

Friday, March 8 at 10:00 AM in Ayres 103  
10 points extra credit in the lecture

[http://www.chrisjordan.com/current\\_set2.php](http://www.chrisjordan.com/current_set2.php)

### SPECIFIC COURSE OBJECTIVES FOR THE WEEK:

- Changes to the schedule: RADIOLAB episode
- Learn basic color theory
- Learn about color modes
- learn about SOFT PROOFING
- learn about color mixing (RGBCY)
- Observe a color correction demo

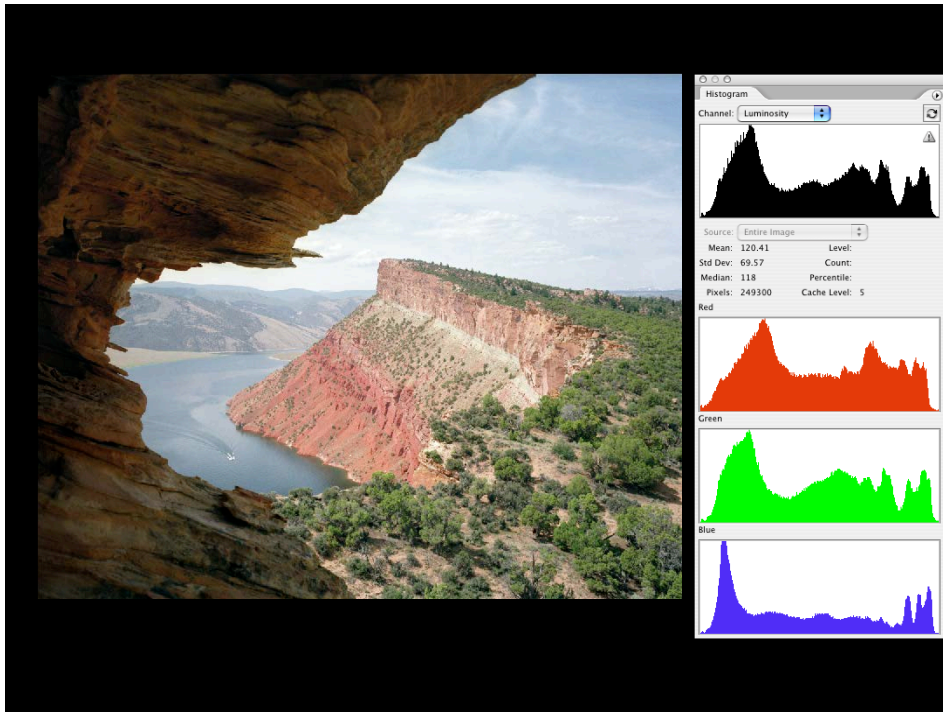
### Color Theory & Practice



### DIGITAL DEFINITIONS

A 24 BIT color image is made from the combination of THREE 8-bit images. A RED image, a GREEN image, and a BLUE image.

$$8 \text{ bits} + 8 \text{ bits} + 8 \text{ bits} = 24 \text{ bits}$$



THERE ARE SEVERAL DIGITAL **COLOR SPACES** (or “modes”):

**RGB** (Three 8-bit channels)= Red, Green, Blue (light)

*This is a way of manipulating light in a way that’s consistent with how digital cameras see and monitors reproduce the world.*

**CMYK** (Four 8-bit channels)= Cyan, Magenta, Yellow, and Black (ink)

*This is a way of manipulating ink in a way that’s consistent with how printers reproduce the world.*

**LAB** (Three 8-bit channels) = Lightness, A-axis, B-axis

*This is a way of manipulating images in a way that’s consistent with how people see the world. When pictures have to be converted between RGB and CMYK, they pass through this mode to best translate the colors.*

THERE ARE SEVERAL DIGITAL **COLOR SPACES** (or “modes”):

**RGB**



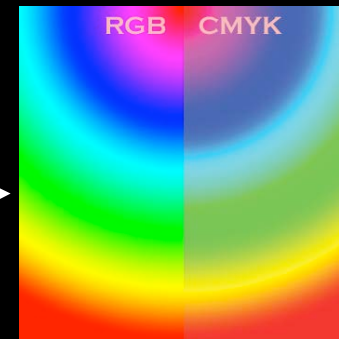
**CMYK**



**LAB**



Monitor →

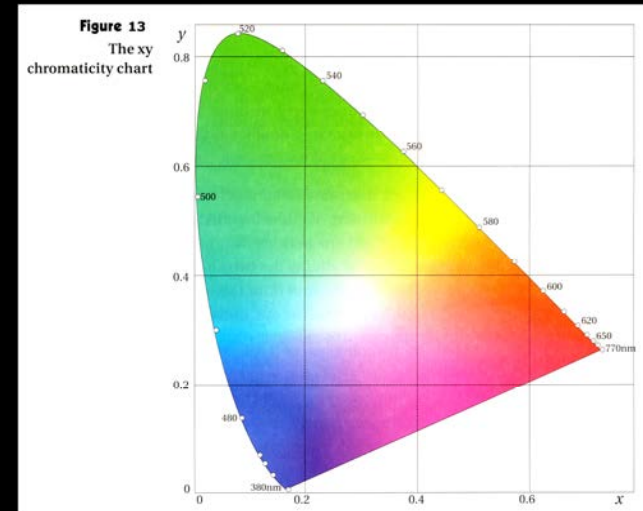
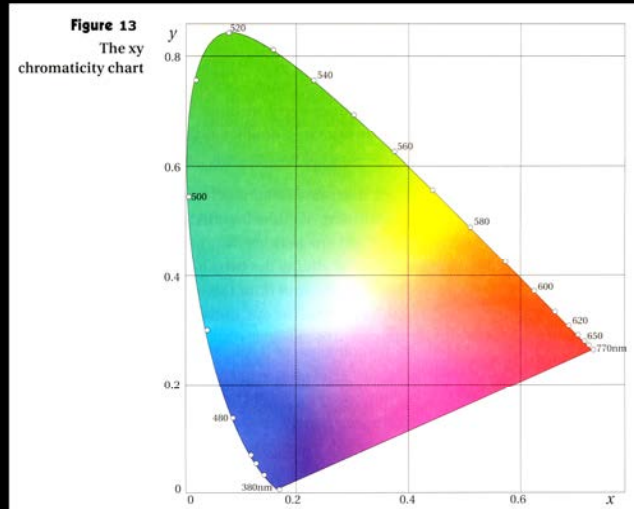


← Printer

The visual differences between two color modes  
(methods of color reproduction)

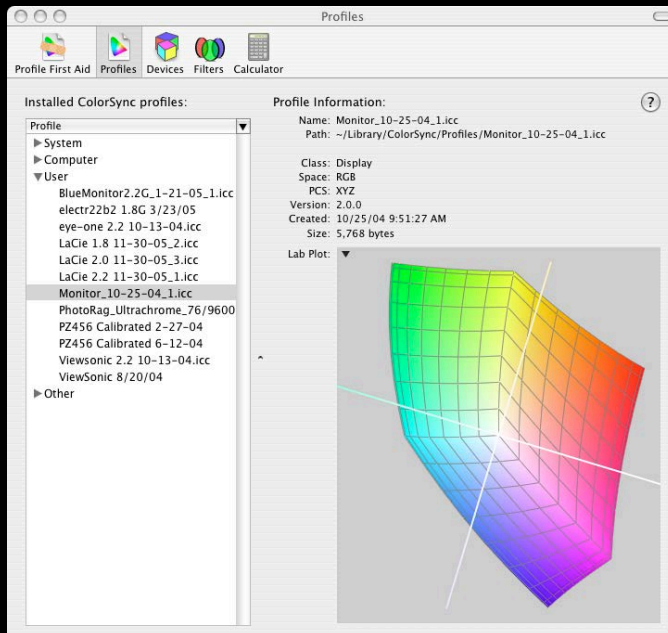
*This is why your prints will never exactly match the computer screen...*

GAMUT = The range of colors a specific device can reproduce.



chromaticity chart = plots the range of colors that can be perceived by an "average" person, or the range of colors that can be reproduced by a specific device.

### Screenshot from the Apple Colorsync utility



So, what does this mean for you?

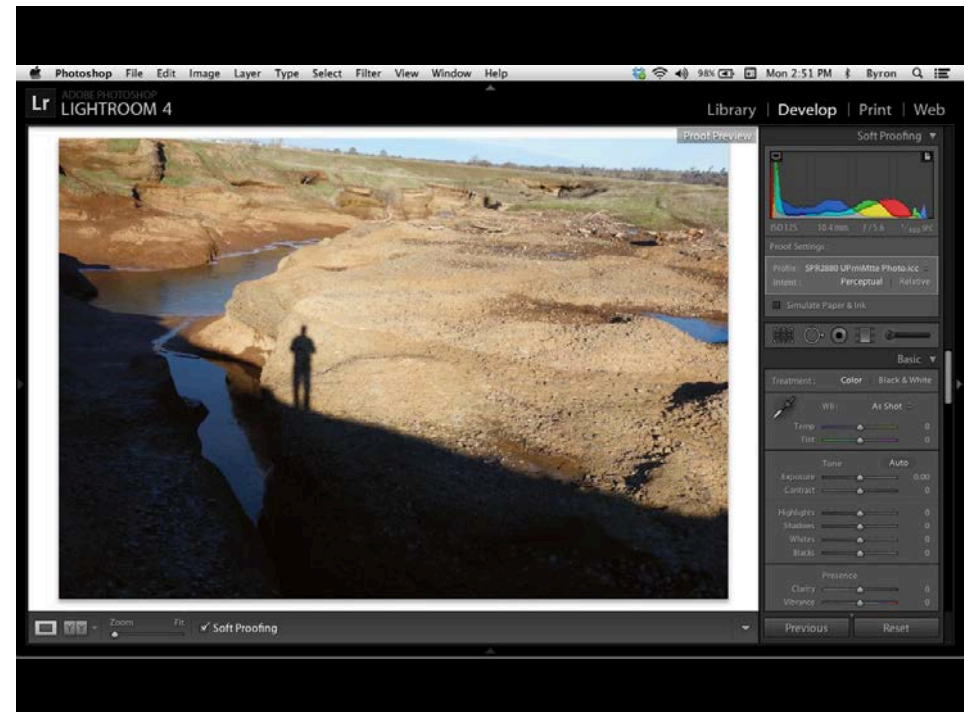
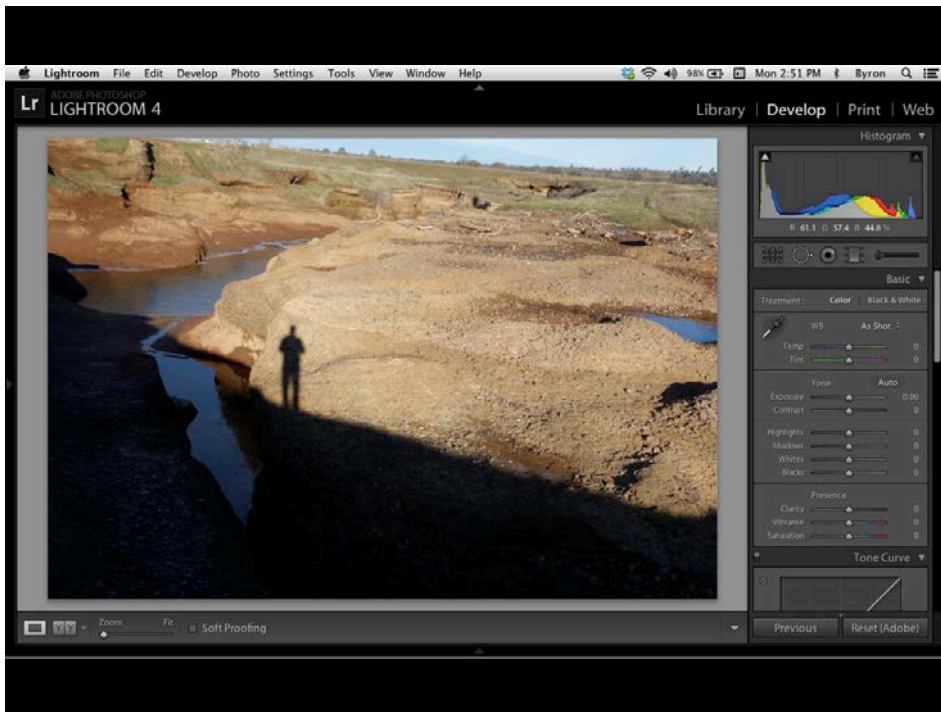
- Software and hardware typically handles all the conversion that needs to be done, so you don't have to do anything.
- **Always** use RGB color mode and don't change out of it unless you're explicitly told by someone to do so.

Most importantly, this should help explain why pictures look different when viewed on a screen vs. as printed objects.

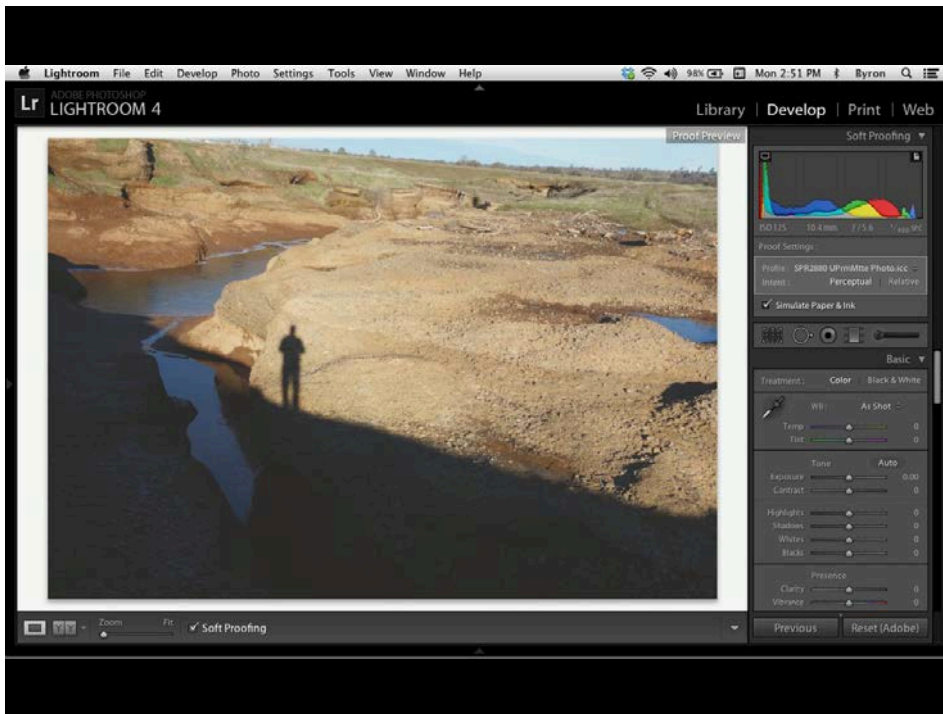
How can you overcome this difference between the projected and printed image?

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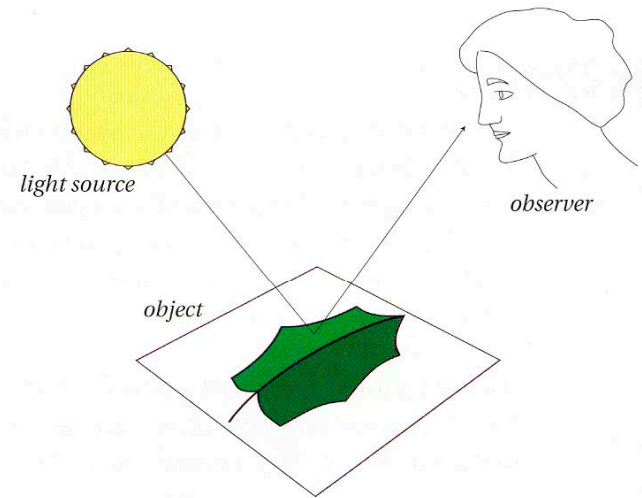
## SOFT PROOF







**Figure 1**  
The color event



*A color event always has three participants.*

When considering the observer, color is a **sensation** and is affected by...

- your mood
- your gender
- your native language
- your age
- the time of day
- and many, many, other factors...

When adjusting the color in photographs, you must be sensitive to **Memory Color** and **Color Constancy\***

\*These terms are described in your reading of *The Human Element* and in the Radiolab episode called *Colors*.

**Memory Color** = the viewer (or photographer) makes an unconscious assumption about the color of something. You often see what you *expect* to see, not what's really there.

**Color Constancy** = the viewer (or photographer/camera) automatically compensates to make the overall color balance of a scene neutral - even if the overall color balance is radically different.

This means that what you think a color *should* be is sometimes different than how a color is actually reproduced. **This means that you may have to change a picture to make it look and feel the way you want it to.**

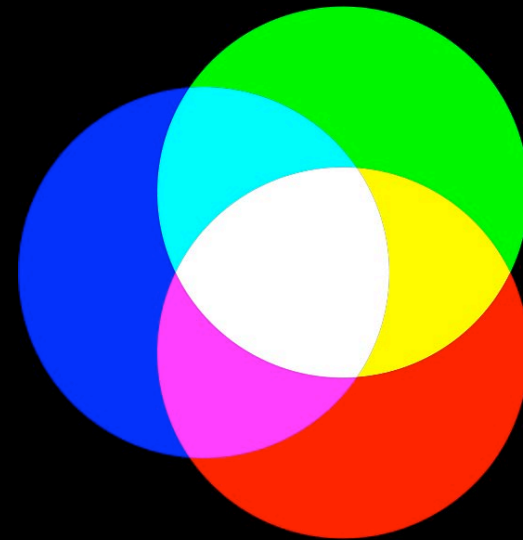
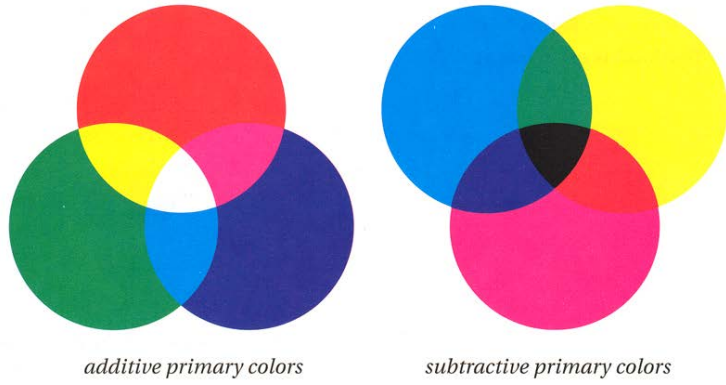


THIS IS NOT A PLUM

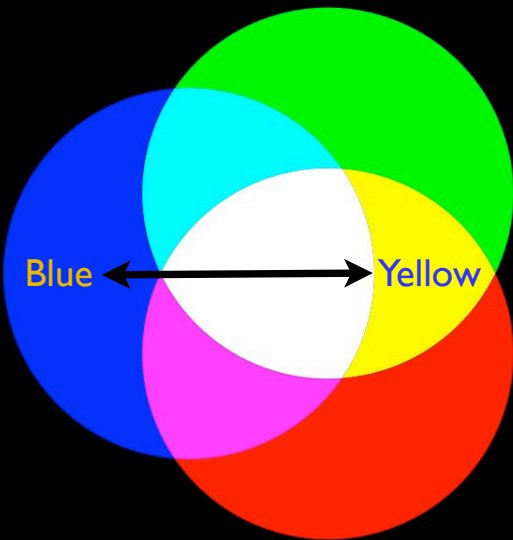


This is a mixture of light that suggest the *idea* of a plum

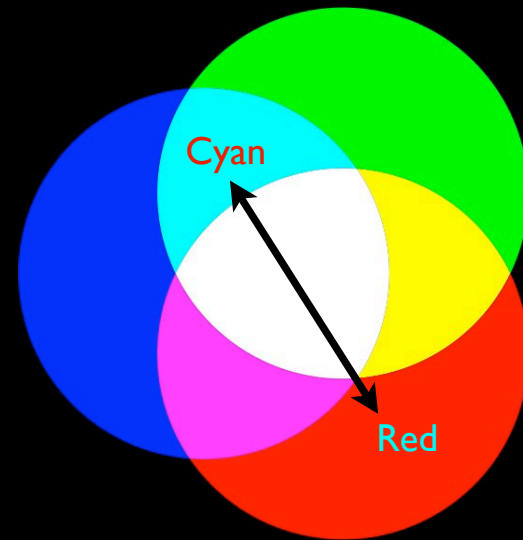
**Figure 7**  
Primary colors



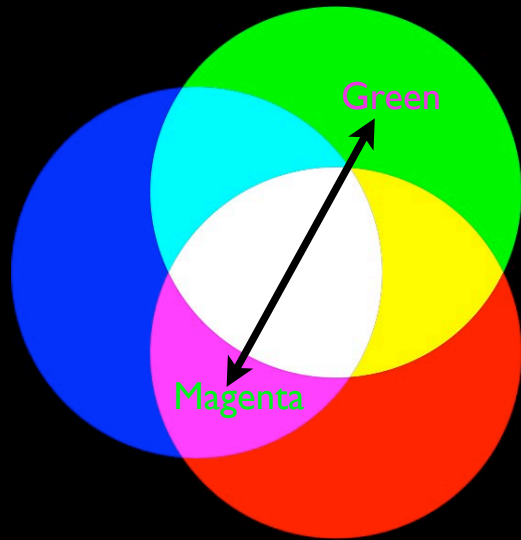
**ADDITIVE COLOR**  
Adjusting color by varying the quantities of each color of light



**ADDITIVE COLOR**  
Adjusting color by varying the quantities of each color of light

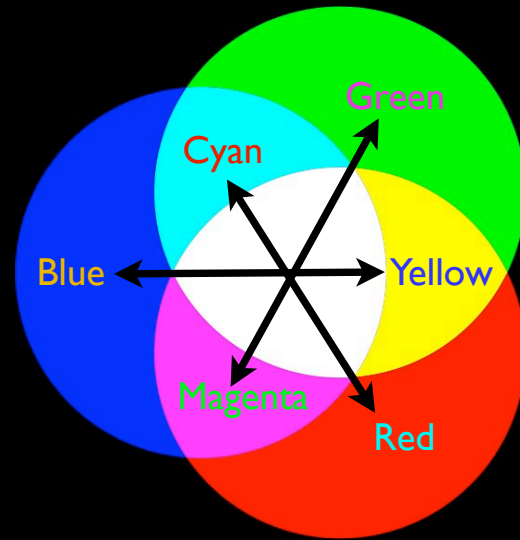


**ADDITIVE COLOR**  
Adjusting color by varying the quantities of each color of light



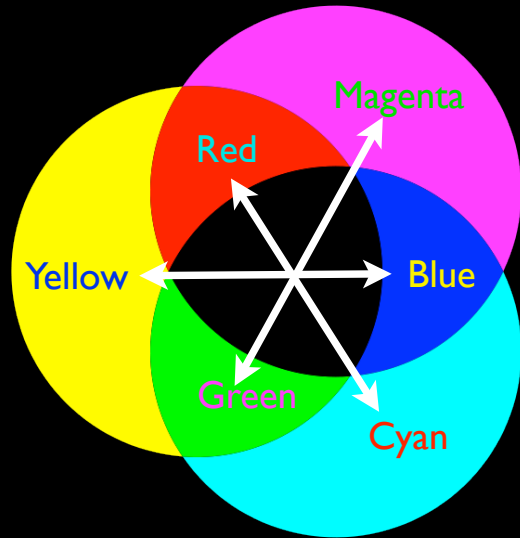
**ADDITIVE COLOR**

Adjusting color by varying the quantities of each color of light



**ADDITIVE COLOR**

Adjusting color by varying the quantities of each color of light



**SUBTRACTIVE COLOR**

Adjusting color by varying the quantities of each color of ink

