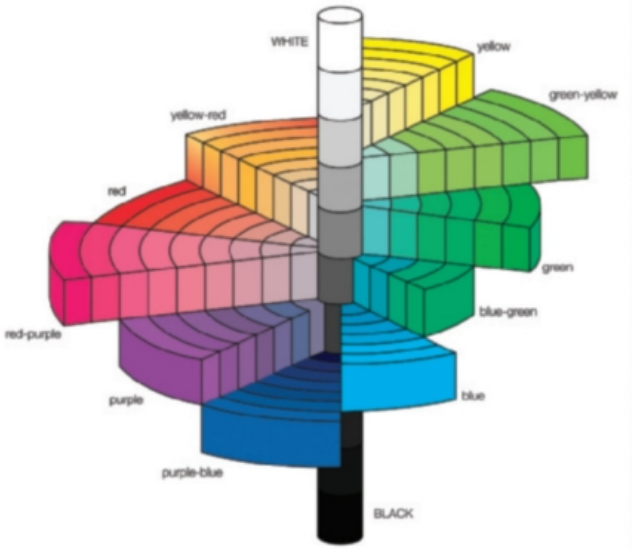
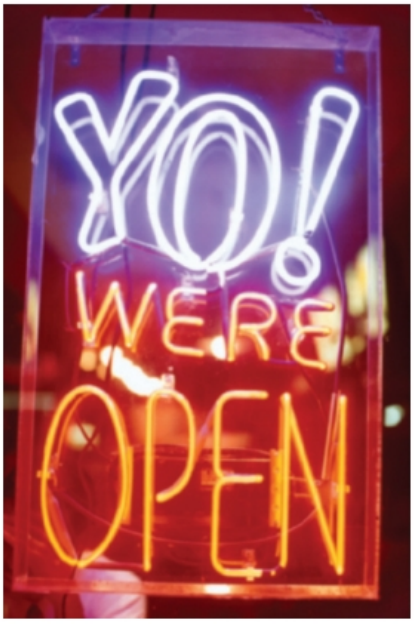
> **5.19 The Munsell Color Tree.** Albert Munsell created a three-dimension model composed of variations in the ten sets of colors in his ten-point color wheel. Colors are mixed with more black at the lower parts of the "trunk," and more white as they rise up through the tree, yielding higher-keyed values at the top. Colors farther out on the "branches" have greater *intensity* (also termed *saturation*, or *chroma*).



THE MUNSELL COLOR TREE. Albert Munsell, who created the ten-step color wheel that bears his name, also designed a three-dimensional color model—a color tree—in which the hue, value, and intensity of colors are arrayed in a branchlike configuration (Fig. 5.19). At the center, or "trunk," neutral colors are arranged



^ **5.20** ***Yo! We're Open.*** Neon sign, Miami Beach, Florida.

^ **5.21 Ed Paschke.** ***Minnie*** (1974) Oil on linen (50 3/8" × 38").
© 1974 Ed Paschke. Courtesy The Ed Paschke Foundation. Gift of the Robert A. Lewis Fund in memory of William and Polly Levey, 1982.397. Reproduction, The Art Institute of Chicago.

5.22 Mixing Complementary Colors Like Orange and Blue Lessens Their Contrast and Makes the Result More Neutral.

with black at the bottom (shades), white at the top (tints), and grays in between (tones). Colors on the tree echo this vertical arrangement of gradation from dark to light, with lower-key values on the bottom and higher-key values at the top. As the colors splay outward from the center, they intensify or become more saturated.

High-intensity colors demand attention. They invite comparison with surrounding colors, with which they compete or clash in highly visible ways (Fig. 5.20). One way to exaggerate the intensity of a color is to place it side-by-side with its complement. **Complementary colors** are positioned across from one another on a color wheel: red and green, yellow and violet, and orange and blue, are complementary pairs in a twelve-point color wheel system. These pairs contrast with each other most extremely, as seen in the juxtaposition of red and green in Ed Paschke's *Minnie* (Fig. 5.21). But when the pairs of pigments are mixed rather than juxtaposed, contrast lessens and the resulting color appears more neutral. A blue that has been mixed with orange will be more muted, as will an orange that has been mixed with blue (Fig. 5.22). In Peter Doig's *100 Years Ago* (Fig. 5.23), the areas in the water where the artist blends blue and orange are a more neutral, dull gold. Mixing a color with gray also weakens its intensity and renders it more neutral (Fig. 5.24).

complementary colors / Colors that sit across from one another on a color wheel and contrast most extremely.

5.23 Peter Doig. *100 Years Ago* (2000) Oil on canvas (78 3/4" × 116 1/4").

5.24 Lynn McCarty. *Separation* (2011) Oil on aluminum (15" × 15").

COLOR MIXING

Beyond the primaries—red, yellow, and blue—colors are created by physically mixing different pigments. "Mixing" can be visual as when the eye "blends" two different colors placed in close proximity to one another.

Visual Color Mixing in Practice

When pigments are mixed, the results differ from those that are achieved through the mixing of colored light. Combining complementary colors or colors adjacent to one another on the color wheel may yield dull or muddy results. It is virtually impossible to recreate, in paint mixtures, the clarity of a mixture of colored light.

Recognizing that mixing colors diminishes their purity and intensity, some artists have experimented with the concept of visual color mixing. Splotches or dabs of pure color are placed side-by-side and close enough to one another that the viewer—with some distance from the painting—does the color blending with his or her own eyes. The late-nineteenth-century art movement called Neo-Impressionism featured a technique called "pointillism" or "divisionism" in which discrete, closely spaced dots of white, primary hues and complementary colors were applied painstakingly to the canvas (Fig. 5.25). The color mixing takes place in the viewer's eye, rather than on the artist's palette. The pointillist method was based on emerging theories of color and optics.

The idea and principles of visual color mixing are central to Chuck Close's portrait titled *Lucas II* (Fig. 5.26; detail, Fig. 5.1). In some areas of the canvas, the eye will blend two adjacent hues but, in other areas, Close maintains the purity of color by leaving enough white space around the dabs to prevent the eye from blending them. Because Close's paintings are very large, even from a considerable distance the viewer will perceive the individual colors in spite of the eye's tendency to blend them.

▲ **5.25** **Paul Signac.** ***The Pine Tree at St. Tropez*** (1909) Oil on canvas (28 1/4" × 36 1/4").

▲ **5.26** **Chuck Close.** ***Lucas II*** (1987) Oil on canvas (36" × 30").
Photograph by Ellen Page Wilson, courtesy Pace Gallery. © Chuck Close, courtesy Pace Gallery.

Physical Color Mixing in Practice

Primary colors can be combined in varying percentages to yield an almost limitless array of colors. When two primary colors are combined in equal proportions, the result is a secondary color—orange, green, and violet. Mixing a primary color with its adjacent secondary color produces an intermediate color—yellow-green, blue-green, red-orange, and so on. The variations among intermediate colors are numerous according to the percentages of color that are mixed. A color can be labeled, for example, red-orange or orange-red, depending on the quantity of red relative to the quantity of orange in the mixture. That is, red-orange looks redder than orange-red.

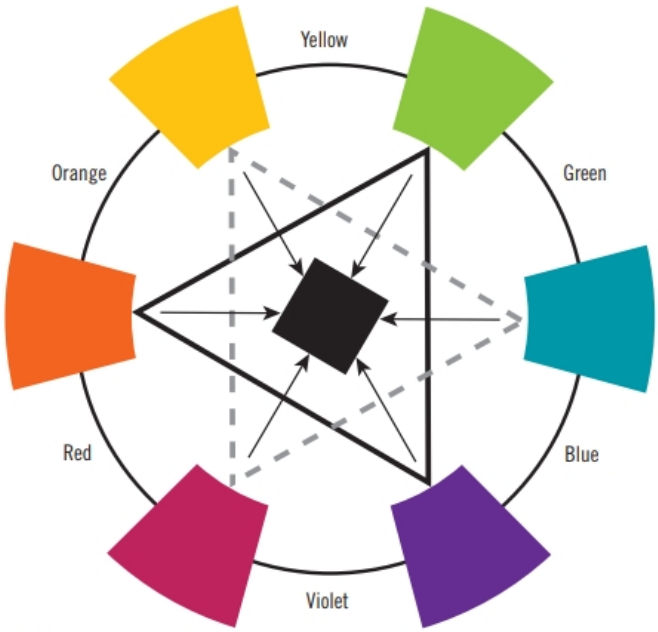
The actual "mixing" experience of the artist may vary according to which paint manufacturer's product is being used. Reds and blues and yellows can be, and are, different. But the general principles of mixing still apply and, for some theoretical guidelines, we return to the color wheel. The twelve-color wheel develops from the concept of **triads,** or groups of three. In a triadic system, the basic color wheel will feature yellow at the top ("twelve o'clock"). Tracing the sides of an equilateral triangle downward, the other two points locate the other two primaries—red and blue (at "eight o'clock" and "four o'clock" respectively)—creating the **primary triad** (Fig. 5.27). *Medusa's Collar* (Fig. 5.28), a fiberwork by Ferne Jacobs, is built around the triadic color scheme red, yellow, and blue. The saturated primaries clash, exaggerated by the flame-like shapes that dip and swirl and curl. The tendrils formed by coiled, waxed linen thread evoke—albeit more benignly—the head of Medusa, the mythological Gorgon with snakes in place of hair.

triad / A group of three colors.

primary triad / The group of three primary colors (yellow, red, and blue) identified by the placement of an equilateral triangle over a twelve-point color wheel with yellow at the top.

▲ **5.27** Primary and Secondary Triads.

▲ **5.28** Ferne Jacobs. ***Medusa's Collar*** (2010) Coiled waxed linen thread (18" × 14" × 19").



▲ **5.29 Tertiary (Intermediate) Triads.**

▲ **5.30 Grays Are Achromatic (without Color), or Neutral.** Grays with more white are higher in key. Grays with more black are lower in key.

The mixture of two primaries forms the **secondary triad** (Fig. 5.27). The resulting colors—orange, green, and violet—occupy the "two o'clock," "six o'clock," and "ten o'clock" positions and are connected by an inverted triangle. **Intermediate triads** are colors created with the mixture of a primary color and its adjacent secondary color (Fig. 5.29). They fill in the remaining positions on the twelve-point wheel. In theory, at least, the combination of all of these colors will result in gray.

The gray in the center of this triadic color wheel is referred to as *achromatic*

secondary triad / The group of three secondary colors (orange, green, and violet) identified by the placement of an inverted equilateral triangle over a twelve-point color wheel with yellow at the top.

intermediate triads / Colors created with the mixture of a primary color and its adjacent secondary color.

(without color) or *neutral* (without any distinguishing color). Neutrals (as discussed earlier) range from white to black, and include tones of gray in between (Fig. 5.30). Grays with varying but higher percentages of black are labeled low-key neutrals. Grays with varying but higher percentages of white are considered high-key neutrals. Paintings that feature a palette of neutrals—tending toward warm or cool tones—are sometimes described as "values paintings." In these works, a spectrum of grays is dominant (Fig. 5.31).

White can be conceptualized as the presence of all colors, reflected equally by a surface. By contrast, black can be defined as the absence of color, the wavelengths having been completely absorbed by a surface.

5.31 Catherine Murphy. ***Plowed Driveway*** (1991) Oil on canvas (55" × 59 1/2").
© Catherine Murphy. Courtesy of the artist.

THEORY & PRACTICE

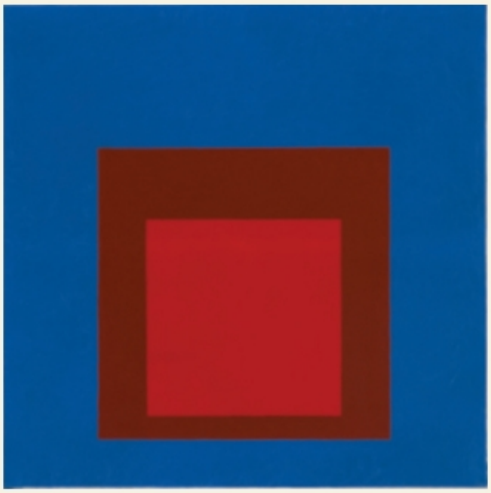
Interacting with Color

Basic color theory tells us that when complementary colors—hues on opposite sides of the color wheel—are placed side-by-side, the optical effect is vibration, a kind of pulsing or glowing along the edges where the two colors meet. Even though the colors are touching, they seem to be moving away from one another. The biological explanation for this sensation is called *retinal fatigue*, an overstimulation of the cone cells in the eyes that are sensitive to red, green, and blue pigments. The phenomenon of retinal fatigue was explored by Josef Albers—a student of Johannes Itten at the Bauhaus—in visual demonstrations of theories on color contrast and color-induced optical illusions.

Albers discovered that the same vibratory effect that is perceived with adjacent complementary colors could be recreated with other, noncomplementary colors if they (a) were pure and (b) contained by very sharp, clear edges. He explored the potential of this effect in more than a thousand versions of his *Homage to the Square: "Yes"* (Fig. 5.32), all consisting of nesting squares of varying palettes and proportions. Albers also used color variations to create an illusion of depth. Dark squares in the center of his compositions that are surrounded by brighter colors seem to recede, tunnel-like, and light squares surrounded by darker ones appear to advance (Fig. 5.33).

Color-induced optical illusions include the "afterimage" effect, especially intense in the presence of complementary

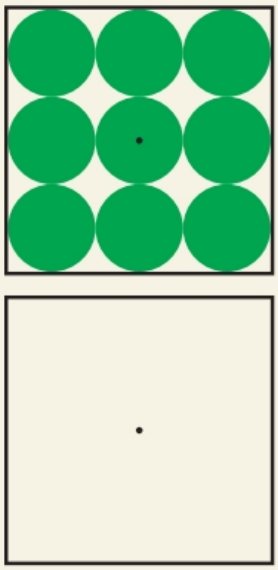
5.32 Josef Albers. ***Homage to the Square: "Yes"*** (1956) Casein on masonite (40" × 40").



5.33 Josef Albers. ***Homage to the Square: On an Early Sky*** (1964) Oil on composition board (48" × 48").

Check out the Visual Glossary–Styles at the end of the book to learn more about Josef Albers and Op Art.

colors. Albers devised visual experiments to create afterimage effects (Fig. 5.34), but you can try one yourself. Create a solid red square on a piece of white paper using paint and tape it up on a wall next to a blank sheet of white paper the same size. Stare at the red square for 30 seconds and then shift your eyes quickly and directly to the plain white sheet. You should see a green square on the white sheet, at least temporarily.



5.34 Albers Experiment with Afterimage Effects.

COLOR AND PRINCIPLES OF DESIGN

Color can be used along with principles of design in any number of ways—to bring emphasis to a specific part of a composition, to lead the eye around it, to balance other elements in a work of art by providing a visual counterpart to one or more shapes. Color can be a unifying element in a work with many components (Fig. 5.35) or add variety to compositions whose palette might otherwise seem monotonous (Fig. 5.36).

5.35 Carolyn Brady. *Yellow Tulip Bed* (1986) Watercolor on paper (59 1/4" × 89 1/2").
© Carolyn Brady. Courtesy Nancy Hoffman Gallery, New York.

5.36 Hung Liu. *Loquats-Blue* (2013) Mixed media (13 1/2" × 13 1/2").
© Hung Liu. Courtesy Nancy Hoffman Gallery, New York.

5.37 Zhang Xiaogang. *Bloodline: Big Family* (1999) Oil on canvas (59" × 74 3/4").

5.38 Vanessa Bell. *Window, Still Life* (c. 1912–1913) Oil on canvas (28 3/4" x 21 7/8").

Color and Emphasis

Color adds visual interest and can be used to draw and hold attention in a work of art. Zhang Xiaogang's *Bloodline: Big Family* (Fig. 5.37) features a passage of bright red in the midst of relentlessly dreary tones. The uniformity of the drab palette reflects the appearance—indeed the lives—of what the artist calls a typical revolutionary family: "asexual, dressed in Mao suits, their gaze glassy and dismal. . . . They could be clones."[1] Shades of red set the child apart from his parents, causing the eye to linger on him and to consider the irony of the painting's title. In "Red" Communist China the

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Michel Nuridsany, *China Art Now*. Paris, France: Flammarion, 2012, p. 114.

5.39 Jennifer Bartlett. ***Yellow and Black Boats*** (1985) Oil on canvas (10′ × 19′6″) and painted wooden boats.

government policy of one child for urban couples rewrites the definition of a big family.

Color and Balance

Color can play a pivotal role in achieving visual balance in a composition—equivalence in terms of visual weight, attraction, or emphasis.

In Vanessa Bell's *Window, Still Life* (Fig. 5.38), color is distributed in such a way as to create compositional symmetry. Blues, greens, and oranges appear throughout, reiterated in the landscape, architecture, and tabletop arrangement. The visual continuity among the spaces in the composition is achieved with precise color balance.

Jennifer Bartlett's installation, *Yellow and Black Boats* (Fig. 5.39), is an example of asymmetrical compositional balance achieved through the use of color. In this two-part work, a large wall painting features ripples of waves gently lapping on a narrow strip of shore where two small boats are moored—one black and one yellow. Two wooden boats, mirroring the painted boats in position and color, are situated on the gallery floor close to the canvas. A visual connection is made between the two yellow boats and the two black boats, connecting the two- and three-dimensional components of the work. If you cover the wooden boats in the photograph with your hand, you will see how vital color is to visual balance in this installation.