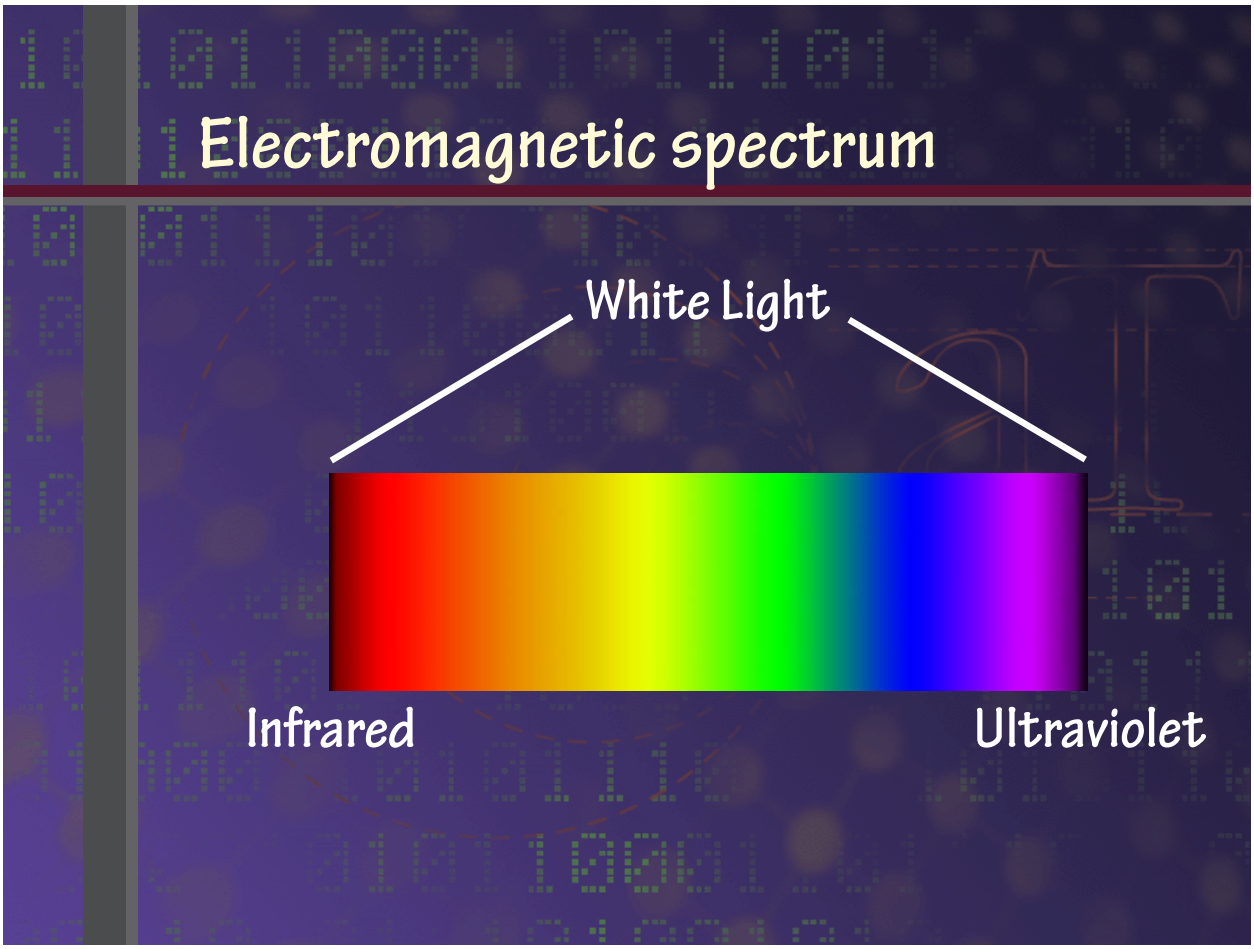
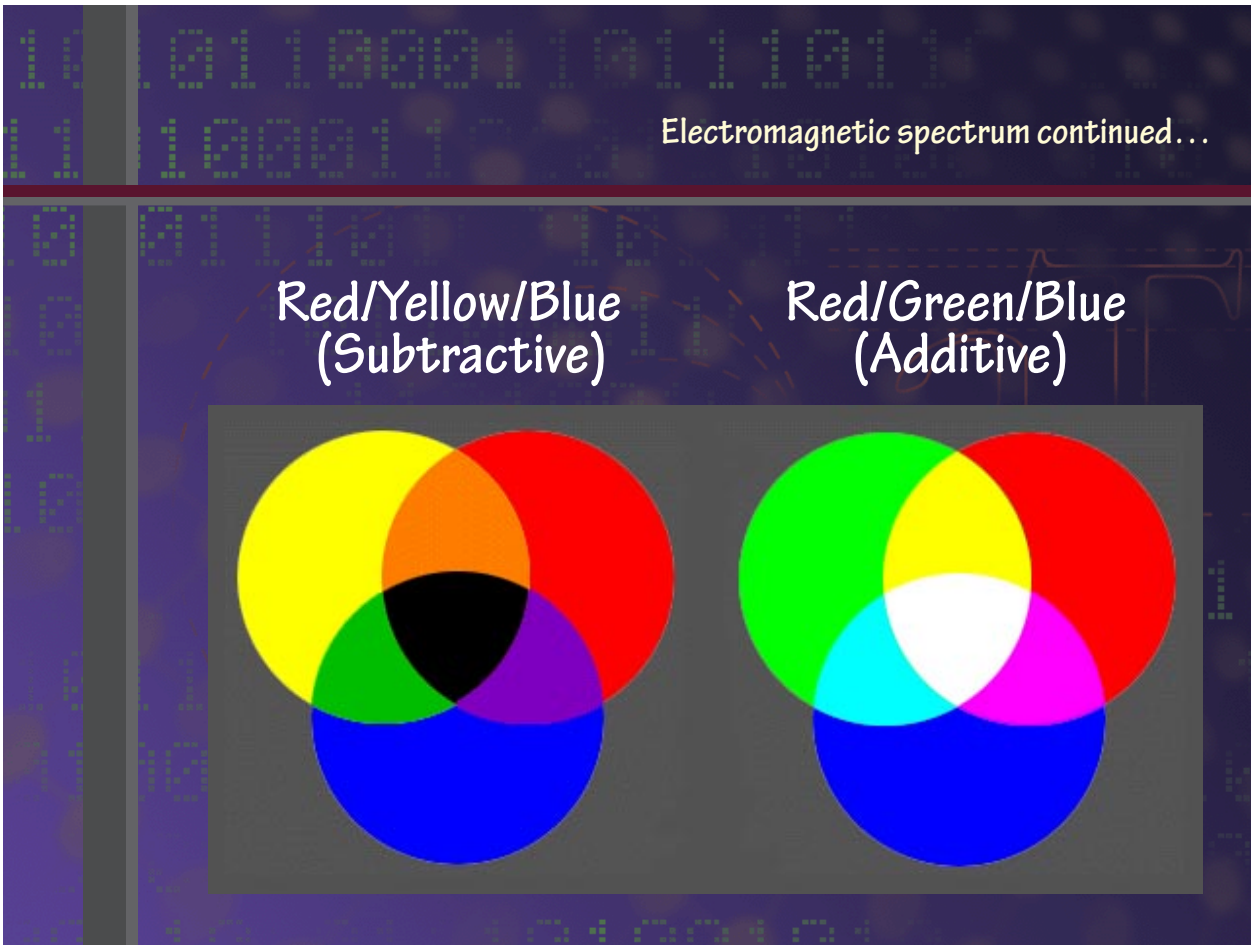
This document contains the first of twelve parts from Jim Royal's seminar "Vectors and Bitmaps: Graphics Techniques for Technical Writers." The text in this document is adapted from the presenter's notes.

For information on the other eleven parts of the seminar, visit http://metaedit.com



Light is a form of electromagnetic radiation, just like radio, microwaves, infrared, ultraviolet, x-rays, gamma rays, and cosmic rays. These forms of radiation are all part of the same phenomenon. Visible light of different colours is electromagnetic radion of different wavelengths.

When we see a colour, the source of that colour is either a glowing object that emits light or at an object that is reflecting light. Understanding this difference is important when dealing with computer colour.



Your art teacher told you that the three primary colours were Red, Yellow, and Blue. That's true for paints — for subtractive colors. Coloured paints work by absorbing some wavelengths from a light source and reflecting the rest. (For example, blue paint absorbs red and yellow light.)

But for video and film (and for computer displays), the primary colours are Red, Green and Blue. These are additive colors.

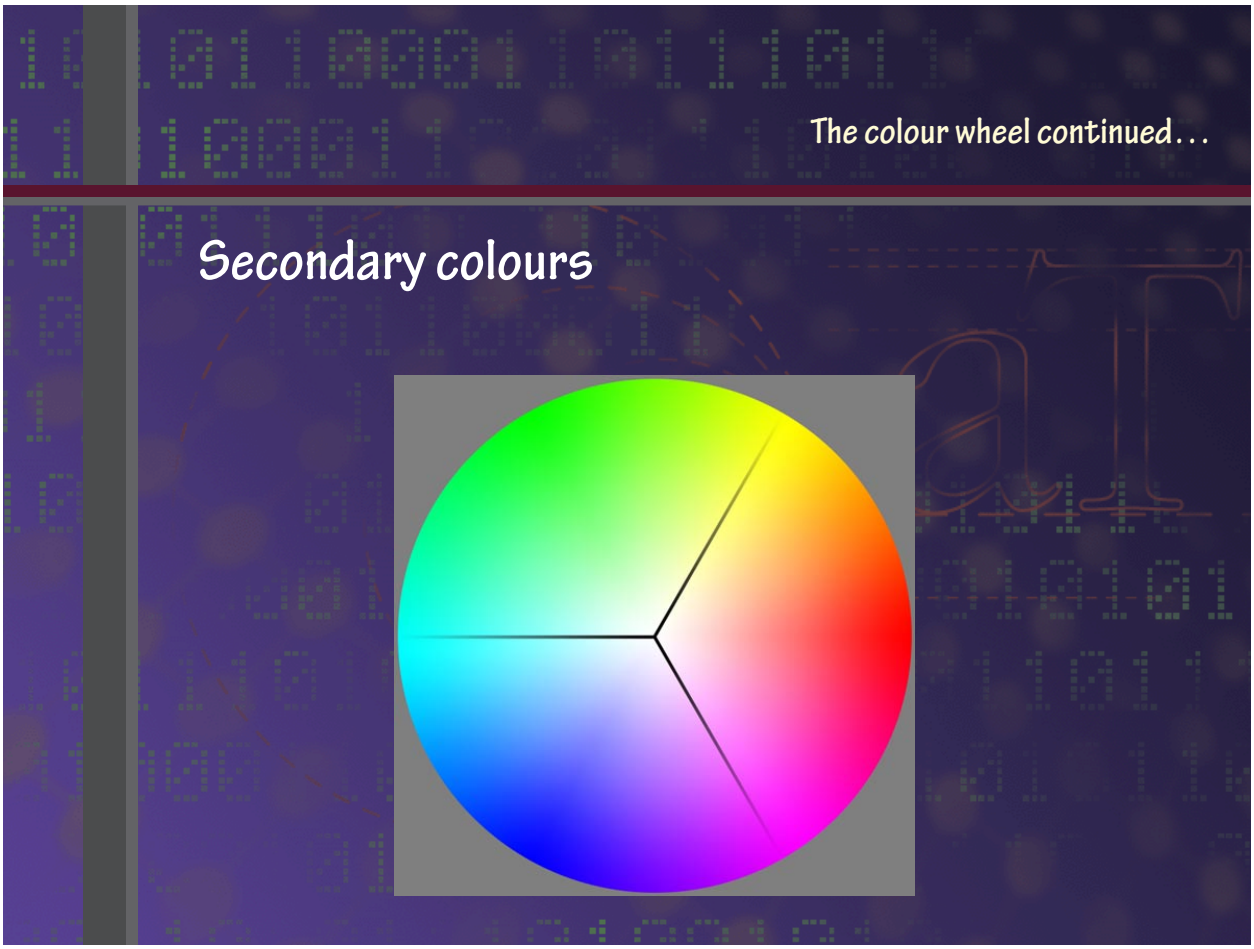
Subtractive means that the more pigment you add, the darker the colour gets. Add red, yellow, and blue paint together in equal quantities, and you get black.

Additive means that the more colour you add, the brighter the picture gets. Add red, green, and blue lights together and you get white light.

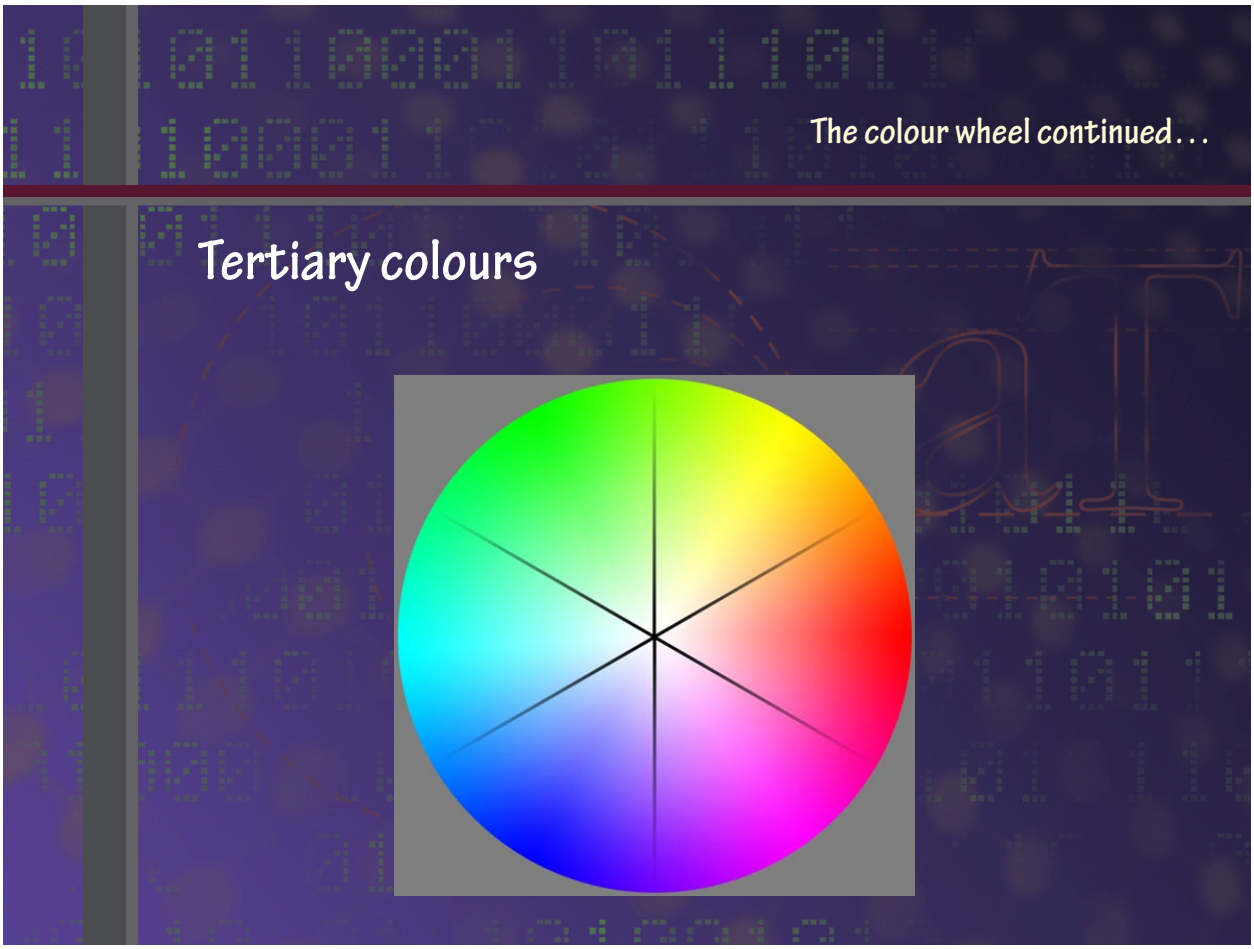
This is the colour wheel, which is used to examine the relationships between colours. When you set out to pick colours for an onscreen presentation, you can pick a harmonious colour scheme based on this colour wheel.

The colour wheel is made by arranging the three primary colours 120 degrees apart on the wheel so they are at the endpoints of an equilateral triangle. You then mix the shades between them.

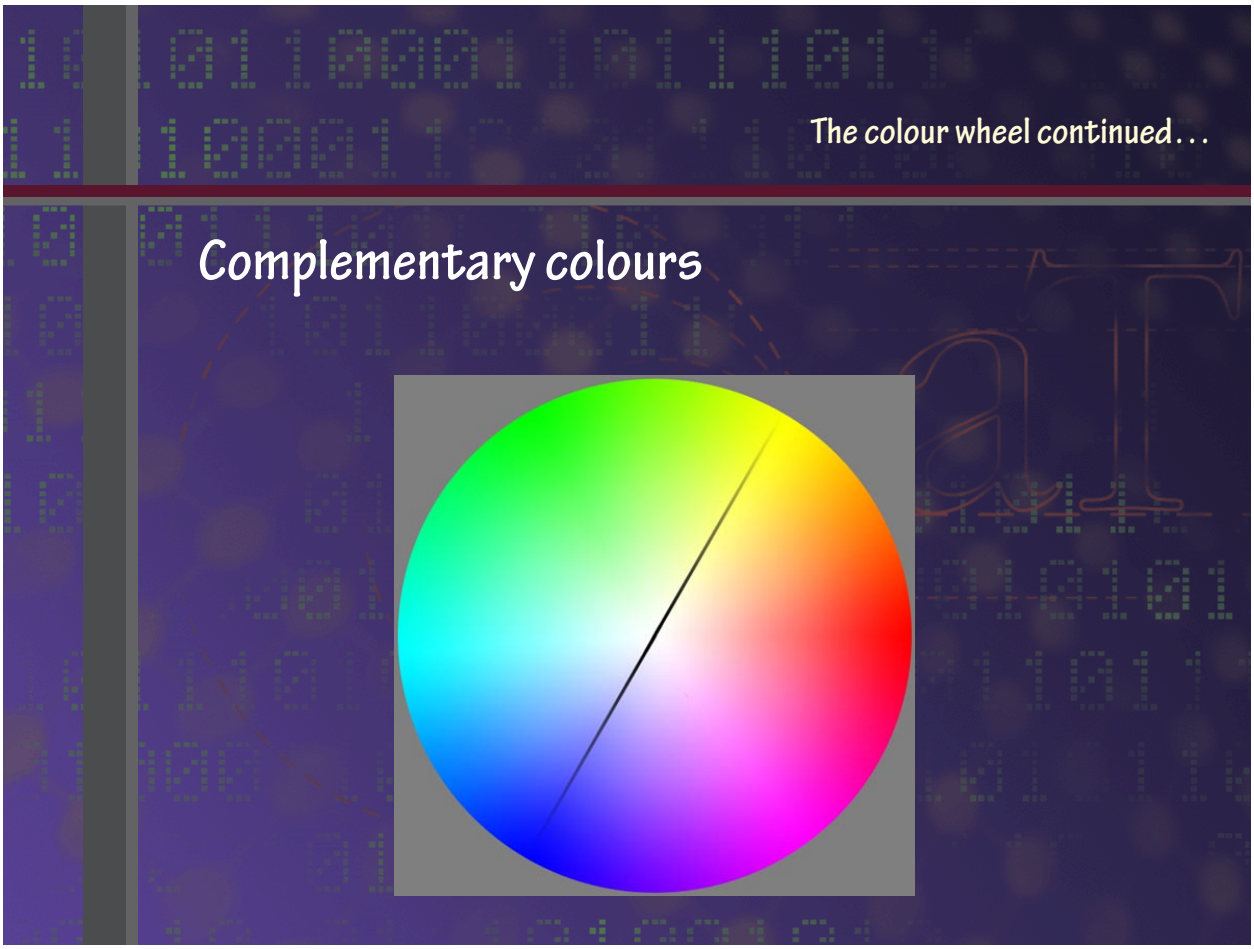
The three primary colours (or any hues 120 degrees apart) can be used in a harmonious colour scheme.



If you mix adjacent Primary colours, you get what are called Secondary colours: yellow, cyan, and magenta. These colours can be organized into a harmonious colour scheme, too.



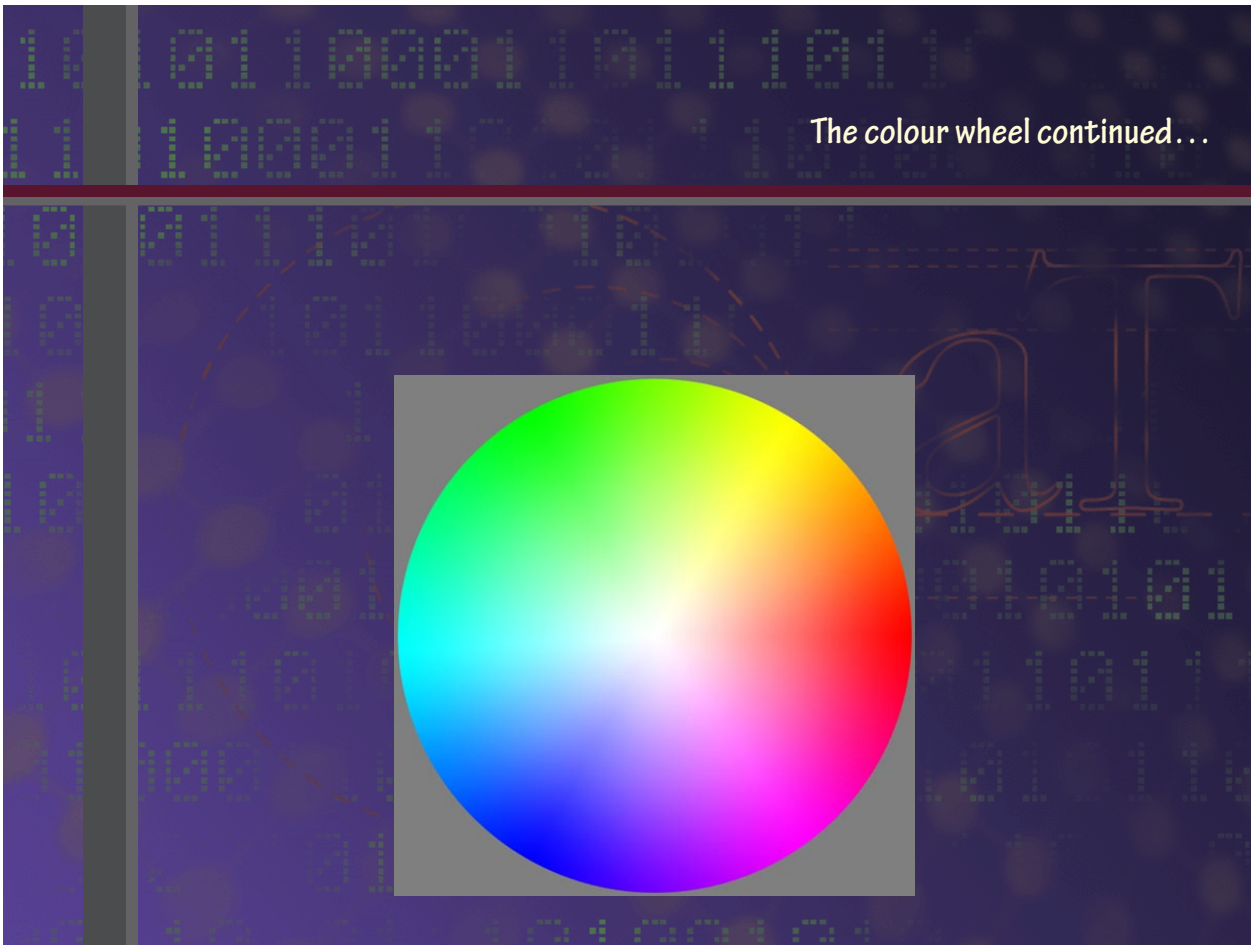
If you mix adjacent primary and secondary colours, you get what are called Tertiary colours. There are six Tertiary colours: orange, pale green, blue-green, sky-blue, purple, and fuchsia.



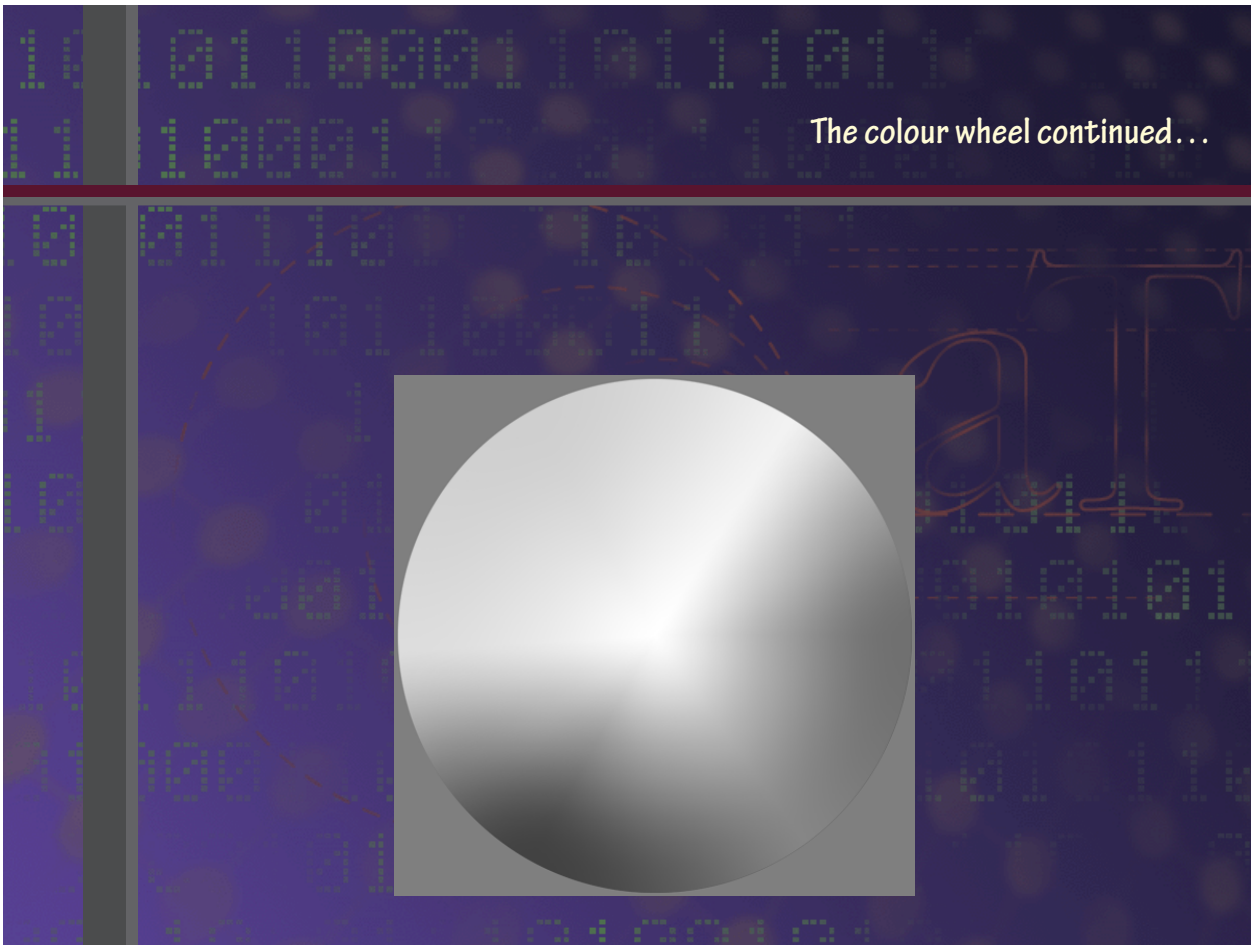
Colours that are 180 degrees apart are called complementary colours. This is because they contrast strongly with each other, and tend to make each other look more vibrant.

Analogous colours are part of a continuous spectrum of colour.

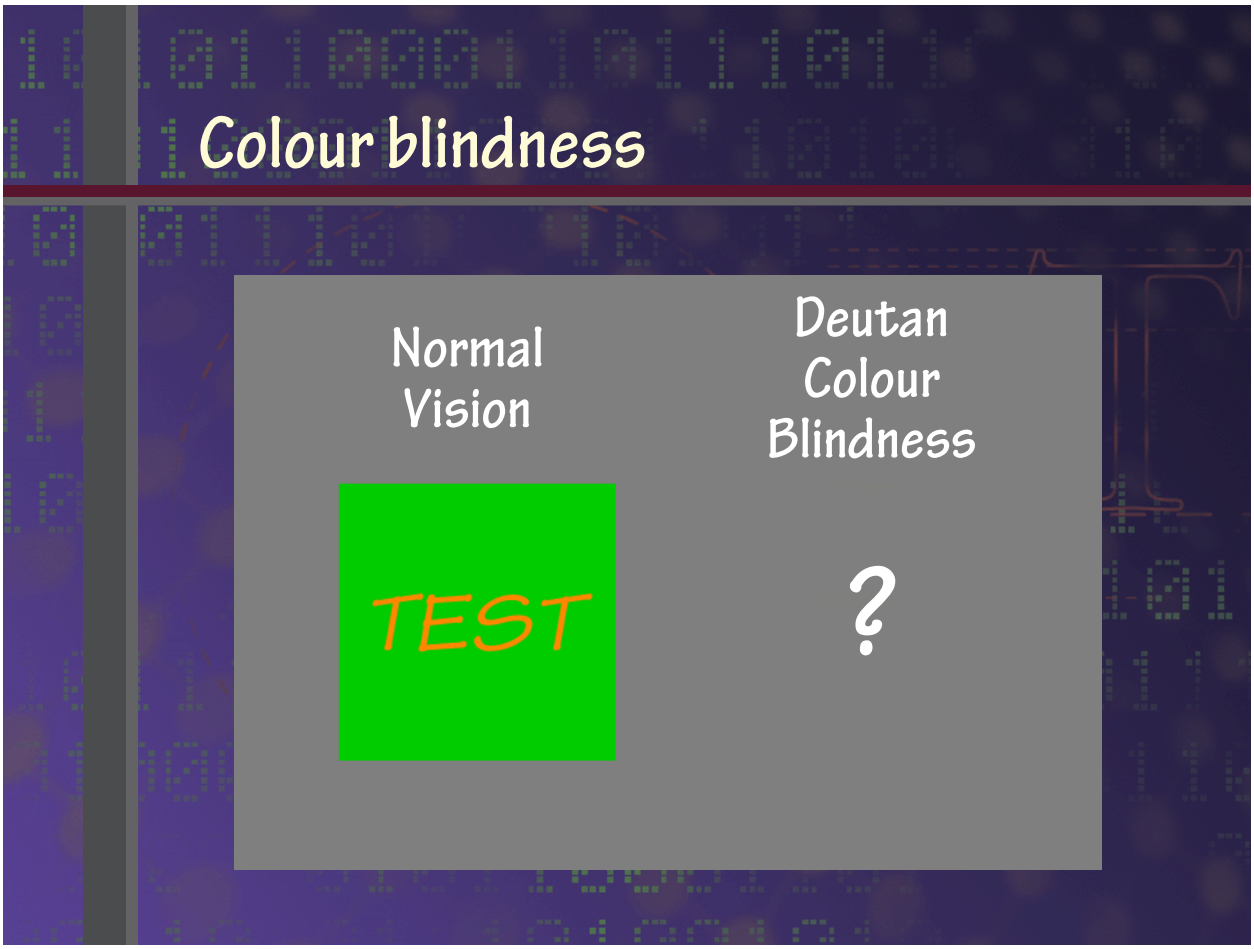
If you take a range of four evenly-spaced colours within a 90 degree wedge on the colour circle, you can create a very smooth-looking colour scheme that can be almost monochromatic.



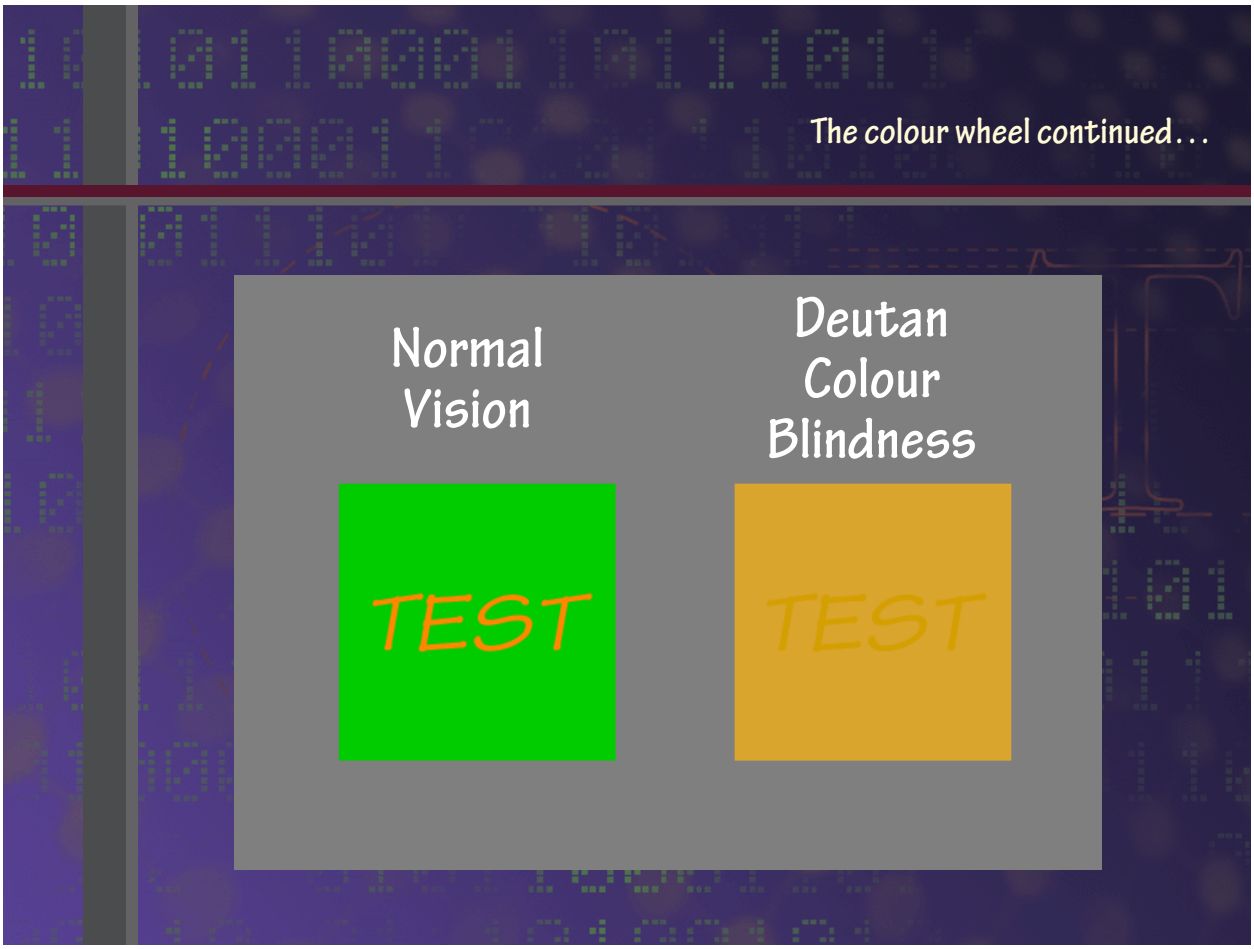
Question: What would this colour wheel look like if it were converted to grayscale?
Logic would suggest that since the various hues around the circumference are fully saturated, and the saturation declines evenly toward the center of the wheel, a grayscale version would therefore be uniformly gray around the edges, and progress evenly toward a white center.



This images was created in Photoshop, which imitates the behaviour of the human eye. The eye does not perceive reds, greens, and blues of equally intensity to be equally bright. The eye is much more sensitive to greens. So, the gray wheel is unevenly shaded.



Question: Suppose you have a web site for Christmas, and you picked Christmassy colours. You have red text on a green background. What would a colour-blind person see?



Since most people with colour-blindness cannot distinguish red from green, such people would likely see dark brown text on a light brown background. And if you decided to use a dark green background instead of a light green background in your web page design, the colour-bland person would see nothing at all. The page would be blank.