

Section 4 Action Summary

Section summary and checklist of the 10 action items

ONE-LINE SUMMARY OF THIS SECTION

Ensure that color is not used as the *only* visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. You can still use color and color-coding, just not as the *sole* means of differentiating multiple things.

BEST PRACTICE

01

Check for color independence as you're designing, and do so by using the grayscale test.

Turn the design grayscale, then ask yourself and/or others with fresh eyes, "Is there anything that you can't identify, or tell the difference between, with the hues gone?".

Why? If you wait until the end of the project to check for color independence, you may run into a domino-effect that bloats the effort of fixing the issues, and/or it might be too late to make the needed changes and still meet the project deadline or stay within budget. The grayscale test simulates complete color-blindness (the worst form of a color deficiency in the vision) and allows you to design for that worst-case scenario from the beginning of your design process.

BEST PRACTICE

02

For error message styling: Indicate errors by adding/changing something structural (e.g. add an icon, indent/offset the field) as opposed to swapping a current color (e.g. gray field border changes to red).

- **Tip 1:** Work in black-and-white first (don't add any red until you're done). *Why? This will ensure we don't rely on color to visually convey that there is an error.*
- **Tip 2:** Use a thicker border around the field with an error. *Why? If the border is red, but not structurally different in any other way, the design will be reliant on color to convey meaning.*
- **Tip 3:** Place the error message and any helper text below the field label and above the input field (and ensure the error message includes instructions on HOW the user can fix/get out of the error). *Why? This way screen readers will read the error message or helper text before getting to the input field.*

- **Tip 4:** Use line, shape, or iconography to call visual attention to the area of the error message. *Why? We can't rely on color to make the error visually obvious, so we need to add something else to do the job.*

①

Signup

Email

An account is already associated with that email.

Password

Must be 8+ characters and include a number.

Sign Up



Signup

Email

An account is already associated with that email.

Password

Must be 8+ characters and include a number.

Sign Up

②

Signup

Email

⚠ An account is already associated with that email.

Password

Must be 8+ characters and include a number.

Sign Up

③

Signup

Email

⚠ An account is already associated with that email.
[Login here](#) or specify another email.

Password

Must be 8+ characters and include a number.

Sign Up

Put the error message and any helper text directly below the field label so screen readers will read them before getting to the corresponding input field.

④

Signup

Email
⚠ An account is already associated with that email.
[Login here](#) or specify another email.

Password
Must be 8+ characters and include a number.

Sign Up

Now the icon looks weird placed there.

⑤

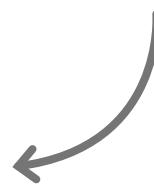
Signup

Email
An account is already associated with that email.
[Login here](#) or specify another email.

Password
Must be 8+ characters and include a number.

Sign Up

The icon was removed and a red vertical line was added.



Signup

Email
An account is already associated with that email.
[Login here](#) or specify another email.

Password
Must be 8+ characters and include a number.

Sign Up

Now when turned grayscale, we see the error state is now distinguishable even if you couldn't see color. This passes.

BEST
PRACTICE
O3

For current menu items (and other “selected” states): Style the currently selected menu item with a color independent indicator (not just a color change), or use relative luminance.

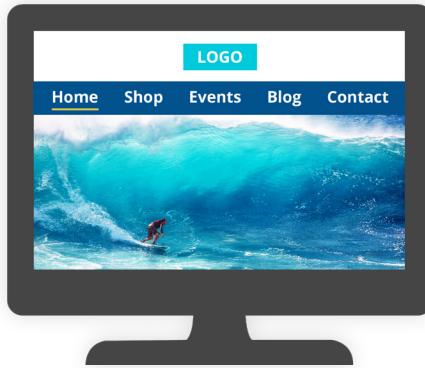
- **Tip:** Turn your design grayscale. Is the current menu item still as clearly distinguishable as before? It should be. *Why? Usability for all. The current/selected item should be distinguishable by everyone, even those with vision impairments.*
- **Preferred method:** Use a non-color indicator such as shape, line, text treatment, size, etc., instead of changing only its color. Note 1: This can be done *in addition* to a color change. Note 2: Single-pixel underlines are not sufficient. *Why? A non-color indicator creates a current state that's visible by all and more usable for all.*
- **Alternative method:** Use relative luminance (where the currently selected state has a minimum 3:1 contrast ratio with the non-selected state of the other menu items). *Why? This heightened contrast between the currently selected and not-selected items will make their difference more visible, even in grayscale.*



Fail (in color).



Fail (in grayscale).



Pass (in color).

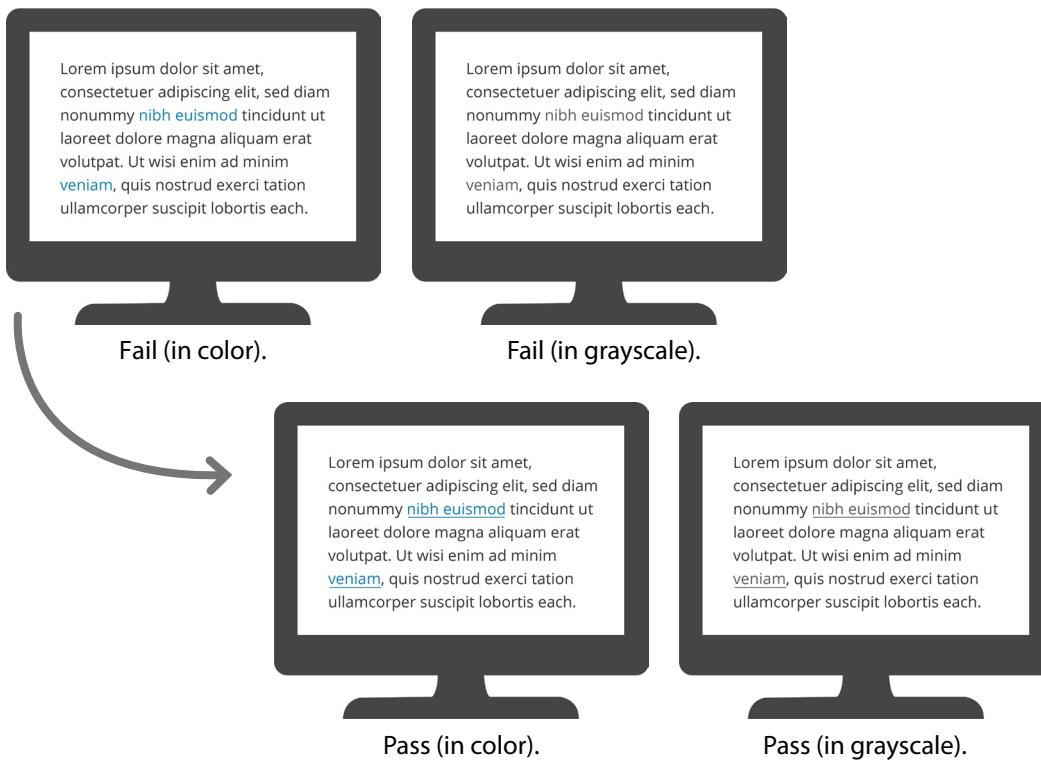


Pass (in grayscale).

For links that have surrounding text, underline them; for links that are standalone, use bold.

Tips for links surrounded by other text:

- **Tip 1:** Turn the design grayscale. Are the links obvious or do they blend in with the non-clickable text? They should be obvious
Why? Some users explore by clicking on everything, others simply look and scroll. We can't expect everyone to click around as they explore, so by making interactive elements obvious at a glance the interface is easier and quicker to use.
- **Tip 2:** Don't want to underline all links that are surrounded by other text? Alternative #1: Use bold or some other non-color-related text styling that's obvious. Alternative #2: Use relative luminance (where the link color has a minimum 3:1 contrast ratio with the surrounding text color, and both have a minimum 4.5:1 contrast ratio with the background color, and the text links acquire an underline or other text styling on hover and a different styling on keyboard focus). *Why? An underline is the best method, but these alternatives help color-blind users, or those with vision impairments (even situational ones) identify the text that's clickable within a block of text.*
- **Tip 3:** Use text styling (aka text decoration), such as underline, *in addition* to relative luminance (plus an underline on hover and focus) for even better accessibility, and usability for all.



BEST
PRACTICE
05

For progress trackers / progress indicators (and other similar UI elements): Start by designing all three states for the steps in a progress tracker (past, current, and future) in one shade to avoid using color to convey meaning, and then make them visually unique using non-color styling, and finally add color as the secondary visual cue.

Deeper perspective: The point of a progress tracker is to offer a big picture view (situational awareness). If some steps are faint colored or disabled-looking then it's offering only a partial view, nulling the overarching benefit of displaying a progress tracker.

Helpful mindset: "If it's too light for everyone to see, then some people aren't seeing it. If it looks like it's not there, then it might as well not be there, so just delete it. Don't want to delete it? Then make it more contrasting."

- **Step 1:** Make everything one color (like black or dark gray) and don't change the color at all until you're done with the structure.



- **Step 2:** Design 3 distinct states: Past, Current, Future. Style each to be visually different from the other two, without using color.

Styling ideas for your inspiration:

- Future steps: hollow-fill (vs. the others that have a solid fill).



- Future steps: A dotted or dashed stroke around the (hollow) circle.
- Past steps: Use a checkmark in place of the step number.



- Current step: A thick line under the step label.
- Current step: A down-pointing arrow below the step label, or attached to the bottom of the circle.



- Current step: Add a second ring/outline around the circle.



- Any steps: Change the size of the circles.
- Any steps: Change the shape of the circles — hexagons, squares, etc. (ensure the new shape is in-line with the brand's personality).
- Any steps: A hollow-fill, with varying thicknesses for the stroke.



- **Step 3:** Add enhancements to further differentiate the 3 states.

Such as:

- Change the font weight (one example: regular for Past and Future, and extra bold for current).
- If each step is clickable, make them look clickable, such as underlining the step labels (Note: in the code, the distance between the text and its underline can be increased, which improves readability).
- Make the connector line thicker between the Past and Current steps.
- Make the connector line from the Current step to all the Future steps dotted or dashed.

- **Step 4:** Finish by designing it with color! (Don't forget to test the colors' contrast ratios with their background colors.)

Example 1 (on a light background):



Example 2 (on a dark background):



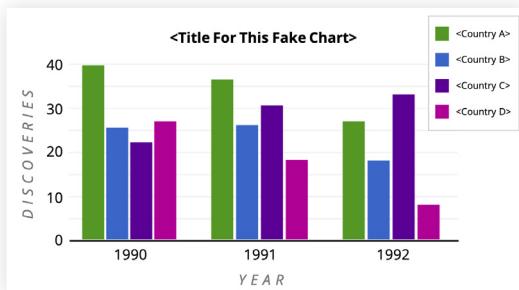
BEST
PRACTICE

06

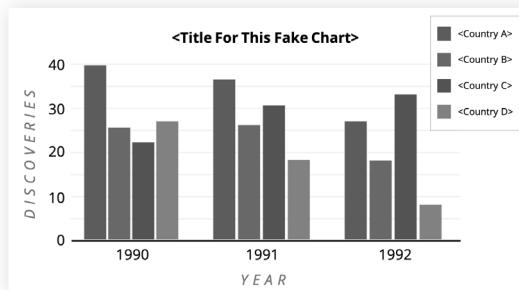


For bar charts (and other similar data visualizations): Use pattern fills for bar charts and other similar data visualizations.

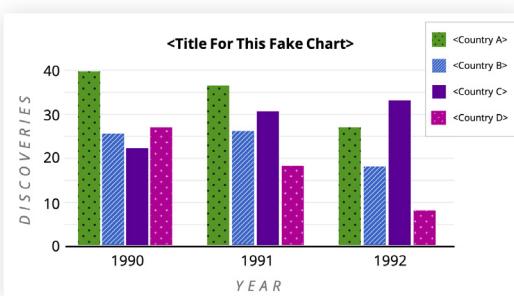
- **Step 1:** Look at your chart in grayscale and see if you can still interpret the data. *Why? This will show you what areas of your chart need differentiating.*
- **Step 2:** Use different pattern fills (when there is an area large enough for a pattern fill to be seen), which can be done in addition to using color. Make sure the color of each pattern has a 3:1 (or greater) contrast ratio with the background color of its bar. *Why? This way it will not matter which colors a person is unable to tell apart (e.g. red-green, blue-yellow, brown-orange) – they can rely on the different patterns to differentiate the bars from one another, and correlate each patterned bar to its corresponding pattern in the legend (don't forget to add the patterns to the legend too!)*
- **Step 3:** After adding patterns, turn the chart grayscale again. Can you clearly tell which bar corresponds to which legend item? If you can't quickly tell the differences, people with vision impairments won't be able to either. You may need to pick different patterns. *Why? Sometimes patterns that are too lightweight or too heavy will need to be swapped for a different pattern that looks more (1) identifiable, and (2) unique from the other patterns used.*



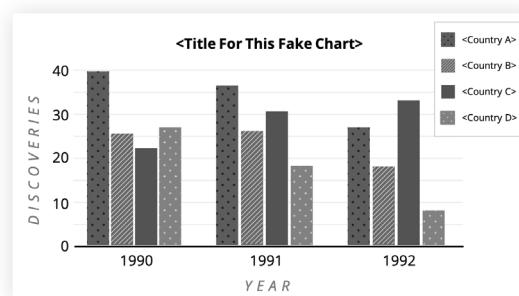
Fail (in color).



Fail (in grayscale).



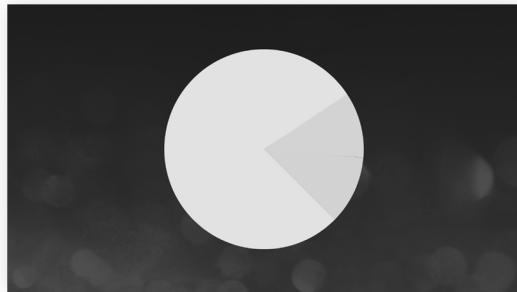
Pass (in color).



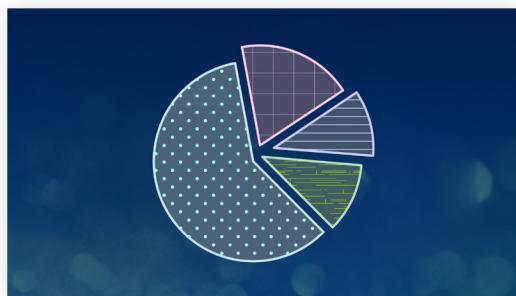
Pass (in grayscale).



Fail (in color).



Fail (in grayscale).



Pass (in color).



Pass (in grayscale).

BEST
PRACTICE

07

For data visualizations: Use interactivity in data visualizations to allow users to pinpoint specific numbers, and to view individual graph elements isolated.

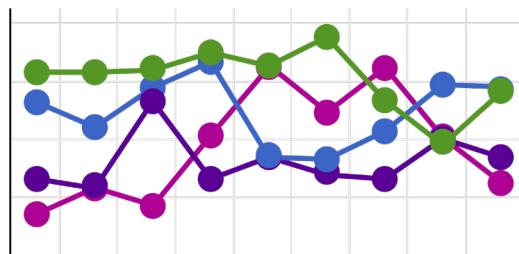
- **Use interactivity to allow users to click/tap/hover on individual data points (bar, node, region) and get its exact value (number, label).** Or for simple data visualizations, display the value next to each data point by default. *Why? Certain areas are likely to call viewers' attention and they will want to know the exact value for that area. Also, this is an accessible alternative for graphs that use a pale grid in the background that's too faint to be contrast compliant (the grid is used to line up the top of each bar or point on each line with the values on one or more axes).*
- **Use interactivity to show a line/area/region isolated on click/tap/hover.** *Why? This makes it easier to see individual parts of the data viz without the "visual background noise" of other data elements that may be overlapping or difficult to distinguish.*

BEST
PRACTICE
08

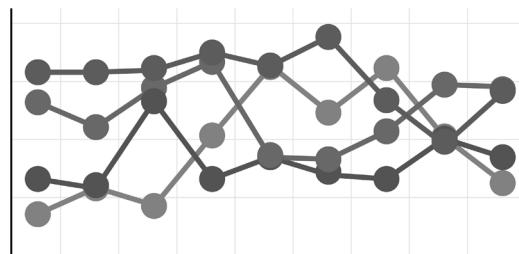


For line graphs (and other similar data visualizations): Use dashed/dotted line styles, and/or varying line widths, for line graphs and other similar data visualizations.

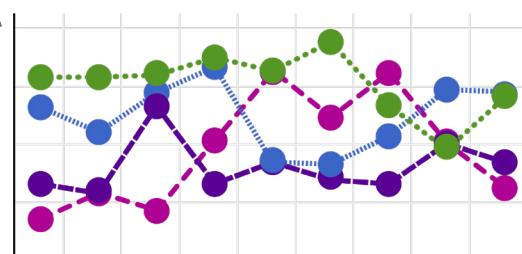
- **Use different dashed/dotted line styles, and/or line widths, for line graphs.** Different line widths work when there is a limited number of lines in the chart allowing for the line widths to be obviously different from one another. Don't forget to apply the same line styles in the legend. *Why? The line styles are what people with vision-impairments can rely on to differentiate the lines from each other and correlate each line to an item in the legend.*
- **Still use color-coding for the lines (in addition to the dashed/dotted line styles).** *Why? This helps those who CAN perceive colors (full colors or even just shades).*
- **Before deeming your graph “finished”, turn it grayscale and have someone who has never seen the graph before look at it.** Can they tell the lines apart, correlate each one to the right legend item, and overall interpret the data? If not, ask what they had a hard time with (remembering that usability and accessibility issues are the chart’s fault, not the viewer’s). You may need to use different line styles that are (1) quick to identify at the size they are scaled to, and (2) more unique from the other line styles.



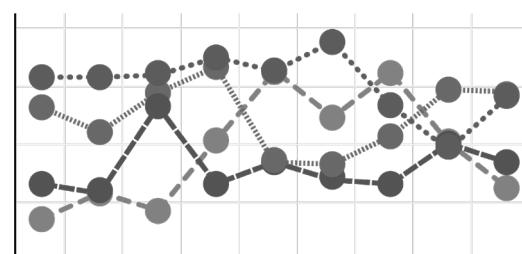
Fail (in color).



Fail (in grayscale).



Pass (in color).



Pass (in grayscale).

BEST
PRACTICE

09

- For data visualizations:** Use other non-color indicators, like shapes, labels, or icons, to make data visualizations color independent (when pattern fills or line styles are not feasible).
 - **Use different shapes for graph elements.** Such as the points on lines in line graphs, nodes in node graphs, bubbles in bubble charts, or rectangles in org charts, gantt charts, or bar/column charts. Think beyond primary shapes. For example, think about how many variations you can make from a rectangle — one clipped corner, one rounded corner, a column with a picket fence top, scalloped top, triangle top.
 - **Add labels (or icons with a legend) on the data viz when possible.** Such as next to each line, pointing to each pie slice, or hovering over each bar. These can be visible by default for simple data visualizations, or triggered on hover/click for more data-heavy visualizations.
-

BEST
PRACTICE

10

- For any colored UI elements:** Combine multiple color independence tactics for a more failproof design that's more usable for all.

For example, you could combine **all** of these tactics:

 - **Non-color styling:** e.g. different patterns, dashed line styles, shapes, text styles, border/line thicknesses, iconography, labels, size.
 - **Relative luminance:** where each color has a 3:1 contrast ratio with the other colors of the color-coded part of the data visualization. A monochromatic color scheme (all shades of 1 color) can make this easier to achieve when you have a lot of colors.
 - **Non-color styling on hover and keyboard focus (if applicable):** e.g. a text link gains an underline on hover and an outline glow on keyboard focus.
 - **Color for color-coding:** still use color as a secondary visual cue because it helps people without vision impairments.

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