Color and Contrast Guideline Scratchpad

Adjust Color

Outcome Description:

Users are able to adjust color schemes

Baseline Test: Users can adjust text and background colors

Silver Test: Users meet baseline and can adjust all non-graphical elements

Gold Test: Users meet Silver and can adjust all graphical elements

Notes:

There are multiple ways to meet these both on the author side through themes and through the platform (where the author's responsibility to to avoid breaking platform/user agent support)

- Themes, including high and low contrast options, can be provided by the author.
- Text on the page does not prevent the user (via user-agent) from adjusting the colors used for text and the background behind text. Exception: Meeting the ‘minimum contrast’ outcome with the authored text colours.

If you use gradients, you are taking on a larger responsibility to ensure the text is readable.

Transparency can cause testing issues, but should be tested as the rendered color.

There should be a built-in concept of ‘conforming alternative version’, so if there is other text on the page conveying the same thing, it passes.

Note: Allow text color override

User Needs & Tests

1. **User Need**: As someone with low-vision, I need to be able to read text, which requires good contrast and/or larger text size.
    a. **Test**: Text on the page does not prevent the user (via user-agent) from adjusting the colors used for text and the background behind text.
2. **User Need**: If the text contrast is locked (e.g. text in images, SVG, canvas, app?), you need to meet the Minimum text contrast requirement.
    a. **Test**: [needed to support user need]

3. **User Need:** As someone with dementia or age-related forgetfulness, I need to read text and identify/perceive all interactive elements, which requires good contrast and plain backgrounds to avoid distraction.
    a. **Test**: Visual information required to identify user interface components (except for inactive components or where the appearance of the component is determined by the user agent and not modified by the author) and text meets X contrast threshold.
        i. **Test:** The background is “plain”. NOTE: “Plain” needs a definition that goes beyond the color and contrast, but also the complexity and “business” of the background.

Minimum text contrast

Outcome Description:

The rendered text against its background meets a minimum ‘*contrast ratio test’* for its text appearance and use.

Note: If red/green CVD is not accounted for within the contrast algorithm, there may need to be a separate requirement.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

1. **User Need**: As someone with low-vision, I need to be able to read text, which requires good contrast and/or larger text size.
    a. **Test:** Check each color combination of text on its background with the X contrast test (to be defined).
    b. **Test**: For variable foregrounds or backgrounds: Test the lowest contrast combination. E.g. the lightest part of the text on the lightest part of the background.
2. **User Need**: As someone with red-green Color Vision Deficit (CVD, color blindness), I need reds on a dark background to have a lighter hue.
    a. **Test**: [needed to support user need]

Maximum text contrast

Outcome Description:

The rendered text against its background meets a maximum '*contrast ratio test'* for its text appearance and use.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

1. **User Need**: As a user, I need to be able to read large amounts of text comfortably, and prefer a slightly more muted contrast.
    a. **Test:** Check each color combination of text on its background with the X contrast test (to be defined).
    b. **Test**: For variable foregrounds or backgrounds: Test the highest contrast combination. E.g. the darkest part of the text on the lightest part of the background.
2. **User Need**: As a person affected emotionally or cognitively by color, I need to minimize my exposure to a sustained strong color while using content.
    a. **Test**: [needed to support user need]

Non-Text Contrast

Outcome Description:

Visual information required to identify user interface components and states meets the '*colour contrast threshold*', except for inactive components or where the appearance of the component is determined by the user agent and not modified by the author;

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

3. **User Need**: As someone with low-vision, I need to be able to identify/perceive all interactive elements (e.g., links, buttons, cards, etc).
    a. **Test**: Visual information required to identify user interface components (except for inactive components or where the appearance of the component is

determined by the user agent and not modified by the author) meets X contrast threshold.

4. **User Need:** As a person with low vision, I need to be able to distinguish between two states of an element without having to rely on observing a change in color.
    a. [*** Need to work out how states are included. Not all state changes are important, so we don't want to create too many variations that need to contrast with each other.]

Interaction indicators contrast

Outcome Description: Interaction i

- **Test:** For all visible focus indicators, the thickness and contrast between the indicator and the adjacent background and foreground colors meets X contrast ratio.

- **Test:** For all non-default mouse cursors, the thickness and contrast between the cursor and the adjacent background and foreground colors meets X contrast ratio.

- **Test:** For all non-default keyboard carets, the thickness and contrast between the caret and the adjacent background and foreground colors meets X contrast ratio.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

5. **User Need**: As someone with low-vision, I can perceive all visible focus indicators
    a. **Test**: Visual information required to identify focus indicators meets X contrast threshold.
    b. **Assertion**:

Contrast of visual information

Outcome Description: Meaningful information in graphics and interfaces does not rely solely on color to convey meaning

Baseline test:

- Whenever perceiving the difference between colors (hue) is required to understand

content within a data-graphic, an alternative visual format is available to the user.

Silver test:

- "Parts of graphics required to understand the content need to meet X contrast, except when a particular presentation of graphics is essential to the information being conveyed."
- Colour (hue) is not relied on for users to understand the content.

Gold test:

- Alternative versions are not relied on, each version of information displayed needs to meet all guidelines.
  (E.g. a data table isn't sufficient to be an alternative for a graphic, and both text and icon in a button need to meet contrast.)

Notes:

- There should be a built-in concept of 'conforming alternative version', so if there is other text on the page conveying the same thing, it passes.
- The 'gold' item here could be a general thing.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

6. **User Need**: As someone with low vision I need to be able to distinguish important information within data-graphics / infographics.
    a. **Test**: Are there
7. **User Need:** As a person with low vision, I want to see scalable content with sufficient contrast (e.g. text, vector graphics)

[Outcome Short Name]

Outcome Description:

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

8. **User Need**:
    a. **Test**: [needed to support user need]
9. **User Need**:
    a. **Test**: [needed to support user need]

Meeting logistics ,

Status at end of subgroup work: TPAC got near to outcomes, meetings began reviewing User needs

- Day and Time
    - Translate this to your local time
- Meeting zoom information
- IRC: #wcag3-contrast
- Github page
- Subgroup participation handbook
- Members: Alastair, Rachael, DJ, Tiffany, Lori Oakley, Makoto, Poornima
- Previous Members: [List previous subgroup members]

Resources

- Writing for WCAG3
    - Guideline Writing Process by Maturity Levels - Q1 2023 (Start Here)
    - Process for Writing Guidelines using Maturity Levels (For more details)
    - Functional needs document (FAST) editor's draft
- Prior work
    - Research
        - The Visual Contrast of Text subgroup of the Silver Task Force wrote a guideline for the First Public Working Draft of WCAG3 to demonstrate a guideline with a significant change from WCAG2. [TASK] The research and resulting algorithm requires extensive peer review from other researchers in color contrast before adoption. There is a lot of useful and insightful material on and linked from this subgroup page.

- Categorization exercise that may apply to your guideline
  - Table summarizing the categorization results for this guideline

WCAG2 Analysis Doc	SC Name
1.4.1	Use of Color (hue and colorfulness)
1.4.8a	Foreground and background colors of blocks of text can be selected by the user.
1.4.3	Contrast (Minimum)
1.4.6 (see 1.4.3)	Contrast (Enhanced)
1.4.3a	Contrast exceptions
1.4.3	Color Choices for Alternate Modes (Dark Mode, High Contrast, Daltonization)
1.4.1a	Use of color in controls
1.4.1b	Use of color in organizing content
1.4.11	Non-text Contrast - UI Components
1.4.11a	Non-text Contrast - Graphics
1.4.11b	Non-text Contrast - Dataviz
1.4.11c	Non-text use-cases: Semantic, Symbolic, DataViz, Container.
1.4.4	Content Zoom
1.4.4a	Proportional Text Zoom
1.4.6	Contrast (Enhanced)
1.4.6a	Font weight and glyph characteristics

1.4.6b	Text use cases: Fluent Body Text, fluent text, sub-fluent, spot-readable, ancillary.
1.4.8	Use of contrast in the visual hierarchy (was Visual Presentation)
1.4.8a	User selectable text and background colors for blocks of text.
1.4.8b	Column width for body-text is no more than 80 characters or glyphs (40 if CJK).
1.4.8c	Body-text is left justified for ltr reading, and right justified for rtl, Body text is never full-justfed. (aligned to both the left and right margins) nor center justified.
1.4.8d	Body-text line spacing (leading) is at least 2.5 times the x-height in paragraphs & paragraph spacing 1.5x line spacing.
1.4.8e	Sufficient margins and padding around text
1.4.5	Images of Text, where the text is part of content meets contrast minimums.
1.4.5a	SVG containing text, rich-text formatted alt-text.

        - Folder of documents from the Categorization Exercise
        - Categorization exercise 2 Aug.xlsx - extract of the database from the categorization exercise used to analyze information. It includes all the success criteria, even the ones that do not have an individual document.
    - Links to relevant content from Making Content Usable
- Other potentially useful research and documents (external to w3c work)
    - See the Visual Contrast of Text subgroup of Silver Task Force
- Research on APCA and color contrast from Andrew
    - peer review
    - **M.Stone (NIST,Guidelines for Using Color...)** Good on color for text.
    - **L.Arends (NASA,Individual Differences in Color Vision)** Good general color design and vision site

- Curated Research
- Contrast Resources
- Copy of this scratchpad with Andy's full comments

Questions

Week 1: Review all research

Instructions

- Group introductions
- Decided on how minutes will be kept (IRC, running google doc, etc)
- Divide up research locations among team. Completing relevant research list is homework.
- Note: Do not cite WCAG 2.x directly in research. Instead trace guidelines back to the research or guidance that led to the SC.

Relevant Research

https://www.w3.org/WAI/GL/task-forces/silver/wiki/Visual_Contrast_of_Text_Subgroup
https://www.w3.org/TR/low-vision-needs/

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

- "Spatial-frequency and contrast properties of reading in central and peripheral vision", Susana T. L. Chung; Bosco S. Tjan.
  https://jov.arvojournals.org/article.aspx?articleid=2122297
  "We found that when text contrast was low, reading speed demonstrated spatial-frequency tuning properties, with a peak tuning frequency that partially scaled with print size. The spatial-frequency tuning disappeared when text contrast was 100%."

- "Human Computer Interaction: Legibility and Contrast", Silvia Zuffi; Carla Brambilla; Giordano Beretta; Paolo Scala. https://ieeexplore.ieee.org/document/4362786
  "light text on dark background is more difficult to read, and that the minimum luminance contrast between foreground and background color, in terms of CIELAB lightness difference, should be about 27 units."

- https://en.wikipedia.org/wiki/Irlen_syndrome

- Review of Relationship between Color Red and Academic Cognitive Performance (PDF). Colors can inhibit cognitive function, depending on context, age, or experience. Machine translation from Chinese to English:
  '4. Subject selection… A study among high school students found that reading "red"

words resulted in lower performance on a test of intellectual structure compared to reading “red” words (Lichtenfeld, Maier, Elliot, & Pekrun, 2009). Gnambs et al.’s study on 190 junior high school students showed that red affects the encoding and retrieval effects of middle school students’ memory tasks (Gnambs, Appel, & Kai, 2015). In addition, studies using college students as subjects also obtained similar results (Shi, Zhang, & Jiang, 2015; Zhang & Han, 2014). Studies of student populations have found that the color red inhibits students' cognitive performance. However, when the study group was transferred from students to the general adult population, the psychological effects of red did not appear. For example, Larsson et al.’s study on 200 adults compared the effects of viewing red and green stimuli on cognitive ability tests before cognitive tasks. The results showed that the main effect of color did not exist (Larsson & Stumm, 2015). The possible reason for the inconsistent results with the student population study is that the subjects in this study were adults. Since the student population has been in academic situations for a long time, the psychological association of red-failure has always affected them. For ordinary adults, because they are less affected by academic situations and have enough time to wash away the association between red and negative performance feedback, they are less affected by the inhibitory influence of red. Zhang et al.’s research on stock brokers also showed that experience can reverse the psychological effect of red (Zhang & Han, 2014).’

Week 2-3: User Needs

Instructions
Make a list of the user needs from research. Clearly reference the research. It does not have to be peer-reviewed papers, but should have credibility within the accessibility community. The list needs to include:

- The barriers encountered by people with disabilities
- The common user needs that apply to all the disability groups
- The unique needs (if any) that only apply to a specific group of functional needs.

When a user need is related but not necessarily within scope, note it anyway and add a note, “may be out of scope”

Capture user needs, even when they are not definitely testable. Assertions (using a process to improve accessibility instead of testing a result) are an option.

User Needs with Referenced Research or Gaps in Research

High level:

- Be able to distinguish things,
    - If you are able to distinguish important content differences (e.g. from non-text contrast, if it weren’t there would it still make sense.)

        - Comfortable read the text
        - Doesn't cause fatigue, e.g. for body-text, super-high contrast might be good for short text, but not for 20 pages. Same for low-contrast.
- Jarring colour changes on page changes
- Strobing when scrolling?
- Transitions between
- Certain colors trigger emotional reactions or impact cognition.

User Need	**Research**
Default: As someone with low-vision, I need to be able to read text, which requires contrast and/or larger text size. (How to define sufficient contrast and text size is TBD)	
Adjustable: As someone with low-vision, I need to adjust the background color and the text color from the full color spectrum that the technology will render. (comment)	https://www.w3.org/TR/low-vision-needs/#user-needs
Adjustable: As someone with low-vision, I need to adjust color combinations of content next to each other from the full color spectrum that the technology will render. (e.g.: background color, focus indicator, actionable items,, pie charts, etc)	
~~As someone with red-green Color Vision deficit (CVD, color blindness), I need reds on a dark background to have a lighter hue. (comment)~~	
Default: As someone with low-vision, I need to be able to identify/perceive all interactive elements (e.g., links, buttons, cards, etc).	
Default: As someone with low-vision, I can identify/perceive all visible focus indicators	
As someone with low-vision, my chosen mode of operation is not impeded by visual elements (e.g. pop up content, hover content, modals, drawers, sticky elements in	

User Need	Research
responsive design, responsive design that allows elements to incorrectly overlap, etc.) (out of scope) **	
Default: As a user with autism, aspergers, or who experience eye strain, I need large amounts of text presented in a more muted contrast.	
Default: As someone with low vision I need to be able to distinguish important information within data-graphics / infographics. (eg: charts, maps, graphs, etc.)	
Default: As a person with color insensitive vision, I need to be able to distinguish the difference between colored lines on a chart or map (comment)	
Adjustable: As a person with low vision, I want to see scalable content with sufficient contrast (e.g. text, vector graphics)	… …
Default: As a person with low vision, I need to be able to distinguish between two states of an element without having to rely on observing a change in color.	
Default: I need to be able to complete a journey without experiencing a high level of visual fatigue	
As a user with low vision, I need to customise the text characteristics such as justification, line spacing, and margins around paragraphs.	
As a person affected emotionally or cognitively by color, I need to minimize my exposure to a sustained strong color while using content.	• Review of Relationship between Color Red and Academic Cognitive Performance (PDF)
As someone with dementia or age-related forgetfulness, I need to read text and	• Smashing Magazine's "Designing a Dementia-Friendly Website"

User Need	Research
identify/perceive all interactive elements, which requires good contrast and plain backgrounds to avoid distraction. (comment)	

Week 4: Tests

Instructions

- Briefly describe or sketch out the test that would be needed to determine if the user need has been met. This can be a structured (traditional computational or guided) accessibility test, a group of tests, an evaluation (fail, good, excellent) or an assertion. An assertion is a declaration that a process was followed instead of a result was tested.
- Aim for covering the user need not for perfectly written tests
- See Writing Process Tests for Goals

Table of Tests

- [User Need 1]
    - [Test 1 needed to support user need]
    - [Test 2 needed to support user need]
- [User Need 2]
    - etc.

User Need	Tests
As someone with low-vision, I need to be able to read text, which requires good contrast and/or larger text size.	Baseline: - Text on the page does not prevent the user (via user-agent) from adjusting the colors used for text and the background behind text. - If the text contrast is locked (e.g. text in images, SVG, canvas, app?), you need to meet the silver requirement. Silver: - The rendered text against its background meets a contrast ratio test for its text size. - For variable foregrounds or backgrounds: Test the lowest contrast combination. E.g. the lightest part of the text on the lightest part of the background.

User Need	**Tests**
	Gold: - Themes, including high and low contrast options, are provided by the author. **Notes:** - If you use gradients, you are taking on a larger responsibility to ensure the text is readable. - Transparency can cause testing issues, but should be tested as the rendered color. - There should be a built-in concept of 'conforming alternative version', so if there is other text on the page conveying the same thing, it passes.
As someone with low-vision, I need to set the background color and the text color from the full color spectrum.	● Covered above.
As a user, I need to be able to read large amounts of text comfortably, and prefer a slightly more muted contrast.	AWK: ● Baseline is as above. ● Silver: Keep body text under a certain contrast level (e.g. 15:1). PHL: possibly provide an upper contrast ratio above which authors should NOT go? AWK: I would love to have data from a study of a bunch of web sites that shows what the average and range/quartiles of contrasts for body text are. My hypothesis is that we would see that it is pretty close to 4.5-7:1. AC: I think it might be a bit higher, 4.5-11. * Check research/evidence on the higher-limit, both impact and suitable level.
As someone with red-green Color Vision Deficit (CVD, color blindness), I need reds on a dark background to have a lighter hue.	AC: ● For red text on the page, its contrast compared to the background meets X threshold. ● (Also could be passed with the customisable tests?)

User Need	Tests
	Note: This could be folded into the main text-contrast guidelines if the algorithm accounts for CVD.
As someone with low-vision, I need to be able to identify/perceive all interactive elements (e.g.,links).	AC: ● Visual information required to identify user interface components and states meets X contrast threshold, except for inactive components or where the appearance of the component is determined by the user agent and not modified by the author; ○ For each (carry on doing tests?) Julie Rawe Commented: ● Re inactive components: Consider adding a test to ensure users who have low vision and/or challenges with attention/distractibility notice inactive components or have an alternative way of knowing additional action needs to be taken to make an inactive component active. See screengrab below for an example of an inactive CTA button that may be hard to notice: 
As someone with low-vision, I can perceive all visible focus indicators As someone with low-vision, my chosen mode of operation is not impeded by poor contrast choices	(Ben) **Silver:** - For all visible focus indicators, the contrast between the indicator and the adjacent background and foreground colors meets X contrast ratio. - For all non-default mouse cursors, the contrast between the cursor and the adjacent background and foreground colors meets X contrast ratio. - For all non-default keyboard carets, the contrast between the caret and the adjacent background and

User Need	Tests
	foreground colors meets X contrast ratio. **Gold:** - Custom mouse cursors are not used - Custom keyboard carets are not used
As someone with low vision I need to be able to distinguish important information within data-graphics / infographics.	(Ben) For all data-graphics and infographics, there is sufficient contrast between adjacent segments For all data-graphics and infographics, colour is not the only differentiating characteristic between items in a data set. **Baseline:** ● Whenever perceiving the difference between colors (hue) is required to understand content within a data-graphic, an alternative visual format is available to the user. **Silver:** ● “Parts of graphics required to understand the content need to meet X contrast, except when a particular presentation of graphics is essential to the information being conveyed.” ● Colour (hue) is not relied on for users to understand the content. **Gold:** ● Alternative versions are not relied on, each version of information displayed needs to meet all guidelines. (E.g. a data table isn’t sufficient to be an alternative for a graphic, and both text and icon in a button need to meet contrast.) **Notes:** - There should be a built-in concept of ‘conforming alternative version’, so if there is other text on the page conveying the same thing, it passes. - The ‘gold’ item here could be a general thing!

User Need	Tests
As a person with low vision, I want to see scalable content with sufficient contrast (e.g. text, vector graphics)	(Mitchell) Proposed: This is not a separate test, but only a setup for other tests. See testing notes. If this is successful, we won't need a measure of (font) thinness. Otherwise: we'll need a measure of how thin is too thin in the source font or source graphic.
As a person with low vision, I need to be able to distinguish between two states of an element without having to rely on observing a change in color.	(Ben) For all elements where colour is used to convey a change of state, the change in colour between the default state and a state in the list below meets X contrast A - focused, active, enabled, disabled AA - selected, hovered, invalid, read-only, checked AAA - visited, required, optional, busy, current
I need to be able to complete a journey without experiencing a high level of visual fatigue	(Ben) Where user journeys consist of reading more 1 paragraph of text, the contrast is not set [above a certain level on the X algorithm]
As user with low vision, I need to customise the text characteristics such as justification, line spacing, and margins around paragraphs.	

Testing Notes

For all visual tests:

- Setup:
    - Locate configuration mechanisms that would improve the visual test outcomes for the content. Examples:
        - Adjust colors
        - Adjust contrast
        - Adjust size of text only

        - Adjust size of text and non-text
        - Turn off antialiasing for text or for vector graphics
- For each configuration mechanism:
    - Observe how the configuration mechanism identifies its purpose to users.
    - Perform all visual tests on the configuration mechanism itself before changing its settings.
    - Adjust the configuration mechanism to meet the user need.
    - Perform all visual tests of the content (contrast, use of color, etc.).
- Outcomes:
    - Minimum: For at least one configuration mechanism, all of these are true:
        - The configuration mechanism identifies to users that it is a way of meeting the user need.
            - Example of an outcome that passes: To meet a user need for color contrast, the content relies on color sliders in the “Adjust Colors” section of user preferences. When the user changes colors, an accurate preview appears.
            - Example of an outcome that does not pass: To meet a user need for color contrast, the content relies on the “Aquatic” option in the “Themes” section of user preferences.
            - Example of an outcome that does not pass: To meet a user need for color contrast of a thin font, the content relies on users increasing the text size, thus reducing the impact of antialiasing on color. The text resize mechanism does not identify itself as a way of adjusting colors.
        - Before a user adjusts it, the configuration mechanism itself meets all visual tests.
        - After a user applies the configuration mechanism, content meets all visual tests without loss of content or functionality.
    - Enhanced: The content meets all visual tests without changing configuration from default.
    - Enhanced: Same as for minimum, but for all such configurations not just one.

General thoughts

As we define how font choice, system antialiasing settings, etc affect these tests: Are there too many variables outside of author control? Too many variables for auditors to test?

Similar “configuration mechanism” setups will likely be necessary for other groups of tests, such as those for pointer operations.

To bridge the gap between default vs customisation/personalisation, we could - just talking about contrast/luminosity - to say that by default ratios need to fall within a “temperate zone” - above a minimum threshold, below a maximum threshold - as a baseline/bronze, and then user needs that ask for being able to go lower/higher, and these would then be “a mechanism is available….” which may be provided by the UA, content, OS, …

User agent developers need to be part of the conversation and not assume that user needs are only to be met by content authors.

How available/unavailable would options in OS/UA be? Classic issue of user education.

Can we say something like user settings are “readily available” or “easily findable”? It is difficult to create a requirement for this. If we don’t create such a requirement: it means content creators who rely on user settings will be explicitly or implicitly telling users of this fact; if the reliance is ridiculous then the content creator has made themselves ridiculous.

Given that when developing digital content, authors simply can’t know the size (as measured on screen) of text, nor the actual values of how colours as defined by authors will *actually* be physically projected/rendered (as measured with a colorimeter on the actual display), we probably need to base things on the known default that the OS/UA/platform uses (e.g. for “standard” text size, whatever the ‘1em’ is). Then onus is on OS/UA/platform to provide a “sensible” default that authors can anchor on (plus the onus of providing customisation/personalisation). TBD: can Accessibility Guidelines therefore write an expected outcome akin to “minimum font size,” with the understanding it’s a mix of author and user agent responsibility?

Hue and brightness illustration

Currently (2023), under some interpretation of WCAG 2 the first illustration below fails Use of Color while the second illustration passes.

Illustration 1: Stacked bar chart with a legend identifying bars by color (cyan, light green, dark green, light orange, red)

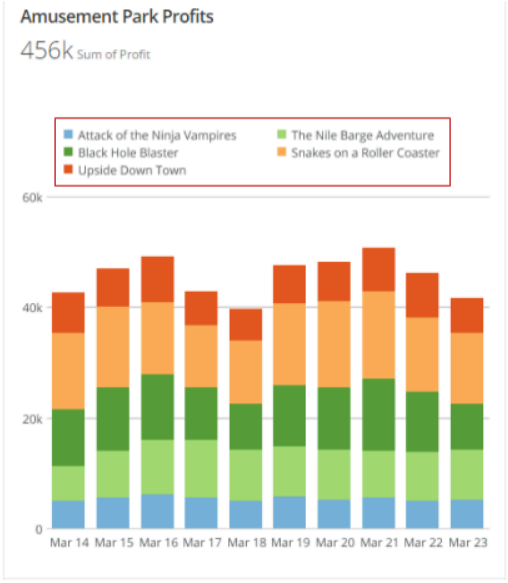
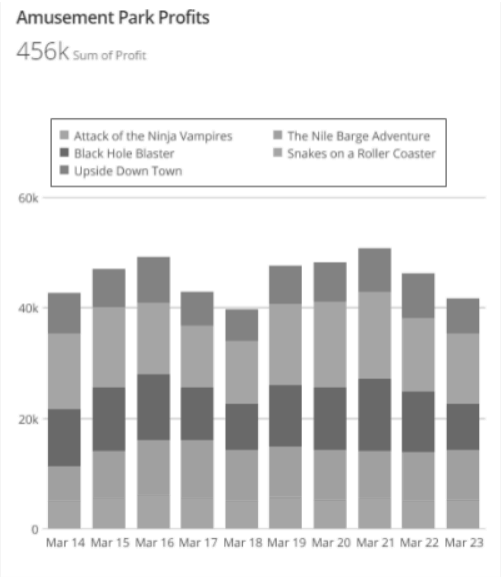


Illustration 2: Stacked bar chart with a legend identifying bars by color (gray 165, gray 164, gray 107, gray 168, gray 130)



([Illustration source])

If we say that hue differences fail but brightness differences do not fail, then WCAG 3 would allow the following nonsense.

- The most subtle brightness difference is impossible for almost everybody, such as 164 to 165. Other brightness differences, such as 165 to 168, are difficult for many and impossible for some. Yet all brightness differences pass WCAG. This is already a problem given current interpretation of WCAG 2, and would continue in WCAG 3.
- By limiting to “hue” we tell authors they can rely on users’ system grayscale settings to pass Use of Color. Consequently nothing will ever fail Use of Color. This would be a new problem in WCAG 3.

To prevent both problems, we must not perpetuate the interpretation of color difference as hue difference alone. Instead, we should define color difference as comprising hue difference and brightness difference.

Week 5: Outcomes

Instructions

- Using the tests list, write plain language outcomes for the user needs. This may mean reworking user needs.

Allow text colour override

Outcome Description:

Text on the page does not prevent the user (via user-agent) from adjusting the colors used for text and the background behind text.
Exception: Meeting the ‘minimum contrast’ outcome with the authored text colours.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

4. **User Need**: As someone with low-vision, I need to be able to read text, which requires good contrast and/or larger text size.
    a. **Test**: [needed to support user need]
5. **User Need**:
    a. **Test**: [needed to support user need]

Minimum text contrast

Outcome Description:

The rendered text against its background meets a ‘*contrast ratio test’* for its text size.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

3. **User Need**: As someone with low-vision, I need to be able to read text, which requires good contrast and/or larger text size.
    a. **Test**: For variable foregrounds or backgrounds: Test the lowest contrast combination. E.g. the lightest part of the text on the lightest part of the background.
4. **User Need**:
    a. **Test**: [needed to support user need]

Text contrast themes

Outcome Description:

Themes, including high and low contrast options, are provided by the author.

Notes:

- If you use gradients, you are taking on a larger responsibility to ensure the text is readable.
- Transparency can cause testing issues, but should be tested as the rendered color.
- There should be a built-in concept of ‘conforming alternative version’, so if there is other text on the page conveying the same thing, it passes.

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

2. **User Need**: As someone with low-vision, I need to be able to read text, which requires good contrast and/or larger text size.
    a. **Test**: [needed to support user need]
3. **User Need**:
    a. **Test**: [needed to support user need]

[Outcome Short Name]

Outcome Description:

Research:

- [Article title] [author(s)][URL] [A few words about what is relevant in the article]

User Needs & Tests

10. **User Need**:
    a. **Test**: [needed to support user need]
11. **User Need**:
    a. **Test**: [needed to support user need]

Week 6-8 Iterate and Write Pull Request

Instructions

- Revisit research and revise the Guideline(s), User Needs, Outcomes and Tests until you are satisfied with them.
- Remember these are at the exploratory level. They do not need to be perfect, just get us going in the right direction.
- Clearly note where additional research is needed
- Call out which outcomes would be difficult to incorporate in WCAG 2.
- Create a pull request in https://github.com/w3c/wcag3 with the new content

Questions

- Customisation vs the requirements for default authoring styles, where do we draw that line?
- (Ben) When measuring foreground vs background combinations, how do you consistently measure where the background is graduated/textured/irregular background.
- Screen refresh rate vs framerate?
- How does night-mode affect the colors displayed? Can we ask the smart-TV manufacturers (e.g. Samsung, LG). How do they think about brightness & contrast? What do they say about text brightness & contrast (AWK)
  E.g. how do they set the brightness of captions?
- Should we include the text justification/line-height/margins in this guideline?
- The font-size aspect means we need support from i18n.
- We're missing the WCAG 2.2 SCs, particularly accessible auth.

Definitions to develop

- In-view conforming alternative version.

Who will work on the PR?

Name: