Color Correction Notes

What is color correction? Corrective.

In general, you adjust color (how much of certain colors are in the shadows, mids, highlights), saturation (how much of a color in general) and then exposure ("crushing" blacks, etc.), which is essentially contrast. The latter (exposure/contrast), is usually the first step in primary color correction.

**The Monitors:**
*These are more objective measuring tools. Remember, your eyes LIE to you about color and exposure.*

You look at the trace, which is all the pixels in the video signal. Each scope has its own scale to measure the trace.

**Tonal Range:** shadows (blacks), midtones (greys), highlights (whites)

**Waveform Monitor:** This is primarily for luma or brightness in general, and to control contrast between lightness and darkness. It mimics the tonal range from black to white, and displays white, grey and black levels in the pictures. It basically measures exposure. A well exposed image has lots of dots spread vertically on the monitor. Dots should not be heavily clumped together. You usually use this in luma, which measures overall lightness in a clip, as well as contrast ratio. Your highlights should be near 100 and your shadows near zero (both should never be below 0 or above 100) and you adjust your mids to spread pixels in the center.

You can also use the RGB parade to see relative color balance between R,G, and B channels or RGB overlay, which does not separate into channels. This is a solid tool for actually correcting color.

**Vectorscope:** This is primarily for color. This shows us two dimensions. 1) the shade/hue of color (where the color falls on the circle and 2) amount (saturation), represented by how far the color is out from the center. A fully saturated color would be out by the outer edge of the circle. This scope measures 6 color values: red (upper left), yellow, green, cyan (greenish blue), blue, and magenta (pink/purple).

This shows us HUE and SATURATION. Hue is the angle around the scope, while saturation is the distance out from the center of the scope. The CENTER is no saturation. Can use the RGB parade with the vectorscope to see color distribution.
RGB: Red, green and blue. This is an additive color model; by adding all three colors in equal values white is created. It starts with the color black.

CMYK: Cyan, magenta, yellow and key (black). This is a subtractive color model that starts with light; it essentially absorbs other colors and subtracts brightness from white (it’s based on printing and white paper; that is, colors are mixed to make black).

***the diagonal line in the vectorscope actually represents skin tones. Most skin tones exist in the midtones of the tonal range.

Histogram: statistical view of the video signal (Luma, RGB, or any of the color channels). Spikes in the trace indicates that you have more pixels or values in that part of the tonal range. Helps to show the values, but not the most useful tool for correction.

Some useful notes for FCPX: match color (in the inspector and choose frame to match), Cmd +6 brings up color board, analyze for color and enable balance in the inspector, colorboard presets under the cog in the inspector, cmd+7 turns scopes on and off, cmd + 6 goes right to the colorboard, save presets so you can apply to other clips.

Colorboard in FCPX:
Color: Global and tonal range. Left to right controls the hue and up and down controls saturation/intensity of that hue. (+/- is going to the opposite side of the color wheel)

Saturation: Global and then tonal range controls how much color is present in the image.

Exposure or Contrast: Global (overall light/dark) and tonal range. You will rarely, if ever, use the global control.

*You make both PRIMARY (the whole picture) and SECONDARY (part of the picture) color corrections. Color Mask (isolate shot) or shape mask (isolate a shape) within the frame.

PRIMARY ADJUSTMENTS:

The typical workflow is to go through the exposure pane and adjust there first for contrast/exposure BEFORE you make actual color corrections.
For Underexposed:
Use the waveform monitor and set it to Luma. In the exposure pane bring up the highlights, then bring the shadows (blacks) down so waveform shows it’s just on the black and then adjust mids. You will notice that any adjustment will change other values in the tonal range so you’ll have to go back to retweak them. If too underexposed and you “correct” it, you may get “noise.”

You shouldn’t have overexposed (at least highly overexposed images) but sometimes you do. First bring down highlights, bring down the shadows so you have black (aka crushing the blacks), then adjust the mids by bringing them up or down a bit.

Contrast: When you have shot flat images, the control you will need to definitely adjust is the contrast/exposure to make the image “pop.” Use the waveform set to luma; the difference between white and black is your contrast (which is vertical). In exposure, bring down shadows so they touch 0%, bring up the highlights to near 90% levels, and then bring up the midtones a bit. Again, you will have to come back and adjust shadows so they touch 0 on the waveform monitor. If you shoot flat images, this will be MOST of your correction time.

If you want a high contrast look, go into the exposure pane. Bring the blacks down and “crush” them, bring up the whites to blow out the highlights, and then nudge up the mids. Then, open up your waveform luma and make sure you have a high contrast read.

Warm Look: To create a yellow or red dominant tones. Bring up the exposure pane and the waveform luma and get you contrast right. Now, bring up the color pane. Bring the mids into the yellow/red tones and dial it up a bit. Now, bring the highlights down a bit in the blue area (this is, well, actually adding yellow). After this, go back and check your RGB luma and make sure that the highlights are under 100, and then check the RGB parade waveform and the vectorscope.

Cool look: To create a blue look. Bring up the waveform luma. Bring the blacks down to 0%, then dial down the highlights to bring down and darken the highlights in the shot. This may bring down your shadows too much, so maybe nudge up those levels. Then, bring up the color pane. Bring the midtones up a bit in positive blue, bring up the highlights into the positive blue. If oversaturated, go into the saturation pane and bring the global settings down a bit. Remember, go back and check your luma waveform, RGB parade waveform, and then the vectorscope.

Wash look: To make the clips have a color tint or a wash. First, adjust your exposure. Then, bring up the vectorscope. Use the global puck and add the wash
in the hue/saturation of your choice. You can also do this with the individual adjustments for the tonal range. Typically start with the mids, then shadows, and then manipulate the highlights

**Neutralizing the Color Cast:** Use the vectorscope to see how the color is cast. If it's stretching out in a particular color region, it may be oversaturated in that color. You could also use the RGB parade in the waveform monitor; if any color is over 100 you will go into the exposure pane and bring down the highlights and get that under 100. Now use the waveform luma and make sure that your shadows are black (near 0). If your RGB waveform shows, let's say too much blue, go into the color pane (in most NLEs this is three color wheels), and start by subtracting blue in the highlights (this is, well, adding yellow, which is the opposite of blue). Left and right is hue, while up and down is the value of the hue. Then, bring down the mids. Then, you will likely bring up the shadows just a bit and maybe in a different hue.

This whole time monitor the vectorscope. Once your color seems balanced, bring the RGB parade waveform back up. If any of those colors are over 100, go back into the exposure and bring down the highlights.

Sometimes here you can correct blue (or poorly white balanced footage).

**Saturation:** Use vectorscope to see the hue and saturation levels. Remember, that the closer the trace is to the center the less saturated it is. One easy thing is to go into the saturation pane and bring up the global saturation level (this may fix it). If there is a color cast, use the RGB parade waveform and adjust accordingly. If a level is over 100, go into the saturation pane and bring the highlights down so that you have a reading under 100. Again, you want BALANCE between the RGB levels. Sometimes you may have to dial down the shadows to correct a color cast. Use the waveform as an objective measurement of the correction you need to make. If a person’s face/skin looks to yellow, try dialing down the midtones.

**SECONDARY ADJUSTMENTS:**

***These are adjustments to only a part of the frame, not the entire frame like in primary color adjustments.

Color mask, ability to key or simply adjust only part of the frame based on color.

**Adjust saturation of one part of the frame using color mask:** In FCPX, add another correction by hitting the + sign. On that new correction effect, click on the eye dropper to add a new color mask. With eyedropper, click on frame and drag out; portions in color will be affected while grayscale portions won't be affected. Shift+click to select more of the part of the frame to be targeted. To subtract, use
opt+click and drag out to deselect part of the frame. Use the scale next to the color mask to soften the edges. Now that you’ve made a selection, go to the colorboard and try manipulating the saturation controls (global maybe).

The default is inside mask, which means everything inside the selection will be affected. Outside mask will manipulate color outside the mask. Outside and inside masks can work together within in the same correction.

**Shape mask:** Often times there are various objects within the frame that share color properties and will be affected. Shape masks are also known as windows or vignettes in other NLEs. These allow you to use a geometric shape to make secondary corrections.

First, add a new correction. Add the shape mask by clicking on the shape mask add button. The green dots allow you to control the aspect ratio of the mask; the translucent control allows you to move from circular to square shaped mask; the center control is position and the control near that controls rotation. The outside line adjusts the softness of the shape mask, which you want to add. Now you are ready to access the colorboard and make the correction. Again, by default this is set to inside mask but you can set it to the outside mask.

*I recommend using circular shapes for people or people-like objects and squares for more symmetrical objects.*

*If you add a color mask and you want to isolate a part of the frame then use a shape mask along with it. These can exist on the same correction. This will limit what you’ve done w/ the color mask to a shape on the frame.*

**Flesh Tone:** Sometimes after primary correction, you may have some reds or blues or general color hue in the human flesh colors. In the vectorscope look the diagonal line is the is the skin tone/flesh tone line (go into the settings to turn off the line or turn on); regardless of race, flesh tone usually is near this line.

Add a color mask and select the flesh part of the actress/actor. Make sure to soften the edges. Then, subtract color as needed using the vectorscope.

**Relighting a scene:** Sometimes you may have overexposed and underexposed parts of each frame and need to correct this. If you adjust the underexposed it will overexpose the already properly or overly exposed part of the frame. To relight this, add a shape mask, set the shape, and then soften the edges. Adjust the exposure inside the mask and then outside the mask to relight the scene depending on where your under and over exposed areas are.

**Correcting Skies:** One technique is to saturate the sky if it looks flat. First, add a
new correction and then add a new color mask. Try to isolate the sky. Access the colorboard and go to the saturation pane and adjust the global saturation control or color.

You can do the same thing but with a shape mask. Add correction, add shape mask, isolate the sky, soften the edges and then add color or saturation

**Pleasantville or Sin City Effect:** This is also known at the “leave color behind look.” Typically, you need to have ONE bold color in the frame.

Add a new correction. Now, create a new color mask and isolate the color. Now, go into the saturation pane and inside the mask bump up the saturation of the color you want to keep. Then, click on the outside the mask and totally desaturate the clip. In some instances you may need to also use a shape mask as well and some keying if other objects in the scene have the same hue your trying to keep.

**Grading and LOOKS:**
Can stack looks as effects onto one another and adjust their parameters. These are just effects and not color corrections. These will be your overall look of the piece, or looks for scenes, etc. After Effects, FCPX, DaVinci Resolve and other software have customizable looks.

A good workflow for looks in FCPX is to apply a look to one clip and adjust the parameters to your liking; add other looks if you wish. After you have graded and have the look that you would like, copy that clip (cmd+C). Select all the clips you’d like to apply the look to and go EDIT>Paste Effects. This will paste all video effect to the selected clips.

If you want to grade in another software such as After Effects or DaVinci Resolve, first set in and out points on your timeline for the clips you’d like to grade. Export (share) the video. It will export as a video file. Import that file into AE or DaVinci, grade it, and then export that video file. Now, import this new graded video file into FCPX and replace the clips in the timeline with this one clip. REMEMBER, you grade AFTER you have made all your edits (transitions, color correction, masks/mattes like the cinemascope croplines). Grading is the last step before output.