Understanding Color

How to Use It to Express Your Creative Vision

Class #2

Mark Fitzgerald

Mark@DDRoom.com ~ (503) 977-2400

© 2021 Mark Fitzgerald

Day 2 – From Concept to Practice

1. Questions from Last Week?
2. Color Models & Color Spaces
3. Measuring and Evaluating Color
4. Color Correction vs. Color Grading
5. Adjusting Global Color
6. Adjusting Local Color

© 2021 Mark Fitzgerald

Questions and Follow Up From Class 1

See slide #22 correction!

© 2021 Mark Fitzgerald

Color Models & Color Spaces

The First Step to Understanding Digital Color

© 2021 Mark Fitzgerald

Comparing Color Models

- **Color models:** Systems for expressing specific colors when working with digital color.
  - **RGB:** Based on Red, Green and Blue color channels
  - **Lab:** L=Lightness, a=Red/Green, b=Blue/Yellow channels
  - **CMYK:** Cyan, Magenta, Yellow and Black channels
  - **HSL (HSB):** Hue, Saturation and Luminance (Brightness) channels
  - **Hex Code:** A 6-digit hexadecimal code that uses numbers and letters to describe a color
  - ☞ *RGB color channels are actually individual B&W channels.*

© 2021 Mark Fitzgerald

Comparing RGB Color Spaces

- Color spaces exist within each color model. Each color space has a defined **gamut** - the range of colors it contains. (Think of a gamut as the total number of crayons in a box.)
- The RGB color model supports the following color spaces.
  - **ProPhoto RGB:** A very large color space that contains all real world colors as well as some "theoretical" colors. This is the best color space for editing raw files.
  - **Adobe RGB:** A larger, more general purpose color space that is suitable for editing in Photoshop, some custom printing, and other high-end output.
  - **sRGB:** A small color space that is suitable for printing at most labs and best for web display.

© 2021 Mark Fitzgerald

RGB Color in LrC & ACR

- ✓ Lightroom Classic and Adobe Camera Raw use a **version of ProPhoto RGB** as the main working color space.
- ✓ Lightroom's color space is **named MelissaRGB.** It is believed to be the only color space named for a woman, who was an engineer who worked for Adobe.
- ✓ These apps use this large color space because they are primarily designed to work with **raw files that have large color gamuts**.
- ✓ If a non-raw photo is imported with a pre-existing, **assigned profile**, it keeps that profile. But the LrC/ACR color space is used for calculations when modifying develop settings.
- ✓ **If a photo is imported/opened without** a color profile, sRGB is assumed.

© 2021 Mark Fitzgerald

Measuring and Evaluating Color

What color is red?

© 2021 Mark Fitzgerald

RGB Color in Lightroom Classic

- ✓ Lightroom Classic uses a **RGB color model**. Each pixel in a photo has a red, green, and blue value.
- ✓ In the Develop module you can **measure these values** in a specific area by hovering the cursor over the area and looking at the R, G, B values beneath the histogram.
- ✓ Lightroom's **standard scale uses percentages** from 0 to 100 with 0 being the darkest and 100 the lightest.
- ✓ When **one color has a higher value** than the others, that color is more dominant visually in the area measured. If it has a lower value than the others, its complement will be dominant.
- ✓ **When all three values** are 0, the color is black. When all three are 100, the color is white.
- ✓ When all colors have the same value, the color you see is gray. **This is also called "neutral".**

© 2021 Mark Fitzgerald

RGB Color in Adobe Camera Raw

- ✓ Adobe Camera Raw uses a color space for editing that is **similar to Lightroom Classic**.
- ✓ **However** when evaluating colors, ACR uses a scale of 0-255 instead of Lightroom's 0-100 scale. *
- ✓ In ACR 0 = Black, 255 = White
- ✓ This is the **same scale Photoshop uses**, and has always used, when measuring colors. It is somewhat antiquated, especially when considering raw files.
  - ☞ ** (Tone Curve in LrC uses 0-255 scale.)*
  - ☞ *Learn more about Lightroom Classic's color space: http://lightroom-blog.com/2009/02/05/rgb-conversion-chart/*

© 2021 Mark Fitzgerald

Color Correction vs. Color Grading

Accurate Color vs. Stylistic Color

© 2021 Mark Fitzgerald

Color Correction

- ✓ With color correction the goal is to **accurately reproduce** the original scene. To adjust for mixed lighting and/or make adjustments for a particular viewing environment.
- ✓ Photographers typically use **White Balance or Color Balance** (in Photoshop) adjustments for global color correction.
- ✓ The general idea is to **neutralize gray** by removing any color cast that may exist.
- ✓ Make the image look "exactly" **as the eye would perceive** the original scene.
- ✓ It is usually a good idea to **apply basic color correction before** getting into color grading. This gives you a base to work from.

© 2021 Mark Fitzgerald

Color Grading

- ✓ Color grading was developed for the film industry and **was called Color Timing**. A *colorist* would duplicate the film while placing filters in front of it for specific durations of time to alter the color of the duplicate. Now color grading is done digitally.
- ✓ After color correction has been applied, color grading is used to modify colors to **create a mood** or emotion, or to create a stylistic effect. An ”emotional polish” if you will.
- ✓ Color grading can include **tonal and contrast adjustments** in addition to color adjustment. An example is “crushing the blacks” (clipping shadows) to add more drama.
- ✓ Creating a **visual atmosphere or aesthetic** for specific storytelling. Setting the mood of an image.
- ✓ Colors and tones are **often more extreme** than color correction.

© 2021 Mark Fitzgerald

Color Grading

- ✓ Making **conscious decisions** about color. Think of Van Gogh’s “The Night Café”.
- ✓ **Primary grading:** *Global* adjustment to all pixels in the photo, though some may not be affected by the adjustment.
- ✓ **Secondary grading:** *Localized* adjustments. In LRC and ACR this would be with the Graduated and Radial filters, and the Adjustment Brush tool.
- ✓ Pick a **dominant color and a secondary** supporting color that works with it. Then maybe a third color to highlight a detail. (Remember color schemes from last week?)
- ✓ The color grading question becomes – *How do we use color to help our images tell their stories?*

© 2021 Mark Fitzgerald

Adjusting Global Color

Taking Control of Your Color

© 2021 Mark Fitzgerald

Display Color Management

- ✓ In order to make accurate color evaluations and judgements it is **important to calibrate your display(s)**. If you don't do this, you can't trust what you see on the screen. It may look perfect to you, but to the rest of the color calibrated world the tone and color could be way off.
- ✓ Datacolor makes a device named Spyder. They have a few versions. https://spyderx.datacolor.com/
- ✓ Xrite makes a device named i1 Display and they also have various versions. https://www.xrite.com/categories/calibration-profiling/i1-solutions

© 2021 Mark Fitzgerald

Global Color Adjustment

- ✓ Global color adjustment affects all tones and colors in the image. Sometimes these are in a specific color range. Global adjustments are **effective at achieving good color balance**.
- ✓ Global color adjustments can also be used for **stylistic color** interpretation (color grading).
- ✓ **Common tools** for global color adjustment are: White Balance, Vibrance, Saturation, HSL (Hue/Saturation in PS), Tone Curve, Color Grading and Calibration.
  - ☞ *Keep in mind that color can also be modified with tonal adjustments*.

© 2021 Mark Fitzgerald

What is White Balance?

- ✓ White Balance is is used to describe **the color of light** and how it affects the scenes we photograph.
- ✓ The *color temperature* of light is measured in **Kelvin degrees on a scale of 1,000 – 10,000**. For example; a candle flame is 2000K and unfiltered daylight is 6500K.
- ✓ A **camera's white balance** setting is used to compensate for the color of light that illuminates the scene being photographed.
- ✓ Using a white balance that **matches the color of the light** compensates for the light's color temperature and results in the accurate reproduction of color.
- ✓ **When shooting raw**, it's easy to adjust white balance during postproduction.

© 2021 Mark Fitzgerald

White Balance Adjustment

- ✓ White Balance adjustment is a **method for neutralizing** the influence of the color of the light that illuminated the scene you photographed. It is typically used to achieve accurate global color.
- ✓ After the appropriate WB is applied to an image an object in the photo that is gray in reality will have RGB values **that are the same value**.
- ✓ When you use the white balance to neutralize a "true" gray, all **other colors should fall into line**.
- ✓ An unwanted color cast is removed by **adding the compliment** of the color you want to remove.
  - ☞ *All colors are affected by white balance, including neutral grays.*

© 2021 Mark Fitzgerald

Color Correction with White Balance Tool

- ✓ When you import a raw photo, LrC and ACR "honor" the WB setting used in the camera (As Shot). If the file is raw, you have full control over WB adjustments during postproduction.
- ✓ The White Balance tool in LrC and ACR offers three ways to adjust the color of your image.
  - ➢ **WB Menu:** More options with a raw file.
  - ➢ **White Balance Selector tool:** Use this tool to "click-balance" by clicking on a color that is known to be neutral.
  - ➢ **Temp & Tint Sliders:** The temp slider works with a blue/yellow axis to adjust color temperature. The Tint slider works with green/magenta axis to remove unwanted tint. Determine which color you want to neutralize and then use the corresponding slider to drag toward its opposite (compliment) color.

© 2021 Mark Fitzgerald

Saturation & Vibrance

- ✓ **Saturation:** Used to modify the intensity of colors. Adjustments done with it are **linear**, which means it affects all colors the same.
- ✓ **Vibrance:** Has a **non-linear effect**. Adjustments have a greater effect on less-saturated colors and less effect on more-saturated colors, resulting in a more subtle adjustment to color intensity.
- ☞ *Saturation, Vibrance and Hue do not affect neutral gray.*
- ☞ *Too much saturation can cause subtle colors to merge as they clip which results in less color differentiation and more color contrast.*

© 2021 Mark Fitzgerald

Hue, Saturation and Luminance

- ✓ **HSL Panel:** This panel is found in both LrC and ACR. It is used to adjust **Hue, Saturation, and/or Luminance** of individual color ranges.
- ✓ HSL is most useful when you need to **adjust a specific color range**, typically hue or saturation.
- ✓ HSL is **somewhat limited** when changing Hue compared to Hue/Saturation in Photoshop. *(See next slide)*
- ✓ **Use the** Targeted Adjustment tool (looks like a target) to click and drag on a color to modify it. Dragging up increases value, dragging downward decreases value.
- ✓ When using the Targeted Adjustment tool it's possible to sample **two component colors**.
- ☞ *HSL does not affect neutral gray.*

© 2021 Mark Fitzgerald

Photoshop's Hue/Saturation Command

- ✓ Hue/Saturation in PS is one of the most powerful methods for modifying specific colors. You can change a color to be just about any color you want it to be. **It can be used as a command or an adjustment layer.**
- ✓ Use the color menu (Master) to choose a specific color range. **Use the eyedropper to sample** the exact color range you want to adjust.
- ✓ Use the + and – eyedroppers **to add or remove colors** from the selected color range (after using the main eyedropper).
- ✓ Use the **sliders at the bottom** to fine tune color range selection.
- ✓ The downside is this tool cannot be used on a raw file.

© 2021 Mark Fitzgerald

Radical Color with Tone Curve

- ✓ **Tone Curve Panel:** This panel offers **a powerful** tonal adjustment tool but it is also complex.
  - ➢ In Lightroom Classic and Adobe Camera Raw, **select the color you want to adjust** (red, green or blue) by clicking its corresponding color above the tone graph.
  - ➢ Then **drag the diagonal line** to make changes. You can adjust shadows, midtones and highlights independently.
  - ☞ *I personally use this technique when I want extreme color adjustments to create a highly stylized look. I personally don't find Tone Curve useful for basic color correction.*

© 2021 Mark Fitzgerald

Getting Creative with Color Grading

- ✓ **Color Grading Panel:** This panel **replaced the Split Toning panel** when LRC 10 was introduced in 2020. It works in a similar way but is much more powerful than split toning.
  - ➢ You can apply colors individually to shadows, midtones, highlights, or globally by using the Adjust buttons at the top.
  - ➢ Using this panel is **similar to creating colored filters** that lay on top of your photo.
  - ➢ Color selection using the Color Grading panel is **more intuitive** than most other methods.
  - ➢ Color Grading **affects neutral gray**.
  - ☞ *Color Grading panel is best used to create stylized colors, though it can be used for general color correction as well.*

© 2021 Mark Fitzgerald

Using the Color Grading Panel

- ✓ Click on the **circular color range display** to choose a color to add or use the Hue, Saturation and Luminance sliders beneath the color picker.
- ✓ **Blending**: Used to affect "color crossover", where colors overlap and blend to potentially create new colors. Moving to the left keeps ranges mostly pure. Moving to the right blends colors more.
  - ➢ When working with midtone color tints, it's best to keep the Blending value low or midtones can be overwhelmed by shadow and highlight colors.
  - ➢ Hold the Alt/Option key while dragging Blending to for a better preview of the primary color that is being influenced.

© 2021 Mark Fitzgerald

Using the Color Grading Panel (2)

- ✓ **Balance:** Shifts the range of values that determine shadows and highlights. Decreasing the value weights the adjustment more toward shadow colors. Increasing the value moves the overall color toward the selected highlight color.
- ✓ Click and hold on an **eyeball to turn off** a single range.
- ✓ When working with a single range (shadows, midtones, etc.) click the small color swatch to the left to open a small **presets panel**.
- ✓ Use the **eyedropper tool in the color presets** to sample a color in the photo. Click and drag to select a color. Release the mouse button when you have the color you want.

© 2021 Mark Fitzgerald

The Calibration Panel

- ✓ **Calibration Panel:** Calibration enables you to adjust color ranges in a slightly different way than the HSL panel. **Calibration affects every pixel** because every pixel is a mix of red, green and blue. HSL only affects specific colors.
  - ➢ Different **camera manufacturers** determine the base colors for their camera systems, which is often called "color science".
  - ➢ Use the Red, Green and Blue Primary sliders to modify a **base color**. For example, if you shoot landscapes and you feel your camera produces blues that are too saturated.
  - ➢ **Shadows slider** is used to remove tint from shadows.

☞ *I find the other tools I've discussed to be more intuitive and nuanced so I rarely use the Calibration sliders.*

© 2021 Mark Fitzgerald

Using Reference View in Develop

- ✓ When editing photos it's **important to have consistency** in color and tone. One of the best ways to do this in LrC is to use the Reference view in the Develop module.
- ✓ When you choose Reference view **you will see two image areas** (cells) in the Develop module. The currently most selected photo is displayed in the right cell, labeled "Active".
- ✓ **Drag and drop** the photo you want to use for reference into the cell on the left, which is titled "Reference". Now any adjustments you make will affect the photo on the right. The reference photo is unaffected.

© 2021 Mark Fitzgerald

Adjusting Local Color

Fine-Tuning the Nuances

© 2021 Mark Fitzgerald

Changing Local Color

- ✓ **Local color adjustment** affects a particular area. These are effective at modifying the tone, color and more in a specific area.
- ✓ Local adjustments are useful when you want to **shift the color in one region** without affecting other regions even though they may be the same color.
- ✓ Though I don't have time to go into it today, **Photoshop** has very powerful tools and techniques for making local color adjustments that primarily involve selections and/or masks and adjustment layers.

© 2021 Mark Fitzgerald

Local Adjustments in LRC & ACR

- ✓ **Graduated & Radial Filters:** These tools are used to isolate tonal, color and other adjustments to specific areas through the use of gradients.
- ✓ **Adjustment Brush:** Used to paint adjustments into areas.
- ✓ All three of these tools have the same color adjustments that can be applied to affected areas.
  - ➢ **White Balance** – Modify the color.
  - ➢ **Hue** – Modify the hue
  - ➢ **Saturation and Vibrance**
  - ➢ **Color** – Use a color overlay to change color. Sometimes this a better result than White Balance. For example white balance will not affect color of a neutral but Color will.

© 2021 Mark Fitzgerald

Using the Graduated Filter

- ✓ **Graduated Filter:** Used to add a gradient that adjusts tone, color and more.
- ✓ Primary methods for adjusting color include: Temp and Tint sliders, Hue and Color.
- ✓ **Temp & Tint:** These sliders work in much the same was as the Basic panel's White Balance sliders.
- ✓ **Hue:** Modify the color hue of the affected area.
  - ➢ **Use Fine Adjustment:** Use this option for making very subtle changes.
- ✓ **Color:** Click the swatch with the big X on it to open a color picker. When the color picker opens, click on it to choose a color. Click on the color chart and drag into the image to select a color from the image. Let go of the mouse button when you have the color you want.

© 2021 Mark Fitzgerald

Using the Radial Filter

- ✓ The Radial filter is similar to the Graduated Filter. It is used to create **elliptical gradients** rather than linear gradients.
- ✓ Click and drag outward from the center of the area you want to isolate. Then use the sliders to make adjustments to the areas outside the radius.
- ✓ Click and drag inside the radius to reposition it.
- ✓ Modify the shape of the ellipse by clicking and dragging **anchor points**. Hold down the Option/Alt key to adjust one anchor point.
- ✓ Use the **Feather slider** to modify the edge hardness/softness.
- ✓ Click and drag just outside the ellipse to **rotate its angle**.
- ✓ Use the **Invert option** to apply the desired effect inside of the radius instead of outside it.

© 2021 Mark Fitzgerald

Range Masking – Color

- ✓ Range Masking is **one of the most important features** of the Graduated and Radial filters. It enables you to fine tune areas affected by the filter.
- ✓ **Color**: Use the eyedropper to sample the color you want to be affected by the filter.
  - ➢ Click and drag a box around a range of colors to include all of them.
  - ➢ Shift + click to add different sample areas.
- ✓ **Use the Amount slider** to increase/decrease similar color ranges that are affected. Increasing the value increases the range of colors affected by the mask. Decreasing the value decreases affected color ranges.

© 2021 Mark Fitzgerald

Range Masking – Luminance

- ✓ Use the **Range slider** to deselect tonal ranges you don't want to affect. Sliding the shadow slider (on the left) inward results in shadows areas being masked out (unaffected). Sliding the the highlight slider (on the right) masks out highlights.
- ✓ Use the **Smoothness slider** to modify the transitional zone between affected and unaffected tones.
- ✓ The **numerical readout** on the right indicates tonal ranges that are being affected. Default is 0/100 – all ranges.
- ✓ **Show Luminance Mask:** Choose this to display a helpful overlay indicating which areas are being affected by the filter. The overlay is green by default and indicates areas that are affected.
- ✓ **Depth:** This is used to create a mask based on depth information, which is found in some mobile phone cameras.

© 2021 Mark Fitzgerald

Range Masking – Depth

- ✓ This is used to create a mask based on depth information, which is found in some mobile phone cameras and apps.
- ✓ Depth masking can be used with photos captured with the **Lightroom camera** on some phones using DNG file format.
- ✓ It also can be used on photos captured with an Apple phone when using the **portrait mode** and HEIC file format.
- ✓ Depth mask adjustment sliders are the same as Luminance adjustment sliders.

© 2021 Mark Fitzgerald

Using the Adjustment Brush

- ✓ Used to paint adjustment into parts of an image.
- ✓ Brush Options: These must be configured before painting.
  - ➢ **Size:** Controls the size of the brush. You can use the mouse scroll wheel to change size too.
  - ➢ **Feather:** Used to soften/harden the edge of the stoke.
  - ➢ **Flow:** Controls how much paint is delivered to the brush. Multiple strokes are additive.
  - ➢ **Density:** Controls opacity. Multiple strokes are not additive.
- ✓ Adjust one or more sliders and begin painting the area you want to affect. You can re-adjust sliders after you paint.

© 2021 Mark Fitzgerald

Using the Adjustment Brush (2)

- ✓ To apply different settings to another area, click New to create a separate treatment. Each treatment is marked with a pin indicating where you started painting.
- ✓ Use **Erase** option to remove paint on the selected pin/area.
  - ➢ Use the **Select Mask Overlay** to help see affected areas as you erase.
  - ➢ Consider reducing **Flow** value to erase an area gradually to help blend it into surrounding areas.
  - ➢ Consider using **Auto Mask** to control areas being erased. *(See next slide.)*
- ✓ Always check every slider setting before beginning a new session with the Adjustment Brush or gradient tools.

☞ *Option/Alt click on Effect to reset all sliders.*

© 2021 Mark Fitzgerald

Adjustment Brush Auto Mask

- ✓ Auto Mask is a cool feature that **helps control** areas being affected by the Adjustment Brush.
- ✓ Keep the cursor's central **crosshair** on the area you want to affect. Then only similar tones/colors will be affected by the brush.
- ✓ Most useful when painting areas that are distinct from surrounding areas.

☞ *Just remember to deselect Auto Mask when you don't need masking or you may get unintended results.*

© 2021 Mark Fitzgerald

Erasing and Painting on a Gradient

- ✓ The Graduated Filter and the Radial filter have a **built in brush tool** that enables you to add to or erase portions of the gradient.
- ✓ Click the word "Brush" to open it. When you do, you will see a **Brush section** open at the bottom of the Graduated Filter panel.
- ✓ **Choose Erase** and then paint to remove the gradient from a specific area.
  - ☞ *Use this method when modifying the Graduated and Radial filters* ***instead of*** *the Adjustment Brush tool.*

© 2021 Mark Fitzgerald

Final Thoughts & Questions

© 2021 Mark Fitzgerald