

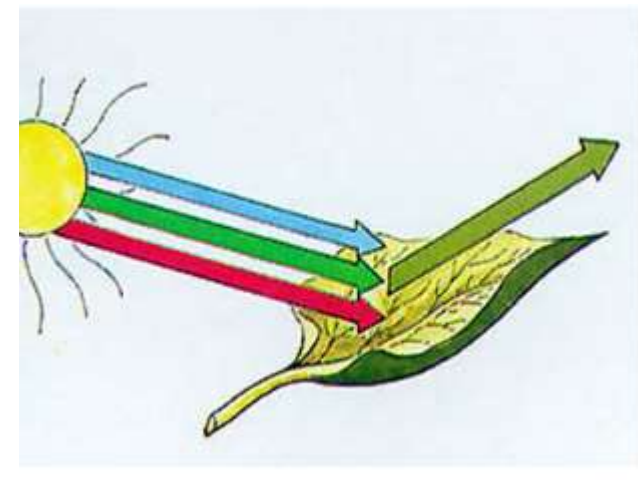
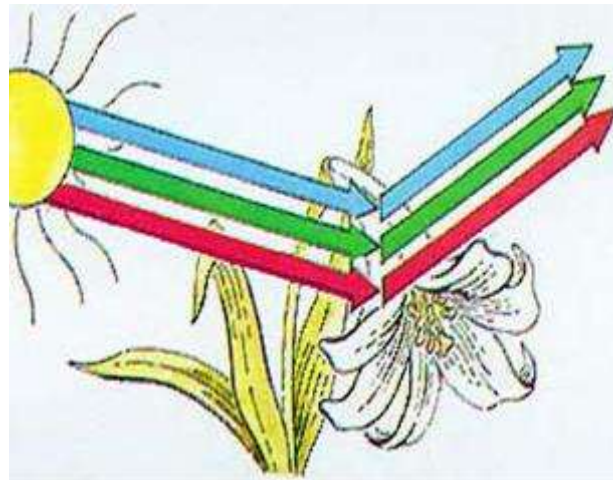
Colour Theory

By
John Salter

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Where does colour come from ?

- Most objects get their colour from light shining on them. They absorb certain wavelengths of light and reflect others.
- Different wavelengths are absorbed to various degrees, so that what gets reflected is a mixture of what does not get absorbed.



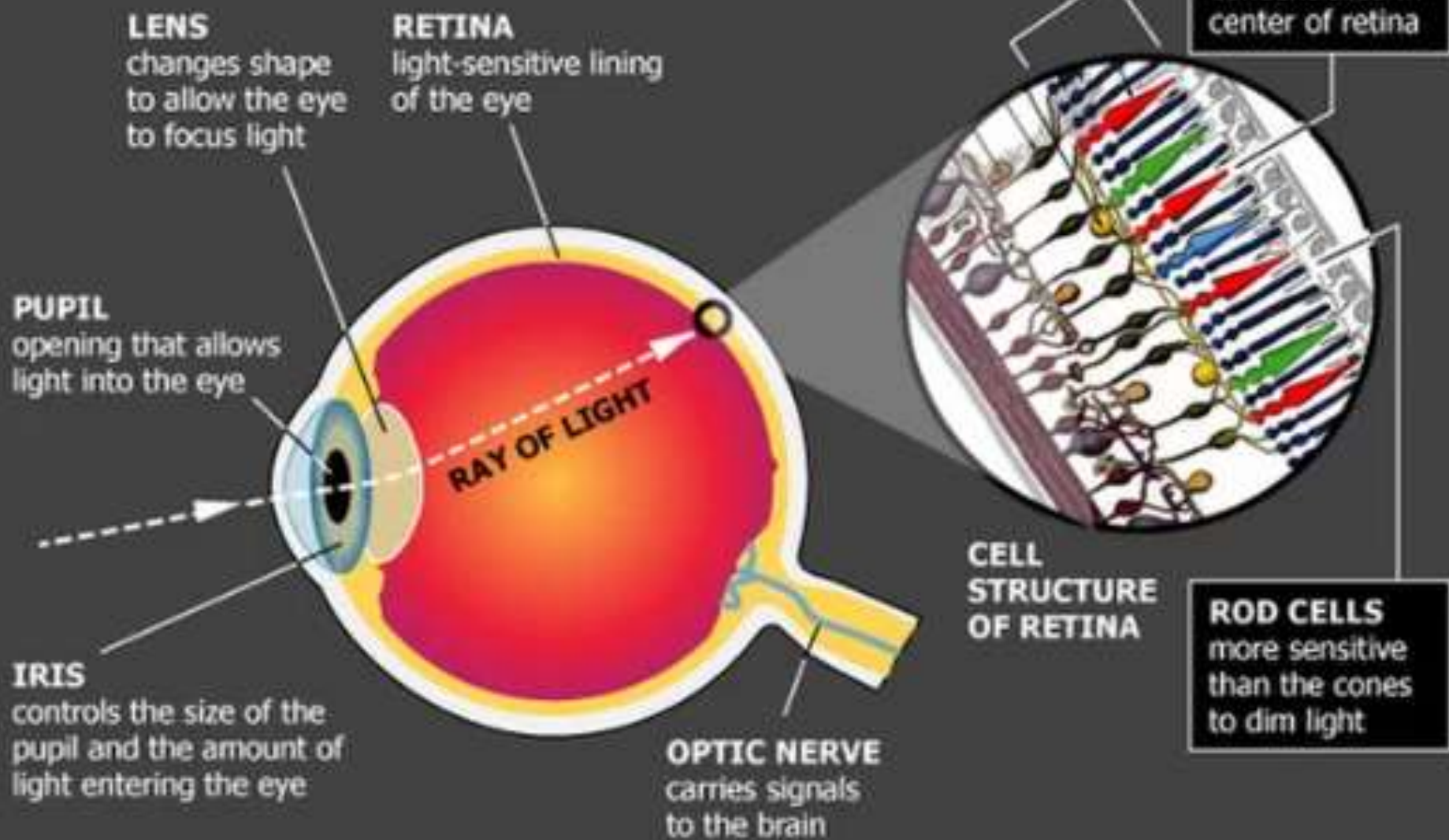
Where does colour come from ?

- Other objects (such as the sun) actually emit light as a spectrum of light at various wavelengths.
- White light (sunshine) contains all the colours mixed together.

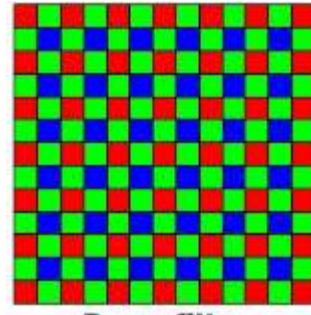


How the Eye Sees in Color

The retina contains cells called rods and cones that are sensitive to different colors of light.



How the camera sees colour



Bayer filter

The camera has a sensor, made up of millions of detectors

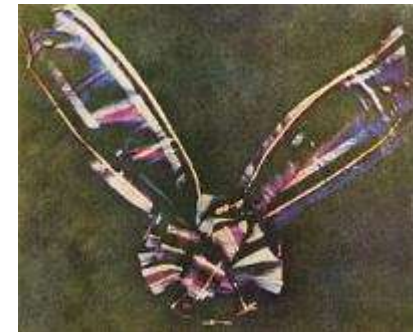
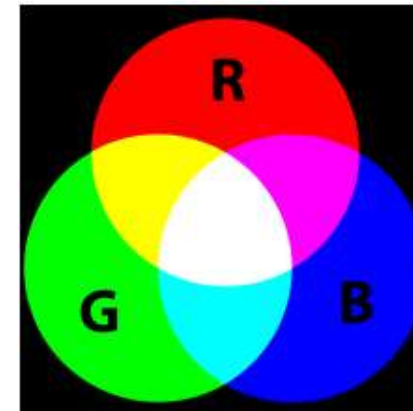
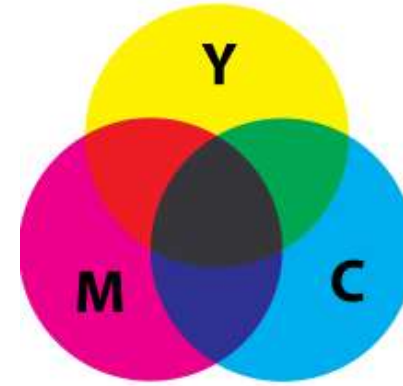
The detectors measure how much light reaches them.

A “Bayer” filter array is placed on top of the detectors, to ensure only light of this type gets through

Software in the camera processes the results

Additive & Subtractive colours schemes

- Dyes, Paints and natural colours contain chemicals which absorb some light wavelengths and reflect the rest (subtractive)
- TVs & computer screens emit light at different mixes of red, green and blue pixels. The intensity of the light can be varied. When these are combined, different colours appear (additive)

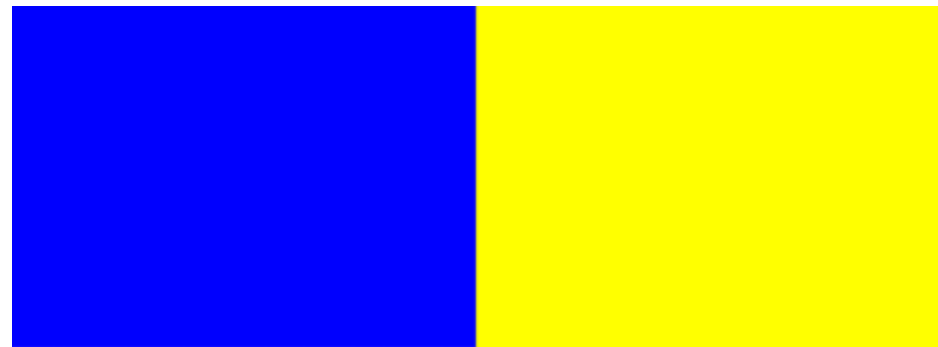
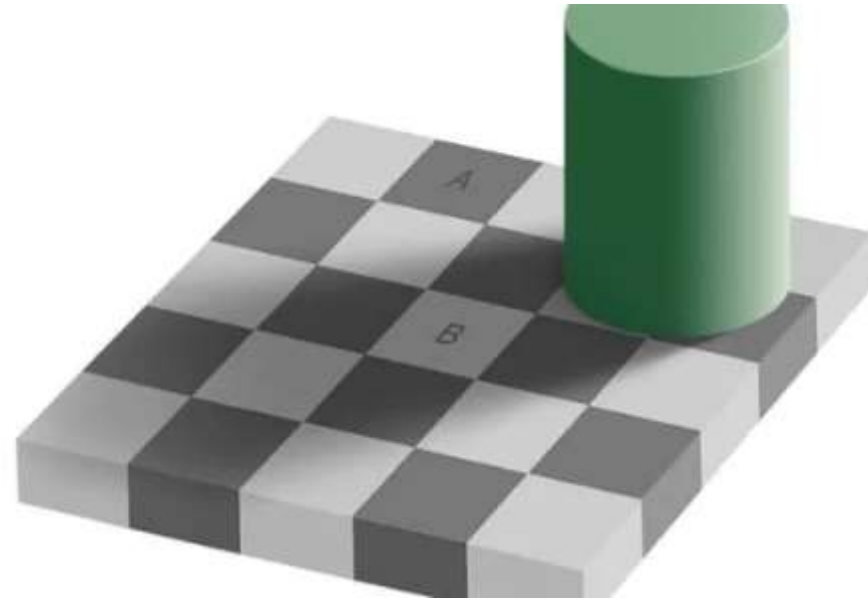


What about White balance ?

- Some light sources emit light with a different distribution of colours. For example, a candle (yellow light) and a fluorescent lamp (blue/purple)
- Our eyes are very good at judging what is white under different light sources, but digital cameras often have great difficulty with this.
- We may have to adjust our cameras to correct this

Our brains make sense of the signals

and they can be fooled !



Our reaction to colours

- Several ancient cultures, including the Egyptians and Chinese, practiced chromotherapy, or the use of colours to heal !
- Most psychologists view colour therapy with scepticism. However, research suggests colours can impact on our mood, our performance and what we buy
- Colours also have different meanings in different cultures



Colour in advertising

COLOR EMOTION GUIDE

The infographic maps emotions to colors and provides examples of brands using those colors:

- OPTIMISM:** CLARITY, WARMTH (Yellow)
- FRIENDLY:** CHEERFUL, CONFIDENCE (Orange)
- EXCITEMENT:** YOUTHFUL, BOLD (Red)
- CREATIVE:** IMAGINATIVE, WISE (Purple)
- TRUST:** DEPENDABLE, STRENGTH (Blue)
- PEACEFUL:** GROWTH, HEALTH (Green)
- BALANCE:** CALM (Grey)

Brands shown include: Nikon, UPS, NBC, Google, Amazon, Sprint, eBay, Coca-Cola, CNN, Dell, Lowe's, HP, Target, Best Buy, DHL, FedEx, McDonald's, and many others.

Bottom icons: Yin-Yang, Peace, Arm flexing, Lightbulb, Lightning bolt, Smiley face, Thumbs up.

Warm and cool colours



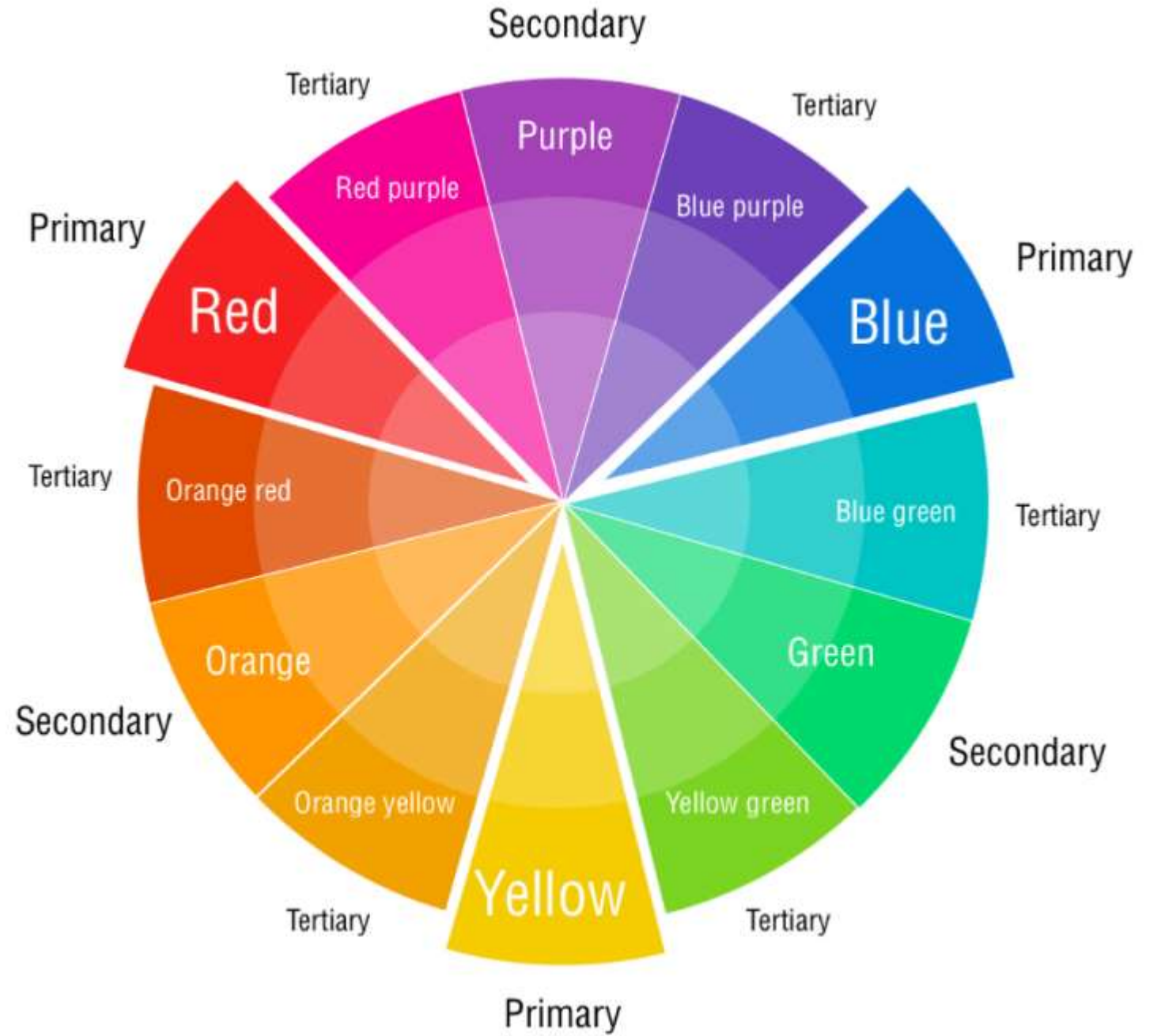
Including more or less colours



Colour for impact



Colour wheel



Recap – monochrome



Recap – analogous



Recap – complimentary



Recap – split complimentary



Recap – Triadic



Summing up

- Our eyes detect light at different wavelengths
- Our brains identify these inputs as colours
- Colours can produce an emotional response in humans
- Photographers can use colour theory to make their photos more appealing
- Think about colours when composing photos



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