

Contrasting the way we see light and color with the way the camera sees light & color....

Light may be ambient or incident, hard or soft, and back, front, or side.

Brightness is a perception. We react differently to different colors... Red 0.3, Green 0.6, Blue 0.1.

Variations in brightness and hue create tones that are solid (spot color) or continuous like the sky.

Original Windows 3.1 had 8-bit (one byte) color depth (RRRGGGBB) for 256 possible colors for any pixel.

Today cameras produce 12-bit color or 68 billion colors. That is color power!

A rainbow's colors: Roy-G-BIV, green dominates.

A camera's sensor sees through a RGB Bayer filter that has twice as many green lenses.

Human eye can discern 10 million colors and, perhaps, as much as 700 to 900 shades of gray.

Black & White photography is easy on the eye (brain and sugar consumption!).

Dynamic Range: the full spectrum of light tones from black to white that the eye or the camera may discern.

The camera "sees" digitally, humans analog. A camera's gamma correction causes images from a camera or displayed on a monitor according to the way humans interpret brightness. We humans are far more sensitive to changes in darker tones than brighter tones. Calibrate a computer monitor to gamma 2.2.

A camera shows us the distribution of brightness values by displaying a histogram.

We can view all light sources as potentially having both a color temperature (amber to blue measured in Kelvin) and a tint (green to magenta). Modern LED lights complicate things.

We may adjust our camera for a specific "color temperature" or Kelvin temperature.

Improper White Balance settings are responsible for 85% of color tints in images.

What is white light? There really is no such thing (our eyes fool us!).

An exposure is the visible product of light captured by the camera. It may be underexposed, overexposed or just right but as little as 1/3 EV (exposure value) can make a significant difference in color and quality.

Camera exposure meters measure reflected light.

The camera's light meter anticipates 50% (46.6) brightness or 18% reflected. Hand held light meters measure light directly and may be more accurate particularly when using a flash.

A gray card (middle gray or hexadecimal 777777) reflects 18% of the light that strikes it. The card should be neutral, that is, reflecting all colors in equal amounts. A gray card is a guide for choosing both exposure and white balance.

Use your camera's exposure compensation adjustment when the subject of interest is decidedly more reflective (+EV) or more light absorbing (-EV) than middle gray.

A camera may have three or more metering modes, Nikon: Matrix, Center Weighted, and Spot.

The number of pixels per inch or PPI in an image file determines its potential resolution.

Color mode and spaces: RGB color mode has a number of color spaces including, sRGB and AdobeRGB. CMYK or Cyan, Magenta, Yellow, and Key (black) is the color mode for printing presses and inkjet printers.

Printers print by placing small dots of ink on paper. Dots per inch is abbreviated as DPI.

Photo paper typically has an ICC profile (International Color Consortium, 1993) that is interpreted by Photoshop when printing.