playing with color

50 graphic experiments for exploring color design principles

richard mehl
To Alicia, my northern star, and to the memory of my parents, Elinor and Ben.

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introduction

Playing with Color is a workbook of color experiments. Whether you’re a professional graphic designer, a DIY enthusiast, or a student of art and design, these projects will provide you with a toolkit of ideas and skills relating to color. The experiments are presented in ways that encourage exploration and discovery through a process based on play.

“play is the highest form of research.”
– albert einstein

play = learning

The notion of play is familiar to people in all creative fields: It is fundamental to the process of making art. It’s fair to say that all original art and design is, on some level, the product of play. Under the best conditions, artists and designers have the freedom to explore possibilities, to experience mystery, excitement, frustration, discovery, joy, and reward—all emotions associated with play. We begin work with the goal of making something, and as we progress, we encounter problems to solve. We ask ourselves “what if?” and find answers through imaginative thinking, trial and error, and improvisation. As in game playing, each experience informs the next. Learning occurs. In time, through repetition, our aesthetic actions become instinctual.

Play is vital to the education of artists and designers. We take this idea for granted now, mainly because of the influence of Bauhaus educational philosophy on several generations of art and design educators. The Bauhaus approach to teaching art and design was indeed radical in its time. Instead of forcing students to imitate historical examples—the common practice in nineteenth-century academies—students in the Bauhaus attended workshops led by artists and craftsmen, where they learned about materials and process.

The “preliminary course,” developed and first taught by Johannes Itten, served as an introduction to form, color, and materials considered fundamental to all visual expression. The role of play was essential in the course. Itten began his classes with physical exercises—stretching, chanting, and breathing—followed by drawing exercises. (Paul Klee, who also taught the course, called this “a kind of body massage to train the machine to function with feeling.”) The assignments were exercises in which students explored Itten’s theory that all art could be understood as a series of oppositions: large/small, long/short, broad/narrow, thick/thin, much/little, straight/curved, pointed/blunt, smooth/rough, hard/soft, transparent/opaque, continuous/intermittent. Compositions were abstract, allowing students to explore the effects of these contrasts.
Itten famously declared it his aim to rid students of "all the dead wood of convention," to encourage a kind of unlearning. Trained as a primary school teacher, he embraced progressive thinking about education, especially the idea that play was central to learning. The lineage of Itten's teaching philosophy can be traced to Friedrich Frobel, the founder of kindergarten, whose twenty gifts and occupations, based on the language of geometry, were designed to employ children's natural sense of curiosity in an environment that fostered play and problem solving. (The list of prominent Modernist artists and designers who directly experienced or were influenced by Frobel's teaching system includes Frank Lloyd Wright, Le Corbusier, Paul Klee, Walter Gropius, Josef Albers, Johannes Itten, Wassily Kandinsky, Piet Mondrian, Theo van Doesburg, and George Braque.)

My own awareness of learning about art through the process of play began in high school, when I studied ceramics. Working with clay, water, glaze, and fire was, for me, totally experimental and unpredictable, and entirely process driven. Rarely did my creations approximate my original visions. In response, I learned to set up conditions that allowed for the possibility of serendipity—the happy accident. Later, as an art school student in love with photography, I was most comfortable and productive in the darkroom experimenting with film processing and printing (where I was quite literally working in the dark). The spirit of play was my best guide. My favorite and most successful photographic projects were usually the result of chance, followed by improvisational problem solving.

In graduate school, I had the pleasure of studying with Paul Rand, America's greatest graphic designer. Rand epitomized the ideal artist/designer. He possessed both the intellectual discipline and formal skills to create visual identities for major corporations and the optimism to design beautiful children's books. In fact, his corporate design work was as playfully created as his children's books.

His teaching was an honest reflection of his love of play. In his essay "Design and the Play Instinct," Paul Rand compared problem solving to game playing by listing the factors that contribute to success in both:

"motivation, competition, challenge, stimulus, goal, promise, anticipation, interest, curiosity, skill, observation, analysis, perception, judgment, improvisation, coordination, timing, concentration, abstraction, discretion, discrimination, economy, patience, restraint, exploitation, excitement, enjoyment, discovery, reward, fulfillment."

"Design and the Play Instinct" is a wonderful compendium of visual play. Rand traces the current of play through the crossword puzzle, the tangram, Chinese calligraphy, Le Corbusier's Le Modulor, Matisse's cut paper compositions, Picasso's humor and spontaneity, Man Ray's and Moholy-Nagy's photograms, Piet Zwart, and the de Stijl movement. He completes the essay with this description of an article of form and function created by means of disciplined play:

"Some years ago in Kyoto I was fortunate enough to witness a young Japanese craftsman make the 'chasen' ... It is a whisk used in the tea ceremony and is cut from a single piece of bamboo with a simple tool resembling a penknife. Both the material and manufacturing process (about one-half hour) are the quintessence of discipline, simplicity, and restraint. The invention of such an article could not possibly have been achieved by anyone lacking the ability to improve and the patience to play with a specific material: to see the myriad possibilities and discover the ideal form."

Rand clearly took play very seriously. He believed in embracing the limitations of the game: "Without the basic rules or disciplines ... there is no motivation, test of skill, or ultimate reward—in short, no game. The rules are the means to the end."

Our goal in this book, in these color experiments, is to explore the possibilities of color in design. You will be encouraged to adopt a disciplined, playful approach to creative problem solving. Each project will provide a color experience; each experience will add substance to your color awareness. Through these explorations, we become connoisseurs of color.
practice and theory

In 2002, I was asked by Richard Wilde, chair of the Advertising and Graphic Design Department at the School of Visual Arts in New York, to develop a foundation course in two-dimensional design and color theory, to prepare students for the rigors of the advertising design program. He proposed that the course be called Principles of Visual Language.

I was comfortable with the idea of teaching two-dimensional design. The “principles of visual language” were, after all, essentially the same design concepts I taught in my typography classes. Color theory was another thing altogether.

Like many graphic designers, I had limited actual knowledge of color theory. My understanding of color was derived from the palettes of favorite painters and designers. Faced with teaching color theory, I was suddenly at a loss. I had no idea what color theory was. How could I teach it?

I found answers in two books: Johannes Itten’s *The Art of Color* and Josef Albers’s *Interaction of Color*. I was aware of the books and had done some of the Albers assignments in school, but Itten’s and Albers’s teaching practices were not familiar. After several readings of both books, I was suddenly full of ideas. Itten and Albers gave me the tools to teach color theory.
Most of the assignments in this book were shaped during the last ten years of teaching Principles of Visual Language. Many are based on assignments originally taught by Itten and Albers. Itten’s color contrasts and twelve-hue color circle are essential to the study of color theory, and are included here in modified versions of the original assignments. A selection of Albers’s experiments with color illusion and his wonderful leaf study assignment are included. These projects are essential experiences in an exploration of color theory.

In teaching Principles of Visual Language, we follow the educational strategy described by Josef Albers in Interaction of Color:

“The aim of such study is to develop—through experience—by trial and error—an eye for color ... it means development of observation and articulation .... This book, therefore, does not follow an academic conception of ‘theory and practice.’ It reverses the order and places practice before theory, which, after all, is the conclusion of practice.”

Teaching color theory and exploring color relationships in work and play has added value to my life and to the lives of my students. Through practice and observation, we gain greater awareness and sensitivity—we develop an eye for color.

Below: Principles of Visual Language class, September 2011
The projects shown in this book were created by my students, who are identified in the captions. Unidentified work is by the author.
a continuum of color

Cave paintings to color wheels

When we play with color, we become part of a continuum that, as far as we know, began with Paleolithic cave paintings. We are not sure what motivated our ancient ancestors to make these representations of large animals, tracings of human hands, and the abstract marks known as finger flutings. We may never understand exactly why these paintings were made, but the styles of rendering, the forms and colors, are deeply familiar. The simple dark outlines and colored shapes are expressions of our play instinct. They demonstrate the important role of color in early human life.

The prehistoric cave painters used charcoal, hematite, and ochre derived from naturally tinted clay. The colors we see in their paintings are the results of experimentation and invention, using materials at hand. As civilizations developed and changed, the use and significance of colors evolved.

The colors of ancient Egypt were symbolic. Black was the color of fertility, resurrection, and regeneration. White represented purity, sacredness, and simplicity. Silver represented the Sun at dawn, the Moon, and stars. Blue was recognized as the color of the sky, the dominion of the gods, and of water and the annual floods; it was used to represent the god Amun, the creator of the world. Green represented healing and wellness. Yellow and gold were used in paintings to represent skin—women and gods, respectively. Red symbolized chaos and disorder, the opposite of black (fertility) and white (purity), but was also associated with blood and fire—life and power.

At approximately the same time in China, yellow was the symbolic color of emperors. As one of the five colors in the theory of elements, yellow corresponds with Earth, the center of life. Black is a neutral color, corresponding with water, and in the I Ching it is the color of heaven. Red corresponds with fire, and symbolizes good fortune and joy. Greenish blue corresponds with wood and represents nature and renewal. White corresponds with gold and symbolizes purity.

In ancient Greece, Pythagoras and Aristotle developed color systems defined by sensual experiences of color. Pythagoras created a system related to his conception of musical harmony, which he believed was defined by the positions of the planets between the Earth and stars. Aristotle’s system corresponded to a linear sequence of colors observed during the course of a day in seven progressive steps—white, yellow, red, violet, green, blue, and black.

Aristotle’s linear system of colors informed later color theory, including the Renaissance polymath Leonardo da Vinci. Leonardo simplified the sequence to six simple colors in spectral order: white, yellow, green, blue, red, and black. He related white to the origin of all colors, black to the absence of light, yellow to Earth, green to water, blue to the sky and red to fire. But Leonardo’s understanding of color was not only based on perception and association. As a painter he was interested in the practical value of color mixing. He understood the necessity of using white and black to achieve rilievo, chiaroscuro, and sfumato—techniques used to create the illusion of volume. He defined green as the mixture of yellow and blue, a principle of modern color systems based on the concept of red, yellow, and blue as parents of all color mixtures.
The great painters that followed Leonardo played with color in a variety of ways, to achieve pictorial effects and to suggest conceptual associations. At the same time, the study of color theory was advancing scientifically. Franciscus Aguilonis, a Jesuit in Brussels, is credited with developing the first color system based completely on the primary red-yellow-blue concept. His linear color system, published in 1613, established the relationship of primary colors and secondary colors. Later in that century, Isaac Newton experimented with light and color, using a prism to separate daylight into a spectrum of seven colors. His color circle, published in 1704, diagrams a continuous sequence of red, orange, yellow, green, cyan, ultramarine, and violet. Newton believed in a harmonic relationship between light and sound, and based his seven-color system on an octave, which displays seven sounds—the names and correlations of his seven colors and the seven musical notes are included in his color circle.

Newton’s color circle was followed by other circular color systems, including some that recognized red, yellow, and blue as primary or primitive colors, from which other colors are created through mixtures. The German poet and philosopher Johann Wolfgang von Goethe developed a color wheel composed of the primary and secondary colors in a spectral sequence and arranged so each primary is opposite a secondary. Goethe had experimented with the perception of colors and was aware of simultaneous contrast—how the appearance of a color changes because of its proximity to another color. His color wheel placed each color opposite the color that is spontaneously generated as an afterimage. “Yellow, blue, and red form a triad, as do the intermediate, mixed, or derived colors. The advantage of this scheme is that any diameter drawn in the circle immediately indicates the physiologically demanded color—the color appearing as a result of successive contrast.”

Goethe’s color wheel formed the basis for Phillip Otto Runge’s color sphere, in which pure primary and secondary colors are located along the equator, white and black are at the poles, and gray in the core. In Runge’s color sphere, the gray core is halfway between the white and black poles. The position of the gray core is constant—a line drawn between any two diametrically opposed colors on the sphere will intersect it. In effect, Runge’s color sphere demonstrates the principle of complementary color: When combined in equal parts, complementary colors produce a neutral color that is not recognizable as either parent.

Following Goethe and Runge, many color systems based on spheres and other shapes were conceived for artistic, educational, scientific, and commercial use. One of the best known is the Munsell Color System, created by the American artist and teacher Albert Henry Munsell. The system was first described in his book A Color Notation in 1905 and is still in print. Munsell based his system on a “color tree,” a structure that, unlike the conceptual solid color sphere model, allows us to observe colors evenly arranged according to hue, value or lightness, and chroma or purity.

Johannes Itten’s Color sphere in 7 light values and 12 tones from 1921 (described on page 23) is the direct descendant of Goethe’s color system. Itten’s basic color wheel became the classic model color system taught in art schools, due to the simplicity and elegance of the design and to Itten’s profound influence as a Bauhaus instructor.
the teachings of itten and albers

The experiments in this book begin with an exploration of Johannes Itten's teachings—the color wheel, color contrasts, and color harmony. The inspiration for these experiments can be found in Itten's *The Art of Color*. Itten directed his teaching toward artistic pursuit. Students in his Bauhaus preliminary course studied the old masters, analyzing compositional structures by tracing lines over reproductions of masterpieces and making notes about the colors.

*The Art of Color* is illustrated with examples of famous European works, from eleventh-century manuscript painting to Mondrian. Itten included only one example of what we might call industrial or functional art—a stained glass window in Chartres Cathedral. This might seem odd, considering Itten's relationship to the Bauhaus, where the curriculum was directed toward functional design. But while his teaching style did not fit the Bauhaus and ultimately led to his dismissal, Itten's preliminary course, with its emphasis on the search for fundamentals, "would serve as the framework for much Bauhaus thinking to come."

The Itten-inspired experiments are followed by a brief exploration of the teachings of Josef Albers, a student of Itten at the Bauhaus and shortly after a Bauhaus instructor himself, and later a teacher at Black Mountain College and Yale University.

Following Itten's departure from the Bauhaus, Albers and László Moholy-Nagy taught the preliminary course. Albers described his version of the course this way:

"First we seek contact with material ... Instead of pasting it, we will put paper together by sewing, buttoning, riveting, typing, and pinning it; in other words we fasten it in a multitude of ways. We will test the possibilities of its tensile and compression-resistant strength. In doing so, we do not always create 'works of art,' but rather experiments; it is not our ambition to fill museums: we are gathering experience."

Albers’s later teaching at Black Mountain College and Yale was driven by his exploration of color relativity. His teachings are beautifully described in *Interaction of Color*. Original printings of *Interaction of Color* can be found in the special collections of art libraries around the world. The book was first printed as a large two-volume portfolio of unbound folders. Later versions of *Interaction of Color*, including paperbacks in different languages, have become art school classics. His color illusion experiments—for example, make one color look like two—are staples of art and design foundation courses.

The color experiments taught by Itten and Albers are demonstrative—they encourage and require exploration and discovery. Their teachings are the foundation for understanding the role of color in art and design. They are connections to the past, our guides to the continuum of color, sources of inspiration for our own explorations.
the playing process

Setting up a workspace

The experiments in this book were created for students living in small spaces with limited financial means. Certain materials used in the experiments, like gouache paint, can be expensive. Other supplies, like leaves and found materials, are free and easily accessible. The tools we use range from pencils to computers—the range of their cost and availability is as diverse as the tools themselves.

I began art school before the advent of the computer as a mainstream tool, and worked as a graphic designer for several years before the profession became digital. And yet, including my precomputer art school experience, I have owned fewer X-Acet knives than computers. The relative costs of these tools are not even remotely close—economically speaking they should not be compared. One is timeless and the other is reliably obsolescent. Yet both tools are absolutely essential to my work.

The best way for me to rationalize the value of my tools and materials—free or costly, finite or replaceable—is to think of them as equals. Each tool is important in its own way, and each material is useful for a specific purpose. My tools and materials are a collective. They enter my life in various ways for various reasons. Certain tools and materials lose their importance but later make a comeback. Some are permanently in play, while others get used up.

Perhaps my most important tool—a flat surface with good light—is the most flexible. My workspace shifts from my kitchen counter, where proximity to water and sink facilitates painting with gouache, to a table where sunlight is strongest, to a floor surface where size is less of a concern, to my desk where a large computer display resides. Like my tools and materials, I consider my workspaces equally important. They all serve a common goal—creating good work.

An often-overlooked consideration of the playing process is time. As Leonard Bernstein said, "To achieve great things, two things are needed: a plan, and not quite enough time." This might not seem like good advice for an art student, but the relationship between "not quite enough time" and "achieving great things" has been consistent throughout my career in design and education. To be confident in our self-reliance, we must all discover, through experience, how time informs our playing process—how having "not quite enough time" is all the time we need.

Materials for playing with color

Gouache paint
- Black, white; common names are lamp black, jet black, zinc white
- Red, yellow, blue; usually identified as primary or spectrum; primary red, spectrum yellow
- Orange, violet, green; the brightest and purest versions of these colors are best; cadmium orange, brilliant violet, and brilliant green

Don’t use cheap gouache—you’ll be disappointed. Buy good paint and use it wisely. If you buy a packaged set of paints, be sure the colors listed above are all included.

Brushes
- 1-inch (2.5 cm) watercolor brush, calligraphy brush, or Japanese stenciling brush
- A range of small watercolor brushes

Watercolor paper
- Cold press, 90 lb., 9 x 12 inches (23 x 30.5 cm) or larger
- Black, white, and gray mounting board, 11 x 14 inches (28 x 36 cm)

Archival paper glue Cups for water and mixing
Masking tape Plastic cutting mat
Square punch craft knife, ruler, pencils

Color-aid paper is available in a variety of sizes in two sets of 220 and 314 colors. According to the product website, Color-aid paper was initially developed for photographic backdrops, and later became a standard material for making Albers’s assignments.

A Color-aid set is composed of hues, tints, shades, pastels, grays, black, and white. Each colored sheet is coded according to the Color-aid system. I encourage my students to group the sheets in a way that makes sense to them. I group my Color-aid according to hue: Each group contains the purest hue, any warm or cool variations, and tints and shades of the hue. I consider pastels to be complex colors and group them separately, again according to hue. Grouping the colors using my own system allows me to quickly find the exact color I am looking for.
Gouache vs. Color-aid

The first experiments in this book—the color wheel and color grids, inspired by Itten—give you the option of making your own colored paper with gouache paint, or using Color-aid or other found colored papers. I encourage you to explore both methods—being good at both will enable you in all of the experiments.

Itten saw value in both methods, but seemed to favor gouache paint. The flat, even surface of painted gouache, along with the richness and opacity of the colors, was ideal for controlling reflection and, therefore, an excellent material for comparing colors. The additional value of gouache is the experience of actual color mixing—observing the subtractive mixture process. By mixing the complements red and green, for example, we can observe color theory in action. We see how an equal mixture results in a neutral dark gray, not recognizable as a color derived from either red or green, yet harmonious with both.

Albers favored using colored paper for his color illusion experiments. He appreciated the practicality, economy, and immediacy of colored paper. He preferred found paper: “... waste stripes found at printers and bookbinders ... wrapping and bag papers ... cut-outs from magazines, from advertisements and illustrations, from posters, wallpapers, paint samples ...” 11 Albers, himself a painter, understood the difficulty of painting the smooth, untextured swatches of color required for his color illusion exercises. He also appreciated the challenge of finding an imagined color:

“It is obvious that in working with color paper there is no way of mixing colors mechanically, as paint and pigment permit, and as they invite one to do on a palette or in a container. Though this may first appear as a handicap, it is actually a challenge to study color mixture in our imagination, that is, so to say, with closed eyes.” 12

To experience the Albers-inspired color illusion experiments as fully as possible, we use colored paper—Color-aid and other found paper.

Computers and digital technology

The majority of experiments in this book are conceived to be executed by hand using simple tools and accessible materials. There are several experiments that can be fully executed using a computer, perhaps with better results than hand building would allow. In fact, most of the experiments can be made with computer assistance. In some cases, the process of making compositions is greatly simplified by the computer—geometric patterns, for example. Difficulty comes with getting an image off the screen; high-quality digital printing is often expensive, and the colors seldom match the brilliance of the screen image. This may not be an issue—some experiments can be fully appreciated as a digital projection. But the precise renderings of a computer always seem to lack the humanistic gesture of the hand. Mistakes often add authenticity to a handmade composition; mistakes made in a computer rendering are rarely seen as anything but mistakes.

My advice is to use your computer skills in your own way, with the best intentions. Follow your play instinct. You may find new ways to use the computer to explore colors.
color and design glossary

Words that describe color

Gradation
transitions of colors in steps or stages

Harmony
agreement between colors; Itten defines color harmony as a set of colors that when mixed result in a grayish neutral color, and refers to these sets as color chords

Hue
the identity of a color; in the Color-aid system, hue refers to the purest version of a color

Relativity
the changing appearance of a color based to its proximity to another color

Saturation
purity of color; sometimes called intensity

Shade
a mixture of a pure color with black, darkening the color

Temperature
the sensation of a color as warm or cool

Tint
a mixture of a pure color with white, lightening the color

Transparency
seeing through colored materials such as film, thin paper, liquids; sometimes overlapping, resulting in color mixtures

Transparency illusion
the suggestion of seeing through overlapping layers of color, achieved by combining non transparent materials

Value
generally, the relative importance of one color compared to other colors in close proximity; in the Munsell Color System, value refers to the lightness of a color

The seven color contrasts, defined by Johannes Itten

Contrast of hue
the most basic of all color contrasts, achieved by combining forms composed of different gray colors in a single composition.

Contrast of light and dark
the difference between black, white, and various grays; also the difference between light and dark versions of a color achieved by adding white or black or by adding the color’s complement

Contrast of saturation
the difference between pure and diluted, or intense and dull colors, achieved by adding gray or the color’s complement

Complementary contrast
the difference between colors that are opposites on the color wheel, sometime including mixtures of the colors ranging from recognizable variations of each parent color to middle neutral mixtures

Simultaneous contrast
the illusion of multiple contrasts that occurs simultaneously to a single color when viewed against different colors; the illusion of different color afterimages on the same gray ground

Contrast of temperature
the difference between warm and cool colors and the sensations they produce; warm colors generally range from yellow to red, and cool colors from green to blue; however, variations of the same hue can be described as warm or cool

Contrast of extension
the appearance of similarity or difference in a composition, based on the proportion of light and dark colors; in essence, small amounts of bright colors will be balanced by large amounts of dark colors, while even amounts of light and dark colors will result in stronger visual hierarchy
**Words that describe design**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstraction</td>
<td>art and design based on nonrepresentational forms</td>
</tr>
<tr>
<td>Anomaly</td>
<td>an irregular form in a design in which regularity exists</td>
</tr>
<tr>
<td>Asymmetry</td>
<td>a free, harmonious, and balanced arrangement of unequal elements</td>
</tr>
<tr>
<td>Balance</td>
<td>a state of equilibrium; elements in equal opposition or attraction</td>
</tr>
<tr>
<td>Collage</td>
<td>a composition of found materials</td>
</tr>
<tr>
<td>Composition</td>
<td>an arrangement of visual elements</td>
</tr>
<tr>
<td>Contrast</td>
<td>difference between elements in a composition</td>
</tr>
<tr>
<td>Curvilinear</td>
<td>form defined by curves</td>
</tr>
<tr>
<td>Dynamic</td>
<td>expressing movement and energy</td>
</tr>
<tr>
<td>Element</td>
<td>the parts of a composition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure</td>
<td>a dominant form in a composition</td>
</tr>
<tr>
<td>Figure/ground</td>
<td>the relationship between the dominant forms and background in a composition</td>
</tr>
<tr>
<td>Focal point</td>
<td>a place in a composition that commands attention</td>
</tr>
<tr>
<td>Form</td>
<td>a shape of definite size and color</td>
</tr>
<tr>
<td>Geometric</td>
<td>form or composition based on mathematical measurement, usually created with mechanical tools or computers</td>
</tr>
<tr>
<td>Rectilinear</td>
<td>a form defined by straight lines</td>
</tr>
<tr>
<td>Rhythm</td>
<td>a sense of movement created by the recurrence of similar features</td>
</tr>
<tr>
<td>Symbol</td>
<td>an abstract rendering of an object, idea, or experience</td>
</tr>
<tr>
<td>Harmony</td>
<td>agreement between elements of a composition</td>
</tr>
<tr>
<td>Symmetry</td>
<td>form or composition based upon reflection and equality</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>the perceived order of importance of elements in a composition, based on contrast</td>
</tr>
<tr>
<td>Unity</td>
<td>oneness, wholeness; the harmony of all parts of a composition</td>
</tr>
<tr>
<td>Weight</td>
<td>the perceived lightness or heaviness of a form</td>
</tr>
</tbody>
</table>

**Compositional contrasts**

<table>
<thead>
<tr>
<th>Contrast of form</th>
<th>geometric/organic, rectilinear/curvilinear, symmetrical/asymmetrical, simple/complex, abstract/representational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contrast of size</td>
<td>large/small</td>
</tr>
<tr>
<td>Contrast of direction</td>
<td>vertical/horizontal/diagonal</td>
</tr>
<tr>
<td>Contrast of position</td>
<td>top/bottom, high/low, left/right</td>
</tr>
<tr>
<td>Contrast of space</td>
<td>active/empty, positive/negative, advance/recede, near/far</td>
</tr>
<tr>
<td>Contrast of weight</td>
<td>light/heavy</td>
</tr>
<tr>
<td>Contrast of texture</td>
<td>fine/coarse, smooth/rough, even/uneven, matte/gloss</td>
</tr>
</tbody>
</table>
"without play, there would be no picasso. without play, there is no experimentation. experimentation is the quest for answers."

— Paul Rand, from an interview with Steven Heller. Design Dialogues, Allworth Press, 1998
color wheels

...yellow demands violet; orange, blue; red, green; and vice versa...

– Johann Wolfgang von Goethe
Itten’s color wheel

The exploration of color theory was a significant part of the Bauhaus training. Johannes Itten, the first instructor of the preliminary course taken by all students, developed a twelve-spoke color wheel, incorporating three primary colors (red, yellow, and blue), three secondary colors (green, orange, and violet), and six intermediate colors (mixtures of adjacent primary and secondary colors).

Itten’s color wheel is an elegant visual display of color relationships. He related his twelve-step color wheel to music: “I must see my twelve tones as precisely as a musician hears the twelve tones of his chromatic scale.”

The basic color wheel model is a highly adaptable example of form and function working in harmony. The colors are displayed in a progressive arrangement, from red to orange, then yellow, green, blue, violet, and back to red. This arrangement provides us with the basis for a simple and memorable naming system. For instance, color that exists between yellow and orange is called, simply, yellow-orange. Yellow-orange can be more yellow or more orange, depending on its proximity to either parent. This rational naming system provides us with a common language for describing color.

A useful feature on Itten’s color wheel is the display of complementary color pairs. Each color is directly opposite its complement: Yellow is opposite violet, orange opposite blue, red opposite green. When complementary colors are mixed in equal parts, the result is a neutral gray. Itten related this to the physical effect of complementary colors—focusing on red makes us see green. He considered this effect a form of balancing—our bodies seeking a state of equilibrium or harmony.

From there, Itten devised a system of harmonic “color chords,” groups of colors that, like complementary pairs, produce neutral gray when mixed. Red-yellow-blue is an example of a three-tone chord; the combination of the primaries produces neutral gray. His color wheel actually functions as a color chord finder. Rotating the triangle of points that connects red-yellow-blue presents us with an infinite range of three-tone color chords. (More about Itten’s color chords on page 40.)

Itten understood that his twelve-step color wheel was limited in its usefulness. In his Colour sphere in 7 light stages and 12 tones, he added tints and shades of each color. This adds more information and functionality to the basic color wheel. The color sphere allows us to imagine a three-dimensional form, with the lightest tints at the top pole, the purest colors along the equator, and the darkest shades at the bottom, with a core of neutral gray.
experiment 1: integrated color wheel and grayscale

Challenge: Create an original and personal design for a twelve-step color wheel based on Itten’s design, combined with a grayscale in a single composition.

Materials option 1:
gouache on watercolor paper, painted entirely on a single sheet

Materials option 2:
gouache on watercolor paper, painted swatches cut into shapes, assembled and fixed on a mounting board

Materials option 3:
shapes cut from Color-aid paper

Begin by making sketches that follow Itten’s basic color wheel model. Use colored pencils or paint markers. In your sketches, try arranging the twelve colors in a variety of geometric shapes: circles, triangles, rectangles, and other polygons. Feel free to explore organic arrangements.

Remember to keep the colors in the correct order: yellow, yellow-orange, orange, red-orange, red, red-violet, violet, blue-violet, blue, blue-green, green, and yellow-green

Ideally, the colors should be contiguous.

Explore ways of including tints and shades in your composition. Consider showing other color relationships (complementary pairs) and effects (illusion of transparency, gradations).

Your design must include a twelve-step grayscale (refer to experiment 2: contrast of light and dark, page 31). The challenge is to integrate the grayscale and the color system in a single composition. Experiment with different compositional strategies. Look for ways to make the composition unified and harmonious.

Consider the background. Warm white, cool white, black, shades, and tints of warm and cool gray are best. The choice of background will have a profound effect on the composition. Light and dark colors like yellow and violet will be affected differently by the same background; for example, yellow on a white background will almost disappear, while violet will stand out. (Uncoated cardboard or book board can produce an interesting background effect.)

After you have made a range of sketches and decided on a design direction, make a full-size pattern drawing of the entire composition. This drawing should be as precise as possible. It can be rendered by hand using drawing instruments, or on the computer.

Your pattern drawing will be used to make the painted and cut paper shapes. Depending on technique, you will transfer or trace the entire pattern onto watercolor paper or mounting board. If you are using cut paper, you will transfer or trace each individual pattern shape onto corresponding hand-painted swatches or Color-aid paper.

If you are using gouache paint, your composition can be any size. If you are using Color-aid paper, the size and design of your composition will depend on the dimensions of the Color-aid swatches.
(Note: Large compositions require more materials and are therefore more expensive to produce.)

For more information about gouache and cut paper, see “the playing process,” pages 14–15.
Opposite page: Bibhika Adhikary
Detail of sketch for color wheel and grayscale composition
pencil and acrylic paint on bristol board

Above: Jeana Hye Min Kim
Left: Pattern drawing for color wheel and grayscale composition
pencil on bristol board
Right: Color wheel and grayscale composition
 gouache on watercolor paper
Opposite, clockwise from upper left:

Alex Morel
Fingerprint grayscale and color wheel diptych
gouache paint on watercolor paper

Carlos Ochoa
Footprint color wheel and grayscale composition
gouache paint on watercolor paper

Julie Keh
Detail of modular color system based on Itoh’s color wheel
Color-aid paper

Jennifer Meyer
Color wheel and grayscale composition
Color-aid paper

Above: Mao Kudo
Woven color wheel and grayscale wall compositions
gouache on watercolor paper, clear mylar
Cory John Stoffa
Color wheel and grayscale composition
Above: computer rendering
Right: gouache on watercolor paper
color grids
color contrasts

When a composition is made with more colors than pure black and white, other dynamic forces come into play. Johannes Itten described these forces as the seven color contrasts: 14

contrast of hue
contrast of light and dark
contrast of extension
contrast of temperature
complementary contrast
simultaneous contrast
contrast of saturation

In color composition, the roles these color contrasts play in determining visual hierarchy are as important as the basic design principles. They are integral and cannot be considered independently.

Exploring composition using color grids

Color contrast and color harmony are best explored when compositional variables are reduced to a satisfying minimum. Simple, modular grid patterns are excellent foundations for these experiments. Of all the possibilities, grid patterns composed of uniform squares provide an ideal playing field for exploring color contrasts. The unified square grid allows us to focus our attention on specific color relationships and effects.

Grid compositions can be simple or complex, symmetrical or asymmetrical, passive or dynamic. The range of color contrast can be maximized or limited. In addition to color contrast, design principles like contrast of size and shape can be explored by juxtaposing groups of similarly colored squares. Repetition and variation in pattern can be useful for creating compositions with strong visual hierarchy. Grid compositions with squares arranged in gradient patterns are particularly useful for developing your sensitivity to color. The most predictable square grid pattern—the checkerboard—is the most restrictive and challenging foundation on which to create truly innovative compositions.

Making color grid compositions

Begin your grid composition by drawing a grid lightly in pencil on white, black, or gray board. The grid should be composed of at least twenty-five ¾” or 1” squares, contiguously arranged in a square or rectangular field. A grid of this size and complexity will provide a limited but challenging range of compositional options. A grid composed of more squares will allow you to explore more compositional possibilities—with greater associated challenges.

Leave a border of clear space around the grid.

The next step is to make colors using gouache paint and watercolor paper, or select colors from a set of Color-aid paper. For information about gouache and Color-aid paper, see “the playing process,” pages 16–17.

Cut squares of each color you plan to use. Cut the squares by hand with scissors or a craft knife, or use a square paper punch (highly recommended, available at craft and paper stores).

Move the color squares around the grid. Leave the squares loose; you’ll glue them to the board at the conclusion of the experiment.

When you create a composition you like, take a photograph. Then do a variation using the same squares in a different arrangement. Take another photograph. Continue this process. The goal is to develop a series of photographic “sketches” with different amounts and kinds of color contrast.

Finally, look closely at all the photographs and choose your favorite composition. Using the photographic sketch as your guide, re-create this grid composition. Work slowly and carefully; invest yourself in the execution. Begin in one of the corners. Glue each square into place. Continue to build out the grid from the corner, carefully adding one square at time. Each square should tightly fit the surrounding squares, ideally with no gaps.

When you have finished, take a photograph or make a scan of the grid composition for your digital color theory portfolio. Then leave the composition in a place where you will observe it casually throughout the day. With each glance, you will discover something new.
experiment 2: contrast of light and dark

When we read, we encounter words arranged in a strict linear structure. In conventional English-language page layout, we begin reading in the upper left and move to the lower right. Each letter, word, sentence, and paragraph compels us to move ahead in a regulated manner, left to right, top to bottom.

When we look at two-dimensional art and design, we “read” the composition based on visual hierarchy. Our eyes move across the surface, lingering in some areas, moving quickly through others, and perhaps settling on one visual element.

Visual hierarchy is the key to composition. It is an essential factor in successful visual communication.

Visual hierarchy is determined by contrast. Compositional elements are assigned relational values based on, among other variables, size and position. For example, a small black shape in a large white field will command our attention—even though the amount of white is greater, the small black shape dominates the composition. A dynamic relationship is established between the contrasting elements.

Visual hierarchy can be regulated by contrast of size, contrast of position, contrast of shape, contrast of direction, contrast of texture, figure/ground relationships, and repetition.

These design principles are best explored first in grayscale grid compositions, followed by monochromatic grids of various hues.

---

Challenge: Explore visual hierarchy using a grayscale palette

Materials: Color-aid and found paper; gouache paint on watercolor paper

White and black are the strongest expressions of color. When sunlight is projected onto a white surface, the entire color spectrum is reflected, and we see pure white. When the same light is projected onto a black surface, all or most of the spectrum is absorbed and we see only black.

Pure white and black are absolute: They suggest totality, infinity, everything, and nothing. They demonstrate the extremes of color contrast.

In between the extremes of pure white and black are grays ranging from light to dark. The observable distinction between the various grays is subjective; it is based on one’s vision and training.

Begin this experiment by choosing a selection of squares in pure white, pure black, and a range of grays from almost white to nearly black, in ten even steps. Place the white and black squares on opposite ends of a straight line. Fill the space in between with a progressive gradation of grays, the lightest next to white and the darkest next to black.

Choose the in-between squares carefully. Look closely at the amount of contrast between each pair of squares. The goal is to achieve a twelve-step grayscale with equal amounts of contrast between each step, from pure white to pure black, with ten grays in between.

Now, make a grid composition using one or more of each color in your grayscale. You may use any compositional strategy you wish: random placements, symmetrical or asymmetrical arrangements, gradients, and patterns.

Consider the effect of each square in your composition. Try to make the same gray look different in different situations based on its relationship to the surrounding colors.
experiment 3: monochromatic scales

**Challenge:** Explore visual hierarchy using one hue in variations of light and dark

**Materials:** Color-aid paper; gouache paint on watercolor paper

After you have explored grayscale, try creating a monochromatic grid based on one color mixed with white and black. Follow the same process. Begin by making a monochromatic linear scale, from the lightest tint of the hue to the darkest.

A blue monochromatic scale will begin with cool, bluish white and end in blue-black. Pure blue will be closer to the blue-black end of the scale: more tints than shades.

A yellow monochromatic scale will begin with warm, yellowish white, and end in greenish brown-black. Pure yellow will be very close to the light end of the scale, and quickly lose its identity as black is added to the mixture, appearing as a progressively darkening yellow-green color (moss green).

A red monochromatic scale will begin with light pink and end in reddish black. Pure red will be close to the middle of the scale, with equal amounts of pink tints and burgundy shades on either side.

Explore the monochromatic scales of all primary, secondary, and tertiary colors. Each hue has its own monochromatic surprises. Each monochromatic palette has its own characteristics and associations, based on contrast of light and dark.
Monochromatic compositions

Left: Nicole Vicencio, Color-aid paper
Opposite: Seulki Heo, gouache on watercolor paper
Below: Hae Jean Lee, gouache on watercolor paper
experiment 4: contrast of hue

When we combine colors, we usually choose colors that we consider harmonious. Our understanding of color harmony is subjective; we all have favorite color combinations, based on our observations, associations, and experiences. We employ our personal color palettes in our day-to-day lives. Our homes, cars, bicycles, clothing, food, and entertainment choices are defined, in part, by our awareness of colors.

For Johannes Itten, color harmony implied balance: the “symmetry of forces.” In his teaching, he defined color harmony in terms of the physiological phenomenon known as simultaneous contrast.

When we look at a neutral gray square on a red background (with the red having the same light value or brilliance as the gray) the gray square will have a greenish hue. When we repeat this experiment on a pure green background the gray square will appear reddish. The results of this experiment are consistent for all colors: The gray square will always assume the appearance of the color’s complement.
Our eyes are balancing the effects of one color by spontaneously adding its complement to the composition. We see both colors simultaneously; one color balances the other.

Itten knew that painted mixtures of complementary colors produce different shades of gray. He also knew that physiologically, when we observe medium gray, a state of equilibrium is generated in our eyes and minds. Itten concluded that a composition made with complementary colors will be harmonious. Depending on the amounts of each color and the resultant effect of simultaneous contrast, the composition will appear to be balanced—the symmetry of forces—or be perceived as discordant, and in effect, more dynamically expressive.

Itten extended his definition of color harmony to include any combination of colors that, when mixed in paint, produce tints and shades of gray. In addition to complementary colors, gray is produced by mixtures of black and white, and by any group of colors that contain the three primaries—red, yellow, and blue—in certain proportions. (It is interesting to note that all complementary pairs contain the primaries. For example, the complement of yellow is violet; violet is composed of red and blue.)
Challenge: Explore color harmony using contrast of hue

Materials: Color-aid paper; gouache paint on watercolor paper

Begin with a grid composed of primary colors—red, yellow, and blue. Use the purest, most brilliant versions of these colors. Try using different amounts of squares in each color, in a variety of different combinations. Try different compositional strategies: a composition with an even distribution of colors; a composition with a distinct focal point and strong visual hierarchy.

Note how each primary color has a distinct identity. Yellow is the lightest and brightest of the primaries, the closest to white. Red is similar to medium gray in value; it can easily be modified to appear warm or cool. Pure blue is the cool primary and the closest in value to black.

Continue on to make a composition with a combination of pure primaries with black and white squares. Compositions made with squares in pure primary colors and black and white, in suitable arrangements and proportions, have the potential of achieving extreme contrast and visual harmony. Try repeating the experiment with secondary colors—green, orange, and violet. Then try different combinations of tertiary colors.

Every pure hue has an extended family of light, dark, bright, and pale colors. Feel free to explore combinations of these color variations. Because of the subtle distinctions, grid compositions made with these colors are often the most expressive and personal.

As you progress, allow yourself to play with colors intuitively. When you see a combination of colors that you like, make note of the colors. The goal of this experiment is to explore color harmony. The color relationships you discover here will be useful in other color experiments.

In *Interaction of Color*, Albers provides us with a basic instruction:

“On the blackboard and in our notebooks we write: Color is the most relative medium in art.”

Proof of his statement will be seen in your contrast of hue grid compositions. Every color square is affected by the surrounding colors; the identity of every color will change relative to its context.

Contrast of hue compositions

Above: Mark Forsman, gouache on watercolor paper
Right: Karishma Sheth, Color-aid paper
experiment 5: color chords

Itten’s color wheel is a tool that helps us see harmonious sets of colors called color chords. Each chord is composed of two or more colors that produce a variation of neutral gray when mixed—Itten’s definition of color harmony.

The simplest chords are called dyadic and are composed of complementary colors.

Three-color chords are called triadic. These chords can be found by placing an equilateral or isosceles triangle on the color wheel.

Equilateral triadic chords include:
- primary (red, yellow, blue)
- secondary (green, orange, violet)
- tertiary 1 (yellow-orange, red-violet, blue-green)
- tertiary 2 (red-orange, blue-violet, yellow-green)

An isosceles triadic chord is composed of a color and the two colors adjacent to its complement. The twelve colors of the color wheel can be combined into twelve isosceles chords:
- yellow, red-violet, blue-violet
- yellow-orange, violet, blue
- orange, blue-violet, blue-green
- red-orange, blue, green
- red, blue-green, yellow-green
- red-violet, green, yellow
- violet, yellow-green, yellow-orange
- blue-violet, yellow, orange
- blue, yellow-orange, red-orange
- blue-green, orange, red
- green, red-orange, red-violet
- yellow-green, red, violet
Four-color chords are called quadratic. They can be found by placing a square or rectangle on the color wheel. Every quadratic chord is composed of two sets of complementary colors.

There are three square quadratic chords:
- yellow, red-orange, violet, blue-green
- yellow-orange, red, blue-violet, green
- orange, red-violet, blue, yellow-green

There are six rectangular quadratic chords:
- blue, green, orange, red
- blue-green, yellow-green, red-orange, red-violet
- green, yellow, red, violet
- yellow-green, yellow-orange, red-violet, blue-violet
- yellow, orange, violet, blue
- blue-violet, blue-green, yellow-orange, red-orange

In *The Art of Color*, Itten goes on to describe the more complex five- and six-color chords. The five-color chord is made with one color and the four colors immediately surrounding its complement. Six-color chords are made by combining every other color on the color wheel, or by combining adjacent equilateral triadic chords.

The twelve pure colors of Itten's color wheel can be combined into forty-nine dyadic, triadic, quadratic, five-, and six-color chords. When tints and shades of each color are added, an infinite range of chord variations is possible, each with its own character and effect.

When used in composition, variations of each chord can be made by combining different amounts of pure colors with tints and shades. Each variation will produce different contrast effects and different kinds of visual hierarchy.

Challenge: Explore color harmony using color chords

Materials: Color-aid paper, gouache paint on watercolor paper

Begin by creating a grid composition made with a triadic chord of pure colors, followed by a grid made with a quadratic chord of pure colors.

Then try making a grid composed of a triadic chord of pure colors, tints, and shades. Follow with a grid based on a quadratic chord of pure colors, tints, and shades.

When you are feeling adventurous, try making grids with five- and six-color chords, of pure colors, tints, and shades.
experiment 6: complementary contrast

When we see a color, our eyes spontaneously generate the color’s complement. We seek a state of equilibrium in which one color is balanced by its opposite. This is the physiological phenomenon known as simultaneous contrast; it is one of the most important principles of color theory. According to Albers, it is the heart of painting. Perhaps it is even more important in work where color performs a basic function, such as directional signage.

Combinations of painted complementary colors and their mixtures can produce extreme or subtle levels of contrast and appear harmonious at the same time. A paint color can be darkened by diluting it with its complement—an alternative to darkening by adding black, with distinctly different results. And when complementary colors are mixed in even amounts of paint, the result is a variation of dark gray. The mixture of colors in between the pure complements, surrounding the middle gray, is often beautiful and surprising.

Each complementary pair has specific characteristics:

- Pure versions of red and green have the same light value; when used in equal amounts, a sense of balance can be achieved.

- Variations of blue and orange, especially blue-green and red-orange, have strong associations with cool and warm temperatures.

- Yellow and violet exhibit almost as much extreme contrast of light and dark as white and black.

**Challenge: Explore contrast with pure hues and mixtures of complementary colors**

Materials: gouache paint on watercolor paper

Begin by creating a complementary grid composition using only squares of pure hues in equal amounts. A complementary grid of equal amounts of pure red and green will have a static appearance, with no clear visual hierarchy. Using uneven amounts of red and green will result in a composition with clear visual hierarchy.

Compositions made with pure complements of contrasting light values—yellow and violet or blue and orange—will appear balanced only when the amounts of each color match their corresponding light values. For example, a very small amount of pure yellow, the brightest hue, will be balanced by a large amount of pure violet, the darkest hue. Pure orange is approximately twice the brightness of pure blue; a balanced composition made with these colors will require at least twice as many blue squares as orange. In compositions made with equal amounts of yellow and violet (or blue and orange), the results will be expressive: One of the complements will play a dominant role.

After exploring compositions of pure hues, try mixing complementary colors together. Mixing complements will result in colors that gradually become less like the parent colors and eventually reach a state of neutrality—a dark gray or brown with notes of the the parent colors.

Compositions made with graduated mixtures of complements will appear to have areas of light and shadow and, perhaps, depth. The intermediate mixtures appear as close relatives to the pure hues; they add nuance to the composition. Adding white to the mixtures increases the size of the color family and provides opportunities for unlimited play.

Opposite: complementary colors in nature
Far left: color grid of pure red and green
Left: color grid with mixtures of red and green
Mixtures of complements red and green, in progress
gouache on watercolor paper; cardboard

playing with color
Jeena Hyunjin Kim, complementary color mixture diptych gouache on watercolor paper, cardboard
experiment 7: contrast of temperature

**Challenge: Explore contrast using warm and cool colors**

Materials: Color-aid paper; gouache on watercolor paper

Abstract compositions, made in the spirit of contrast of temperature, have the power to be highly evocative. When we approach a composition with the intention of exploring this contrast, our work is naturally informed by our memories of warm and cool sensations.

Experiments have shown that humans respond to color with changes in body temperature. We feel warmer in rooms decorated in warm colors. Red, orange, and yellow hues tend to excite us; they command our attention. Blue and green hues have a tendency to suggest coolness and distance—less urgency.

Contrast of temperature is present in every pair of complementary colors. The complements blue-green and red-orange are considered the extremes of cool and warm.

Begin your contrast of temperature grid by making a selection of pure hues that evoke the associations of warm and cool. Your selection should include the obvious choices: red, orange, and yellow for warm; green, blue, and violet for cool. Look for variations of all primary, secondary, and tertiary colors.

Compositions made with these pure hues will express different levels of temperature contrast. A composition made with blue-green, blue, blue-violet, and violet will seem generally cool; contrast of temperature will be low, and the visual hierarchy will be subtle.

Adding a small amount of any warm color will immediately and dramatically change the composition—contrast will be increased and a strong visual hierarchy will be achieved.

You may also select tints and shades of warm and cool hues. Tints and shades will complicate a contrast of temperature composition by adding effects related to light and dark contrast. It is best to begin this exploration with a selection of similar tints or similar shades. Create a composition with all tints or all shades. This will minimize the effects of light and dark and promote contrast of temperature. The results will parallel those seen in compositions of pure colors.

Adding a warm shade to a composition of cool tints will result in expressions of both contrast of temperature and contrast of light and dark. The effects of contrast of light and dark will dominate.

Our associations with hue and temperature are often very personal and sometimes deeply emotional. Compositions made with these colors have the potential to evoke strong emotional responses. In this way, contrast of temperature can be a very effective means of personal expression.

Contrast of temperature compositions

Right: Karishma Sherth, Color-aid paper
Far right: Dona Kwon, gouache on watercolor paper
Opposite: Seulki Hae, gouache on watercolor paper
Following spread: Vera Carbone, gouache on watercolor paper
experiment 8: contrast of extension

Challenge: Explore color contrast using Goethe’s theory of light value

Materials: Color-aid paper; gouache on watercolor paper

Johann Wolfgang von Goethe, the eminent German artist, writer, biologist, and physicist, was the first to explain the relationship between color and perception. He realized that our definition of color depends on how our brains process the sensations caused by light.

Goethe was interested in color harmony. He devised a system of proportion based on the brilliance, or light value, of primary and secondary colors. The light values for each color are expressed numerically:

- Yellow: 9 highest light value
- Orange: 8
- Red: 6
- Green: 6
- Blue: 4
- Violet: 3 lowest light value

Yellow is three times as brilliant as violet. A grid composition using those colors will appear balanced and harmonious when the ratio is reversed: three times as many violet squares as yellow.

Orange is twice as brilliant as blue, so a balanced and harmonious composition will have twice as much blue as orange.

The light values of red and green are equal. Using equal amounts of red and green squares will result in a balanced and static composition.

Itten refers to the effects produced by Goethe’s theory of light value as contrast of extension. Essentially, contrast of extension is the proportional relationship between areas of color.

Begin your contrast of extension experiment by creating a grid composition using a pair of pure complements. Try to create a balanced composition using Goethe’s theory of light values as a guide. In another composition, use his theory to create a more expressive composition, with one color dominating the other. Repeat this experiment using three pure colors.

After you have completed several contrast of extension grid compositions using pure hues, try working with tints and shades of the primary and secondary colors. Create a composition using only complementary tints or only complementary shades. Then try combining complementary tints and shades in a single composition. Finally, create a composition with complementary tints, shades, and pure hues. The results will be surprising and beautiful.

Contrast of extension is an excellent way to test your sense of proportion. As you exercise your ability to use this color contrast, your awareness of proportion will grow, your confidence will increase, and your process will become intuitive.
Jin Young Yoo, contrast of extension compositions
gouache on watercolor paper
Contrast of extension compositions

Above: Karishma Sheth, Color-aid paper
Opposite: Seulki Heo, gouache on watercolor paper
The experiments described in this section are inspired by a group of assignments Josef Albers taught in his color classes and in his classic text, *Interaction of Color*. These color experiments are excellent starting points for a wider exploration of Albers’ teaching and practice. They are the tip of the iceberg—the richness of Albers teaching provides us with a lifetime of play.

Albers’s directive in his color experiments was to expose the illusionary nature of color. He used the term *relativity* to describe color’s capacity to deceive. His experiments show us that color is never absolute.

To fully appreciate the following experiments, I encourage you to study his *Interaction of Colors*. Take note of his belief in the role of trial and error—the play instinct—and the importance of observation and discovery in the creative process.
Experiment 9: Relativity of Color

Challenge: Make one color look like two; make three colors look like two

Materials: Color-aid paper

Begin by selecting a monochromatic range of Color-aid paper, including the pure hue and all corresponding tints and shades. From this range of colors, select two with contrasting values: one light and one dark. Place a large rectangle of each color on a black or white board. The two rectangles should be placed side by side, like pages in a book, with no space in between.

In the center of each rectangle, place a small rectangle of a third color from the same monochromatic range. The goal is to find a single tint or shade that changes appearance on different backgrounds.

A light color, placed on a lighter background of the same hue, will appear darker. Likewise, a dark color, placed on a darker background of the same hue, will appear lighter.

A greater challenge is to find a set of monochromatic colors that satisfies this goal: Make three colors look like two. In this case, the middle color used in both small rectangles should not only change appearance on the different grounds but also appear to be the same as the opposite background color.

This simple experiment based on three colors of the same hue proves the relativity of color: The same color can look very different on two different grounds.

To continue this experiment on an advanced level, repeat the process using two different hues.

The ultimate challenge: Select a pair of complementary colors to use as backgrounds. Now, find a middle color that appears to be the same as the opposite background. In effect, a single middle color appears to be the complement of two different background colors: Three colors appear to be a complementary pair.

Remember that every pair of complements is an extreme expression of contrast. Finding the middle color—one that is able to change identities to match two different colors of extreme contrast—will require trial and error, patience, and luck!

Left: Jeena Hyejin Kim, color illusion composition
Make three colors look like two

Above and opposite: Make one color look like two
Jeena Hyunjin Kim, color illusion composition
Make one color look like two
experiment 10: subtraction

Challenge: Find colors that look the same on different backgrounds

Materials: Color-aid paper

In this experiment, begin with two background colors that are light and dark variations of the same hue. The goal is to find two different colors that appear the same when placed on these different backgrounds.

Now, try the same experiment with two backgrounds of different hues. Again, the goal is to find two different colors that appear the same on the different backgrounds.

As in our preceding experiment, discovering a set of colors that accomplishes this goal will require trial and error. In the beginning, there are no formulas for success. Only experience will lead to a satisfying solution. To paraphrase Albers, in these experiments, theory follows practice. Through selection and comparison, we learn how to recognize the interaction of colors. We learn to anticipate results.

When you have found colors that satisfy the goal of these experiments, look carefully at the relationship between the small rectangles of color and their backgrounds. Note how the ground color appears to subtract itself from the color of the small overlapping rectangle. Albers calls these effects “subtraction of color.”

Albers’s color illusion experiments demonstrate the always playful and sometimes beguiling nature of color. Now that you’ve experienced the tip of the iceberg, I encourage you to continue the exploration of color illusion by studying the assignments in Interaction of Color.

This page: Claire Lin, color illusion compositions
Make two colors look alike
experiment 11: transparency

Challenge: Explore color mixing with transparent materials

Materials: transparent paper; tissue; gels

Using transparent materials in compositions is an excellent way to study color mixing. It is more immediate and less challenging than mixing paint. The process is simple and objective. The visual effects are factual—layering specific transparent materials will always have the same results.

This process frees us to observe and consider the mixtures achieved by layering certain colors.

Begin by layering the transparent materials in various combinations. Make note of the parent colors and their mixtures. The colors you observe—parents and mixtures—will be your palette.

Experiment with the layering order. Different kinds of transparent material react differently to layering. Unlike transparent ink, paint, and some gels, transparent papers are not completely transparent. The texture of paper adds itself to the mixture of colors. This makes layering a decisive factor in working with transparent paper—the bottom layer is partially obscured by the layers that cover it.

Keep your compositions simple. Try to include the parent colors and all possible mixtures.

The mixtures will be darker than the parent colors and will be closest in appearance to the top layer color. This factual effect adds contrast of light and dark to the composition.

Play with various ways of making shapes. Scissors will produce one effect—similar but different from the effects of using a craft knife and a straightedge. Both tools can make geometric and organic shapes. Folding paper adds a sense of play to the process. Tearing instantly creates organic shapes and makes the material recognizable as paper.
experiment 12: illusion of transparency

Challenge: Mix colors with your eyes closed

Materials: Color-aid paper

In my professional graphic design practice, I am sometimes called upon to create a transparency effect in print or onscreen. In both cases, I create the transparency effect digitally. The computer renders the transparency effect perfectly, based on my instructions. I can easily and quickly mix and adjust complex groups of colors and effects.

In experiment 11 we explored the effects of working with transparent paper. Similar effects can be achieved with watercolor paint and transparent ink. The process is simple: A layer of transparent media is applied to a surface, a second layer is applied over the top of the first, and transparency results. We literally see through the layers to the surface below.

Working digitally or with physical media allows us to concern ourselves mainly with results. The transparency effects are produced by mechanically mixing colors. We are not required to mentally visualize layers of transparent colors, isolate the color produced by the interaction of the overlapping colors, and find or create that color.

Leave it to Albers to ask us to do just that!

Albers defines the interaction of color as “seeing what happens between colors.”” He challenges us to “study color mixture in our imagination, that is, so to say, with closed eyes.” He asks us to conceptualize the process of color mixing.

Begin by selecting two Color-aid swatches of contrasting pure hues. Choose two colors with predictable mixing results, such as red and yellow. Imagine the mixture of red and yellow. We know the mixture is orange. Since the parent colors—red and yellow—are pure hues, the resultant orange mixture will be relatively pure.

With your imaginary mixture in mind, select an orange Color-aid swatch. Now you have two parent colors and their mixture color. Using only the parent colors, create a composition in which two shapes, the parents, partially overlap. The shapes and arrangement of the parent colors can be simple—two identical rectangles, one overlapping the other.

Attach this parent color arrangement to the middle of a white board. The overlapping arrangement should be surrounded by clear space.

Cut a shape from the mixture color that precisely fits the area of intersection/overlap. Glue this shape precisely into place. The resultant composition will be an expression of color mixture. It will also exemplify the illusion of transparency.

This basic experiment can be repeated with any pair of parent colors. As the parent colors and their mixtures become less predictable, the experiment becomes more challenging.
Illusion of transparency compositions
Above: Robert Marchhart
Opposite, top: Elizabeth Vautour; bottom: Claire Lin
experiment 13: transparency and spatial illusion

**Challenge: Create an illusion of spatial arrangement**

Materials: Color-aid paper

Now that you have discovered a new skill—mixing color with your eyes closed—you can use this skill to tell a simple visual story: how two transparent colors on different planes meet but do not touch.

We know that mixing red and blue results in violet. And we know that when these parent and mixture colors are arranged correctly, the illusion of transparency takes effect. Now, imagine transparent red and transparent blue on separate layers, with both layers in front of a white background. A spatial arrangement is implied. The challenge in this experiment is to discover transparent mixtures that produce the appearance of different spatial arrangements of the same parent colors.

In our experiment, imagine red on the top or front layer. In order to make this layering order convincing, the violet mixture must be closer in hue to red than to blue. If the violet mixture is closer to blue, the layer order will change. Blue will appear to be on top.

Experiment with different parent colors. In each case, imagine the colors in a spatial arrangement, one in front of the other. Play with the order of the layers. Imagine both layers against a nonwhite background—a mixture of three colors: two parents and the background.

Albers calls this process “thinking in situations.”

The illusion of transparency, combined with spatial illusion, is one of the most interesting ways to create visual hierarchy with color. The sense of order can make the composition readable—we understand the spatial relationship of the elements in the composition. Alternatively, illusions of transparency and space can add a sense of mystery to the composition.

**Below:** Sue Perk, spatial illusion transparency composition
experiment 14: transparency and visual narrative

**Challenge: Create an abstract visual narrative based on transparency and spatial illusion**

**Materials:** Color-aid paper

Consider this experiment a final test of your ability to mix colors with your eyes closed. The context is the same as in the preceding experiment, except there are now more variables.

In this experiment, multiple parent colors result in multiple mixtures. Each mixture is the combination of at least two parent colors, or as many as the total of all colors in the composition.

A visual narrative is a story told using visual cues. The goal of this experiment is to create a visual narrative using simple abstract shapes based on transparency and spatial illusion.

The characters in your visual narrative inhabit a single stage: the compositional surface. The characters are transparent parent colors. They are all present on the stage at the same time, in different places, some in front of others.

In this metaphorical structure, a moment in time is captured in freeze-frame. The composition you create is a single frame—a still image taken from a larger narrative.

Another approach to this experiment is to create a composition in which a single transparent color moves through several layers of transparent colors. In this story, a lone character is able to move through walls of transparent color. As it moves through walls, this character seems to emerge and recede in the spatial arrangement. A composition based on this metaphorical structure will resemble a time-lapse image, in which changes in time are expressed through movements of the character.

Begin this experiment by making sketches indicating the position of each character/color, including notations of spatial arrangement.

Consider each parent color mixture separately, and find swatches of each color as you progress. One decision will inform the next.

When you have visualized and found all the colors, begin executing the composition. In light pencil, make a pattern drawing on the background. Remember that the background can be white, black, a tint, or a shade.

Each shape in the composition should be traced and precisely cut from a Color-aid swatch, then carefully glued in place. Ideally, all of the cut paper shapes will be flush mounted to the background. However, this is not a necessary condition. The goal of the experiment is to create an integrated composition, not an intimidating situation.

This is the most technically challenging of the transparency experiments. Focus your energy on exploring the interaction of the colors. Simple geometric shapes are the easiest to render and can be playfully expressive.

Complete this experiment by assigning a title and caption to your narrative composition. Include a description of each character and its relationship to the story. Use the words of color theory to describe the action.

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**Narrative transparency compositions**

Opposite, left: Claire Lin; right: Julie Keh
abstract composition
experiment 15: tangrams

My first encounter with a tangram was, surprisingly, in graduate school, while working on Paul Rand's “Design and the Play Instinct” assignment. I was immediately impressed by the simplicity and beauty in form and concept of this ancient Chinese “toy.” After doing a little research, it became clear that many people, of all ages, take this simple toy very seriously—including Professor Rand:

"Many design problems can be posed with this game in mind, the main principle to be learned being that of economy of means—making the most with the least. Further, the game helps to sharpen the powers of observation through the discovery of resemblances between geometric and natural forms. It helps the student to abstract: to see a triangle, for example, as a face, a tree, an eye, a nose, depending on the context in which the pieces are arranged. Such observation is essential in the study of visual symbols." 20

I begin every basic design course with the tangram assignment, first in black and white and then in color. It is an excellent warm-up exercise for more complex assignments.

Challenge: Explore abstraction using economy of means

Materials: Color-aid paper, computer

Begin by choosing a color effect; for example, contrast of light and dark. Find paper in the colors needed to create the effect.

Make an outline drawing of the tangram, sized to work with the dimensions of your paper. The individual tangram shapes are created by dividing a square into seven parts: five triangles, a square, and a parallelogram. Trace the tangram shapes onto the paper and cut them out. On a white, black, or colored background, rearrange the parts and experiment with color relationships and composition. Allow the shapes to touch but not overlap.

Considerations:

- Economy: making interesting and playful designs with simple shapes

- Figure/ground: activating the entire composition, including all positive and negative shapes

- Asymmetry: making harmonious and balanced arrangements with a variety of shapes

- Abstraction: exploring the relationship between natural forms and geometry

- Color contrast: experimenting with color relationships and visual harmony

Your tangrams can be structural, dynamic, expressive, and symbolic.

When you find an arrangement of the shapes that you like, carefully glue each shape in place, or not. After all, tangrams are toys, and toys are meant for play. Feel free to leave the shapes unattached, to be reused another time.

*Opposite and following spread:
Drea Zianabtng, tangrams*
experiment 16: stripe compositions

Challenge: Explore visual rhythm, spatial illusion, and color relativity

Materials: Color-aid paper, gouache on watercolor paper

Stripe compositions are similar to color grids. The fundamental concept is more minimal—stripes are aligned along two sides, while grids align on four. If a stripe composition is dynamic enough to suggest movement, the movement will be side to side or up and down, but not both.

This limitation provides us with the opportunity to explore visual rhythm more specifically. When we observe a stripe composition, certain colors seem to emerge and others recede, creating a sense of visual hierarchy. Colors seem to change their appearance, depending on their size and situation. These factors determine the suggestion of movement. As we observe the stripes, our eyes move from one stripe to another. The forces that enable us to see the illusion of movement are within our control.

Begin by making a grayscale stripe composition. Choose a range of gray paper. Lay them out in a staggered stack, so you can see thin stripes of all the colors. Play with the arrangement of stripes in the stack. Try changing the width of the stripes.

Try placing the same color paper in different parts of the stack—this allows you to see the same color in different situations, with the possibility of making one color look like two.

When you create a composition you like, take a photograph. Using the photo as a guide, carefully cut the stripes and glue them in place on a black, white, or gray background.

Repeat this process using pure colors. Base your first color compositions on one of the color contrasts. Then try working with two or more kinds of color contrast within the same composition.

If you are musical, think of the stripes as strings on a harp or as keys on a keyboard. With imagination, the stripe composition can become an instrument for exploring visual rhythm.

Opposite: Jin Young Yoo
contrast of temperature stripe composition
gouache on watercolor paper

Left: grayscale stripe composition
Color-aid paper
experiment 17: stripe diptych

**Challenge**: Create a set of reflexive compositions

**Materials**: Gouache on watercolor paper

In the stripe composition experiment, we see how parallel stripes of different sizes and frequencies can suggest rhythmic movement. In this experiment, we take that concept one step further. We add a composition to the original, using the same colors in a way that is simultaneously different and alike. The original and new compositions are placed on opposite sides of a hinge, like facing pages in a book.

Begin by creating a stripe composition, as in experiment 16. Then, using the same colors, try making a new composition that performs differently. A rational approach to this experiment is to transpose the colors: One color takes the place of another, with no other changes to the composition. A more playful approach is to work intuitively with the intention of creating different color effects with the same colors.

In the diptych structure, colors on one side relate to their counterparts on the opposite side. The stripe diptych demonstrates an attraction of harmonious opposites: reflexive, but not necessarily reflective.

Stripe diptychs  
gouache on watercolor paper  
Left: Hye Jeon Lee  
Opposite: Pablo Delikan
Geometric form compositions

Above: Mark Chang, gouache on watercolor paper
Above right: Drea Zarealtring, Color-aid paper
Right: Robert Marchhart, gouache on watercolor paper
experiment 18: geometric forms

**Challenge:** Explore unity, harmony, and color contrast in geometric composition

Materials: Color-aid paper, gouache paint on watercolor paper

Circle. Square. Triangle.

These are the basic shapes of the things we make. Look around: You see geometry. The type on the page or screen is based on geometry. The book or device you are looking at is geometric in form and construction. It is truly almost impossible to escape the geometric objects that shape our daily routines.

Geometry can appear beautiful or ugly, suggest elegance or brutality, seem mechanical or humanistic. Color has the power to strengthen or weaken these associations.

The goal in this experiment is to explore the possibilities of a single geometric form and the effects of color on our perception of geometric composition.

Begin by choosing one of the basic geometric forms: a circle, square, or triangle. Make sketches using only that form. The shapes may touch and overlap. Try using only outlines, then only solids, then combinations of outlines and solids. Use colored pencils.

Considerations:
- Unity of form
- Contrast of size
- Combining the forms into compound shapes
- Illusion of space and visual hierarchy
- Color contrast and transparency illusion

Explore contrast of light and dark using monochromatic palettes. Then try other color contrasts—hue, complementary, temperature, extension. Finally, try incorporating transparency into compositions.

The solid forms you draw are called figures. The spaces inside and around the figures are called ground. The success or failure of a composition of solid forms is due, in part, to the relationship of figures and ground. If a composition appears harmonious, the figure/ground relationship is most likely playing a prominent role.

After you have made a few sketches, choose one and make a precise, full-size outline drawing. This will serve as a pattern for making the color shapes.

Carefully trace the figure and ground shapes on corresponding Color-aid paper. Cut out the shapes and assemble them on black, white, or neutral gray board.
experiment 19: units to super-units to patterns

“What I am after is to develop some kind of visual logic by which students can be led to understand the elements of design, the possibilities of organizing them, and the limitations.”

— Wucius Wong

If you are looking for a rational and objective approach to learning the principles of two-dimensional design, Wucius Wong is an excellent source of information and inspiration. In Principles of Two-Dimensional Design, Wong provides clear and concise descriptions of the visual language of design. He covers the subject using familiar words and ideas—it is his systematic delivery that is unique.

While his highly rational, step-by-step approach is too rigid for certain kinds of design work, it is ideally suited for designing patterns. Wong defines the subject in terms of construction: unit forms, super-units, and repetition.

The best way to understand a pattern is to deconstruct it. The process of deconstruction is relatively easy when the pattern is composed of geometric forms. Although the same methods can be used to deconstruct organic form patterns, the process is usually more difficult due to its less predictable nature. Therefore, begin this exercise by finding and deconstructing a pattern based on geometric forms. The pattern can be any color or combination of colors.

Carefully observe your found geometric pattern. Using tracing paper and pencil, trace the common geometric forms in the pattern. You are searching for the “unit” forms: the basic form that is repeated to create the pattern—a circle, a square, or a triangle. The repeating geometric forms in your found pattern might be more complex—each composed of several basic forms. These complex forms are “super-units.”

When you finish deconstructing one pattern, try another. You will find patterns composed of only unit forms, others composed of one or more super-units, and still others composed of various combinations of both. Some patterns appear to be composed of only unit forms, but are, in fact, based on super-unit concepts. For example, the checkerboard pattern is composed of one unit form—a square—repeated in a unified grid structure. It is one of the simplest and most elegant patterns. However, to be fully functional the checkerboard needs to be more than just a grid of squares—it needs contrast. The solution is a pattern composed of super-units of alternating light and dark unit forms. The super-units in a checkerboard are not visible—we are aware of only individual squares. But the super-unit concept is essential to the identity of the checkerboard.

The goal of deconstruction is to demystify the pattern, to perhaps learn the secrets of the original designer. It is a process of discovery. Now it’s time to invent.
**Challenge: Discover the secrets of patterns**

Materials: pencils; tracing paper; computer; Color-aid paper

Begin by choosing a geometric form—a circle, square, or triangle. Make outline drawings of combinations of your chosen form. Begin with two forms of the same size. Try a variety of arrangements: side by side, above and below, aligned, unaligned, disconnected, overlapping. Be aware of the shapes in between the forms, as well as the shapes that result when forms are overlapped.

Essentially, you are drawing the outlines of super-units. The next step is to make the forms solid. Drawn in solid form, figure/ground relationships of the super-unit compositions will become apparent. The solid form drawings can be made with tracing paper and pencil—using tracing paper allows you to use the outline drawings as templates for the solid form drawings. Unpredictable and surprising results can be achieved by layering your tracings.

When you are satisfied with your solid form drawings, your next task is to consider color. Look for ways to express color theory concepts using the solid forms of your super-units. Again, begin with drawings. When you are satisfied with your color drawings, create a larger rendering using Color-aid paper. Choose your colors thoughtfully, but be open to improvisation and your play instinct. Experiment with a variety of color and form combinations. The goal is to find the perfect combination—one that makes the colors and forms dance.
experiment 20: geometric patterns

Challenge: Explore repetition using geometric forms and color contrast

Materials: pencils; tracing paper; Color-aid paper; stencils; paint; computer

In this experiment and those that follow, we explore a variety of geometric pattern forms using Wucius Wong’s constructivist method of composition. While it is possible to successfully execute these experiments by hand—using cut paper construction or by painting or stenciling—you will find that when it comes to designing geometric patterns, the computer is an excellent tool. The concept of “step and repeat” is integral to the computer and to Wong’s methodology.

Feel free to explore designing patterns by hand and by computer. Geometric patterns made by hand will have a humanistic character—the flaws and irregularities that come with working by hand are part of that character and can be beautiful. Patterns designed on a computer can be ultraprecise.

To understand how patterns work, we explore repetition. To experience repetition, we only have to observe. Looking out my window, I see a repeating geometric pattern of windows, bricks, and other architectural details. Looking more closely at things on my desk, I see the geometric pattern of keys on my computer, and the measurement markings on my cutting mat. Looking down, I see rectangular strips of wood flooring and repeating geometric forms in a woven rug.

Clearly, we find comfort in repetition—patterns are the visual manifestation of security. Geometric patterns, in particular, can be expressions of strength and durability.

The key to achieving an expression of strength and security in pattern design is the use of even spacing or regular intervals. The most basic geometric pattern is composed of unit forms repeated at regular intervals—a simple polka-dot pattern is a good example. Super-units can also be repeated in uniform intervals, resulting in more dynamic patterns. In either case, strength and security are expressed by the consistent rhythm of the evenly spaced, unified forms.

The goal in this experiment is to create colored patterns based on geometric forms repeated at regular intervals. Feel free to explore pattern designs using units and super-units—if you wish, experiment with the unit and super-unit forms you created in experiment 19.

Patterns made with super-units can evolve from simple to complex. Begin by designing a pattern based on a single unit form, such as a square. The unit forms should be of equal size, arranged in an invisible uniform grid structure. Each unit should be surrounded by equal amounts of clear space. Next, design a pattern using a super-unit composed of the same unit form in two sizes. Repeat this super-unit in a unified grid with equal clear space; an expression of unity of form, contrast of size. The next pattern design could use the same unit form in three or four different sizes, and so on—each new design builds on the preceding version.

Explore a variety of pattern structures. The most basic structure is the unified grid, consisting of evenly spaced vertical and horizontal divisions—the linear structure of a checkerboard. The checkerboard grid can be altered dramatically by shifting columns or rows of the divisions, creating a pattern that resembles a brick wall. The entire grid can be angled for even more dramatic effects. Super-units can be reflected and rotated. The process of exploring pattern structure is like a game within a game, with ample room for improvisation and personal expression. Feel free to deconstruct existing patterns to discover their secrets and be inspired.

Experiment with color contrast in your various pattern designs. You can create patterns that express contrast of light and dark, complementary contrast, contrast of temperature, and contrast of extension. Begin with a greyscale or monochromatic scale—a simple geometric pattern based on a single unit form, set on a unified ground, with the forms and ground rendered as a tint and a shade of the same hue.
Look for playful combinations of forms and colors. A simple geometric pattern based on a single unit form can be very dynamic when the unit forms and the spaces in between are rendered in complementary colors—form and space, expressed in a dyadic color chord. A pattern with the same unit form in two sizes on a unified ground can be expressed with a triadic color chord. Super-units can be composed of multiple colors—monochromatic scales, warm and cool colors, complementary colors, and color chords.
experiment 21: gradation patterns

**Challenge: Create patterns that change before your eyes**

Materials: pencils; tracing paper; Color-aid paper; stencils; paint; computer

A gradation is a gradual, ordered change. It usually involves a change in amount—dark becomes light, warm becomes cool, large becomes small. We see commonplace examples of gradations every day. In *Principles of Two-Dimensional Design*, Wong gives the example of observing a building with a large facade of evenly spaced windows. If we stand at a distance and look straight at the center of the facade, the windows appear as rectangles of equal size and shape—a basic repeating pattern. But if we move closer to the facade and observe it from an angle, the size and shape of the windows appear to change—the closest windows appear larger than those far away, their rectangular shapes change proportion as they recede in the distance, and the spaces in between the windows appear to become smaller as the distance increases. The size, shape, and spatial relationship of the window forms are governed by perspective. The result is a gradation pattern.

A basic gradation pattern can be created by repeating unit forms of consistent size while incrementally increasing the distance between the forms. Wong refers to this as “spatial gradation.” The simplest spatial gradation is one in which the spaces in between same-size unit forms are progressively increased in one direction. Basic spatial gradations can be playfully constructed using number systems like the Fibonacci series (0, 1, 1, 2, 3, 5, 8, 13, 21, 34… ) to determine the sizes of in-between spaces. Complex spatial gradations can be made by changing the size of the in-between spaces in more than one direction, or by changing the size of the unit forms, or by a combination of both.

A different kind of gradation pattern can be made by gradually changing the shape of the unit form. Wong refers to this as “shape gradation.” The effect can be achieved by stop-action morphing. For example, a triangle can be slowly transformed into a circle in a series of incremental steps. If the transformation steps are arranged in a horizontal row with even spaces in between, and the horizontal row is repeated vertically, the effect will be a shape gradation. Complex shape gradations can be made by using transitions of more than one unit form, by arranging the transitioning forms in unpredictable ways, and by changing the size of the in-between spaces.

In addition to changes of shape and space, the character of a gradation pattern is determined by its structure. As noted earlier, the most basic gradation pattern is based on parallel divisions. In a gradation pattern with parallel divisions, the unit forms appear in steps that move from side to side, up and down, or diagonally. Complex structures can be based on overlapping concentric divisions. Even more complex gradation patterns can be made in which divisions of unit forms appear to shift, bend, curve, reflect, combine, and subdivide, often resulting in optical illusions of form and space.
The gradation pattern is one of the defining characteristics of op art, a playful form of abstract art in which the intent is to create illusionary effects. Many famous op art paintings are black and white—they depend entirely on discordant figure/ground relationships. Others use principles of color theory to create fantastic compositions of spatial illusion.

Begin this experiment by creating a basic spatial gradation pattern, using a single geometric unit form repeated in the same color, on a complementary ground color. Try different complementary pairs—each pair of colors will result in different figure/ground and proportional relationships.

Next, create a spatial gradation pattern using a geometric unit form, in which the unit forms change colors incrementally, from light to dark—a monochromatic scale. Play with different ground colors. Try making the ground color the same as the darkest color in the monochromatic scale—the unit forms on one side of the pattern will seem to disappear into the ground. Next, try making the ground color match one of the intermediate steps in the monochromatic scale—this will make a middle section of the unit forms seem to blend into the ground.

Then try creating a shape gradation pattern in which a geometric unit transforms into a different geometric form—a triangle becomes a circle. Explore combinations of unit form and ground colors that express contrast of light and dark, contrast of hue, and contrast of temperature.

Finally, experiment with a variety of gradation structures—parallel divisions, overlapping concentric divisions, divisions that bend, curve, and zigzag. Your goal is to create dynamic patterns that appear to move in unusual and mysterious ways.
experiment 22: interrupted patterns

Challenge: Find the tipping point

Materials: pencils; tracing paper; Color-aid paper; stencils; paint; computer

From our exploration of patterns, we understand that patterns can be made in a variety of ways with very different results. So far, all of our patterns have relied on unity of form—repetitions of unit forms or super-units, in consistent or gradually changing intervals, arranged in a variety of compositional structures. We explored how color contrast can be integrated with the pattern forms to achieve dynamic effects.

In this experiment, we look first at a different kind of pattern, in which unit forms are based on similarity, rather than unity. Examples of these patterns are common in nature and exist in a range of similarity. Similarity is a relative matter—some things are more similar than others. A honeycomb is a beautiful pattern based on unit forms that are very similar in hexagonal shape, close in size, and monochromatic in color. A pine comb is composed of unit forms that are very similar in shape, but change in color according to the season. The leafy upper part of a maple tree is composed of unit forms—maple leaves—that are similar to one another in size and shape, but significantly less so, compared to the similarity of honeycomb cells or the scales in pine combs. Patterns of maple leaves become even less similar in the fall, when the colors change from green to red, orange, and yellow.

In the first part of this experiment, our goal is to explore the concept of similarity in patterns using geometric unit forms. The compositions that result from this exploration should express a subtle, overall interruption in repetition—an interruption that is not concentrated in one area, but is created by many small changes throughout the composition. The challenge is to see how much things can change before a pattern is no longer a pattern.

Another form of interruption is caused by changes that are focused or concentrated in one area of a pattern. Wong refers to this as anomaly: “Anomaly is the presence of irregularity in a design in which regularity still prevails. It marks a certain degree of departure from the general conformity, resulting in slight or considerable interruption of the overall discipline.”

Anomaly is one of the most important tools in an artist and designer’s toolbox. An anomaly in a pattern focuses our attention. It is an expression of importance—an excellent way to create a strong visual hierarchy. Anomaly can be used as a transition between pattern forms. The transition can be smooth, like a segue, or different in character, like an interstitial. Anomaly can be used simply as a way to introduce variation in a repeating pattern.

In the second part of this experiment, the goal is to explore the concept of anomaly. The challenge is to find a pattern’s tipping point—a change that interrupts unity and conformity, acts as a transition, or introduces variation in the pattern that alters its character.

Similarity and anomaly can be created by changes in form, color, or both. Our goals in this experiment encourage playfulness—with perhaps even a bit of mischievous intent. Similarity and anomaly are techniques for breaking away from repetition and regularity. The resultant compositions can be highly conceptual—subtle or aggressive expressions of sea change or individuality.

Karishma Sheh, opposite: similarity pattern composition
Left: anomaly pattern composition; computer renderings
experiment 23: transparent patterns

Challenge: Create patterns that suggest transparency and spatial illusion

Materials: pencils, transparent paper, Color-aid paper, stencils, paint, computer

In this experiment, the goal is to combine transparency and repetition in a geometric pattern. You are encouraged to utilize any of the ideas we explored in the transparency experiments: factual transparency, the illusion of transparency, spatial illusion, and visual narrative. Since transparency requires the intersection of at least two forms, this pattern must be created with repeating super-units.

Begin by designing a super-unit based on a simple geometric form, or a combination of geometric forms. Play with intersecting and non-intersecting forms. Wherever the forms overlap is an opportunity to express the appearance of transparency and spatial illusion. Working in concert with transparent intersecting forms, nonintersecting forms will be perceived as opaque and relatively flat. Feel free to adapt the super-units you created in previous experiments for this experiment—adjust the composition so that the unit forms appear to intersect and overlap. Feel free to work with the colors and mixtures you explored in our previous transparency experiments.

Or start fresh. Experiment with combinations of geometric forms in super-units. Try combining intersecting and nonintersecting forms. A grayscale or monochromatic scale provides enough variety to create playful illusions of transparency, while the limitation of one hue strengthens the sense of unity in the pattern. From our color grid experiments, we know that mixing complementary colors produces neutral shades—Itten’s definition of color harmony. This color theory principle, combined with unity of form, can be used to create patterns that use the illusion of transparency to express visual harmony. Illusionary mixtures of warm and cool colors produce similar results—colors of neutral temperature, the calm in the middle of the storm.

Patterns with transparency often remind me of stained glass windows. While stained glass windows sometimes include pattern forms, repetition is not their defining characteristic. A pattern is created by the combination of forms, repetition, and colors working in concert. But the specific association of a transparent pattern with stained glass is dependent on the illusion of transparency—the suggestion of looking through.

Kashirn Shetty, transparency pattern; computer rendering
experiment 24: organic forms

Challenge: Explore unity, harmony, and color contrast using organic forms

Materials: Color-aid paper; gouache paint on watercolor paper

Is organic form the opposite of geometric form? Do organic forms behave differently when we employ principles of design like unity of form and contrast of size? And what about color?

We can assume that color contrasts and transparency will have the same effect in geometric and organic compositions. We can also assume that composing with organic forms will be dramatically different from working with geometry—as different as sinuous and straight.

In "Design and the Play Instinct," Rand describes his own appreciation of composing with nongeometric forms:

"It is inconceivable to consider Matisse’s cut paper compositions without, in some way, linking them to the play element—the joy of working with simple colors and the fun of "cutting paper dolls." The greatest satisfaction, perhaps, is derived from creating a work of art with ordinary scissors and some colored paper—with so simple means, such satisfying ends." 25

You may find that working with wild organic forms suits you. Or you might prefer the ordered structural safety of geometric composition. The usefulness of color contrasts and transparency effects is as important in one as in the other. Both organic and geometric composition can be approached with openness to our play instinct.

And both kinds of composition can be approached with the same sense of restraint. Limitations are especially important when working with organic forms—it is very easy to overindulge. Use unity of form to create visual harmony, and contrast of size to provide visual hierarchy.

Above right: Jeema Myunjin Kim, organic form compositions
gouache on watercolor paper

Right: Andy Seagrave, organic form collage
gouache on watercolor paper
experiment 25: contrast of form

Challenge: Explore visual harmony and color contrast using combinations of organic and geometric forms

Materials: Color-aid paper; gouache paint on watercolor paper; computer

In this final abstract composition experiment, the goal is to combine contrasting organic and geometric forms in the same composition. The process is the same as in experiments 18 and 19.

Compositions that combine organic and geometric forms are perhaps the easiest to conceptualize. Models of inspiration are all around us. Looking over my computer screen, I see green leaves, window frames, a brick wall with ivy—a combination of things we construct and things we grow. We can readily see ourselves in contrast of form compositions.

Begin by experimenting with compositions that employ both kinds of forms. Go on to explore other ways of expressing formal contrast. Try using geometric forms arranged in unstructured, organic compositions. Then explore the opposite—organic forms arranged in ways that suggest geometry.

In our abstraction experiments, we have explored how color contrast can be used in concert with geometric and organic forms to create unified, dynamic and expressive compositions. In this experiment, look for ways to combine contrasting forms and colors in harmonious compositions that celebrate difference.

John Allen, contrast of form accordion book
found paper
Cory John Stoffa, color dot compositions
gouache on watercolor paper, cut with a circle punch

abstract composition
Dree Ziebelinig

Above: contrast of form composition computer rendering

Opposite: contrast of form collage found materials
experiment 26: found materials

**Challenge: Explore abstract composition using found materials**

Materials: various found materials and objects

As a recognized form of art, collage is roughly a century old. According to Wikipedia, “The term collage derives from the French colfer meaning glue.” Of course, collage now means more than simply gluing things in place. Braque and Picasso were the first to make collages by adding pieces of found paper—patterned wallpaper, oil cloth—to charcoal drawings and oil paintings. Collage played a major role in the beginning of modernism, and in particular, it provided a new way to experience painting. The fundamental concepts of collage—using found things, making commonplace things seem uncommon—are now conventions in art, music, writing, and theater.

In this experiment, we use collage as a medium for exploring the principles of design and color contrasts and color illusion.

Everything we explored in previous experiments is possible in collage. A collage can be a color wheel. It can be an expression of contrast of light and dark using a monochromatic palette or any of the other color contrasts. In a collage, one color can look like two. Geometric and organic forms can exist in harmony.

The found materials of collage provide us with a new compositional tool: contrast of texture. They also bring content to the work: competing logos, a blurred fortune cookie fortune, names of colors. These recognizable things are playful elements that, intentional or not, give meaning to abstraction.

Begin by working with scraps of paper and other materials. After making a few simple collages with the materials at hand, you’ll be ready to go hunting. Hardware stores that sell paint are usually generous sources of color swatches, perfect found material for exploring color contrast. Maps, packaging, and art supplies add meaning, form, and color.

Found materials are the heart of collage. The most challenging aspect of collage, and the only requirement, is restraint.

“... the early Cubist collages, in which cut paper played an important part, are products of strict rules, limited materials: newspapers mounted on a surface, with the addition of a few charcoal or pencil lines .... The playfulness and humor in the production of some of these compositions in no way detracts from the end result of a serious work of art.”

– Paul Rand, “Design and the Play Instinct”

Collages made with found materials

Right: Pablo Deikan

Opposite, clockwise from upper left:
Lisa Case, Kony Oh, Pablo Velaz, Hae Jeon Lee
leaf compositions

In *The Interaction of Color*, Albers declared his love for the colorful autumn foliage he discovered in the United States. At Black Mountain College in North Carolina, where Albers first taught in the U.S. and where he developed his color course, leaves were part of the natural landscape. Albers appreciated the economy of found objects. He advocated that his students use leaves in free study assignments.

Dried and flattened leaves are a perfect material to partner with paper. Leaves can be uncoated and left open in the air to change color or coated with varnish to preserve the color. They can be painted or dyed, and cut into shapes. Leaves can be painted and pressed onto paper, leaving a skeleton-like impression.

The joy of making leaf collages begins with collecting. This is best done in the autumn, when colors are most vivid. However, leaf collages can be made year-round with leaves and petals from cut flowers and seasonal plants. When collecting, look first for interesting colors.

Dried and flattened leaves, pressed between the pages of a heavy book, will last for many years.

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experiment 27: leaf collage

**Challenge:** Make common objects uncommon; transform ordinary into art.

Materials: dried and flattened leaves; found paper; Color-aid paper; gouache paint on watercolor paper; paper cement

Leaf collages should be considered free studies. Use this as an opportunity to play with composition. Experiment with contrast of size, direction, and placement. Look for strong shapes that offer interesting figure/ground relationships. Explore repetition and variation.

Carefully study the colors of the leaves. Explore different combinations of leaves and paper. Look for interesting color relationships between leaves and paper. Consider the texture of the various surfaces. Feel free to cut the leaves into different shapes.

After completing the composition, you may leave the surface uncoated or cover with varnish. Leaves left uncoated will continue to change color; varnished leaves with keep most of their color.

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Top right: Red and Green 2004
Dried and flattened leaf, Color-aid paper
photographed in-progress, 2004

Opposite: detail of Red and Green 2004
photographed 2011

Unvarnished leaves will continue to change color.
In this case, the leaf plays the role of the chameleon, assuming the color of the cardboard background.
Left: Peter Drobetskoy
Leaf grid
dried and flattened leaves

Opposite, clockwise from upper left:

Junho Lee
Leaf pattern with interruption
dried and flattened leaves

Jonas Christiansen
Leaf stencil composition
dried and flattened leaves, spray paint

Bhikhika Adokeany
Fall
dried and flattened leaves, mixed media
experiment 28: letters and leaves

Challenge: Explore contrast of natural and invented forms

Materials: dried and flattened leaves; found paper; found type; Color-aid paper; gouache paint on watercolor paper

Letters and leaves have much in common, as well as much in contrast. Combining them in free-form compositions provides an opportunity to explore the variety of relationships.

In experiment 27, we explored the shapes, textures, and colors of leaves. We used leaves as abstract forms in free-form compositions. In our leaf collages, we recognize the intrinsic form of leaves: the symmetrical shapes; the subtly asymmetrical arrangements of stems and veins; the contour edges that, upon close examination, appear as repeating triangular cuts.

Begin this experiment by looking carefully at a leaf: the overall shape, the texture, and colors. Then compare the leaf to the letterforms in a common typeface like Times or Helvetica. Look for relationships of shape: how the overall shape resembles a symmetrical cluster of A’s, or the convex shape created by overlapping O’s; how the contour edge resembles the curves of an S; how letterforms, like leaves, are composed of contrasting shapes.

The letterforms you use in your letter and leaf compositions can be found, or they can be made by hand using cut paper, or by setting type on a computer and carefully trimming out the backgrounds. They can be painted directly on the leaves, by hand or with stencils and rubber stamps.

The colors in your composition can be determined by the colors of the leaf or leaves. A green leaf naturally encourages us to see red—the theory of complementary colors and simultaneous contrast. A combination of yellow, orange, and reddish brown leaves suggests contrast of light and dark and complementary contrast. Yellow-green leaves combined with red-violet letterforms and a blue background suggests contrast of temperature.

Letters and leaves collages made with dried leaves, found paper, gouache
Left, and below left: Lisa Case; below center: Abby Beck; below right: Dana Goor
Opposite: Hwa Young Jung
typography and color

The study of typography is a study of human history. The letterforms that comprise the alphabets of our languages began as simple marks—symbols of ideas and sounds. The shapes and proportions of these early symbols were derived from natural and human-made things. In ancient Roman capital letters, we see organic and geometric forms: straight strokes of even thickness contrasting with curved strokes that taper from thin to thick. Roman capitals were displayed on architectural forms; the specific shapes and proportions of Roman capitals are completely harmonious with their architecture.

The strokes that make up the original letterforms were created by hand with simple tools. The design of letterforms has evolved along with changes in art and technology. We are now accustomed to seeing and reading a diversity of typeface designs based on humanistic and mechanical forms.

When we think about typography, we mostly think in black and white. Reading requires contrast—we need to clearly see letterforms, therefore, the figure and ground must be in contrast. The history of the written word is exemplified by contrast of light and dark. Ancient lapidary writing and contemporary forms of inscription are defined by light and shadow. The use of dark ink on light colored surfaces can be traced back to eighteenth-century BCE Chinese writers and continues as a global convention.

Beautiful examples of harmonious color and typography can be seen in medieval manuscripts. Gutenberg and other early printers emulated the style of the manuscript by adding hand-painted flourishes. The history of typographic printing that followed is mainly composed of black ink with the occasional red accent. Modern printing introduced the wide range of colored typography we now take for granted. Today, type displayed on screens can appear in virtually any color imaginable.

Opposite: Karishma Sheeth, letterform drawing; pencil, oil pastel on plywood

Above: Prologue of the Gutenberg Bible, printed by Johannes Gutenberg and Peter Schoffer, Mainz, 1454–68; Bibliothèque Mazarine, Paris, France; Archives Charmet, The Bridgeman Art Library
experiment 29: found type collage

**Challenge: Explore color and typography using found materials**

Materials: newspapers; ink; paint; pencils; markers

The goal of this experiment is to explore abstract forms and color contrast, using found type. The words in your found type collage are not there to be read—each letterform is a shape to be played with. One of the challenges of this experiment is to make letterforms transcend their original symbolic function.

Begin by collecting examples of found printed type. I recommend using newspapers, mainly because the uncoated paper is a good surface for adding ink, paint, and pencil colors. A typical newspaper contains many different typefaces printed in a variety of colors. Later, you can expand your sources of found type to explore different kinds of paper—magazines, packaging, and signage.

Choose letters based on their shapes. Cut the letters, words, and sentences out of the newspapers precisely or unevenly, feel free to fragment, fold, and tear.

Your found type collages should be composed with basic design principles in mind: contrast of size, form, position, direction, and texture. Try to activate the entire composition to create a harmonious figure/ground relationship. Repetition and patterns are vital parts of the language of typography.

The colors in your found type collages should be based on one or more of the color contrasts: contrast of light and dark, monochromatic scales, simultaneous contrast, complementary contrast, contrast of hue, color chords, and contrast of temperature. Depending on your materials, color transparency may be an option.

As in all abstract composition, the keys to success in found type collage are contrast, visual hierarchy and visual harmony.

Opposite: Jeeyoon Song, found type collage; newspapers
Above right: Reggie Dankwa, found type collage; newspapers, found paper, pastels
Right: Alan Tang, found type collage; newspapers, colored pencils

typography and color 115
experiment 30: roman capitals

Challenge: Explore classical letterform design

Materials: pencils; Conté crayons; charcoal; paint; newsprint; drawing and watercolor paper

Roman capitals are considered by many lovers of typography to be the most beautiful of all letterforms. Jan Tschichold, in his wonderful book *Treasury of Alphabets and Lettering*, introduces the subject this way:

“...The Roman letters reached their highest perfection at the end of the first century ... after an evolution of about a hundred years. The most beautiful example is the inscription on the Trajan column in Rome. These letters, called *capitales romanae,* which are on the average 4 inches high, were painted on the stone with a flat brush used like a pen. The well-articulated endings of the letters owe their form to the artist’s intention to decisively finish the line on the top and on the bottom. The proportions of this justly acclaimed alphabet are of great nobility and have rarely, if ever, been surpassed. The Trajan column lettering continues to be the source from which all our type styles derive.”

Begin this experiment by drawing strokes on 18 x 24 inch (46 x 61 cm) newsprint using Conté crayons and charcoal. Break a stick of crayon or charcoal down to create a small piece approximately 1-inch (2.5 cm) wide. Attach a sheet of newsprint to a drawing surface with drafting tape. Holding this 1-inch (2.5 cm) stick of Conté crayon/charcoal parallel to the top edge of the newsprint, draw a wide vertical stroke from the top of the sheet to the bottom. Practice making this wide vertical stroke. Explore using different amounts of pressure—the ideal pressure will result in an evenly dark stroke. (If you tear the paper, you are probably using too much pressure.)

Next, while continuing to hold the crayon/charcoal parallel to the top of the sheet, move the crayon/charcoal from left to right to form a thin horizontal stroke. Practice making thin horizontal strokes of uniform thickness.

Now, still holding the crayon/charcoal in the same position, try moving it from left to right, slowly curving downward. Make sure the crayon/charcoal stays parallel to the top edge of the sheet. Made properly, this movement will result in a stroke that begins thin and smoothly tapers downward in a curve, becoming thicker as it moves.

Practice this curving stroke. Try making thin-to-thick and thick-to-thin variations of the stroke. When you are comfortable with the movements, try making a crescent-shaped stroke that begins thin at the top, tapers to a thick area in the center, and tapers back to thin at the bottom. Variations of this crescent-shaped stroke—thin, thick, thin—can be used to make all of the curved strokes in Roman capitals.

Your drawings of Roman capitals should be large. Consider the proportions of your letterform drawings carefully. The proportional relationship of the widest stroke to letter height in classical letterforms is approximately 1.10, so using a 1-inch (2.5 cm) wide crayon, as described earlier, is ideal for letters that are approximately 10 inches (25 cm) tall.
Models for drawing Roman capitals can be found on the Web and in numerous books on the history of writing and typography. I encourage my students to look for Roman capitals in their environments. Architectural and monumental inscriptions are often excellent sources of inspiration. Not surprisingly, cemeteries are also good places to find Roman capitals. Headstones are frequently accessible for making graphite rubbings of letterforms, which in addition to being beautiful on their own, can be used as models for drawings and paintings of classical letterforms.

I find drawing Roman capitals to be a truly joyous experience. The movements of my arm and hand, as described earlier, feel good, especially when the resultant strokes are beautiful to look at.

As you gain skill and confidence, begin using Roman capitals in compositions that combine multiple letterforms. Consider the principles of design: contrast of size, position, form, and direction; repetition; abstraction; and figure/ground relationships.

Add color to your drawings. Feel free to experiment with other color media: gouache and acrylic paint, colored pencils, and colored paper. Explore one or more of the color contrasts—light and dark, monochromatic scales, contrast of hue, color chords, complementary contrast, contrast of temperature, and extension.

Opposite, clockwise from upper left:
Dae-sul Ryu, Roman capitals, acrylic on paper
Michael Mackey, Roman letter drawing, pastel on colored paper
Samantha Raso, Roman capitals, watercolor
Haenara Lim, I letterform painting, acrylic
Left: Alex Cook, Roman capitals, graphite, watercolor
Below: Katia Hakko, letterform rubbing, graphite on paper

118 playing with color
experiment 31: calligraphic chalk drawings

**Challenge: Create a daily practice of color and calligraphy**

Materials: colored chalk; black chalkboard paint

The calligraphic compositions reproduced on these pages were made by Pablo Deikan while he was my student at the School of Visual Arts. Deikan’s calligraphic skills are self-taught—a blend of his classical training in graphic design and typography and his more personal interest in handmade letterforms, color, painting, and drawing. The letterforms in these compositions are experimental, ranging from readable to abstract. The compositions themselves range from structured to free-form.

Deikan began this series of calligraphic chalk drawings as a daily practice—a kind of meditation. The drawings were made early in the morning on a section of his kitchen wall coated with blackboard paint. The words used in the drawings were derived from headlines in the New York Times on the morning the drawing was made.

Each composition is approximately 30 inches (76 cm) wide and 30 to 40 inches (76 to 102 cm) tall, and took one to two hours to complete. Deikan documented the compositions with a digital camera. The drawing was later erased in preparation for the next day.

Each morning a new drawing was made from headlines of the day, later wiped away and replaced by tomorrow’s news.

The play instinct is easily engaged in this experiment. Drawing large on the wall allows the artist to use the movements of his arm to create graceful, humanistic strokes. The softness of the chalk and ability to erase makes correcting mistakes a simple task—this encourages risk taking and invention.

Color contrast is used in various ways, adding value to the finished drawings—the effects are apparent in the photographs of the work. The exploration of color contrast also added value to the experience of making these drawings. The sense of play is clearly present.
PATH IS
FOUND FOR
THE SPREAD OF
ALZHEIMER'S
experiment 32: scratchboard drawings

Challenge: Explore serendipity and color contrast

Materials: oil pastels; cardboard; tools for scratching

The original scratchboard technique involved scratching the surface of a board coated with a base layer of white clay, covered by a layer of black ink. As the ink is scratched away, a bright white line is revealed. Images are built up by removing the surface. In our experiment, the scratching technique is the same, but we replace clay with oil pastels to achieve brilliant color effects.

When I was a child, I made scratchboard drawings using crayons, a technique I learned in school. I clearly remember the mystery and excitement before making a scratch and the surprise and delight when the underlayer colors were revealed. As my experience grew and my strategy developed, I would make a mental map of the patches of underlying colors and later challenge myself to remember their locations. The process was entertaining and the results were usually satisfying. It was a truly playful experience, from which I learned the value of serendipity—the happy accident.

The exploration of form and color that scratchboard allows can be applied to many kinds of image making. The fine lines that are characteristic of scratchboard are as excellent for making calligraphy and other hand-drawn letterforms, as they are for other kinds of drawing. What all color scratchboard experiments share is the element of mystery and surprise of discovery.
The Eyes of a Firestorm
Who didn't mind

Pablo Deukan, sketchbook drawings
oil pastel on illustration board
experiment 33: primitive printing

Challenge: Explore color contrast and transparency in typographic monoprints

Materials: stencils; linoleum block; wood type; gouache; watercolor; printing ink; various papers

In this experiment, the goal is to use simple printing techniques to explore color contrast and mixture, using opaque and transparent paint and ink.

A monoprint is a one-of-a-kind print that cannot be exactly reproduced. Since reproduction is not the intention, each print is an experiment. A variety of printing, painting, and collage techniques can be used when making a monoprint. The process can be spontaneous or calculated—both approaches involve exploration and discovery.

Pochoir is the French word for stenciling and the name of a popular printing method used in France from the late nineteenth century through the 1930s. It is most often associated with Art Nouveau and Art Deco patterns used in fashion and architecture.

The pochoir technique allows you to use opaque and transparent colors—gouache and watercolor paints—to create beautiful, lush color effects. Paints can be brushed, dabbed, sprayed, splattered, and sponged, creating a wonderful variety of textures. The thickness of gouache creates a buildup on the printed surface that can be seen and felt.

Linoleum block printing, or linocut, is a form of relief printing similar to woodcut. A design is cut into the linoleum surface with a sharp knife or chisel. The result is a printing block. The area that remains after cutting is transferred to paper with ink. Unlike wood, linoleum has no grain; this results in flatter, less textured fields of color. The material is softer than wood, making it easier to carve—an ideal introduction to printmaking.

In pochoir and linocut printing, each color requires a separate stencil or linoleum block. The use of separate stencils and blocks often results in forms that overlap or appear out of alignment, either on purpose or accidentally—another example of serendipity, the happy accident.

Pochoir and linocuts are both excellent techniques for exploring hand-made typographic composition and experimenting with color.

Of all the primitive printing techniques, my favorite is printing with wood type. Wood type was developed in the early nineteenth century for printing broadsides—large sheets of paper, printed on one side. Most broadsides are advertising posters with words set in large type in a range of letterform styles. The decorative sensibility of the Victorian era defines wood type—big and bold, designed to get attention.

Like many of the tools we use for color experiments, wood type letters are beautiful objects in themselves. They can be found in antiques shops, yard sales, and flea markets, on eBay and other auction sites. They can also be seen in museum collections. One of the most comprehensive is the Rob Roy Kelly American Wood Type Collection at the University of Texas at Austin—their website is an excellent source of information.

Although wood type was designed for high-volume printing and is still used by letterpress printers, the letters are perfect tools for making typographic monoprints. Paint and ink can be applied to the face of the letter and then pressed on to the compositional surface. Making monoprints with wood type is a playful and spontaneous process. Each impression is a response—first to the unprinted surface, then to successive additions of forms and color.
Above: Pablo Deikun
Days of Gray, linoleum block print

Right: wood type monoprint

Opposite: Fernand Léger
La Fin du Monde, Filins par l’Angé de N.-O.
By Blaise Cendrars (Péridéric Sauser), 1919.
Plate folio 20 verso.
Illustrated book with twenty-two pachoirs,
12 1/2 x 9 7/4 inches (31 x 25 cm)
experiment 34: found letterforms

Challenge: Hunting for type in unusual places

Materials: gouache and acrylic paint; charcoal; Conté crayons

In my teaching, I see many beautiful images of color and typography—it is one of the benefits of my job as a typography instructor. The presentation of drawings and paintings of found letterforms is always among my favorite moments of observation. My experience is informed by the excitement of discovery and the fascination of play that is so apparent in the work.

This experiment has one simple goal: to make a suite of original compositions based on found examples of the twenty-six letters of the alphabet and the numerals zero through nine. The example letterforms can be found in the usual places—books, magazines, packaging, posters, the Web—but are best discovered elsewhere. I encourage my students to get away from their computers and search for the unusual: hand-painted signs on the fronts of bodegas, the fading remains of mid-century block type murals on the sides of buildings, the dynamic brush scripts on commercial garbage trucks, graffiti on the walls of train tunnels.

When interesting examples of the twenty-six letters are found, they are photographed or sketched. These images serve as the models for drawings and paintings. The twenty-six letters can be composed individually or in groups. Color contrast must play a role in the compositions: contrast of light and dark, hue, complements, temperature, and extension.

The best way to begin this experiment is to take a walk outside with a camera or sketchbook. Make note of the first letters you see—perhaps on a street sign or a license plate on a passing car. As you walk, continue to observe the letters around you. Eventually, you’ll see examples of letters that interest you. Take photographs and make sketches of these found letterforms.

As you plan and create your drawings and paintings, allow the found letterforms to transcend their original purpose—to become forms and colors united in dynamic and playful compositions.

Annie Paszel, found type painting
acrylic paint and charcoal on burlap
Left: Chat Puchac, bodega letters
acrylic paint on canvas and board

Opposite: Justin Romard, graffiti letters
charcoal, marker, acrylic paint on plywood
Left: Victoria A. Bellavia
found letter drawings, Conte crayons

Opposite: Amie Passel
digital collage of found letter paintings
(original art made with acrylic paint and charcoal)
experiment 35: the painted word

Challenge: Explore form, color, and meaning in handmade type treatments

Materials: gouache and acrylic paint on plywood panel

This experiment is similar to our previous study of found letterforms. Here, the exploration of individual letters is expanded to whole words, painted in ways inspired by found typography and our associations with the words.

Word paintings are like logos—an effort is made to communicate a message; the forms and colors express the meaning of the word. The goal of this experiment is to create engaging and memorable compositions of letterforms, color, and meaning.

Because our goal includes communicating a message, the forms and colors in your word paintings must be carefully chosen, based on principles of color theory and popular associations.

Begin by choosing a word, ideally one that inspires playful associations of forms and colors. Is there one color that best represents our associations with the word? When you determine this color, consider all the possibilities of color contrast. Look for contrast effects that suggest the meaning and associations with the word.

The type treatment—typeface and arrangement—must be carefully considered in terms of form and meaning. Typefaces have strong cultural and historical associations. We relate Helvetica and other functional sans serifs to the International Style aesthetic in which they flourished. Our associations with script typefaces range from wedding invitations to travel posters. Black letters bring gothic imagery to mind—medieval manuscripts and horror movie titles.

Begin with color sketches, and when you are ready, proceed to full-size drawings on plywood. You may prep the surface of the plywood by sanding lightly and coating it with an even, thin layer of gesso. Your drawings can be loose or precise. Feel free to make expressive lines and marks with pencils—your graphite markings will add value to the final painting, a record of the creative process.

Before painting the words, carefully test the colors on the back of the plywood, or on a scrape of the board, prepared exactly like you have prepped the surface to be painted. When painting the compositions, you may find it necessary to change a color after it has been applied, due to the effects of simultaneous contrast and color subtraction. This can be a good thing—multiple coatings of paint can enrich the surface.

Victoria A. Belavia, word paintings
expressive color

Color has the power to affect our emotions, through cultural associations and personal experience. Certain colors actually produce physical effects—make us anxious, calm, happy, angry, or melancholy.

Our favorite colors are often those that bring us comfort and security. Blue is the color of clear skies and good weather. We assign blue to be the color of water—the ocean, the origin of life. We associate blue with calmness, wisdom, rationality, fairness, and loyalty. Blue is the color of winter—a time of rest. It has a quiet transcendental power. It is not surprising that blue is the most popular color in the world, far ahead of every other color. Perhaps also not so surprising: The complement of blue is orange, the international color of caution, the opposite of calm.
Blue, red, yellow, green, orange, and violet all have associations that can be used to transmit visual messages. Combinations of colors also have the power to affect our emotions and physical responses. Indeed, the value of color contrast as a tool for making visual communication cannot be overstated.

In *The Art of Color*, Itten describes his theory of color expression. He provides a thoughtful, instructive, and poetic analysis of the "mental and emotional expressive values" of the primary and secondary colors. Here is a sample:

"Yellow is the most light-giving of all hues. It loses this trait the moment we shade it with gray, black or violet. . . . Golden yellow suggests the highest sublimation of matter by the power of light, impalpably radiant, lacking transparency, but weightless as a pure vibration. . . . Just as there is but one truth, so here is only one yellow. Adulterated truth is vitiated truth, untruth. So the expressions of diluted yellow are envy, betrayal, falseness, doubt, distrust and unreason . . . . On the other hand, yellow is radiantly cheerful when contrasted with dark tones."

I encourage you to read all of Itten’s theory of color expression. His insights make us more aware of the emotional power of color, and provide positive reinforcement about our own conclusions.

The rainbow flag is a powerful symbol that owes its success entirely to a simple arrangement of expressive colors. There have been many variations of this design, symbolizing different ideas, in different locations to different groups of people.

Today, the rainbow flag is closely associated with the LGBT movement. The original LGBT flag had eight colors. Each color was assigned a special meaning: sexuality (pink), life (red), healing (orange), sunlight (yellow), nature (green), art (blue-green), harmony (blue), and spirit (violet). The current version is composed of six horizontal stripes of even thickness. The arrangement is based on the color wheel: red, orange, yellow, green, blue, and violet. This design has become a symbol of diversity—the many different people who make up the LGBT community. The design is also a symbol of pride of identity and common, joyful, and positive goals.

In the experiments that follow, we explore how colors can be used to express ideas. Each experiment will provide an opportunity to create color compositions as meaningful and memorable as the rainbow flag.
experiment 36: color and memory

Challenge: Use color contrast to visually express a moment in time

Materials: Color-aid paper, gouache paint on watercolor paper

This experiment is an exploration of color contrast, visual hierarchy, and visual harmony. It is also a memory exercise and an exploration of the color relationships associated with memories.

Many artists have made daily recordings of the colors they routinely observe. The resultant color studies serve as memory guides to intervals of time—a timeline of colors observed.

In this experiment, we take a different approach to expressing time with colors—the colors come from our memories. The goal is to record a memory, using color contrast as a means of expression. The experiment can be driven by a moment in time, a minute, or longer—a day, a month, a season.

Begin by finding a color that best expresses your memory of the time you have chosen to record. Then, consider the narrative of your memory: Can color contrast suggest the narrative—the relationships of images in the memory? Contrast of light and dark and contrast of temperature have obvious associations with day and night and warm and cool sensations—expressions of transition. Contrast of extension can be used to suggest balance and harmony, or the opposite. Complementary contrast can be an expression of harmony and contrast, coexisting in the same space.

The methodology is the same as in color grid experiments 2 through 8.

I find color grids to be excellent warm-up exercises for many kinds of visual work, in my graphic design practice and in my home life. Sometimes, these warm-up grids are composed of many colors, sometimes few. Sometimes, I glue the pieces into place, and sometimes I simply take a photograph and store the color swatches for future use. As with most exercises, it is time well spent, positively influencing the work ahead.

The color and memory experiment is, indeed, an excellent warm-up for the assignments that follow, in which visual communication is explored using color and form.
experiment 37: communicating with color and form

Challenge: Express feelings and thoughts using color contrast and abstract form

Materials: Color-aid paper; gouache paint on watercolor paper

In experiment 36, we explored visual communication using only expressive color relationships. In this experiment, the goal is to express ideas through the integration of color contrast and abstract form.

We begin with the intention of communicating how our feelings and thoughts are affected by changes in light and temperature.

We have two primary considerations: color and abstract form. Our exploration of color will involve contrast of light and dark, and contrast of temperature. Abstract forms can be organic and geometric, simple and complex.

Summer and winter, the equator and the poles, day and night—these opposing concepts represent physical extremes of light and temperature. Each of us, depending on the conditions of our life, has personal relationships with these extremes. Our emotions and thoughts may depend on a general preference for a time or place, or may be something very specific—a physical or mental reaction, an allergy or mood.

Your choices of colors and forms should be expressive of your physical and/or emotional responses to changes in light and temperature.

Try using the diptych structure to express contrast. If changes in your feelings and thoughts are better expressed in more than two compositions, feel free to make a series.
This page:
Han Gyeol Ryu, melting/freeze diptych
Gouache on watercolor paper

Opposite:
Moo Nea Kim, separate/together diptych
gouache on watercolor paper
experiment 38: the seasons

Challenge: Express universal and personal feelings using color and form

Materials: Color-aid and found paper; gouache paint on watercolor paper

"The youthful, light, radiant generation of nature in Spring is expressed by luminous colors ... The colors of Autumn contrast most sharply with those of Spring ... Nature in Summer, thrust materially outward into a maximum luxuriance of form and color, attains extreme density and a vividly plastic fullness of powers ... To represent Winter, typifying passivity in nature by a contracting, inward movement of the forces of earth, we require colors connoting withdrawal, cold and centripetal radiance, transparency."

– Johannes Itten

Like many others in this book, this experiment takes inspiration from Johannes Itten. In his theory of color expression, he states that when it comes to associating colors with natural subjects like the four seasons, a community of individuals can be in agreement. But agreement will occur only when we “apply reason to the choice of color combinations, keeping the total universe of colors before us ... Stated in terms of the four seasons, this means that for each season we are to find those colors, those points on and in the color sphere, that distinctly belong to the expression of that season in their relation to the whole universe of colors.”

In order to find a general understanding, we must consider all of the options. This includes all of the possible variations of a hue: the pure color, the tints and shades, and the warm and cool versions. Itten describes how one hue, observed under different conditions, can produce different responses:

"The deep blue of the sea and distant mountains enchant us; the same blue as an interior seems uncanny, lifeless, and terrifying. Blue reflections on the skin render it pale, as if moribund. In the dark of night, a blue neon light is attractive, like blue on black, and in conjunction with red and yellow lights it lends a cheerful, lively tone. A blue sun-filled sky has an active and enlivening effect, whereas the mood of the blue moonlit sky is passive and evokes subtle nostalgias.”

Begin this experiment with a color grid exercise in which the colors are associated with our shared understandings of the four seasons. You can create one grid composition with four areas that express aspects of each season, or create a series of four separate but harmonious compositions, each expressing a single season.

In determining which colors to use in this grid exercise, take Itten’s advice and consider “the whole universe of colors.” Begin by exploring pure hues of different temperatures—warm red, cool red—then explore tints and shades of those colors. Finally, look at the expressive characteristics of pastel colors—light and dark, bright and dull.

After you have completed the color grid exercise, begin to consider a more personal expression of the seasons, this time using both color and form. Think about the story you wish to tell—your personal relationship to each season. The colors and forms you choose to work with will be informed by the story.

As in the grid exercise, consider the whole universe of colors: hues in various temperatures, tints, and shades. Think about ways of using other forms of color contrast to express your feelings—how color chords and complementary colors can simultaneously express harmony and contrast; how contrast of extension can suggest balance or imbalance.

Your choice of forms should also be driven by the story you wish to tell. As we learned in experiment 37, abstract forms can be highly evocative and personally expressive, while allowing room for the viewer to bring his or her own interpretation to the work. However, your relationship to the seasons may suggest or even require a less abstract, more representational approach. Feel free to explore both directions. In any case, the forms must be unified and harmonious. Geometric forms, organic forms, contrasting forms—these are your playing options.

Opposite: Anastasia Dudin, Seasons composition, gouache on watercolor paper
Seasons compositions

Above: Lisa Case, found paper

Above left, and left:
Miao Kusda, gouache on watercolor paper; metallic paper

Opposite:
Sarah Yoo, gouache on watercolor paper
Left to right:
Jonas Christiansen, Brasil
Sungwol Bang, Korea
Hwa Young Jung, Fiji

Left to right:
Ashley Denise Torneck, La France
Rebecca Lhm, Grønland
Pablo Deikart, USA

Left to right:
Jason Grafinger, Deutschland
Hae Jeon Lee, USA
experiment 39: country stamps

Challenge: Express identity with color and form

Materials: Color-aid paper; gouache paint on watercolor paper

If you were to identify yourself as a citizen of a country, what colors and forms would you use to express your identity? And what if that message needed to be delivered in a composition the size of a postage stamp? The goal in this experiment is to do exactly that: Design a postage stamp that is an expression of citizenship.

In the context of this color experiment, citizenship is conceptual. It extends beyond common legal definitions to your associations with any country—your own or any other—in which you have a personal interest.

The primary consideration is size. A postage stamp is a miniature composition. The principles of design—contrast of size, form, position, direction, texture; figure/ground; repetition—and the color contrasts of light and dark, saturation, hue, temperature, extension, and complements—can play their usual roles in these miniature compositions. However, the small overall size of the stamp changes the way we engage with it: Instead of letting our eyes roam over the surface as we would in a larger composition, we take in the entire composition all at once. After the initial glance, we may focus on a specific part of the stamp—the image, name, or currency value. But it is the first quick look that establishes the message.

In order for a composition to work in a common stamp size, you must design and execute at a large size while thinking small. The high level of finish that can be achieved while rendering a large composition gives the stamp its precise appearance.

As you design the stamp at a large size, you must look at it in the reduced stamp size. You can use a reducing glass (the opposite of a magnifying glass), or simply observe the composition from a distance.

The process of working large and viewing small is an excellent opportunity to play with scale relationships. At stamp size, the visual gestures that bring meaning to the composition must be dramatic to be noticeable. The smallest forms in the large rendering may be too small to be seen at stamp size. If these forms are necessary parts of the stamp—required for the message to be understood—you may need to exaggerate their size so that they can be seen. This abstraction of scale can add a sense of playfulness to the composition.

Begin by choosing colors that suggest or symbolize your expression of citizenship. The colors might have something to do with a concept, such as the energy of athletic activity. They may suggest a costume, a holiday, a natural setting, or a landscape. The colors might correlate with an existing symbol, like a mascot.

After you have selected colors, look for ways to use color contrast to strengthen and unify the composition. Try to include large areas of one or two hues in the composition. Ideally, your stamp composition should be identifiable by its color relationship: the black and red stamp, the yellow and green stamp.

The forms—abstract representations and letterforms—must be harmonious and integrated in the composition. Remember to test all the forms to make sure they are noticeable at stamp size.

After you have completed the full-size rendering of the stamp composition, make a scan of the rendering. Open the scan in Photoshop and view the design at a common stamp size, and eventually try printing the composition at stamp size.

The most memorable stamp designs are those that communicate a single, simple message using strong colors and accessible forms. We remember the dancer wearing a red dress and black fishnets, the green lizard and red-orange bird on a yellow ground, the red tiger outlined in blue and highlighted in yellow.
experiment 40: landscape translation

Challenge: Express your response to an experience using color and form

Materials: found materials; drawing materials; camera

The basic idea of graphic translation is derived from object-drawing exercises, an important component of visual training for graphic designers and illustrators. In object translation, we reduce the forms of a three-dimensional object to two dimensions. We study the object carefully, making special note of areas of light and shadow and changes of color. The goal of this exercise is to discover the essential forms—the shapes and lines—that define the object. It is a process of visual editing: reduce, then reduce some more. Continue reducing until the object is unrecognizable, where translation becomes transition. The results are often beautiful compositions of harmonious figure/ground relationships.

Landscape translation involves more than one object, usually of large scale and space. The goal is to discover the essential forms and colors that express your response to the landscape. As in object translation, the landscape translation is defined by the play of light and shadow on objects.

The physical space between objects in a landscape is as important as the objects themselves. The forms of objects and spaces should be equally studied and considered. The edges that separate objects and spaces can be obscured by light and shadow. In translation, this can result in more dynamic figure/ground relationships and, perhaps, expressions of ambiguity and mystery. The edges between colors can be abrupt and decisive or composed of gradients of light and dark that can express a merging of object and space.

This experiment begins with documentation of a landscape. Remember, the goal of the experiment is to visually express your response to the landscape. So take photographs, make sketches and notes, and if possible, collect things from the landscape, like leaves or found objects. These materials will serve as a source of inspiration for your response.

With your source materials in front of you, make sketches that express your impressions of the landscape. The sketches can be made with pencils, gouache paint, or markers, or by cutting, tearing, and folding paper. Remember to consider the objects and spaces in between—the figure/ground relationships. When you are satisfied with your sketches, begin executing a larger, more precisely rendered composition.

In the variation of the experiment shown on these pages, our choice of subject was an interior landscape—an installation of large-scale sculptures by the artist Richard Serra, at the Gagosian Gallery in New York in 2011.

Inspired by the surfaces of Serra’s sculptures, we expanded the boundaries of the experiment to include found materials. The found materials add value to the experiment, by juxtaposing the colors, textures, and associations of the materials with the forms of the landscape.

Opposite: Shaun Cronin, drawing for landscape translation; Serra exhibition
Landscape translations: Sense exhibition
found materials

Above: You Jung Choi
Opposite: Danielle Lee
experiment 41: visual semantics

Challenge: Use form and color to express your response to an artist and his work

Materials: colored paper; gouache paint on watercolor paper

The visual semantics assignment is an experiment invented by Paul Rand. I had the pleasure of working on this assignment with Professor Rand as a second-year student in the graduate program in graphic design at Yale. A detailed description of the assignment can be found in Paul Rand: A Designer's Art. Included here are excerpts from Rand’s original assignment handout, beginning with a definition of visual semantics:

"The term Visual Semantics refers to the use and manipulation of words (letters) to illustrate an idea, an action, or evoke some particular image. This involves the arrangement and distribution of letters in a given space in such a way as to make a work, as far as possible, visually self-explanatory. It may involve unorthodox cropping, distorting, contrasting shapes, size, colors, values, textures, aspects of repetition, and space manipulation."

As subject matter for this assignment, Rand chose the painter Fernand Léger. Rand specifically directed us to Léger’s early Cubist paintings as sources for inspiration and study.

"The object of this exercise is to discover the fundamental ideas and design principles governing the work of Fernand Léger, but not (superficially) to imitate his technique or style … As subject matter, Léger favored the commonplace, so as to minimize psychologically extraneous associations and to emphasize form … The visual power of the machine, which he saw as a ‘tool of social liberation’ and a thing of beauty, was interpreted with great force, in its fixed and, particularly, in its moving state. He was obsessed by the idea of movement."

Rand provided specific instructions for this assignment, including the size, presentation format, and colors:

"Develop three designs with the word ‘Léger’ as the theme. From four specified colors, use black for your first version, add a second color for the next, and all four for the last. If designs two and three are merely variations of the basic theme, but not essentially different in concept, they should at least look different in the way elements are manipulated. More change of background colors without some other meaningful alteration does not constitute an acceptable variation."

In regard to the typography, Rand advised the following:

"Simple letters are preferred to elaborate ones … Originality is related more to the unexpected idea than to some flamboyant or peculiar technique. To defamiliarize the commonplace, to see it as if it were the first time, is the artist’s goal."

The compositions displayed on the opposite page show my response to the assignment. I chose to focus my attention on exploring and reinterpreting Léger’s use of Cubist principles: repetition, contrast of form and size, and simultaneity. As much as I was inspired by Léger’s personal sense of Cubism, the visual language of form and color that Rand used in his professional practice was equally inspirational. I saw the connection between Léger and Rand, between art and design. I recognized a source of Rand’s own inspiration, and realized this was the hidden lesson of the assignment.
experiment 42: synesthesia

Challenge: Express the synesthetic experience using color and form

Materials: gouache paint on board

Synesthesia is a condition in which stimulation of one sense produces effects associated with other senses. One of the most common forms is “grapheme-color synesthesia,” in which a person’s perception of letters and numbers (graphemes) is associated with colors. Studies demonstrate underlying similarities in the synesthetic experiences of groups; individual accounts suggest different causes and effects. In all cases, the experience is involuntary and highly memorable.

Many artists have described variations of synesthetic experiences. The writer Vladimir Nabokov describes his synesthesia in his autobiography, Speak Memory. He refers to his condition as “audition colorée,” color hearing, but adds this explanation: “Perhaps ‘hearing’ is not quite accurate since the color sensation seems to be produced by the very act of my orally forming a given letter while I imagine its outline.”

Synesthesia has been a compelling subject for many artists, including both actual synesthetes and others who, although they have no firsthand experience, use it as an influence in their work. A beautiful example of such influence can be seen in illustrations by Jean Holabird, published in Vladimir Nabokov: Alphabet in Color.

In The Mystery of the Seven Vowels in Theory and Practice, Joscelyn Godwin describes a poetic exploration of synesthesia:

“In color, as in the vowels, there are certain extreme fixed points, like black and white or three primary colors, while between them runs an infinitely divisible range of shades .... The most famous attempt at a vowel-color parallel is the one proposed by the poet Arthur Rimbaud, who in his early sonnet on the vowels assigns black to A, white to E, red to I, green to U, and blue to O.”
There is no evidence that he was a synesthete—two years after writing “Voyelles,” Rimbaud said that he invented the colors of the vowels. But the poem made synesthesia a popular topic.

Begin this experiment by researching synesthesia. Wikipedia is a good place to start. Make sketches as you read. Feel free to take your inspiration from Rimbaud, or Nabokov, or any of the other artists, musicians, or writers whose work is associated with the subject. If you are one of the lucky synesthetes, your goal is to find unique ways to explore and express your own experiences.

The compositions included here, created by Jeun Sherry Choi, a nonsynesthete, use Rimbaud’s sonnet as inspiration for a series of color compositions. In these compositions, playful combinations of colors and geometric patterns are expressions of the sounds and shapes of vowels.

Vowels (Yellowed)

A black, E white, I red, U green, O blue: vowels
Someday I’ll talk about your secret birth cries,
A, black velvet jacket of brilliant flax
That buzz around the stanchions of the owl,

Gulls of shadow: E, candour of mists, of tents,
Lances of proud glaciers, white kings, shivers of parsley:
I, purples, bloody saliva, smiles of the lonely
With lips of anger or drunk with penitence:

U, waves, divineuddles of vapidian seas,
Peace of pastures, cattle-filled, peace of furrows
Formed on broad studious brows by alchemy:

O, supreme Clarion, full of strange sidencies,
Silences crossed by worlds and by Angels:
O, the Omega, violet ray of her Eyes!

Jeun Sherry Choi, AEIOU
Gouache on plywood

expressive color
experiment 43: music and color

**Challenge: Create a musical notation system using color contrast**

Materials: Color-aid paper; gouache paint on watercolor paper; computer

"Color is the keyboard, the eyes are the harmonies, and the soul is the piano with many strings. The artist is the hand that plays, touching one key or another, to cause vibrations in the soul."

— Wassily Kandinsky, *Concerning the Spiritual in Art*, Munich 1911

The relationship between music and color has been, and continues to be, an inspiration to musicians, artists, teachers, philosophers, and scientists. Plato first described tone and harmony in relation to art. Much later, Newton wrote of comparisons between music and color. Beethoven referred to certain notes as “color keys.”

As noted in previous sections of this book, Johannes Itten compared the twelve colors of his color wheel to the twelve tones of the musical scale, and referred to harmonic color combinations as “chords.”

There are many ways to express music with color. Perhaps best known is the work of abstract painter and Bauhaus instructor Wassily Kandinsky, who explored his own multisynesthetic experiences in his art and writing. He referred to the colors and shapes in his abstract paintings as musical notes and chords that visually harmonized, and often added musical titles to his paintings. The art critic Roger Fry called Kandinsky’s paintings “visual music.”

Kandinsky’s paintings inspired by music are richly layered and dynamic, based on a personal and expressive language of form and color. In our experiment, we simplify the process by minimizing contrast of form and focusing our exploration on color contrast. The goal is to create a color system that corresponds to musical notation—a system that can be “played” like a musical instrument.

The color notation system described below is the invention of Santiago Carrasquilla, created while he was a student at the School of Visual Arts. Using Itten’s color wheel as a starting point, Carrasquilla assigned the twelve colors of the color wheel to a twelve-note scale:

- B = green
- A# = yellow-green
- A = yellow
- G# = yellow-orange
- G = orange
- F# = red-orange
- F = red
- E = red-violet
- D# = violet
- D = blue-violet
- C# = blue
- C = blue-green

To demonstrate this system, Carrasquilla chose the Beatles song “A Hard Day’s Night.” He used a stripe composition as the structure for this color expression of music. Shown on the opposite page are three stripe compositions; each composition is an expression of a separate track of the recording: the vocals (top), bass (center), and guitar (bottom). To create each stripe composition, Carrasquilla played the colors while listening to the song.

Left: *Soul Bass*
*Tone Poems of Color, album cover: 1966*
beyond two dimensions
Challenge: Explore color in the dark

Materials: flashlights; color gels; camera

All of the color experiments so far have relied on reflected light. In this assignment, we explore color contrast with projected light. The goal is to create compositions of form and color by moving a colored light source—a flashlight with the lens covered in colored gel—in a dark room and recording the movements with a camera.

Light painting is almost as old as photography—the word *photography* is a combination of the Greek words *phos* (light) and *graphis* (stylus, brush); together they mean “drawing with light.” The first light paintings were scientific recordings of animal and human movements. Later, the painter/photographer Man Ray created a series of light paintings, called *Space Writings*, considered the first intentional use of the technique to make art. Man Ray’s work was followed by Picasso’s light drawings, photographed by the experimental photographer Gjon Mili and published in *Life*. Since those early experiments, light painting has become a staple of experimental photography. Images created by moving lights—light trails on a freeway, star trails in the night sky—have become cultural icons.

This experiment can involve planning and choreography, but only after much experimentation. First, you must determine a camera setting that will record forms and colors. The exposure needs to be long enough to allow movements of the light source to be recorded as shapes. However, projected light is an additive process—the effects are intensified by amount. If the exposure is too long, too much light will be recorded and colors will not be visible.

Claire Lin’s light paintings, shown on these pages, were shot with a digital camera using exposures of fifteen to twenty-five seconds. In some of these photographs, the colored lights were turned on and moved in front of the camera for only a few seconds, with the remaining exposure time in complete darkness.

Finding the right exposure is a process of improvisation and discovery. Digital cameras make this process efficient—you can see the color effects immediately and make adjustments as needed. With film, the process is the same but slower.

Begin by experimenting with one color gel. Place a single layer of the gel over the flashlight lens. If the light source is too bright, the gel will have little or no effect—in this case, use multiple layers of the gel.

Set up your camera on a tripod in a darkened room. Press the shutter release button and begin moving the colored light source in front of the camera. Try moving the flashlight fast and slow, up and down, side to side, near and far from the camera. Experiment with different light levels in the room.

Using just one color gel will result in light compositions in a monochromatic range of colors. After you are satisfied with this exploration of light and dark contrast, try working with two colors—look for ways to express complementary contrast and contrast of temperature. Continue the experiment using triadic color chords.

Depending on the movements of the flashlight, light compositions will appear as combinations of parallel and intersecting strokes of color, cloudlike shapes and gradients without boundaries. Some compositions will be dynamic; some will look motionless. Colors may appear to overlap, producing an illusion of transparency. Strokes and shapes will combine to create strong figure/ground relationships.

Light painting compositions can be printed like conventional photographs, or projected digitally on screens—a series of light paintings can make a beautiful slide show.

Serendipity is definitely a factor in light painting. But as noted earlier, planning and choreography can be important considerations as well. Strategies for the movements and timing of the light painting may help you achieve a desired result. Thinking of light painting in terms of choreography may inspire you to explore the integration of color, motion, and sound, recorded in high-definition video.
experiment 45: color concertina book

Challenge: Use the accordion structure to create a visual narrative about color

Materials: paper; cardboard; found materials

The first book I made by hand was based on an accordion structure. At the time, I knew very little of the history of books and bookbinding and nothing of the prominence of this form of bookmaking. To me, accordion binding was a simple and elegant way to assemble pages that required no special tools or supplies. The accordion, or concertina, is still one of my favorite book forms. It is an excellent way to begin an exploration of book design and construction.

Think of the concertina as a scroll folded into pages. The scroll can be a single sheet or several smaller sheets attached end to end along the folds. A simple mock-up can be made with a strip of paper, approximately 8 x 2 inches (20 cm x 5 cm) wide. Fold the strip in half to make a 2 x 4 inch (5 x 10 cm) rectangle, and then fold it again to make a 2 inch (5 cm) square. Now, unfold the strip to its full length, and refold in the shape of an accordion. The result is a four-panel accordion book, with four “pages” on each side. This is the basic structure of the concertina.

The goal of this experiment is to play with the concertina book form, using color theory as the subject matter. As you can see in these photographs of a mock-up, the accordion structure has specific characteristics. It can be displayed like a conventional book with pages viewed as spreads, or it can be unfolded and displayed standing up.

The concertina book—indeed, any book—is a three-dimensional object in which the overall shape and every surface must be considered. The visual harmony of a book depends on the relationship of all its parts—size, shape, content, composition, and sequence of the pages, materials, and construction.

Begin this experiment by exploring a variety of accordion structures. Make sketches and simple mockups. Try different forms of construction—folding pages, taping pages together, and connecting pages with tabs. Try different folding schemes, with different size pages, or staggered folds that fan out the pages.

When you are satisfied with your exploration of structure, consider ways to use the accordion form to create a visual narrative that expresses principles of color theory. Begin with a simple plan: Each page in the book is an expression of a distinct color concept. Experiment with this basic plan by making sketches and mock-ups. Consider the number and sequence of pages and how the book will be displayed. Think about the composition of each page and how each page relates to the others. Finally, consider the materials and construction, and test your materials and methodology on a small scale before executing it at full size.

Left, opposite, and following spread: Aerial Chen, contrast of temperature cloth concertina book
experiment 46: type and pattern concertina book

Challenge: Create an accordion book based on a geometric typeface design

Materials: pencils; cut paper; computer

In this experiment, simple geometric forms are used to create all the content for a book: a typeface or group of letterforms based on a single geometric shape and colored patterns made from combinations of the letterforms.

As in our earlier exploration of patterns, this experiment can be created by hand using cut paper or by computer. In those experiments and this one, each technique will result in work with different characteristics. Humanistic patterns are best when the characteristics of working by hand are accepted and celebrated. Computers can synthesize and reproduce humanistic designs, but are much better at expressing machine characteristics. Computer-generated patterns are strongest when they are absolute and precise.

We explored abstraction using geometric forms in experiment 18. The goal in that experiment was to explore the compositional possibilities of a single geometric shape. In our current experiment, the first goal is to use variations of a single geometric shape—a circle, square, or triangle—to create a typeface.

Begin by choosing a geometric form. Each basic form has its own characteristics that inspire different responses. Circles, squares, and triangles all play important roles in conventional letterform design. The influence of these forms can be seen in letterform designs from ancient Roman capitals to Victorian wood type to Bauhaus.

Make sketches of each letter using only combinations of your chosen form. Try to keep each letterform design as simple as possible. The twenty-six designs that comprise your typeface should be visually unified. Think of your typeface as a system of interchangeable parts. Look for relationships between letterforms, and try to find ways to economize the system.

Along with sketching, try playing with cut paper. While sketching is a process of filling outlines, cut paper allows you to immediately see the solid forms of the figure/ground relationship.

Simplicity is important. Each letter must have the potential of becoming a unit in a repeating pattern or of being combined into super-units and employed in patterns.

When you are satisfied with the designs of your geometric typeface, arrange the twenty-six letterforms in an invisible grid. All twenty-six letterforms should be displayed at the same size; each letterform should be surrounded by equal amounts of clear space. A version of this typeface grid will ultimately be displayed in your concertina book, along with patterns made with your letterforms.
The patterns in your concertina book must be based on your letterforms. Begin making patterns by repeating individual letterforms. Explore as many variations as possible: letterforms arranged in ways that allow viewers to recognize the letter; abstract arrangements where recognition is less important or insignificant. As in the earlier pattern experiments, your geometric letterform patterns should also express color theory concepts, such as contrast of light and dark, complementary contrast, contrast of temperature, and contrast of extension.

When choosing colors, consider your memory associations with the geometric forms and patterns and, perhaps, with the letterforms themselves. Combinations of colors and patterns can be as universally symbolic as possible or personally expressive. For example, it is common to associate a red and white checkerboard pattern with summer picnics and perhaps cooking in general. The same pattern in black and white has nearly universal recognition as the finish flag in racing. It is possible for each of us to carry more specific associations with these color patterns. I have personal and not-very-appealing associations of a red and white checkerboard pattern with a certain fish shack in Maine. The black and white version of the pattern reminds me of ska music, which I associate positively with a creative time and place in my life.

When you are satisfied with your pattern designs, it is time to assemble the parts into an accordion structure. Determine the size and shape of the pages. Play with the number and sequence of pages—the order and arrangement of the typeface grid and the patterns. Remember to consider all sides of the concertina.

When you are satisfied with the pagination, begin carefully constructing the book. If you are assembling the book by hand with compositions of layered paper, be sure to consider the thickness of each page in relation to the folding scheme—depending on their thickness, the pages may need to be attached with enough space around the folds to allow the book to close. Getting this right will require experimentation.

If you are designing on the computer, you must determine how the pages will be printed. If you are using a letter or tabloid-size printer, your page size must fit within the printable boundaries. For example, a page that is 8 x 8 inches (20 x 20 cm) can be printed as a single page on a letter-size printer or as a two-page spread on a tabloid-size printer. If you have the means to print on both sides of the paper, you can do so. However, accommodations must be made for connecting the pages or spreads together with tape or tabs—ideally, the connections should be integrated into the design of the pages. It is also possible to print to a roll of paper that can be folded into an accordion structure. Of course, you can avoid this complication by printing only on one side and either making the concertina a one-sided book or attaching single-sided prints back to back for a double-sided concertina.

Below and following spread: Juwon Kang, pattern book with typeface and shapes computer renderings, digital prints
experiment 47: color pop-up book

Challenge: Express color contrast in pages that move

Materials: colored paper

A pop-up book is a variation of a movable book. The earliest movable books were manuscripts with rotating parts, designed for anatomical instruction, to map and predict the movements of planets and stars, and later for entertainment. The pop-up form is defined by folding paper. Pop-ups were invented in the nineteenth century as entertainment for children, who continue to be the main audience. The imagery in pop-ups has evolved along with forces in art and design, ranging from representational to abstract.

The goal in this experiment is to use pop-ups to illustrate color theory concepts. Begin by experimenting with simple pop-up techniques. The simplest is a reverse fold:

1. Fold a sheet of paper in half.
2. In the center of the fold, make two parallel cuts of equal length, perpendicular to the fold.
3. Unfold the sheet to make an L-shape
4. Carefully reverse the fold between the two cuts by pushing the section forward.
5. Flatten the L-shape against a smooth, hard surface and lightly burnish.
6. Unfold the sheet to an L-shape and see the pop-up.

This simple technique can be modified to make a variety of pop-up effects. Experiment with the basic forms. Instructions for making more complex pop-ups can be found on the Web. As you experiment, consider ways to use the folding forms to express color theory concepts.

Your color pop-up book should have four to five spreads. This will allow you to explore a variety of color theory concepts and create a dramatic visual narrative.

A pop-up book is essentially a sequence of folded pop-up forms. When unfolded, each pop-up form is a two-page spread. The movement of opening the book expands the first pop-up. Turning the page automatically compresses the first pop-up and opens the next spread, expanding the second pop-up, and so on.

When you have a basic plan for the pop-up book, create a small mock-up. Be sure to account for all the spreads. Consider the sequence of the pages—how one spread leads to another, what happens when the book is opened in the middle or when the spreads are viewed in reverse order. Think about the rhythm of the colors and forms as the pages are opened and closed. Use contrast to create dynamic relationships between the spreads.

The size and shape of the pages should be consistent so that when they are connected they form a unified stack. Construct each full-size pop-up form individually, and then put them together with glue, stitching, or tabs.

For a book of this kind, I recommend designing the covers last, after the inside pages are finished. The cover should be an expression of the content, but not necessarily a repetition or variation of the designs seen inside. In the case of a pop-up book, the cover design should suggest the content in a simple and elegant manner—the effect of the first pop-up will be more surprising.

Other movable book forms include transformations, in which vertical slats are pushed and pulled to animate parts of the page; volvelles, books that feature pages with rotating parts; and tunnel books, in which pages with cutouts are viewed through a hole in the cover and resemble theatrical stage sets. For those with a knack for cutting and folding paper, movable books are the ultimate form of expression.
Opposite, above, and following spread:
Aerial Chen, complementary contrast pop-up book, found paper
experiment 48: perpetual color calendar

**Challenge: Express time using an adaptable color system**

Materials: acrylic paint on wood blocks

This experiment was developed by one of my former students, Kenton Powell. Powell is now an information designer—his job is to use form and color to express information.

I presented Powell with this challenge: express time using an adaptable color system, preferable in an analog manner, using simple materials and methodologies. His response was to first locate a source for a perpetual calendar system, and second, devise a corresponding color system.

This particular perpetual calendar kit is made of smooth, unpainted wooden blocks—an ideal surface for acrylic paint. There are six parts: the base cradle, three rectilinear “month” blocks, and two cube shaped “date” blocks. When the date blocks are placed side by side, they are the width of a month block. When the blocks are stacked together and viewed from the front, we see a combination of three colors, expressing the day and month.

Powell devised this color system for displaying the dates in the perpetual calendar:

0 = dark blue  
1 = red-orange  
2 = blue-green  
3 = dark yellow  
4 = dark green  
5 = purple  
6 = light blue  
7 = warm pink  
8 = cool pink  
9 = light blue

When placed side by side, the date blocks must display the two-unit number combinations that represent the days of every month: 01, 02, 03 ... 10, 11, 12 ... 20, 21, 22 ... 30, 31.

The two date blocks are colored accordingly:

- Block one, side one: dark blue  
- Block one, side two: red-orange  
- Block one, side three: blue-green  
- Block one, side four: light blue  
- Block one, side five: warm pink  
- Block one, side six: cool pink

- Block two, side one: dark-blue  
- Block two, side two: red-orange  
- Block two, side three: blue-green  
- Block two, side four: purple  
- Block two, side five: dark yellow  
- Block two, side six: dark green

The twelve long sides of the three rectangular “month” blocks are painted the twelve colors of Itten’s color wheel, signifying the twelve months.

Feel free to adapt the structure of this system using your own colors. Perhaps there are certain colors and color combinations that you associate with specific dates. Or you might choose a color effect that suggests time—for example, a range colors that suggest transitions, from early in the month to late, from one season to another.
Dates and corresponding color sets:

- 01 = dark-blue/red-orange
- 02 = dark blue/blue-green
- 03 = dark blue/dark yellow
- 04 = dark-blue/dark green
- 05 = dark-blue/purple
- 06 = dark-blue/light blue grain v.
- 07 = dark-blue/warm pink
- 08 = dark-blue/cool pink
- 09 = dark-blue/light blue grain h.
- 10 = red-orange/dark blue
- 11 = red-orange/red-orange
- 12 = red-orange/blue-green
- 13 = red-orange/dark yellow
- 14 = red-orange/dark green
- 15 = red-orange/purple
- 16 = red-orange/light blue grain v.
- 17 = red-orange/warm pink
- 18 = red-orange/cool pink
- 19 = red-orange/light blue grain h.
- 20 = blue-green/dark blue
- 21 = blue-green/red-orange
- 22 = blue-green/blue-green
- 23 = blue-green/dark yellow
- 24 = blue-green/dark green
- 25 = blue-green/purple
- 26 = blue-green/light blue grain v.
- 27 = blue-green/warm pink
- 28 = blue-green/cool pink
- 29 = blue-green/light blue grain h.
- 30 = dark yellow/dark blue
- 31 = dark yellow/red-orange
experiment 49: bookshelves and other installations

Challenge: Create arrangements of common objects based on color theory principles

Materials: books and other objects

In this experiment, we explore ways to organize collections of colorful objects. We begin our exploration with books—for most artists and designers, they are perhaps the most common collectible. From there, you are encouraged to explore organizations of other, more personal and exotic collections, and to think in terms of installation.

Artists and designers tend to collect books—especially books about art and design. As electronic books become a larger part of our lives, physical books become even more collectable. The display of books is a common concern. We typically arrange them in shelves and stacks based on subject, title, and size, and sometimes, if we are lucky enough to possess rare books by their age and value. Appearance is certainly important to collecting. But when it comes to arranging books, the physical characteristics of form and color are usually secondary considerations to accessibility—our ability to find what we are looking for.

So what happens when we reverse the criteria and arrange books by their physical appearance? We change the concept of the bookshelf. Subject and title become secondary considerations—the arrangement is determined by the form and color of the book covers. The functionality of the bookshelf changes from accessibility to aesthetics. We fully acknowledge the existence of books as objects—more than just words on pages. We celebrate their existence by grouping them in compositions of form and color.

Begin this experiment by separating your collection of books into groups according to the colors of their spines. Within each color group, arrange the books from large to small. Now, with your colors before you, explore ways to combine the books to express principles of color theory: contrast of light and dark, complementary contrast, contrast of temperature and extension, color chords, and color illusion. A bit of online research will provide examples of predictable responses—colors arranged according to Itten’s color wheel. Your challenge is to go beyond the predictable. Be alert for serendipity. You may find that arranging by color and form leads to unusual groupings of subjects and titles.

Bookshelves are an excellent introduction to the exploration of installation art. They are interactive, three-dimensional, site specific, temporary or semipermanent, composed of everyday materials—all characteristics of installation art. Installations are often transformative. Everyday objects transcend their original identities.

In the second part of this experiment, the goal is to explore color contrast and illusion with a different collection of objects. As in our exploration of bookshelves, your challenge is to go beyond predictable responses. Look for playful relationships of color, form, and environment—combinations that transform how we perceive and define the objects.

Opposite: Bandana color grid, from the collection of Paul Melesching
experiment 50: a color theory dinner party

**Challenge:** Make a meal based on color theory concepts (and still make it taste good)

**Materials:** food

This experiment was inspired by a student’s response to an assignment in my Principles of Visual Language class: Create a free-study composition based on complementary contrast, due the following week.

A week later, before we began our critique of the work, the student, Alexandria Maranto, asked to present her work last, after all of her classmates. Three hours later, after looking at many complementary color projects, Alex produced a tray of complementary cupcakes. Her project is a beautiful integration of concept and form. It began with a playful idea, followed by a design process that involved invention and improvisation. The presentation was perfectly executed—a truly memorable display of complementary contrast, and a welcome treat for a group of hungry students. It was an ideal conclusion to our discussion of complementary contrast.

The complementary cupcake project led me to ask the obvious question: Can other principles of color theory be used in prepared food? Food photographers and stylists use color theory in their work, and good chefs are aware of the effects of color on the perception of taste. But in most cases, the colors of professionally prepared food are secondary to taste. I was curious about what would happen if the idea of complementary cupcakes was taken further—when taste, color, and forms are considered equally, when the intention is to make food that tastes and looks good, and the results are beautiful and memorable displays of color contrast.

My curiosity was completely satiated by the Feed Me Collective—a group of friends who perform culinary experimentation within a framework of thematic dinner parties. (Some past themes: “the culinary pursuit of world peace,” “the South will rise again,” “wonders of the world”)

A theme is chosen and each participant is assigned a course related to the theme. There are usually eight courses and eight participants. Most of the food is prepared on the spot.

I proposed the idea of an eight-course dinner based on color theory principles:

- Prep-time snacks and cocktails must be in a secondary color chord.
- The appetizer must express contrast of temperature.
- The first main course must express contrast of light and dark.
- The second main course must express complementary contrast.
- The side dish must express the illusion of transparency.
- The third main course must include two different colors that appear to look alike.
- The fourth main course must use the primary color chord.
- Dessert must make one color look like two.

The participants were shown examples of these color theory concepts in conventional color study form—color grids, stripe compositions, Albers’s color studies, and illusion of transparency compositions. The results are displayed on the following pages. Each course tasted good, looked appetizing, and in most cases satisfied the corresponding goals. The mixture of playfulness and commitment was very impressive.
Food by the Feed Me Collective

At the end of the dinner, I asked the cooks if color theory would continue to play a role in their food preparation. Everyone agreed that while they would never compromise taste in order to achieve a color effect, the experience had indeed transformed their awareness of color in cooking, and perhaps in other parts of their lives. In their own ways they had become connoisseurs of color.
conclusion: the joy of seeing color in nature

To me, there is no better way to appreciate the principles of color theory than to discover them in nature. I’m very lucky to have access to city parks and rural gardens. As I write this, it is still early spring. Flowers and trees are blooming, producing fantastic color combinations. My eye for color makes every trip outside a journey of discovery.

I grew up in greenhouses in northwestern Minnesota. My parents were in the flower business. They grew seasonal plants, and they created “flower arrangements”—three-dimensional compositions using organic forms. They were self-taught floral designers. They took specific inspiration from FTD catalogs, copying the arrangements in the photographs as closely as possible. Visual harmony was the goal of every assignment. The compositions were based on symmetrical and asymmetrical balance. Contrast of color, size, shape, position, direction, and texture was combined to achieve a clear sense of organization. The work was very precise, but in an organic way. There always seemed to be room for variation—the little notes of expression were the details that gave each arrangement its authenticity.

The greenhouse environment nourished my awareness of color. Unaware of color theory, I was surrounded by beautiful examples of color contrast. At Christmastime, the perfect complementary chord of poinsettias in deep red and green; in early spring, the subtle contrast of light and dark in the white flower of a lily. Later, spring and summer plants—geraniums in red and green, pansies in violet and yellow, and the radial and star-shaped color gradients in petunia blossoms. In September, we picked wild cattails with red-hued spikes. The refrigerated display usually contained varieties of roses—red, pink, yellow, white—and assorted seasonal cut flowers in pastels and fully saturated colors. In addition, color contrast was on daily display in the racks of ribbons, glitter, foil, and paints that were used to add decoration to the flower arrangements and plants. The ribbons were stacked side by side and arranged by hue—they resembled stripe compositions.

Now, I see color contrast everywhere, and especially in nature. Contrast of light and dark is part of every day. As morning changes to night, the color of the sky changes in brightness and hue. Wherever we see light and shadow, we see gradations of dark and light. Watching a sunset over water is a perfect way to observe the complements of blue and orange and their mixtures.

The photos shown here were taken in our friend Louise’s summer garden on the north fork of Long Island. In this simple but glorious sanctuary, blue sky becomes the cool ground for warm red blossoms on a trumpet vine, whose green stems and leaves are the blossom’s complement. Yellow, yellow-green, and pure green suggest the relationship of the Earth and the Sun. The colors of a ripe tomato form a beautiful gradation, like a section of the color wheel: red-orange, orange, yellow-orange, yellow, yellow-green, green. Variations of yellow and violet color the landscape. Contrast of light and dark can be seen in the wings of a Monarch butterfly.

When we observe colors in nature, we exercise our sense of sight in the most elegant and harmonious way possible. The colors of nature can be seen as inspiration for making art, or they can simply be seen. Each experience is uniquely loaded with the possibility of discovery.
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2. Ibid., 17.
4. Paul Rand, A Designer’s Art; 189.
5. Ibid., 201.
6. Ibid., 218.
8. Johann Wolfgang von Goethe; Theory of Colours; 1810.
10. Ibid., 17.
12. Ibid., 24.
15. Ibid., 21.
17. Ibid., 20.
18. Ibid., 7.
19. Ibid., 24.
20. Paul Rand, A Designer’s Art; 197.
22. Ibid., 39.
23. Ibid., 39.
24. Ibid., 61.
25. Paul Rand, A Designer’s Art; 197.
26. Ibid., 197.
27. Jan Tschichold, Treasury of Alphabets and Lettering; 23.
29. Ibid., 131.
30. Ibid., 131.
31. Ibid., 130.

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www.playingwithcolorbook.com

The author will respond to questions about the color experiments described in Playing with Color and comment on color work posted by readers. He will also post new examples of color projects created by his students and other color-related food for thought. Readers are encouraged to join in the dialogue.