# Colour Blindness

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## Introduction

Colour-blindness is the inability to distinguish the differences between certain colours. The first scientific paper about colour blindness was written by John Dalton in 1793 entitled 'Extraordinary facts relating to the vision of colours'. About 8% of all men and 0.5% of all women are colour-blind; However, women are carriers. Colour blindness is not deadly but it comes with many issues such as difficulty in school, problems with food, confusing medications, and trouble identifying safety signs.

## Causes

The cause could be genetic and passed on in X-linked inheritance pattern, or it can be caused by an underlying health conditions such as diabetes, glaucoma, age-related macular degeneration and multiple sclerosis , side effects of medication including digoxin, ethambutol, chloroquine, hydroxychloroqine, exposure to harmful chemicals such as carbon disulphide and styrene and finally as people get older.

## Symptoms

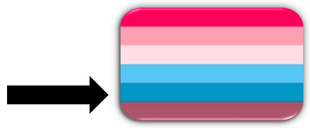
- Difficulty distinguishing between colours .
- Inability to see shades or tones of the same colour.

## Mechanism and Types

It happens in the retina cones which work in daylight and are responsible for colour discrimination. There are three different types of cones: S cones which are responsible of short wavelength and blue colour, M cones which are responsible of medium wavelength and green colour, and L cones which are responsible of long wavelength and red colour.


Normal vision ( tri-chromatic) the S cones for blue, M cones for green, L cones for red, are working.

Tritnopia (absence of S cones for blue colour) and it's rare.



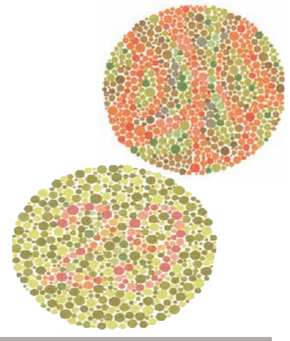
Deuteranope (absence of M cones for green colour).

Protanope (absence of L cones for red colour).

Monochromatic lack inability to distinguish colours.

## Diagnoses

- Ishihara test: to identify numbers contained within images made up of different coloured dots.
- Colour arrangement: arrange coloured objects in order of their shade differences.



## Treatments

There's no cure for colour blindness but most people find ways to adjust.
If it occurs from a health problem or medication problem, the doctor will treat the condition that's causing the problem.
If it's causing problems with everyday tasks, there are devices and technologies that can help, including: lenses, glasses and visual aids.


## References

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- https://www.nhs.uk/conditions/colour-vision-deficiency/
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