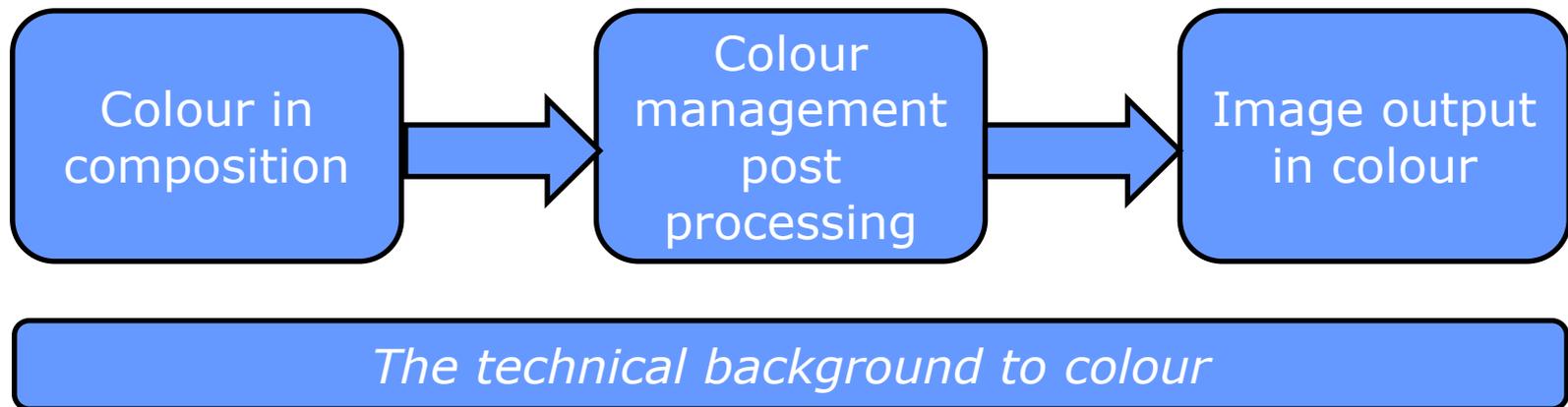


Obtaining optimum colours in your image

Bob Breach

TOPICS COVERED TONIGHT



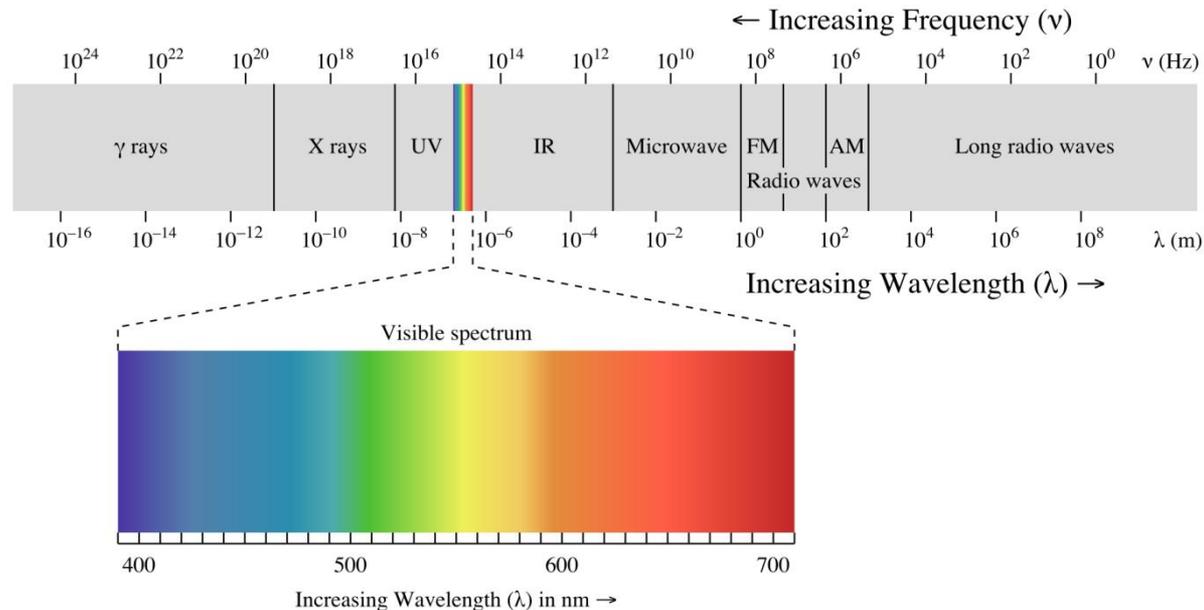
A lot of the benefits of colour management are lost if you do not have correct calibration of your monitor



*The technical
background to
colour*

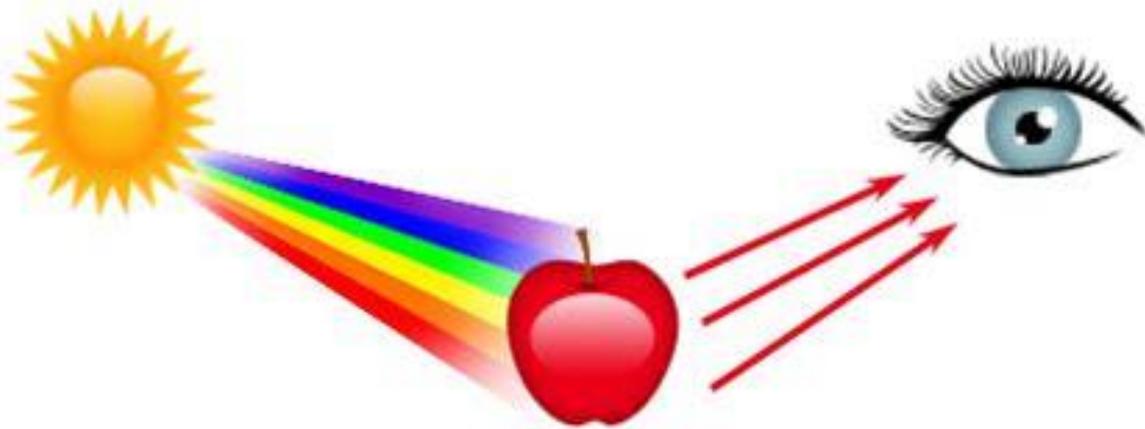
WHAT IS COLOUR ?

- Light is a form of electromagnetic radiation
- Glass and other materials can split (refract) white light into the different component wavelengths (the spectrum)
- Photographic lenses use combinations of glasses of different refractive indices to enable different colours to focus in one plane (apochromatic)



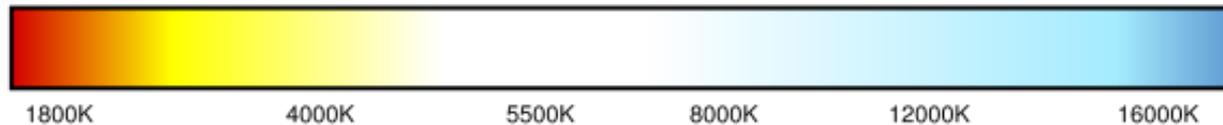
HOW DO WE SEE COLOUR?

- We all see and perceive colour differently
 - For example 12- 20% of white males and a much smaller proportion of females suffer from colour blindness, usually mild red/green.
- The colour we see depends on -
 1. Light source
 2. The absorption and reflection of light from an object
 3. The observer – human eye, digital camera
- The light source may have a continuous spectrum (e.g. sunlight) or a restricted spectrum (e.g. coloured sodium street light)
- Under normal light we “see” an object as “red” because it adsorbs other wavelengths and reflects only the red part of the spectrum



COLOUR TEMPERATURE

- Continuous light can vary in the predominant wavelength or colour and this is defined in terms of “colour temperature”
- Measured in degrees Kelvin (K)
 - Tungsten lamp – 2800 K
 - Sunset – 3000 K
 - Electronic flash/average noon daylight – 5500 K
 - Noon sunlight/international white light – 6500 K
 - Overcast sky – 7000 K
 - Clear blue sky – 10000 K
- In photography this is termed the coolness or warmth of an image



COLOUR CODING

- To help designers/web managers, colours are now coded to ensure colour consistency
- Very complex but in essence there are two main systems
- RGB
 - An RGB color value is specified with: `rgb(RED , GREEN , BLUE)` where each parameter defines the intensity of the colour as a number between 0 and 255.
 - For example, `rgb(0,0,255)` is blue, because the blue parameter is set to its highest value (255) and the others are set to 0.
- *Hexadecimal*
 - *A hexadecimal color is specified with: #RRGGBB.*
 - *RR (red), GG (green) and BB (blue) are hexadecimal number between 00 and FF specifying the intensity of the colour.*
 - *For example, #0000FF is displayed as blue, because the blue component is set to its highest value (FF) and the others are set to 00.*

COLOUR CODE EXAMPLE



Maya blue

#7CB9E8 Save

rgb(124,185,232) Open

rgb(0.49,0.73,0.91)

CMYK(0.4655, 0.2026, 0, 0.0902)

Hue: 206, Saturation: 47, Value: 91

The benefit is that if you know the colour code you can accurately reproduce that exact colour



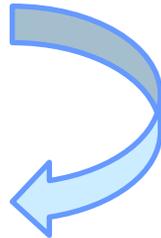
Colour in composition

COLOUR GIVES MOOD TO AN IMAGE

- Think about what mood you want to convey with your image
 - Bold and dramatic
 - Soft and subdued
 - Harmonious or vibrant
- Some of this can be best created at the time of image capture
 - Train yourself to see the “right colour balance” when looking for shots
 - Use colour as a compositional tool
- But can also change to some extent in post production

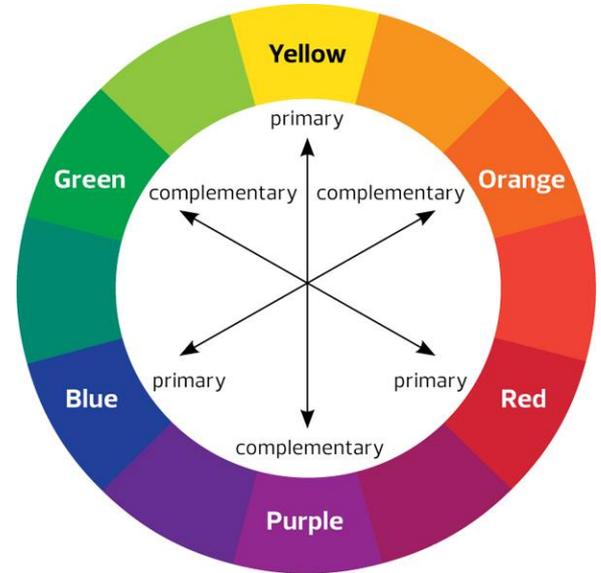
COLOUR BALANCE

- Understand the colour wheel
- Complementary colours provide strong contrast
 - Do not have to be the same dominance in the picture
 - If equal amounts then can create tension
 - Often better if you make one of the colours less prominent than the other



- Adjacent colours are harmonious

- Use to provide soft and restful pictures
- Can keep the eye of the viewer looking within the picture



COLOUR SCHEME DESIGNER

The screenshot displays the Color Scheme Designer (CSD) web application interface. At the top, a navigation bar includes links for "Undo", "Redo", "Random", "Colorblind", "Color space", "Export", and "Help". Below this, the text "Color Scheme Designer is now Paletton! Check out Paletton.com" is visible, along with the "paletton" logo and copyright information: "2002-2010 © Petr Stanicek • v3.51 • [Blog & News](#)".

The interface features a central color wheel with "warm" and "cold" labels. The current hue is set to 0°, and the opposite color is selected. The color wheel shows a gradient from red at the top to blue at the bottom. The current color is red, with RGB values of R: 100 %, G: 0 %, B: 0 % and a hex code of FF0000.

Below the color wheel, there are six color palette icons: "mono", "complement", "triad", "tetrad", "analogic", and "accented analogic". The "complement" palette is currently selected, showing a horizontal row of four color swatches: a bright red, a light red, a very light red, and a dark red. The "Scheme ID" is displayed as 0011Tw0w0w0w0.

On the right side, there is a button that says "CREATE FREE STUNNING WEBSITES GO >>".

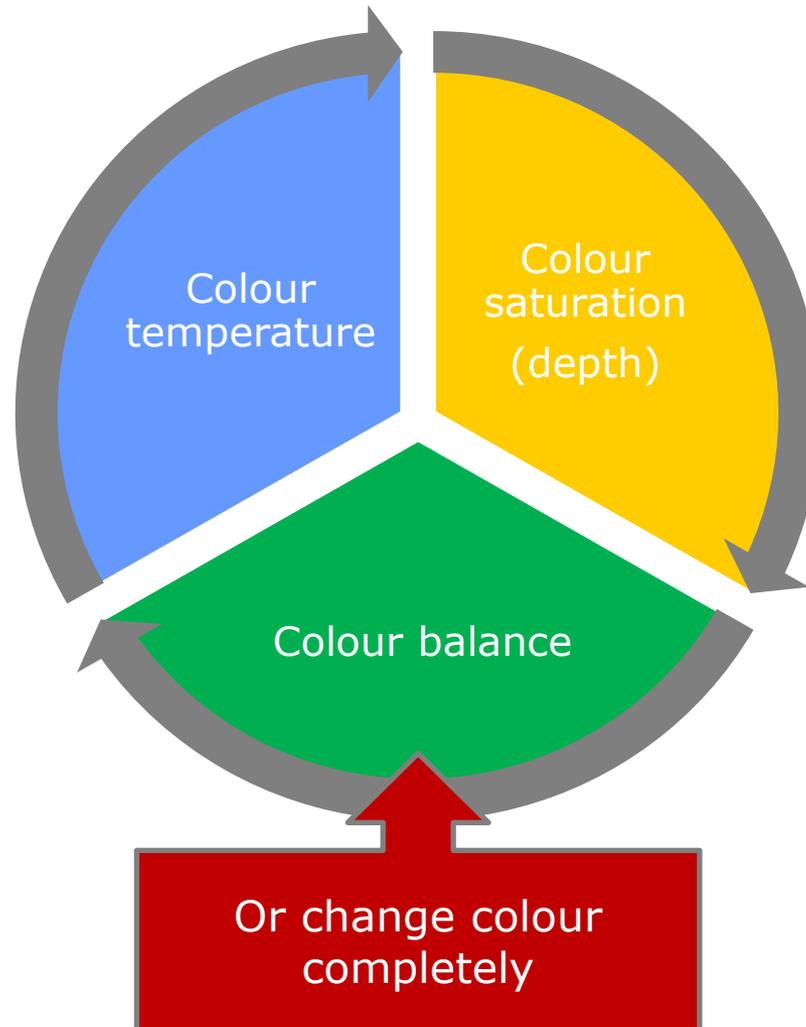
<https://colorschemedesigner.com/csd-3.5/>



Colour management post processing

**Note : Modifying colour is much easier and better on raw files
and indeed some features are only really possible using raw**

THE MAIN ELEMENTS OF COLOUR MANAGEMENT



MANAGING COLOUR TEMPERATURE

White balance

- The time of day (with natural light) or type of artificial lighting (indoors) can impact on the overall warmth or tone of an image
- On a digital camera you can:
 - Set an appropriate colour (white) balance appropriate to the conditions (shade/daylight etc.)
 - Leave camera on fixed (e.g. 5200 K setting)
 - Leave camera on auto white balance
- Auto white balance usually easiest unless for example you want to take dramatic sunsets or very accurate colour
- Where necessary in post processing for raw files you can:
 - Use the temperature slider to adjust colour temperature
 - Or use white balance colour picker to get neutral tones



ACCURATE WHITE BALANCE



- For really accurate colour (white) balance e.g. for product shots or at weddings you may need to use a “grey card”
- This is a neutral coloured card which you include in a trial shot
- In post processing you can then bulk edit the white balance for all other images taken under the same conditions



Grey card in
use

AN EXAMPLE



- Depending on the raw software you use you should have a “white balance” eye drop picker
- Use this to pick on a suitable neutral tone in the image and check the result.
- May have to choose different points in the image to get right
- Can also use to change the “time of day” or to improve sunsets!

What time of day was this taken?



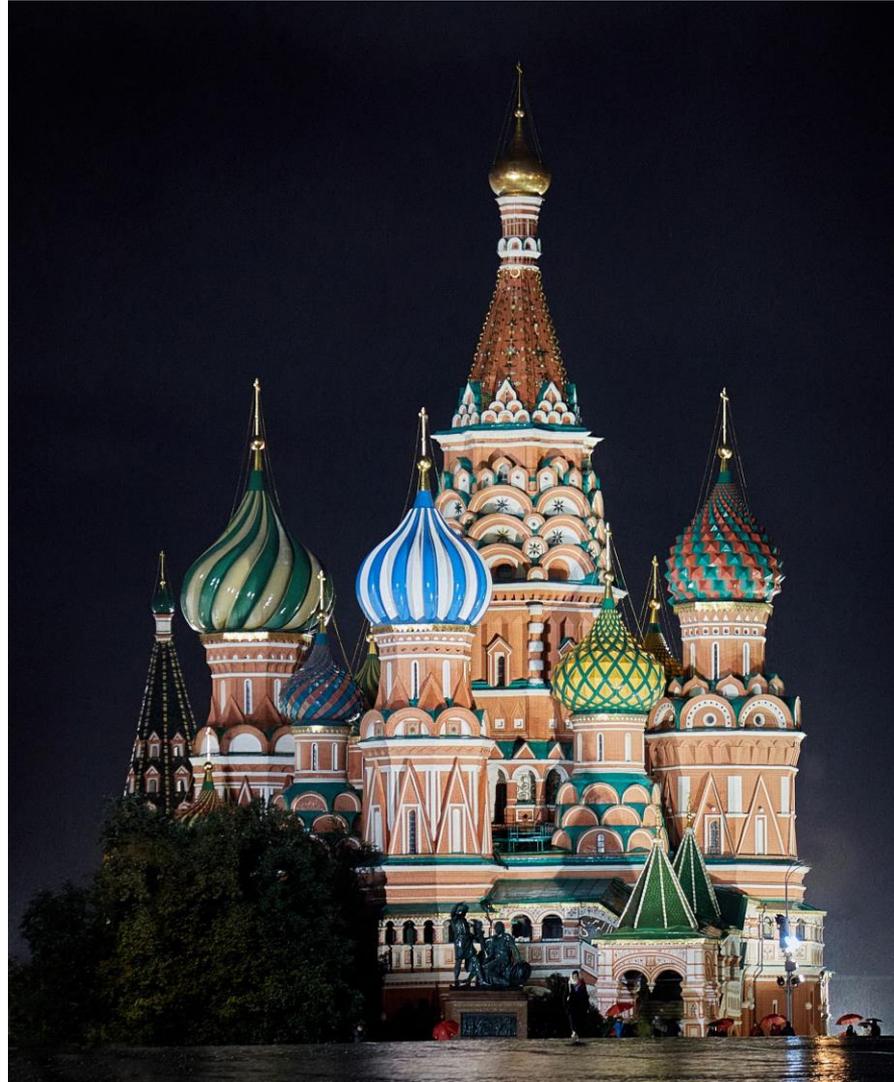


Demonstration

MANAGING COLOUR BALANCE

- Depending on your software you can significantly alter the colour balance post processing
- This can also help to correct colour casts derived from point of capture
- Use with care or you can get some weird effects (unless this is what you wish!)
- Some software has special tools for this
- In PS use new layer and adjust colour tone through
 - single colour tone
 - colour balance tool
 - hue/saturation layer tool
 - gradient mapping (maps grey tones and then adds colour)
- You can then moderate the extent of the changed colour tone by blending between the two layers or use different blend modes

AN EXAMPLE





Demonstration

MANAGING COLOUR DEPTH

- The depth of colour (saturation) can significantly impact on how an image is perceived
- High levels of saturation are bold and punchy
- Low levels of saturation can provide a soft subtle image
- Sometimes just a little colour can be used to emphasise small tonal differences within the image
- Complete desaturation (a monochrome image) works best when there are significant tonal differences within the image
- Use the saturation slider to adjust the depth of colour
- Contrast (+/-) can also emphasise the degree of saturation
- Can also just adjust a part of the image using layer masks

AN EXAMPLE



Desaturate whole or part of image to give different moods



Demonstration

CHANGING COLOUR !

- It is also possible to selectively change colours
- Use image/adjustment/replace colour
 - Use colour picker to choose colour to be replaced
 - Use fuzziness slider to alter exact colour range in image
 - Choose replacement colour
 - Can do on separate layer if you wish
- Usually works best when certain key objects within the image have a distinct colour



Blue tomatoes
anyone ???



Demonstration



Image output
in colour

COLOUR IMAGE OUTPUT

Each output format has different requirements

High quality
jpegs or TIFFS



Large prints for
competition or
display

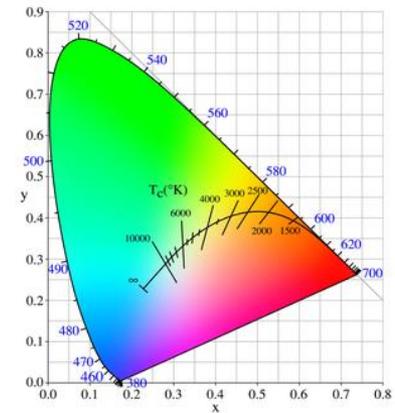
Jpegs at screen
resolution



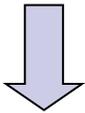
Projected
image/slide show

ACCURATE COLOUR PRINTS REQUIRE CORRECT PROFILES

- The underlying basis of colour profiling is very complex, but in practice is easy to manage
- Each piece of kit can reproduce colour slightly differently
- Ideally camera, monitor, printer and each paper type, and projector should be colour calibrated so that they match
- Thus minimum colour matching necessary
 - Monitor
 - Borrow/buy calibration equipment
 - Make sure monitor position and lighting good
 - Printer/paper
 - Can usually get free “standard” profiles
 - Better to use specialist service
- Make sure the profiles are set up properly in your software and changed when you use different paper



COLOUR ICC PROFILES



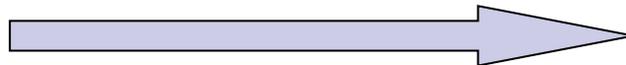
Monitor profile sets
"standard" colour
reproduction

*(but will be influenced by
lighting and monitor position)*

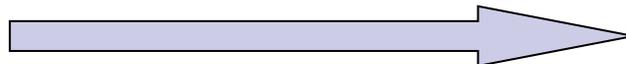
Print profile 1



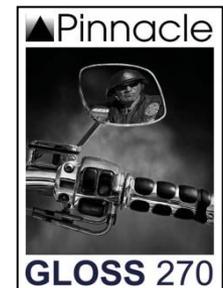
Print profile "matches" monitor
colour to printer/paper combination



Print profile 2



Projector profile





Now for some questions,
discussion

And if you really want to boggle yourself with
technical details Spyder e-books are available