commons Checkpoint (.docx) if the text contains no Interactive Elements for all subcategories under checkpoint 15

15. Interactive Elements

STEPS:

- Without assistive technology, use the TAB key to navigate the menu
- Items that are selected will have a box around the link
- Use the ENTER key to select a link or other item

15. Interactive Elements

☑ Markup

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

- ☑name
- ☑type
- ☑status

15. Interactive Elements

☑ Text prompts
The following are conveyed with assistive technology:
☑Instructions
☑Prompts
☑Error messages

How to:
Use Tab key to activate the interactive elements and check if you receive any text prompts.

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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).