

## A PHOTOGRAPHER'S GUIDE TO COLOR

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In photography, color is not an element simply to be observed. It should be an important part of a creative photographic image. If we have knowledge of color, its physical and emotional effects, we see color differently and are able to use it to enhance our images.

Photographers use many different elements such as composition, depth of field, exposure, focus, and lens selection to create a more striking image. Color, too, should be added to this list of photographic elements to be used intentionally, artistically, and creatively.

Color adds a magical dimension to a photograph. It has a strong effect on the viewer apart from subject matter and composition. This emotional effect of color is potentially greater than that of subject matter. At times, color can actually be the subject of the image. Color awareness can be the difference between a memorable or commonplace image.

I hope this presentation will increase your COLOR AWARENESS and help you make color an important element in your images.

**BASICS:** Although color has always been an important part of Man's artistic expression, it was only about 50 years after the Pilgrims came to America that Isaac Newton (1676) began to describe the physical properties of color. He demonstrated that white light (sunlight), when passed through a prism, results in the rainbow of colors we call the visible spectrum.

Light is the source of all color. All light has color, no matter what the source of the light is. Sunlight, considered white light, is a mixture of all the colors we humans can see—the visible spectrum.

Light is a form of electromagnetic energy which radiates from its source in waves, similar to the ripples on a pond. The length of the wave determines its color (hue). The visible spectrum encompasses red/orange (long waves) through blue/violet (short waves). Invisible light (infra-red or ultra-violet) can contribute photographic illumination by the use of specially sensitive films or techniques.

Just as a prism separates white light into separate colors, the physical makeup of objects does, too. When sunlight strikes a red apple, all colors are absorbed except red, which is reflected back to us. Light striking a white egg is not absorbed but is completely reflected.

The three PRIMARY COLORS are red, yellow, and blue. These are called primary because they cannot be produced by mixing other colors. SECONDARY COLORS are produced by mixing two primary colors. Yellow and red mix to produce orange, yellow and blue produce green, and red and blue produce violet.

Colors can be described as COLD or WARM according to the perception of temperature found in natural substances possessing that color. Warm colors are yellow, orange, and red (sun, fire). Cold colors are green, blue, and violet (vegetation, ocean, sky).

Warm colors are usually thought of as exciting or active, and cold colors as relaxing or quiet. This widespread emotional effect is seen in a restful landscape with greens and blues, or an exciting sunset with a dramatic red/orange sky.

Warm colors have high luminosity or kinetic activity, and seem to advance toward the viewer. Cool colors seem heavier and retreat from the viewer. Thus, a red or yellow spot of color on a center of interest can "reach out" to grab the viewer's attention. This kinetic effect of warm colors is demonstrated by viewing equal-sized warm and cool colored squares on the same dark background. The warm square appears larger because it is more active and stimulates the retina to a greater extent.

COMPLEMENTARY AND HARMONIOUS COLORS: Relationships between colors have strong effects on the viewer. These are demonstrated on a COLOR WHEEL. Colors opposite each other on the color wheel are called complementary, and those adjacent are called harmonious.

Complementary color pairs are red and green, orange and blue, yellow and violet. Johannes Itten defined complementary colors as "opposites which require one another. They incite each other to maximum vividness when adjacent." In other words, the eye requires any color to be balanced by its complement, and will produce it automatically if it is not already present.

Prove this concept to yourself by staring at a red square on a gray or black background. A green outline will soon appear around the red square. Now, after about 30 seconds, close your eyes and see an after-image of green where the red was. This exercise also shows why black or dark backgrounds produce colors of higher luminosity or radiance; because the complements are always present. This vibrance results from the eye making rapid adjustments between the different wavelengths of complementary colors.

Harmonious (similar) colors produce a sense of balance, symmetry, and order. Although personal judgments determine part of this sense of what is harmonious, a few general rules usually apply: Colors are harmonious if they are similar in 1) hue (color), 2) saturation (intensity), 3) lightness, or 4) luminosity (brightness).

As we observe an image, the presence or lack of a sense of harmony results mainly from color relationships. This doesn't mean that the end point of all photography is a restful image. Harmony can be present in an exciting image, an image showing action, or one that is highly stimulating. If similarity between colors makes them harmonious or restful, then the opposite is also true. Colors which CONTRAST with one another can give a dynamic, exciting, and active effect. Colors may contrast not only in hue, but also in brightness, size, temperature (warm/cool), or sharpness.

THE PSYCHOLOGY OF COLORS: Colors in themselves produce strong emotional responses and have certain commonly perceived qualities. These universal responses to color can be used by the photographer to add to the message of the image.

The color RED suggests or symbolizes heat or fire, as well as fiery emotions such as courage, anger, passion, and aggression. It is a cheerful and vibrant color whose radiance is second only to yellow. It can imply activity or, at sunrise and sunset, peace. It is a hard, heavy color that says "notice me!".

BLUE, a cool color, is found in sky and water. It symbolizes hope, peace, serenity, and regal elegance or dignity. It can also be a sad color, suggesting loss or disappointment. It is usually passive or restrained. Blue is a distant and receding color. In a landscape, the distant elements (sky, mountains) usually look blue. This is because atmospheric haze scatters the shorter wavelength blue light, keeping it in the distance.

YELLOW is nearly opposite blue on the color wheel and also on the emotional scale. It is a hot, active color, suggesting speed. Yellow is both cheerful and divine or powerful, symbolizing gold and the sun. The yellow (golden) light of morning or evening gives a sense of splendor and luster. Yellow is the most active and reflective color and is always prominent in an image because the retina of the eye is more sensitive to yellow than any other color. It is uniquely brightest when fully saturated, and underexposure can

cause it to look muddy. (Use a polarizer to avoid this.) Yellow presents the same exposure challenges as white.

GREEN, a mixture of blue and yellow, is another unique color. It is usually thought of as a cool color, but it can be quite warm if its yellow component is strong, (and cooler if blue predominates). It is universally the color of spring vegetation, giving a sense of youth, hope, and renewal. It is usually a quiet, soothing, and soft color. Varied shades of green in a landscape, enhanced by a polarizer, produce a sense of restful harmony. (The greens are harmonious.)

PURPLE, having the coolness of blue and the warmth of red, is usually a quiet, regal, and dignified color. At twilight it is especially peaceful, as well as a bit sad.

ORANGE, a mixture of the two hottest colors (yellow and red), is surprisingly less warm than its component colors. It has, however, a strong emotional effect on the viewer, suggesting sunset and fire. It is a glowing, warm, yet soothing color. The monochromatic orange light of sunrise or sunset can be captivating.

BLACK, the absence of color, is a paradox. It suggests death, night, and sadness, but its effect on other colors is the opposite. In the presence of black, other colors look brighter and more saturated. Black brings out an adjacent color's brilliance and luminosity. It allows the mind to add complementary colors if they are not already present.

WHITE, the presence of all colors, suggests purity, truth, and innocence. It tones down adjacent colors. On film, as in nature, white reflects the colors of its surroundings and of the light source. This can be seen in shadow areas, snow, or skin.

PASTELS are lighter, less saturated colors, thought of as softer and more delicate. They seem more feminine and graceful than the more saturated colors. When presented as monochromatic, pastels have the greatest emotional effect of all colors. Slight overexposure can sometimes give a pleasing pastel effect, but be careful not to spoil your image by accentuating the highlights.

#### COLOR RELATIONSHIPS-PRACTICAL POINTS:

VISUAL DEPTH-OF-FIELD is the mind's perception of depth or range in a photograph. It is the viewer's feeling of a third dimension. We know that warm colors advance and cool colors recede. An image with a cool background and a warm foreground has greater visual depth than one with a warm background and a cool foreground.

The result of greater visual depth is greater contrast. A cool background such as blue sky or green foliage will recede and provide greater contrast with a warm-colored subject in the foreground. Remember, though, that any blurred or un-sharp area is more active than the same colored area in sharp focus. Thus a warm, out of focus area in the background becomes the most obvious element of the image, and is usually a distraction.

Sometimes blurred or out of focus elements in the background can be helpful. Two adjacent colors appear more alike (harmonious) if the transition between them is gradual or softer. Thus, varied shades of blue or green in a background appear pleasing or harmonious. This effect is enhanced by the

relative un-sharpness of background elements (compared to a sharp subject in the foreground).

The contrast between adjacent colors can be increased by using sharper focus, thus making the transition between them more sudden. This sharpness accentuates the difference between the colors. A black line or shadow between the colors contrasts them even further.

IRRADIATION: Bright or light colors are more active and vibrant. They make subjects look larger by reflecting more light from their brighter surface, thus stimulating the retina more. A bright colored object looks bigger than a darker object of the same size. This principle can be used to accentuate a subject. It also explains why highlights can make or break an image. An obvious highlight can emphasize the subject or even be the subject. More often, however, it is an obvious distraction.

TIME OF DAY AND ITS EFFECT ON COLOR: Before sunrise and after sunset, colors are cool and muted, and there are no shadows. The contrast between colors is minimal. Light intensity changes rapidly, so be sure to meter frequently, bracket exposures, and use a tripod.

Shortly after sunrise (or before sunset), light is very warm, since it travels a longer distance through the atmosphere and the shorter blue wavelengths are scattered by atmospheric haze. This reddish or golden light has a soft, nostalgic quality. Textured surfaces are exaggerated, providing their own inherent contrast. Shadows are longer and bluer, since they are not illuminated by the warm light and they reflect the blue sky.

Mid-day light is the purest white light of the day. Colors are seen in their true hues, and are easily differentiated, thus creating more color contrast. Shadows are black, increasing the brilliance of colors. Capitalize on midday color brilliance and contrast by simplifying your compositions and limiting the colors used.

At midday a thinner layer of atmosphere must be penetrated by light allowing more blue to shine through and creating a slight bluish cast. Many photographers use warming filters to balance this bluish midday light.

WEATHER CONDITIONS which diffuse sunlight (fog, haze, dust, smoke, pollution, and rain), soften the light, resulting in less color contrast and more blending or harmony. Shadows become less noticeable. This is similar to the lighting situation before sunrise. Colors become subdued and more monochromatic. These conditions soften the light by redistributing the strongly directional rays of the sun to a larger area. To emphasize the effect of this diffuse, often colored light, shoot toward it. Use a lens shade to prevent flare. This results in better visualization of the weather condition.

Snow may present exposure problems, especially in bright sunlight. Overexposure is often needed to prevent muddy or gray snow. Side or backlighting can give a dramatic, textured appearance to snow. Snow is highly reflective. It picks up surrounding colors. Warm light early or late in the day can be dramatic when snow is on the ground. Some photographers like the blue cast in snow from a clear or even overcast sky. Others prefer to warm up the image with an 81A filter or in postprocessing.

DIGITAL SENSORS, FILM, AND LIGHT SOURCES: The human eye and cameras see color in very different ways. All light has color but the eye usually ignores it.

What you see with your eye is different from what you get with your camera. The eye sees all color as if lit by mid-day sunlight or strobe light, both white light sources. It "disregards" the light source, ignoring the warmer cast of tungsten light and the blue-green cast of fluorescent light. A camera, however, is merely a recording device, and color balance must be selected according to the light source. You can use the way cameras see different light sources to produce striking effects. One example is a cityscape at twilight, a mixed lighting situation. The warm tungsten and cool fluorescent lights contrast with dark buildings and dark blue sky to produce a deeply colored and rich image.

**DIRECTION OF LIGHT AND ITS EFFECT ON COLOR:** When the subject is FRONTLIT, the colors recorded are produced by reflected light, and the source of light strongly affects the colors we see. Try metering the color area you want to be most brilliant, and then underexpose slightly.

**SIDE-LIGHTING** brings out texture and gives the potential for color harmony by producing varied shades of the same color, (for example, grass or ocean). The many small shadows produced by side-lighting also increase the eye's perception of a color's brilliance.

When a translucent subject, (a leaf or flower), is BACKLIT, the light producing the color is transmitted. It is more brilliant than the reflected color of front-lighting. When a backlit subject is photographed at the extremes of light (dawn or dusk), or in hazy weather conditions, the color of the light source is more evident and has the potential for increased monochromatic impact.

### **HOW TO MAXIMIZE COLOR SATURATION:**

1. Use the LOWEST POSSIBLE ISO SPEED with a tripod and cable release to minimize movement.
2. UNDEREXPOSE slightly in most situations, but BRACKET EXPOSURES in any lighting situation you are unsure of.
3. Be aware of how the DIRECTION OF LIGHT will affect the color of your subject. If possible, use side-lighting.
4. Use a LENS SHADE to prevent stray light from desaturating your colors.
5. FILTERS: Use a polarizer to eliminate glare and allow the maximum amount of true color to show. Try a graduated neutral density filter if there is a 2+ stop difference between the sky and the foreground.
6. COMPLEMENTARY COLORS will make each other appear maximally saturated and brilliant.
7. Limit the number of colors used. SIMPLICITY SUCCEEDS.
8. Allow the viewer to concentrate on color. AVOID DISTRACTIONS by paying attention to technique and composition.
9. Light intensity falls off with distance. Use a shorter focal length lens if possible and GET CLOSER TO YOUR SUBJECT.

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