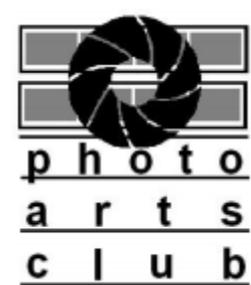


White Balance

- What is White Balance?
 - Sometimes called neutral, gray or color balance. Adjustment to get the color you want in photography and image processing,
 - An important goal of this adjustment is to render specific colors – particularly neutral colors (colors not found on the color wheel such as beige, brown gray, black and white) – correctly
 - Color balance changes the overall mixture of colors in an image and is used for color correction; generalized versions of color balance are used to get colors other than neutrals to also appear correct or pleasing.
- Why is it important?
 - Our eyes and brains adjust to viewing color differently under varying lighting conditions. White objects appear white to us whether they are viewed in sunlight or under indoor lighting. Digital cameras can sense color temperature and adjust the color balance to compensate, but often need assistance from us to obtain the desired results.
 - Digital cameras are generally very good at deciding the correct white balance using the “Auto” setting when there is abundant light and that light comes from a single source, but in low light situations and especially when light comes from multiple sources with different color temperatures the results will probably not be acceptable. The photographer will need to select one of the other white balance modes.
- “Correct” White Balance
 - The “correct” white balance is subjective. To achieve the most realistic color balance the whites should look “white” and the blacks should look “black”, but white balance can also be used to create an artistic look.



White Balance

- Different ways to set or change White Balance

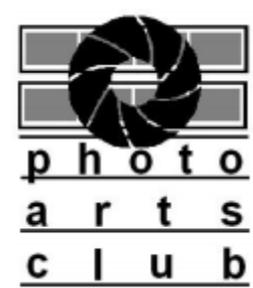
- In The Camera:

- Auto
 - Let the camera decide.
- Camera Presets (Canon / Nikon)
 - Daylight / Sunny
 - Shade / Open shade
 - Cloudy / Cloudy
 - Tungsten / Incandescent
 - Florescent / Florescent
- Kelvin Temperatures
 - Set the “Color Temperature” degrees K.
- Custom:
 - Canon Menu Item: “Custom White Balance”
 - Nikon Menu Item: “PRE Preset manual”

WB Settings	Color Temperature	Light Sources
	10000 - 15000 K	Clear Blue Sky
	6500 - 8000 K	Cloudy Sky / Shade
	6000 - 7000 K	Noon Sunlight
	5500 - 6500 K	Average Daylight
	5000 - 5500 K	Electronic Flash
	4000 - 5000 K	Fluorescent Light
	3000 - 4000 K	Early AM / Late PM
	2500 - 3000 K	Domestic Lightning
	1000 - 2000 K	Candle Flame

- Change in Post Processing

- RAW images -- Adobe Camera Raw, Adobe Lightroom, etc.
- JPG images – Photoshop, Photoshop Elements, Paint Shop Pro, GIMP, etc.
 - White Balance settings are “baked” into JPG images by the camera. White balance can still be adjusted in post processing software but with less flexibility than with RAW images.



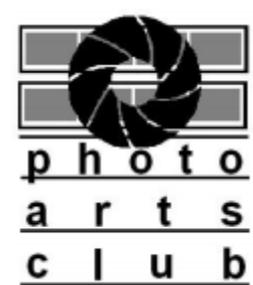
Reference Card



A reference card for custom white balance usually consists of a rectangle containing 18% gray. These cards vary from large to small. Some will fit into a billfold.

You can use the rectangle above for today's "custom white balance" experiments.

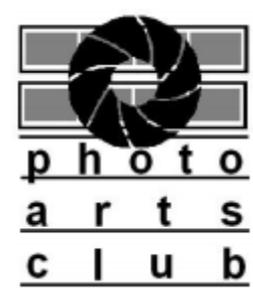
- Position the reference card so that it receives the same lighting you'll use for your photo.
- Frame the shot so that your reference card fills the center area of the viewfinder.



CANON Custom White Balance

- How to set CANON “Custom” White Balance
 - Position the reference card so that it receives the same lighting you'll use for your photo.
 - Set the camera to the P, Tv, Av, or M exposure mode.
 - Set the White Balance setting to Auto.
 - Set the camera to manual focusing and then focus on your reference card.
 - Frame the shot so that your reference card fills the center area of the viewfinder.
 - Make sure that the exposure settings are correct.
 - Take the picture of your reference card.
 - Display Shooting Menu 2 and choose Custom White Balance.
 - Last picture taken should be displayed (or scroll to desired picture)
 - Press “Set” and then confirm to select the desired image.
 - This image will remain the basis for the custom white balance until you change it.
 - Change your White Balance setting to “Custom” .  Custom

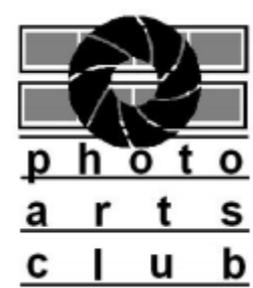
Note: Based on CANON Rebel T5i, may vary slightly for other models.



NIKON Custom White Balance

- How to set NIKON “Custom” White Balance
 - Position the reference card so that it receives the same lighting you'll use for your photo.
 - Set the camera to the P, S, A, or M exposure mode.
 - Set the White Balance setting to Auto.
 - Set the camera to manual focusing and then focus on your reference card.
 - Frame the shot so that your reference card fills the center area of the viewfinder.
 - Make sure that the exposure settings are correct.
 - From the Shooting menu, select White Balance, press OK, and select the PRE Preset Manual White Balance setting.
 - Press the Multi Selector right, select Measure and press OK.
 - (Select “Picture” if you want to use an existing photo for reference)
 - Select Yes and press OK
 - Take the picture of your reference card or neutral image.
 - Camera will automatically set your White Balance to PRE so you can begin using your preset.

Note: Based on NIKON D5100, may vary slightly for other models.



White Balance Experiments

- **Two stations have been set up**
 - Station **1** has a 5500K bulb simulating average daylight
 - Station **2** has a 2700K bulb simulating average indoor lighting using tungsten bulbs.
 - **Note:** The room is also illuminated by florescent lights from above (~ 4500K)
- **Go to both stations and take at least three photos.**
 - **Photo 1:** Use Auto White Balance (AWB) setting on your camera. 
 - **Photo 2:** Set WB to the appropriate setting for the light.
 - Station 1 –  Daylight
 - Station 2 –  Tungsten
 - **Photo 3:** Set custom WB or set color temperature.  Custom  Kelvin
- **Which photos do you prefer? Why?**