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Color Basics for Landscapes

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The topic of color can become very complicated. This publication introduces some basic concepts of color theory and some ideas about our reactions to color that may be applicable to choices we make when choosing plants for landscapes.

We see only a small portion of the total electromagnetic spectrum. We cannot see ultraviolet or infrared light, X-rays, gamma rays, microwaves, radar, or waves from television or FM, AM, or short-wave radio. What we perceive as "visible" is light waves of a limited range of wavelengths. We "see" these light waves when they are reflected from objects to the retinas at the back of our eyes. We see black when nothing is reflected, and white when all visible-wavelength light is reflected. We see red when all light is absorbed except red, blue when all light is absorbed except blue, and yellow when all light is absorbed except yellow.

Twelve basic colors form the *color wheel*, which was invented by color theorists to help us think about color. The twelve colors are called hues. Three colors (yellow, red, and blue) are called *primary* colors because you cannot mix other colors to make them. If you mix the primary colors you make the *secondary* colors (orange, purple, and green). If you mix the primary and secondary colors that are adjacent to each other on the color wheel, you create six more *tertiary* colors.

Twelve hues of the color wheel

Primary colors
Yellow
Red
Blue

Secondary colors
Orange (yellow-red)
Purple (red-blue)
Green (blue-yellow)

Tertiary colors
Yellow-orange (saffron or amber)
Orange-red (vermillion or terra-cotta)
Red-purple (magenta or fuchsia)
Purple-blue (navy or royal blue)
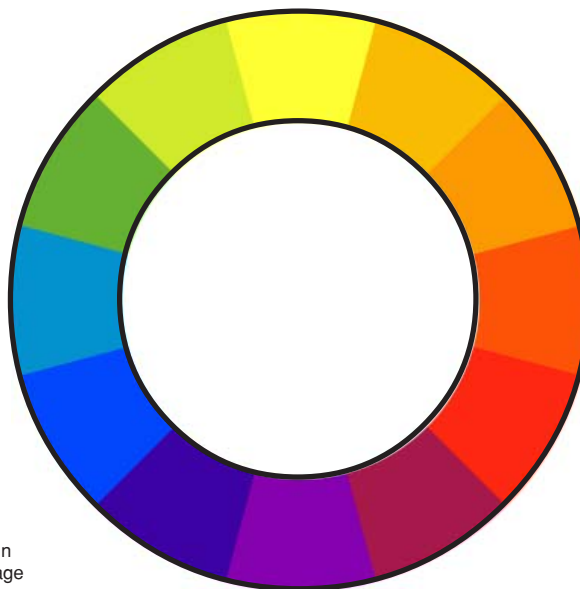Blue-green (teal)
Green-yellow (chartreuse)

Image from "Color theory" (11/2/2006) in *Wikipedia, The Free Encyclopedia.* Image created by Ray Trygstad on 10/11/04.

These twelve colors can be mixed with white to form *tints* or black to form *shades*. This produces different *values* (gradations of lightness or darkness) of the hues. For example, if you mix white with red you can produce the tint of pink; if you mix black with red you can produce the shade of burgundy. Many tints and shades can be produced, depending on how much white or black is added.

Colors of varying *intensity*, sometimes referred to as chroma or saturation, are developed by adding grey or the *complimentary* color, the color on the opposite side of the color wheel; the more that is added, the less the intensity.

Examples of complimentary colors

Yellow and purple
Blue and orange
Red and green
Yellow-orange and blue-purple
Red-orange and blue-green
Red-purple and yellow-green

Complimentary colors, when placed next to each other, intensify each other. This phenomenon is called *simultaneous contrast*. This works especially well when the two colors are of similar value. Because green is a dominant color in landscapes, a commonly used complimentary color is red. If you stare at a color for a while and then shift your eyes to a white background, you will tend to see an afterimage of the complimentary color; this phenomenon is called *successive contrast* (for more on this, see the reference by Zelanski and Fisher). Therefore, in landscape arrangements the placement of complimentary colors next to each other will tend to intensify each color and create a harmony.

Colors not opposite on the color wheel are usually referred as colors of discord, especially when they are far from the complimentary color. Examples are orange and yellow-green, and blue-green and blue-purple. Colors of discord often have been frowned upon, but today less rigid color prohibitions are followed. However, it is usually safer to use complimentary colors, which produce harmonious color combinations.

Balance of colors

Certain colors are more intense than others. Yellow is much more intense than its compliment, purple, and orange is more intense than its compliment, blue, while red and its compliment green are equal in intensity (Itten, 1970). To balance these complimentary colors, use the following ratios:

Yellow:purple	1:3
Orange:blue	1:2
Red:green	1:1

In landscaping it would be balanced to have equal amounts of red and green. Fully saturated, pure hues are heavier than lighter and darker values of each hue. When located higher, blue and yellow are lighter, and red is heavier. When located low, blue is heavy, red is stable, and yellow is buoyant (Itten, 1970).

Depth of field

To create depth of field in a landscape, place cool colors in the background and warm colors in the foreground. More contrast and larger size will tend to move the objects forward (Lauer, 1990). In tropical gardens, try all-green palms in the background and plants with warm-colored flowers or leaves in the foreground.

Symbolism

The culture of the country where the landscape is, or the country that it is trying to evoke, must be considered. Examples of cultural symbolism given by Lauer (1990) include the following:

- Green is a holy color in Moslem countries.
- Red represents good luck in China.
- Black represents death in the United States, purple in Latin America, and white in China.
- In the USA, where traffic lights are common, red means stop, green means go, and yellow means caution, but in rural China where no stoplights exist, these colors do not have the same meanings.
- Brides wear white in the United States, yellow in Hindu India, and red in China.

Color and feelings
(examples from Whelan, 1994)

Yellow—moving, lively and happy, constant motion, bright

Yellow-orange (amber or saffron)—most welcoming.

Yellow-green (chartreuse)—accent color used in youthful and offbeat objects.

Orange—friendly, open and easy, used in some fast food operations

Orange-red (vermillion or terra-cotta)—if dark, earthy; otherwise vitality, vigor, and warmth

Red—powerful, forceful, bold and extreme, masculine, always attracts attention

Red-purple (magenta or fuchsia)—energetic and active

Purple—elements of surprise and magic, unpredictable personality

Purple-blue (navy or royal blue)—dependable, authority, regal, police and navy officers

Blue—strong and calm

Blue-green (teal)—refreshing, invigorating and depicts travel and leisure

Green—fresh, health and prosperity, tranquil and pastoral

Burgundy (shade of red)—wealth

Hunter green (shade of green)—possession, banks and legal offices

Pink (tint of red)—romance!

Turquoise (tint of teal)—tropical, tranquility

Pastel cream (tint of yellow)—elegant, impression of ease and opulence, classic understatement

Light blue (tint of blue)—young and sporty, calming and restful, sense of well being and peace

Darkness vs. brightness of colors
(examples from Berry and Martin, 1991)

Dark	*Bright*
Rich	Inexpensive
Exc1usive	Mass market
Authority and dignity	Youth culture
Restrained	Loud
Passive	Active

Physical and psychological impact of color
(examples from Berry and Martin, 1991)

Warm	*Cool*
Active	Passive
Impulsive	Contemplative
Artificial	Natural
Sun	Shadow
Opaque	Transparent
Stimulant	Sedative
Dense	Rare
Earthy	Airy
Near	Far
Heavy	Light
Dry	Wet

Feminine vs. masculine
(examples from Berry and Martin, 1991)

Feminine	*Masculine*
Cool colors	Warm colors
Curvilinear lines	Sharp angles, geometric lines and forms
Silky, fine texture	Broad texture
Lighter values	Darker values
Muted contrast	Sharp contrast

Literature cited

Berry, Susan, and Judy Martin, editors. 1991. Designing with Color. Quarto Publishing, Blundell Street, London.

Itten, Johannes. 1970. The Elements of Color. Translated by Ernst Van Hagen and edited by Faber Birren. Van Norstrand Reinhold, New York.

Lauer, David. 1990. Design Basics. Holt, Rinehart and Winston, Inc., The Dryden Press, Saunders College Publishing, New York.

Whelan, Bride. 1994. Color Harmony 2. Rockport Publishers, Inc., Rockport, Massachusetts.

Zelanski, Paul, and Mary Pat Fisher. 1989. Color. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.