Syntax
Color Concepts

Also called semiology, semiotics concerns the study of signs and how viewers interpret them. The goal of semiotics is to understand how signs communicate concepts—artists and designers apply that understanding to convey their ideas to their audiences.

Color Space / The physical properties of objects and media that we use for communication affect light in different ways; some, like computer screens and projectors, generate light themselves. That means designers have to think about what light does differently when it's reflected from a surface, like paper, as opposed to when it radiates from a monitor—and so, how color might best be used for a particular project.

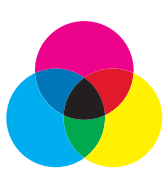
—

The basic concerns here are how wide a variety of colors will be able to be appreciated (what's called the color gamut, or range), and the way color wavelengths will be mixed for us depending on the medium in question. These two aspects together define a color space, and there are two basic kinds.

Additive color describes color when it is perceived in the form of radiant light. In this color space, all visible hues combine to create white, or "pure" light.

RGB COLOR

The color space of most monitors is produced using a combination of three colors of light (red, blue, and green), each emitted at one of 255 levels of brightness within the same pixel area. Groups of pixels of differing colors, seen together, mix optically to create the appearance of a wider range of colors.



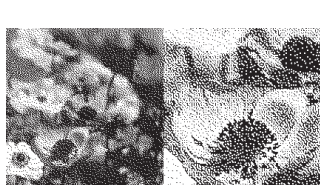
Subtractive color describes color when reproduced as pigment, like paints or inks. In this color space, mixing pigments (which refract or reflect different wavelengths of pure light) eventually results in the perception of black, or the absence of light.

PROCESS (CMYK) COLOR

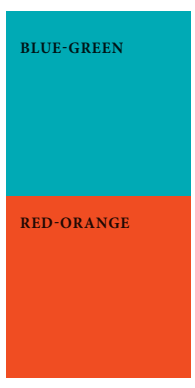
Most commercial printing uses a combination of four ink colors (cyan, magenta, yellow, and black), printed in different densities, to create the illusion of a wider gamut. While process color simulates full color pretty well, it's never able to achieve the subtlety or range possible with additive color like RGB.

Grayscale, or the black-and-white color space, is also subtractive (white is pure light; black is the absence; grays are levels of diminishing light between); it can be one of continuous tone (grayscale) or a representation of tonal value using only pixels or dots of black in different densities (bitmap).

BITMAP



Color Identity / Every color is defined in relation to four fundamental aspects—hue, saturation, value, and temperature. The qualities of each aspect vary to differing degrees in each color. A single hue (for example, "red") may be very vivid (or very saturated), but also dark or light in value, as well as relatively warm or cool at the same time.

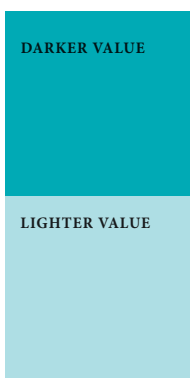


HUE

A distinction between color identities as defined by their wavelengths.

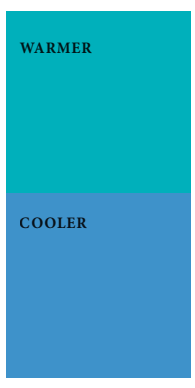
SATURATION

The relative brightness or dullness of a color: Saturated (vivid, brilliant, pure) versus desaturated (neutral, grayed out).



VALUE

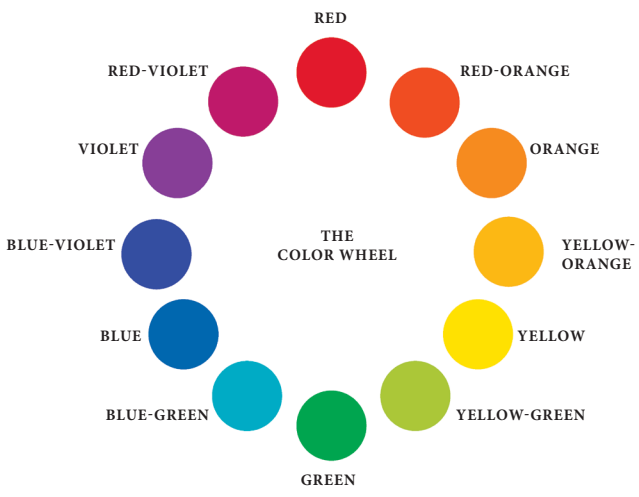
The relative darkness or lightness of a hue, as compared to balck or white.

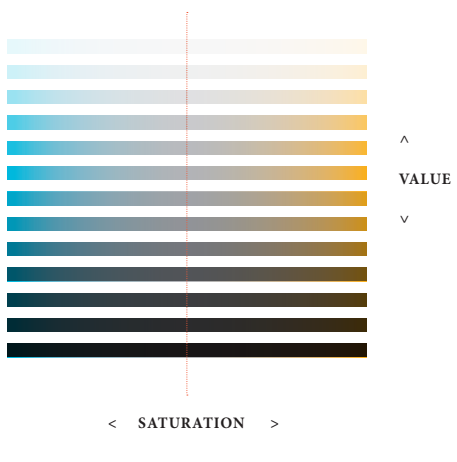


TEMPERATURE

A color's perceived warmth or coolness, usually as an association with real-world phenomena (reds, oranges, and yellow are warm, like fire; greens and blues are cool, like plants and water).

Color Model / A diagram that represents the perceptual relationships of colors. Relationships between colors are most commonly defined by their relative position on a model known as the Munsell color wheel—which actually is a set of concentric rings, like those of an onion slice, stacked over each other into a cylinder: hues are mapped, in their purest (most intense) saturation around the outer ring, and gradually desaturate toward the center; value is shown as a progression in the "slices"—from lightest (top slice) to darkest (bottom slice).

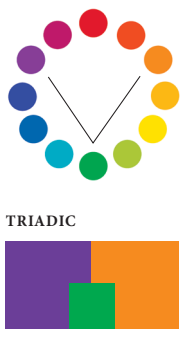




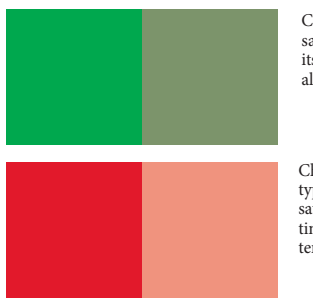
Hue Relationships / Although other relationships like value [darker or lighter], saturation [more vivid or more neutral], or temperature [warmer or cooler] are also visually important, the most important is that of how the hues relate to each other. There are three basic kinds: Analogous hues (next to each other on the Color Wheel); Complementary hues (those opposite each other on the Color Wheel); and Triadic (also called Split Complements—those at 120° to each other across the Color Wheel).

ANALOGOUS

COMPLEMENTARY



TRIADIC

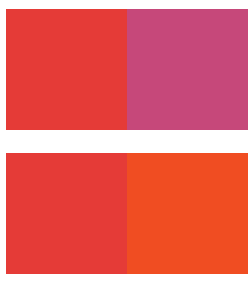


Changing a hue's saturation typically alters its temperature, and may also affect its value.

Changing a hue's value typically diminishes its saturation, and sometimes affects its apparent temperature as well.

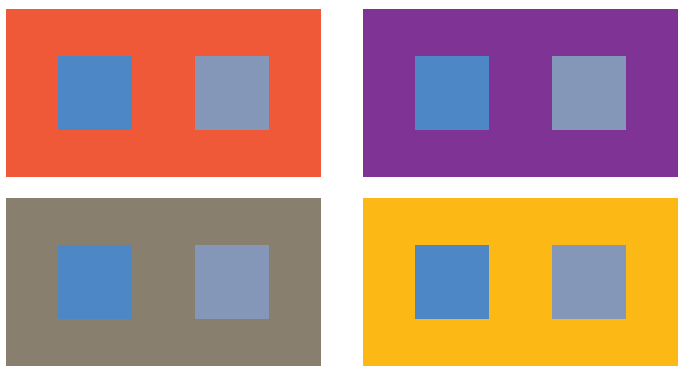
Color Relativity / Colors appear to change—in all their attributes—as soon as they come into contact with other colors. It's actually impossible to accurately describe a particular color in the absence of others.

Simultaneous Contrast / Each of the colors in one's field of vision is affecting the other ones at the same time. What happens (basically) when two colors are juxtaposed is that each exaggerates the other's apparent attibutes: A saturated color will desaturate the other, and vice versa; a dark value color will lighten the other's value; temperatures will shift, and so on. And these effects will happen in combination.



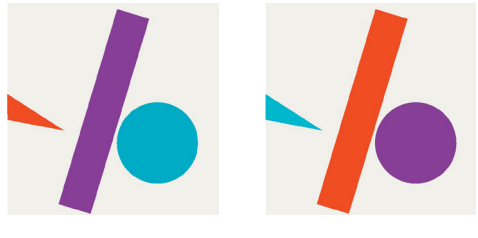
A color's true identity can never be appreciated until it appears in some context—one will always become cooler or warmer, darker or lighter, and/or more saturated or duller in appearance, in comparison—as with these swatches, at left,which are all basically "red."

In the examples at right, the same two swatches of a blue hue appear to change when surrounded by fields of different hues.



Color, Space and Hierarchy / Colors exhibit a number of spatial properties: their relative temperatures, values, and saturations, in combination, will cause the forms to which they are applied to occupy an apparent foreground, middle-ground, or background position. By extension, this means that how colors are applied to different elements (as well as to the field) will alter perception of each form's relative dominance and, thus, have a dramatic effect on hierarchy.

Our optical system (eyes and brain) perceive the three primary colors as existing at different depths in space, a function of how our brains interpret the wavelengths of these colors. Red appears stationary at a middle distance and seems to sit on the surface of the picture plane, neither in front of nor behind it. Blue appears to recede behind the picture plane, while yellow appears to advance.



Applying the same set of colors to different elements causes each to seem more or less dominant.

Color and Emotion / The greatest power of color stems from the way we so readily associate it with physical, real-world experiences—but color comes a variety of psychological messages. This emotional component of color is deeply connected to human experience at an instinctual and biological level. Colors of varying wavelengths have different effects on the autonomic nervous system. The psychological properties of color, however, also depend highly on a viewer's culture and personal experience. Acknowledging the audience's background, then, becomes extremely important for ensuring that their interpetation of color messages—which can be quite subjective—is likely to be a little more reliable. The examples provided here present emotional associations of colors in a Western context.

Arousal
Violence
Hunger
Impulsive

Calm
Reliable
Likeable
Safe

The Sun
Happiness
Energy

Earthy
Dependable
Comfort
Timelessness

Unknowable
Exclusive
Death and eternity
Outer space

Mysterious
Compromising
Elusive
Magical

Relaxing
Organic
Safe
Energy and growth

Outgoing
Adventurous
Exotic
Irresponsible

Aloof
Sophisticated
Industrial

Purity
Innocence
Wholeness
Authority

Symbolic Color / In addition to the purely psychological effects of color are the associations that we make on a culturally symbolic level: Within a particular group, certain colors may be associated with holidays, industries, notions of gender, cultural identity (flags, for example), historical periods, and so on.

MOODS AND EMOTIONS

Sinister

Artificial

Organic

INDUSTRIES

Gardening

Contemporary
Home Furnishings

Consumer Health Care

CULTURAL CONTEXTS

East Indian

European

Japanese

HISTORICAL PERIODS

Postwar/Baby Boomer (1950s)

New Wave Pop (1980s)

Internet Futurism (2000s)