



**Adaptation of learning content for students with SLDs**  
**What are Specific Learning Disorders (SLDs)?**

## **Accessibility guidelines for visually impaired players**

### **Introduction**

The term **blindness** is used for complete or nearly complete vision loss. **Low vision** is a functional definition of visual impairment that is chronic, uncorrectable with treatment or contact lenses, and impacts daily living. **Colour blindness (colour vision deficiency)**, is due to deficient receptors in the eyes that reduce the ability to see a particular chunk of the colour spectrum. It makes it difficult or impossible to see the differences in colour. It affects 1/12 men and 1/100 women.

### **Why are these guidelines needed?**

If the hand is the primary mean of input toward the game, vision is the primary way of receiving input from the game. Vision impairment can then critically impact the way players can enjoy a game.

# Guidelines

## Colour blindness

### Types of colour blindness

Red-green colour blindness (deuteranopia (green) and protanopia (red)) is the most common form. Blue-yellow colour blindness (tritanopia) is much rarer than total colour blindness.

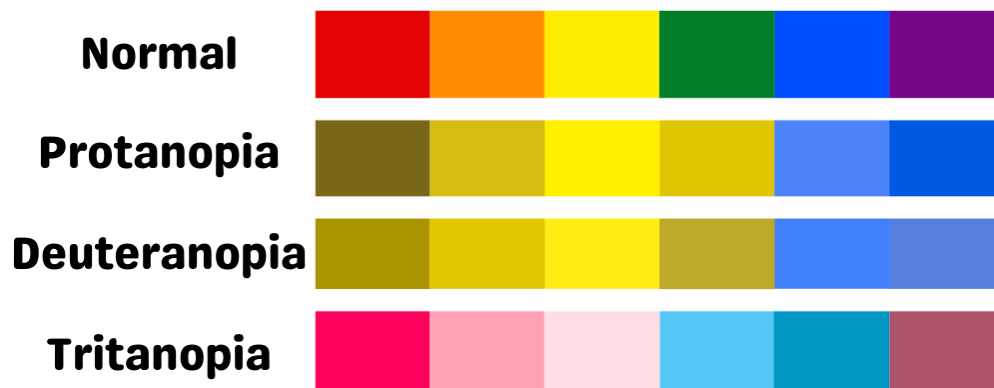


Figure 1. Types of colour blindnesses ( source: Wikimedia commons)

### Free tools to test your games:

Colour oracle ([colouroracle.org](http://colouroracle.org)) converts static images to what a colourblind person would see  
Sim daltonism ([michelf.ca](http://michelf.ca)) does it in real-time.

Industry-grade engines like Unity and Unreal propose built-in filter systems.

### Good practices

The main question to ask yourself is: “Are game elements well distinguishable ?”.

The game elements may be damage indicators, interface elements, alerts and cues, enemies and ally characters, waypoints, items...

To this aim:

- Avoid relying on colour alone to distinguish game elements or cues.
- Try adding shapes, symbols, shading, and animation to support the colour differentiation.

- You can make these supplementary pieces of information optional.
- Ideally you can allow players to customize the colours they see on screen or choose between colour palettes.



Figure 2. Visual elements supplementing colour in a game about mixing colours: ChromaGun (Pixel maniacs, 2015) (source: reddit.com).

If you don't have time to set such options and must go for a colour choice, choose blue and orange as primary colours for your colour palette. They are universally recognizable and distinguishable colours whatever the colour-blindness' type. Very light and dark colours contrast will also show up for everyone, best of all: black and white.

## Low Vision

### Good practices

For low vision, everything that helps distinguish elements and participates in easier reading of visual elements is good.

It generally boils down to size (font size) and contrast (dark shadows and outlines).

For example:

- Big text: do not go under 28 pixel fonts on User Interface texts and nothing below 46 pixels for subtitles.
- Contrast: diminishing opacity of the background of the text, or making it darker can help the player read action by making game elements appear more clearly.
- Use sound cues that support the gameplay. For example, you could use a sad/danger-evoking sound for health loss and a happy/hopeful one for health gain.
- Use readable fonts, if you have written text for immersion, provide an interface that gives it in a readable font version.

If you have time and resources, you can add screen-readers to help read menus or text (like in a visual novel). Some game engines implement them natively like Unreal Engine. If not, third-party solutions exist.

Give the opportunity to increase the opacity of the background to let game elements pop out. Don't forget to test your game at a higher distance than a meter away from the screen.

## Subtitles

- Make subtitles large or give the option to choose the font size. They should be readable across a room.
- Use simple, clean, sans-serif fonts.
- Use a semi-transparent black box behind the subtitles to avoid bad contrast.
- Each line of subtitles should be short: 27 to 42 characters (BBC guidelines), and 2 lines at once maximum.
- Use text breaks at a natural point in the dialogue (according to Netflix's guidelines):
- Text should usually be kept to one line unless it exceeds the character limitation. Follow the [BBC guidelines](#) when the text has to be broken into 2 lines.
- Ideally the player should be able to skip subtitles using an input but if not possible, subtitles should stay on screen long enough. According to the BBC: 0.3 seconds per word.
- For easily reading, it' is also better to have a gap between subtitles: frames without text between subtitles change.

- Subtitles should indicate the speaker. Name the character or give them a text colour.
- Don't forget to use subtitles also during gameplay and not only during narrative sequences.

## Conclusion

For visually impaired players the key is size, contrast and colour. Make sure that game elements are readable and distinguishable. This requires considering also colour for players with colour-blindness. Ideally, make visual elements customizable (colours etc). It is also important to provide sound cues that support the visual elements.

## Resources and references

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## Images

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