Understanding Colour Vision

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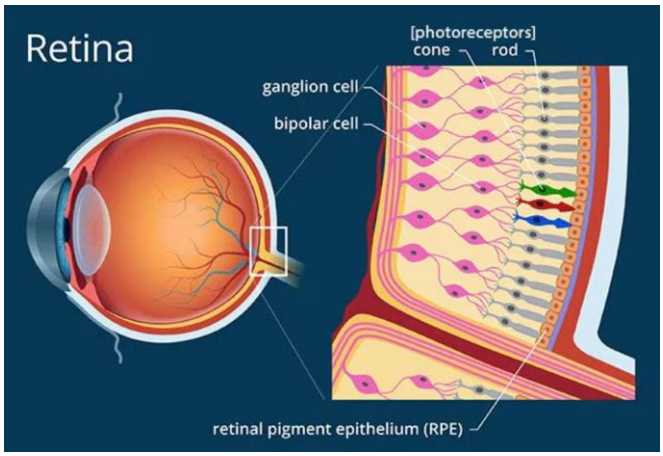
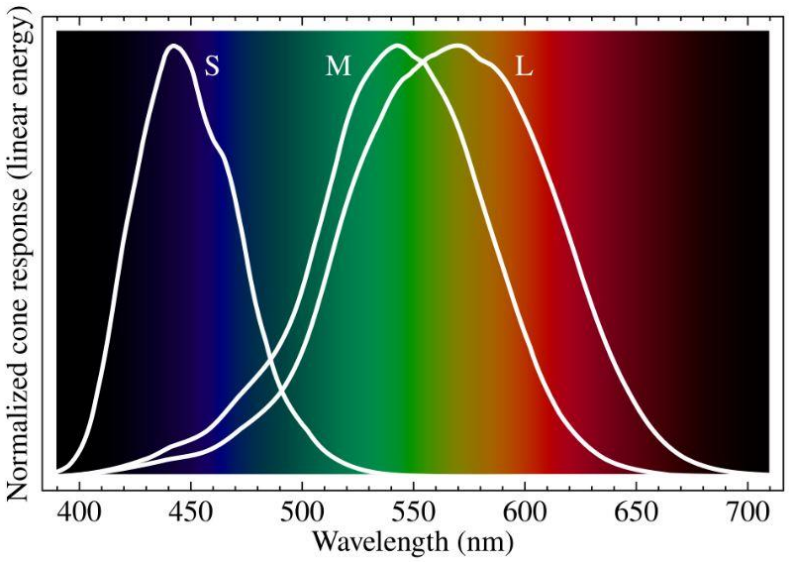
Colour makes the world bright, rich, and easy to understand. It helps us tell the difference between objects, read signals like traffic lights, and enjoy things like art and nature. But not everyone sees colour in the same way. Some people have colour vision differences which can change how colours appear.



How Do We See Colour?

At the back of your eye is a layer called the retina. This is where light is turned into signals that your brain understands as ‘vision’. Inside the retina are special cells called ***cone cells***, which are responsible for colour vision. They are ‘tuned’ with different pigments to catch different colours.

There are three types of cone cells, each sensitive to a different range of colour:



- One type (L) responds mostly to red light
- One type (M) responds mostly to green light
- One type (S) responds mostly to blue light

Your brain combines signals from these three types to create ***all the colours you see***. When all three are working well together, you can see a full range of colours clearly.

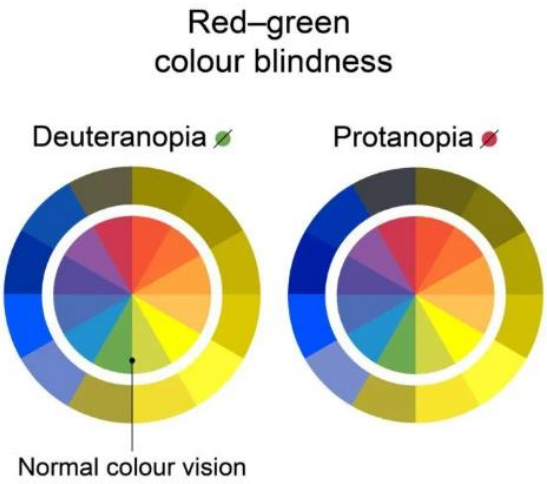
What Is Colour Vision Deficiency?

Colour vision deficiency (often called “colour blindness”) happens when one or more of these cone types does not work properly. It does not usually mean seeing only black and white. Instead, it means some colours are harder to tell apart.

This condition is **usually inherited**, which means you are born with it. It is more common in men than women.

Common Types of Colour Vision Deficiencies

The most common colour vision differences **affect how people see red and green**.



Deuteranomaly (Reduced Sensitivity to Green)

People with 'deuteranomaly' have cone cells that do not respond strongly to green light.

This can cause:

- Greens to look less vibrant
- Confusion between green, yellow, and red
- Difficulty telling similar shades apart

This is ***the most common type*** of colour vision defect.

Protanomaly (Reduced Sensitivity to Red)

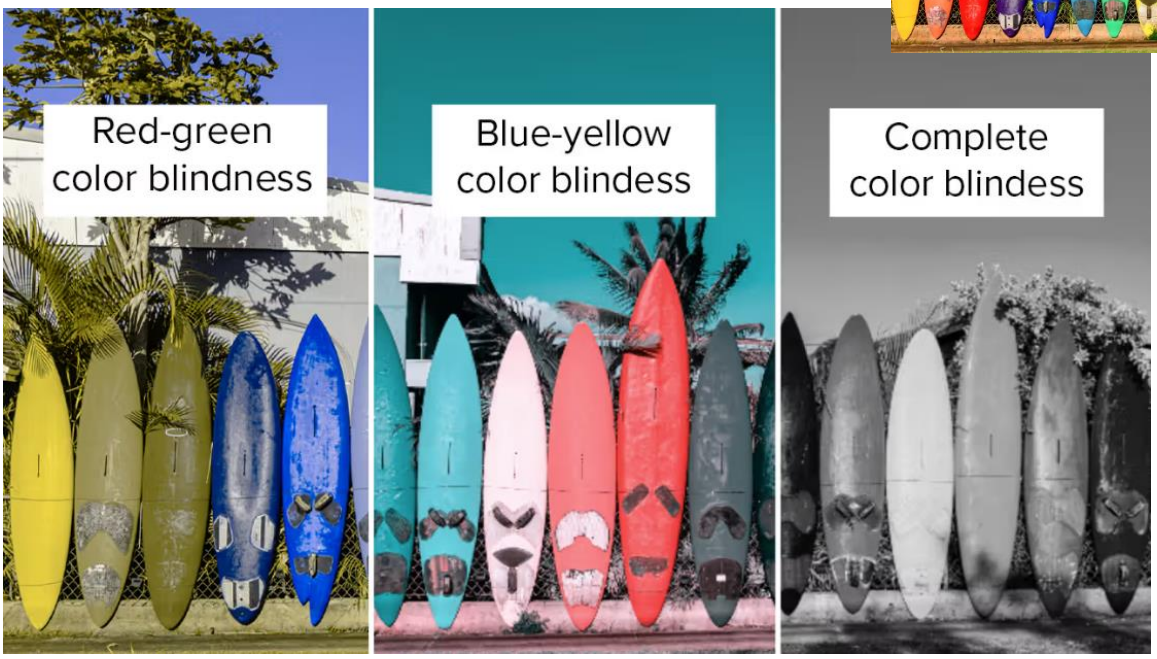
People with 'protanomaly' have cone cells that do not respond strongly to red light.

As a result:

- Reds may look duller or darker
- Red can sometimes appear closer to brown or grey
- It may be harder to tell red from green

For example, a bright red object might not stand out as much as it does for other people.

What Does the World Look Like?



People with colour vision defects still see the world clearly — but colours may look muted, blended, or confusing.

For example:

- Traffic lights may be harder to tell apart by colour alone
- Clothing colours may not match as expected
- Maps, charts, or graphs using colour can be difficult to read
- Ripe and unripe fruit may look similar

Many affected people learn to rely on position, brightness, and context instead of colour alone.

Is It Safe to Drive?

In most cases, yes — it is safe to drive with a ***mild*** colour vision deficiency.

People with colour vision differences can usually:

- Recognize traffic lights by their position (red at the top, green at the bottom)
- Distinguish lights by brightness and surroundings
- Have been colour deficient since birth and are 'used to' the appearance of traffic lights and road signs.

In Abu Dhabi a colour vision screening test is now a mandatory part of the licensing process.

Please ask your local license-issuing authority for specific rules about driving with a colour vision defect.

How Is Colour Vision Tested?

Your optometrist can check your colour vision using simple tests, such as:

- Dot pattern tests (where numbers are hidden in coloured dots)
- Coloured tile sequencing tests (Farnsworth-Munsell Test)

These tests are quick, painless, and help identify the type and level of colour vision difference.

Can Colour Vision Deficiency Be Treated?

At present, colour vision deficiency cannot be *cured*, especially if it is inherited. However, there are ways to make daily life easier.

Helpful Tools and Strategies:

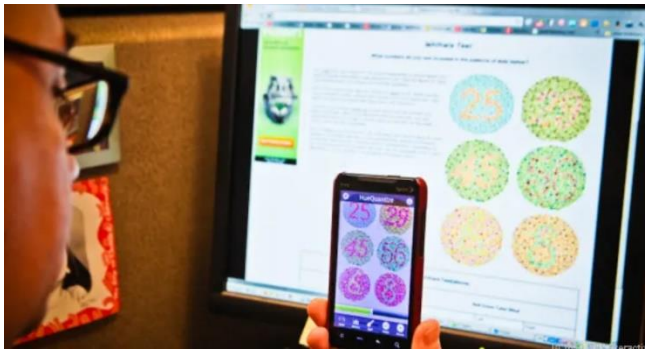
Special Glasses and Filters

Some tinted glasses or contact lenses can improve contrast between colours, making them easier to tell apart. They do not restore normal colour vision, but they may help by enhancing the contrast between colours.

Apps and Technology

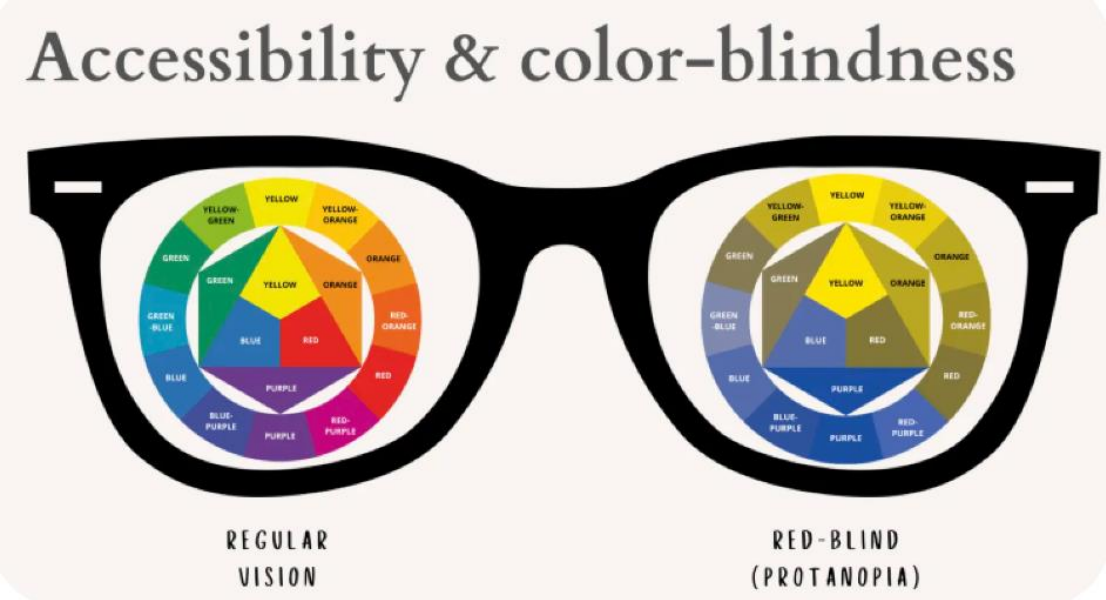
Smartphone apps can:

- Identify colours
- Label objects
- Help with choosing clothes or reading charts



Simple Everyday Tips

- Label clothing to avoid colour confusion
- Use good lighting when choosing colours
- Arrange items in a consistent way
- Ask for help when colour is important



In Summary

Colour vision depends on three types of cone cells in the retina that detect red, green, and blue light. When one type does not work properly, colours may appear different or harder to tell apart.

Conditions like protanomaly and deuteranomaly are common and usually mild. Although they cannot be cured, most people adapt very well and can safely carry out everyday activities, including driving.

If you have concerns about your colour vision, a simple eye test can provide answers and helpful advice.