Channels

A channel is basically a greyscale image. A color image on a computer screen needs 3 channels to display properly- Red Green and Blue. Each color needs to vary the amount of light coming to the screen and this is represented as a greyscale image, black meaning no color and white meaning 100% of the color. The varying amounts of each channel determine the color that is displayed.

The number of grey values is typical 256 shades of grey, which is standard 8-bit color. Photoshop supports 16 bit color which is 65536 shades of grey per channel (256X256). For most graphics needs 8bit is standard

When color correcting an image, you basically want to pick a neutral white or grey area and adjust the Levels or Curves to create equal values of each "channel" or "color", this makes the neutral area a neutral color, thus the whole image becomes color correct.

Adjust Levels

1. Open a Levels dialogue box or use the preferred method of creating an Adjustment Layer above your image layer. Open the Layers dialogue, select the B/W Yin/yang looking circle and select Levels.
2. The Levels represent the total number of pixels in each value area, from dark to light. In general, you want to spread these out fully from one end to the other.
3. The Black (left) triangle represents the darkest value, move it to where your dark values start. Move the white (right) triangle to where your highlights start.
4. Make sure you are not losing data by keeping any major areas of the chart within the Black and White arrows.
5. Now, using your eye, move the middle grey slider to make the image look as good as possible.

You have now maximized the value range of your image. On to color correction:

Color Correction Basic Steps

1. Find an area that is truly white (note that white can be a warm white, or cool white) or if you used a Grey Card, use that area
2. 'Blown out' highlights don't work well because they are off the charts in terms of whiteness, so pick an area like a piece of paper, tissue or a white shirt
3. Roll the eye dropper over the area while looking at the RGB Color values. To be color correct, a true white or grey area should have equal percentages of each color, so take note which channels R, G, or B has too much or too little color.
4. Open up a Curves editor (in Photoshop the preferred method is a "Curves Adjustment Layer" created by looking at the bottom of the Layers menu, clicking on the circle yin/yang looking symbol and selecting "Curves)
5. Select an individual channel to adjust in the pull down menu
6. Click on the middle of the curve and gently drag up and down while watching the RGB Color values change. You may need to resample with the eyedropper tool (with the Curve box open, move your mouse over the neutral area and it turns into an eyedropper)
7. Gently adjust each channel until the values are approximately equal.
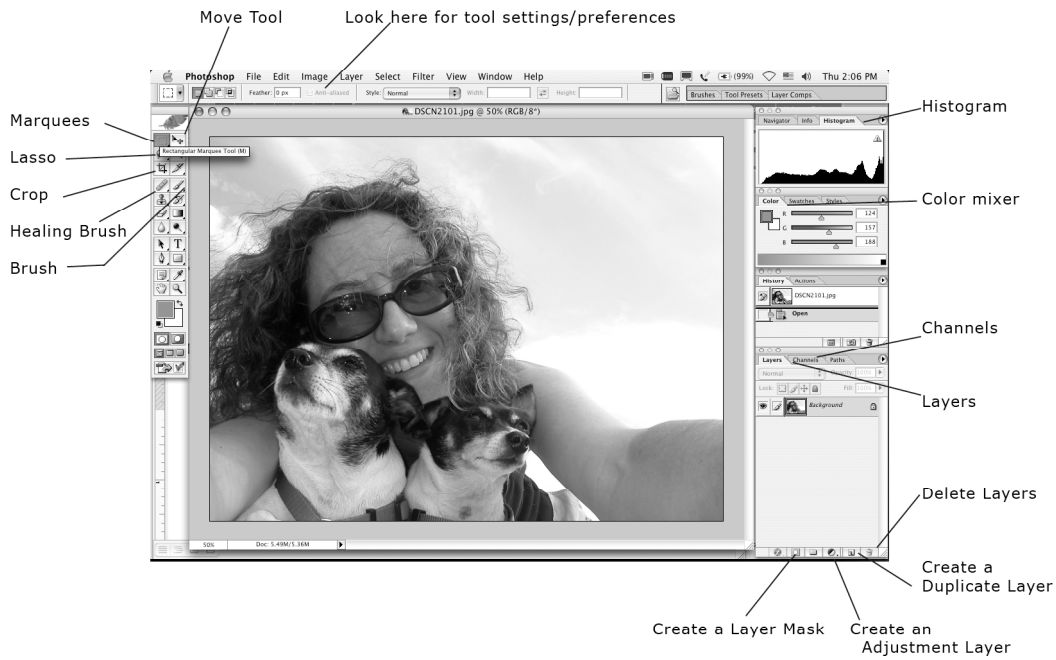
Once your neutral area is neutral, virtually all the other colors will snap into color correct space. To see the results, turn on and off the Curves Adjustment layer to see the "cast" that has been removed. I really like keeping my curves as an adjustment layer because our eyes will naturally get used to any color cast and we won't recognize it's out of whack. By turning the layer on and off quickly, you can see a fairly dramatic difference.

Curves are an awesome way to create really complex effects. Try reversing the Red channel Curve and see what it looks like. Turn the Green Channel Curve into a U shape and see how that affects the color. Using simple "tools" like channels, mixers, etc. allows you to do the same thing in video or other applications.
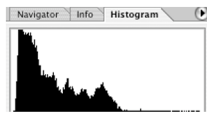
Optional ways to correct color using Photoshop:
(Use the 'Help' area, Go to 'How to' and select "remove a color cast", look in the "How-to" area of the help page)
1. Image -> Adjustments -> Auto Color
2. Make an Adjustment layer for Levels, choose the middle grey eyedropper and select a grey area, or the white eyedropper to select a white area. Photoshop will attempt to make that area a neutral grey or a neutral white color, thus making a color corrected image.

Move Tool

Look here for tool settings/preferences

Marquees

Lasso

Crop

Healing Brush

Brush

Rectangular Marquee Tool (M)

Histogram

Color mixer

Channels

Layers

Delete Layers

Create a
Duplicate Layer

Create a Layer Mask   Create an
Adjustment Layer

This image has a lot of
highlight information and
is lacking in shadow detail

This has a lot of shadow
(dark) detail, but very
little highlight information
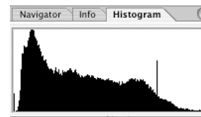
This one is about right,
good spread throughout
the range