DESIGN PRINCIPLES:

RHYTHM

BALANCE

FIGURE/GROUND

FORMAL CHARACTERISTICS:

SHAPE

SCALE

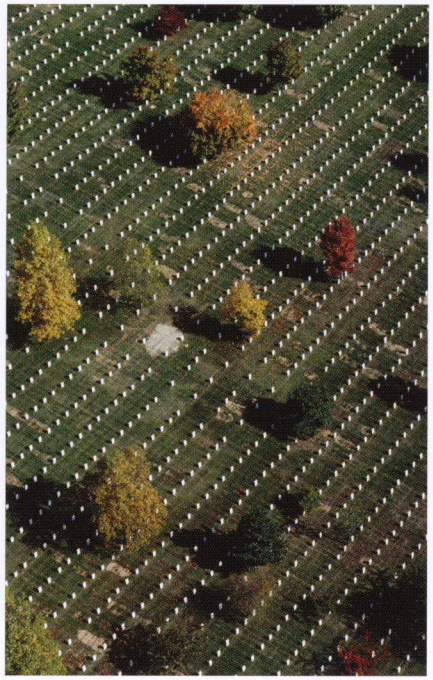
TRANSPARENCY

COLOR

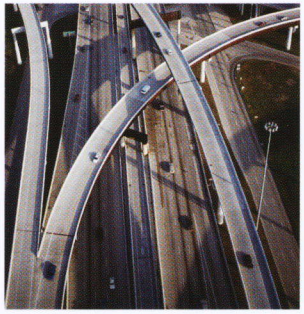
DESIGN PRINCIPLE

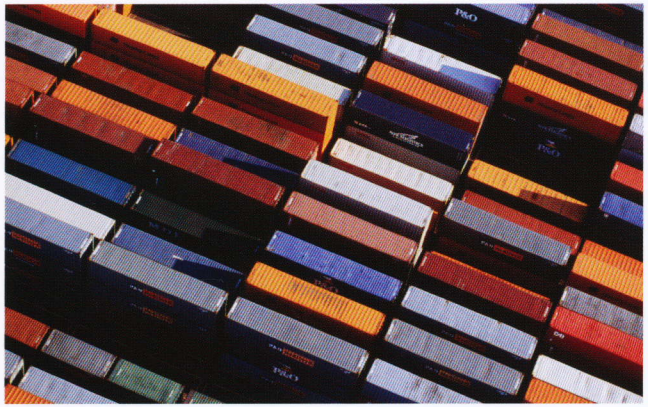
RHYTHM & PATTERN

Repetition & Change



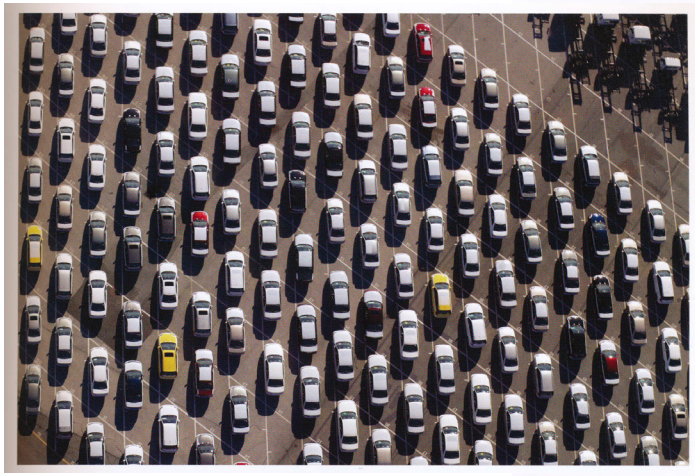
Highway Overpasses, Houston, Texas





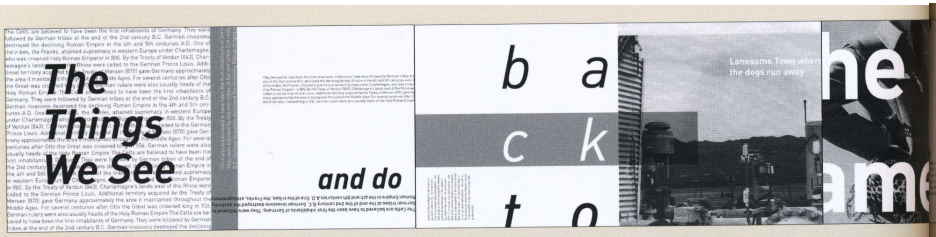
Shipping Containers, Norfolk, Virginia

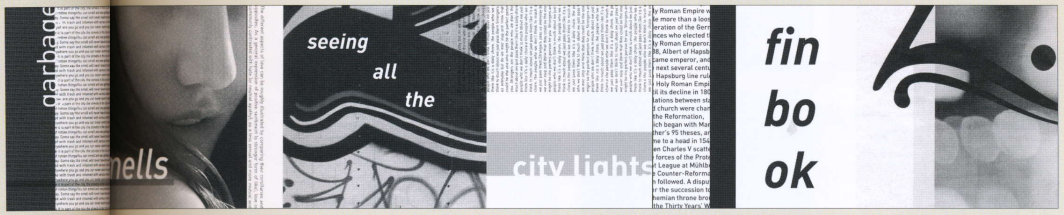
Repetition and Change
From the flowing contours of a farmer's fields to a sea of cars tucked into the lined compartments of a parking lot, repetition is an endless feature of the human environment. Like melodic consonance and fervent discord in music, repetition and change awaken life's visual juxtapositions. Beauty arises from the mix.



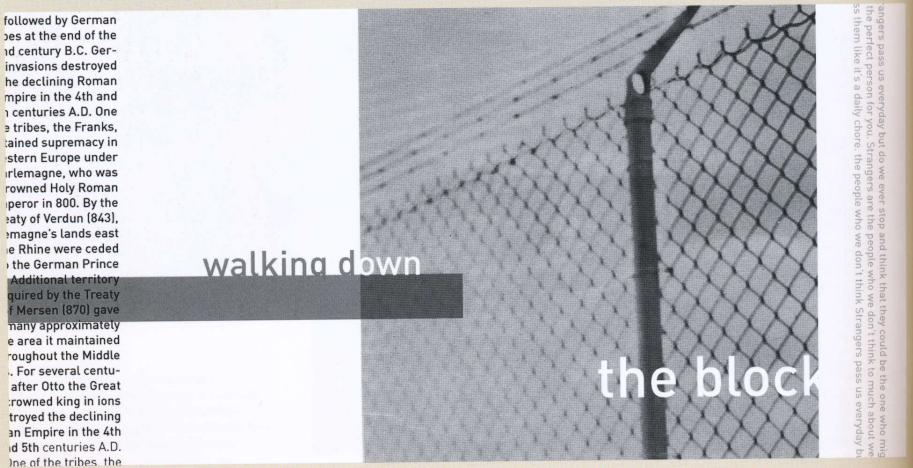
Contour Farming, Meyersville, Maryland

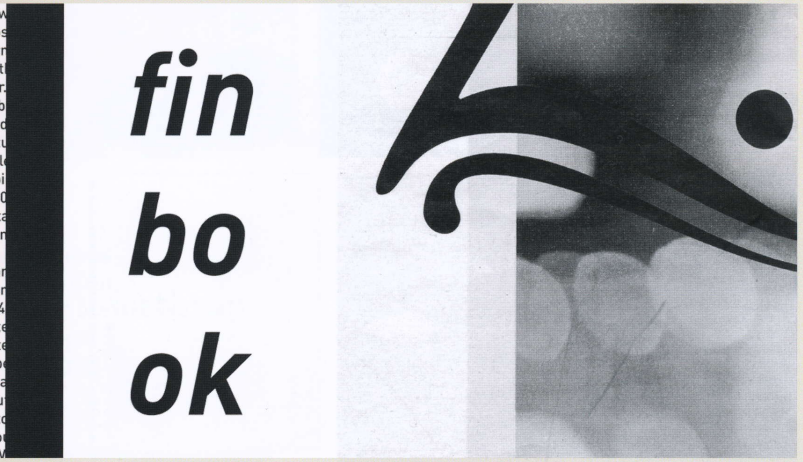
Consistency & Variety





Rhythm and Pacing
Designers often work with content distributed across many pages. As in a single-page composition, a sequential design must possess an overall coherence. Imagery, typography, rules, color fields, and so on are placed with mindful intention to create focal points and to carry the viewer's eye through the piece. An underlying grid helps bring order to a progression of pages. Keeping an element of surprise and variation is key to sustaining interest.





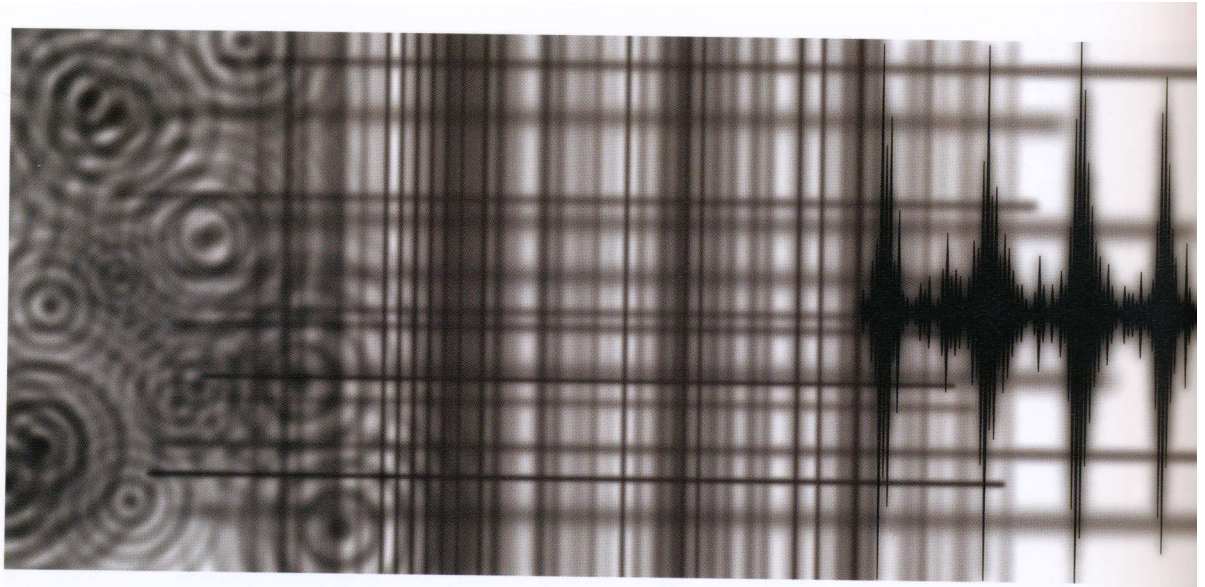
Found Rhythms In this project, designers cut a 2.5-inch square cleanly through a magazine, yielding dozens of unexpected compositions. Each designer used ten of these small squares as imagery in an accordion book. The squares were scanned at 200% and placed into a page layout file (formatted in 5-inch-square pages) and paired with a text gathered from Wikipedia.

Each designer created a visual "story" by considering the pacing and scale of the images and text within each spread and across the entire sequence. Working with found or accidental content frees designers to think abstractly. Molly Hausmann, Typography I. Jeremy Botts, faculty.

Contrast

Pattern Dissonance Letterforms with abruptly shifting features are built around a thin skeleton. The strange anatomy of the letters plays against the comfortable, gentle rhythms of the old-fashioned wallpaper behind them. Jeremy Botts, MFA Studio.

Time & Sound



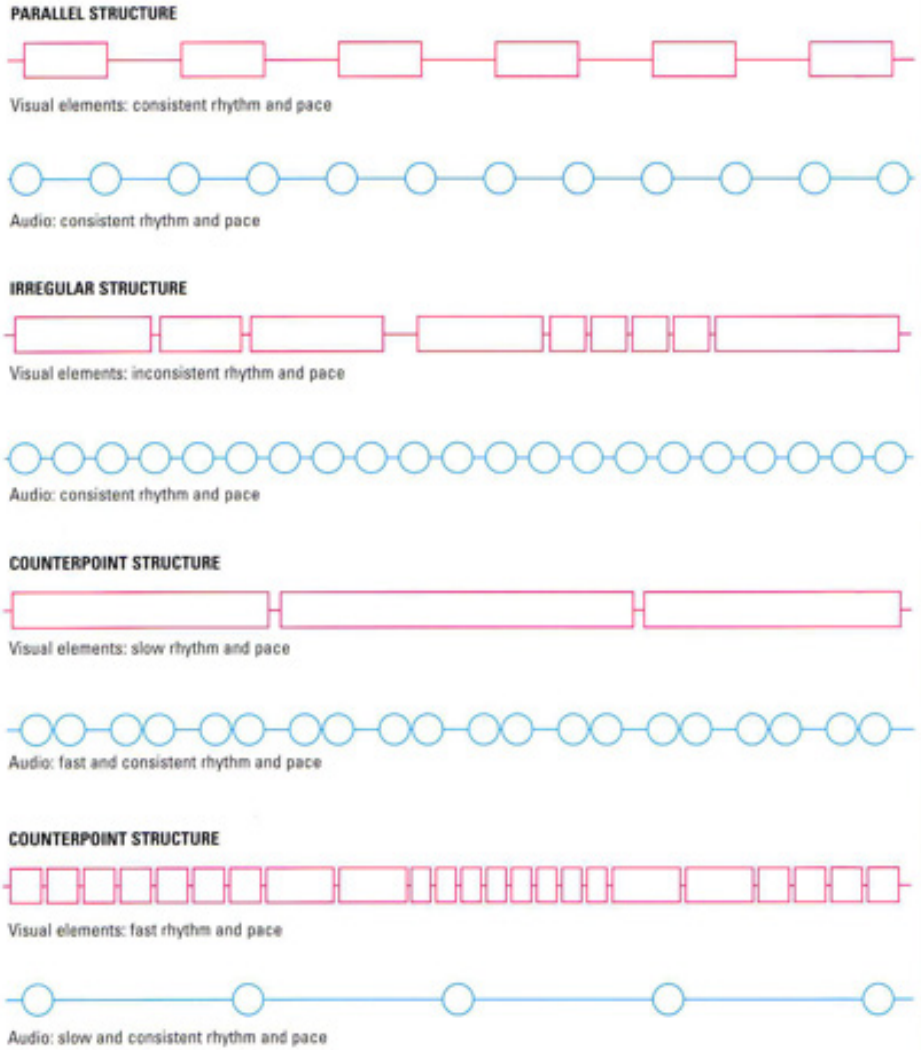
Jason Okutake, MFA Studio

Rhythm and Time
We are familiar with rhythm from the world of sound. In music, an underlying pattern changes in time. Layers of pattern occur simultaneously in music, supporting each other and providing aural contrast. In audio mixing, sounds are amplified or diminished to create a rhythm that shifts and evolves over the course of a piece.

Graphic designers employ similar structures visually. The repetition of elements such as circles, lines, and grids creates rhythm, while varying their size or intensity generates surprise. In animation, designers must orchestrate both audio and visual rhythms simultaneously.

Frozen Rhythms Long-exposure photography records physical movements in time on a two-dimensional surface. Sketching with light yields a rhythmic line of changing intensity. Jason Okutake, MFA Studio.

Structures & Sequence

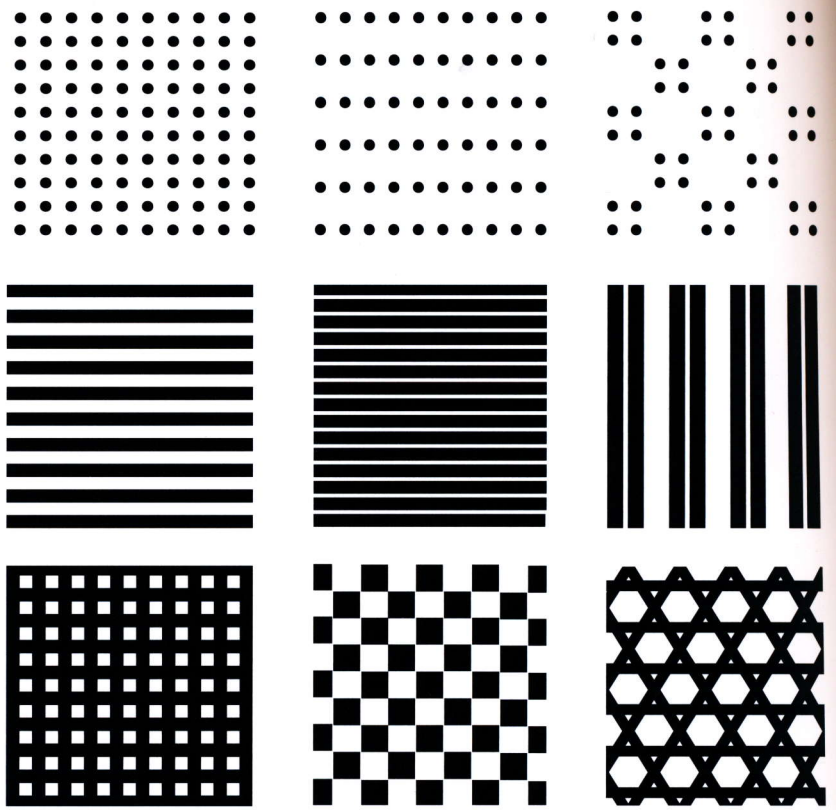


Design Elements

Dots, Stripes, and Grids
In the nineteenth century, designers began analyzing how patterns are made. They found that nearly any pattern arises from three basic forms: isolated elements, linear elements, and the criss-crossing or interaction of the two.[1] Various terms have been used to name these elementary conditions, but we will call them dots, stripes, and grids.

Any isolated form can be considered a dot, from a simple circle to an ornate flower. A stripe, in contrast, is a linear path. It can consist of a straight, solid line, or it can be built up from smaller elements (dots) that link together visually to form a line.

These two basic structures, dots and stripes, interact to form grids. As a grid takes shape, it subverts the identity of the separate elements in favor of a larger texture. Indeed, creating that larger texture is what pattern design is all about. Imagine a field of wildflowers. It is filled with spectacular individual organisms that contribute to an overall system.



1. Our scheme for classifying ornament is adapted from Archibald Christie, *Traditional Methods of Pattern Designing; An Introduction to the Study of the Decorative Art* (Oxford: Clarendon Press, 1910).

From Point to Line to Grid As dots move together, they form into lines and other shapes (while still being dots). As stripes cross over each other and become grids, they cut up the field into new figures, which function like new dots or new stripes.

Some of the most visually fascinating patterns result from figure/ground ambiguity. The identity of a form can oscillate between being a figure (dot, stripe) to being a ground or support for another, opposing figure.

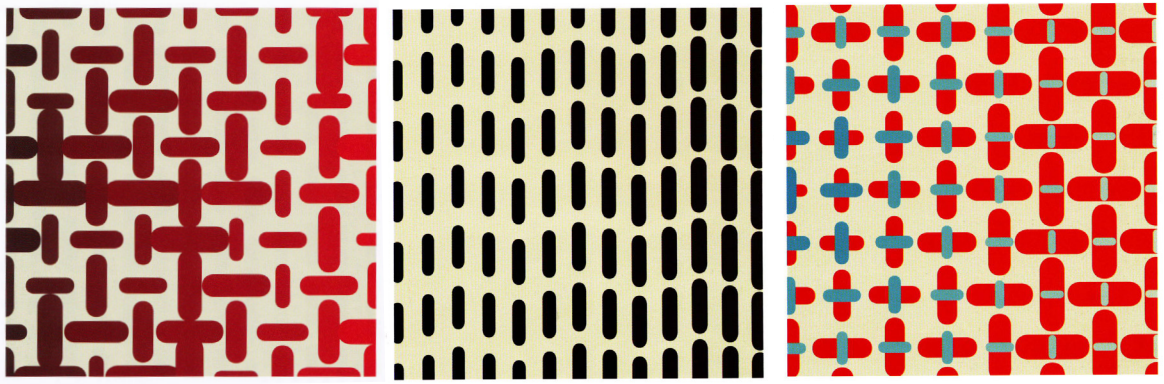
Pattern

Repeating Elements
How does a simple form—a dot, a square, a flower, a cross—populate a surface to create a pattern that calms, pleases, or surprises us?

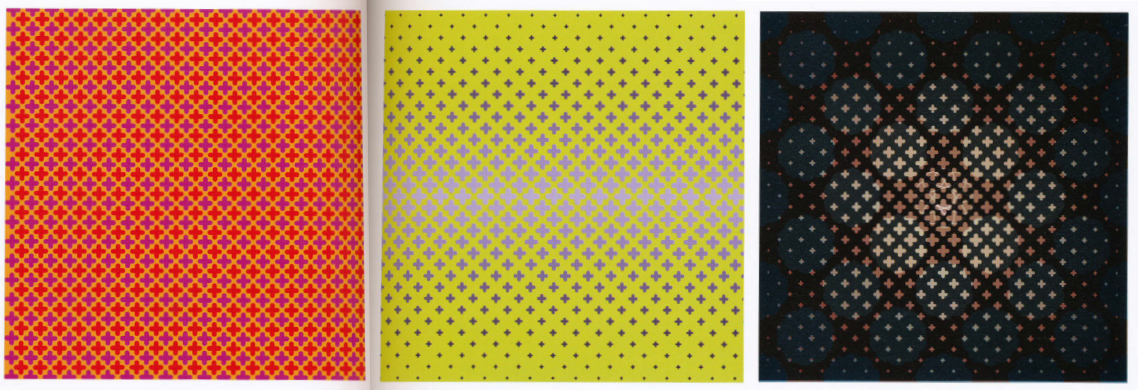
Whether rendered by hand, machine, or code, a pattern results from repetition. An army of dots can be regulated by a rigid geometric grid, or it can randomly swarm across a surface via irregular handmade marks. It can spread out in a continuous veil or concentrate its forces in pockets of intensity.

In every instance, however, patterns follow some repetitive principle, whether dictated by a mechanical grid, a digital algorithm, or the physical rhythm of a craftsperson's tool as it works along a surface.

In the series of pattern studies developed here and on the following pages, a simple lozenge form is used to build designs of varying complexity. Experiments of this kind can be performed with countless base shapes, yielding an endless range of individual results.



One Element, Many Patterns The basic element in these patterns is a lozenge shape. Based on the orientation, proximity, scale, and color of the lozenges, they group into overlapping lines, forming a nascent grid. Jeremy Botts, MFA Studio.



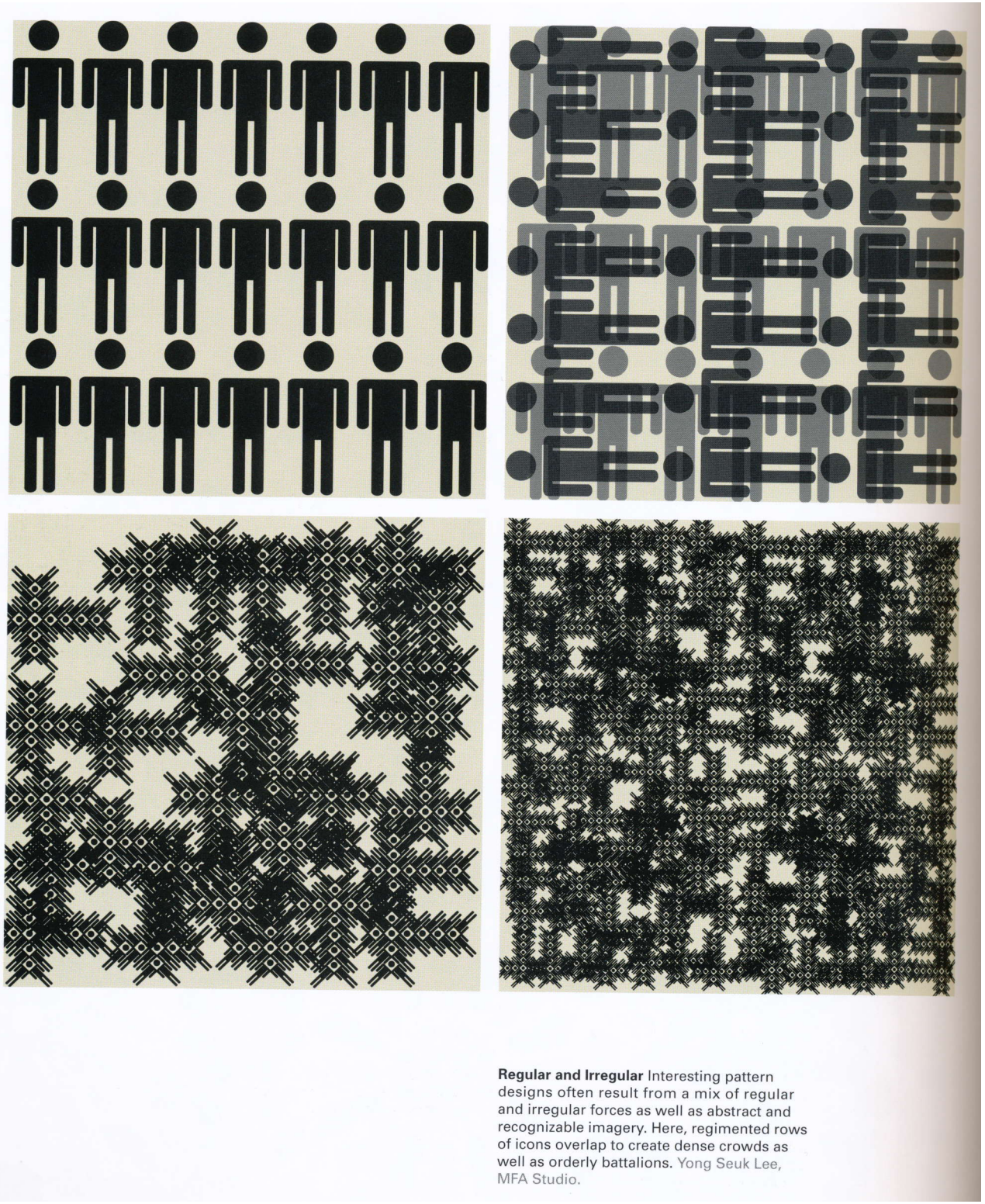
One Element, Many Patterns In this series of designs, the lozenge shape functions as a dot, the primitive element at the core of numerous variations. This oblong dot combines with other dots to form quatrefoils (a new super-dot) as well as lines.

As lozenges of common color or orientation begin to associate with each other visually, additional figures take shape across the surface. Jeremy Botts, MFA Studio.

Changing Color, Scale, and Orientation Altering the color contrast between elements or changing the overall scale of the pattern transforms its visual impact. Color shifts can be uniform across the surface, or they can take place in gradients or steps.

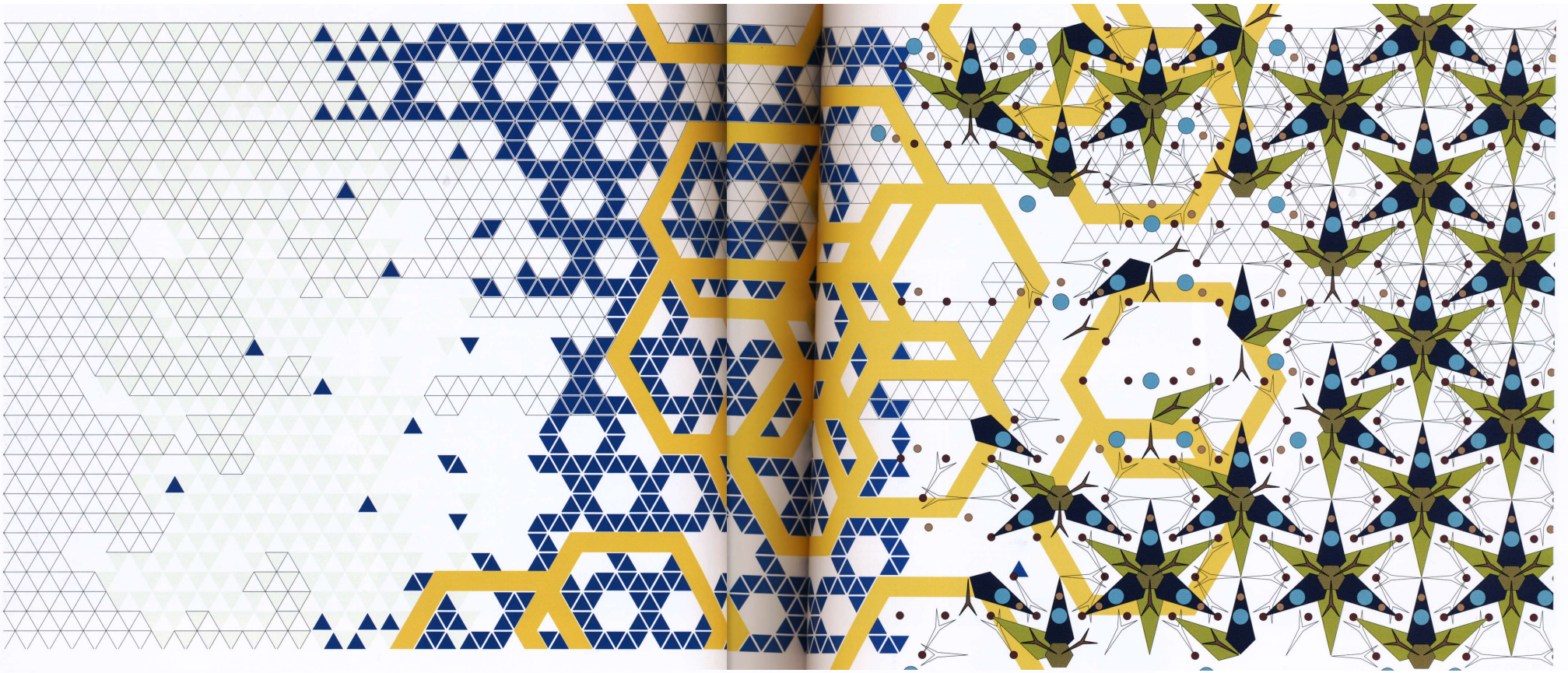
Turning elements on an angle or changing their scale also creates a sense of depth and motion. New figures emerge as the lonzenge rotates and repeats. Jeremy Botts, MFA Studio.

Regular & Irregular



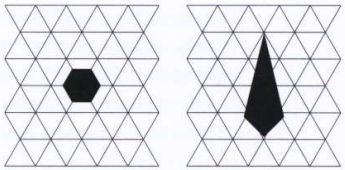
Regular and Irregular Interesting pattern designs often result from a mix of regular and irregular forces as well as abstract and recognizable imagery. Here, regimented rows of icons overlap to create dense crowds as well as orderly battalions. Yong Seuk Lee, MFA Studio.

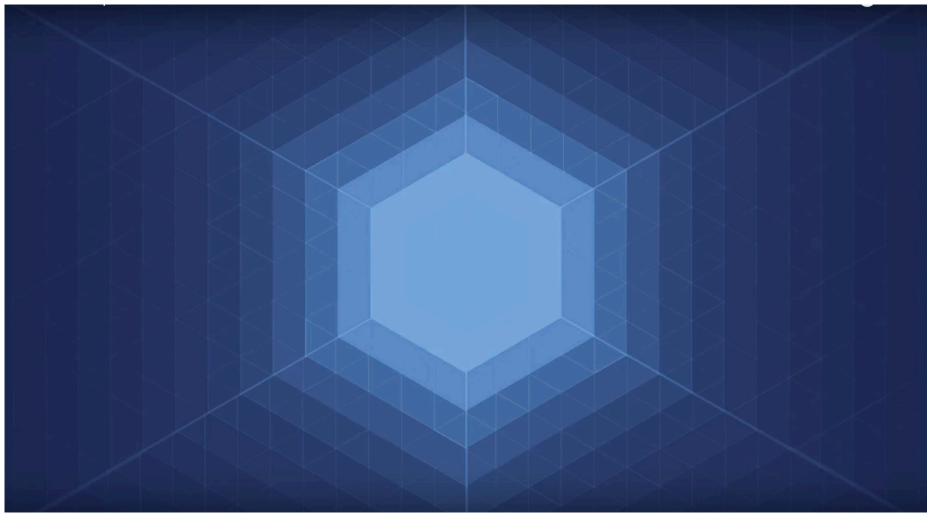
Grid

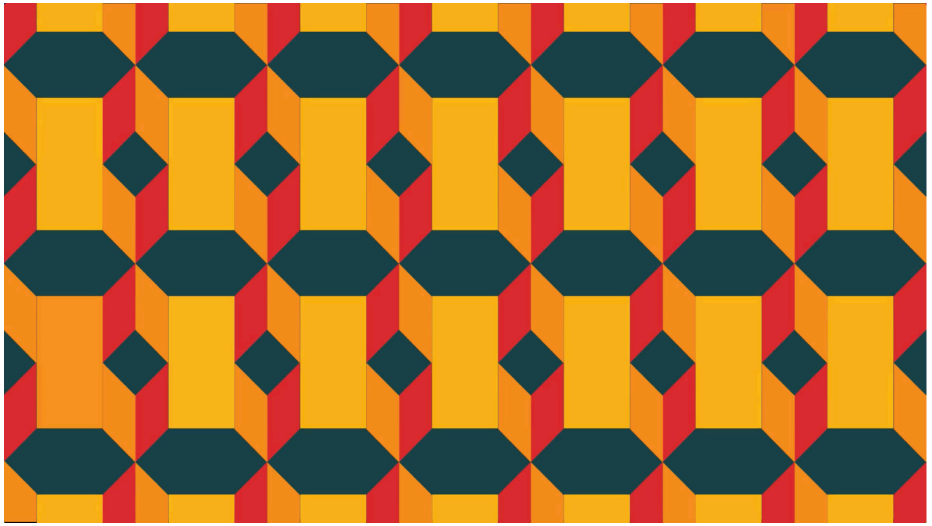


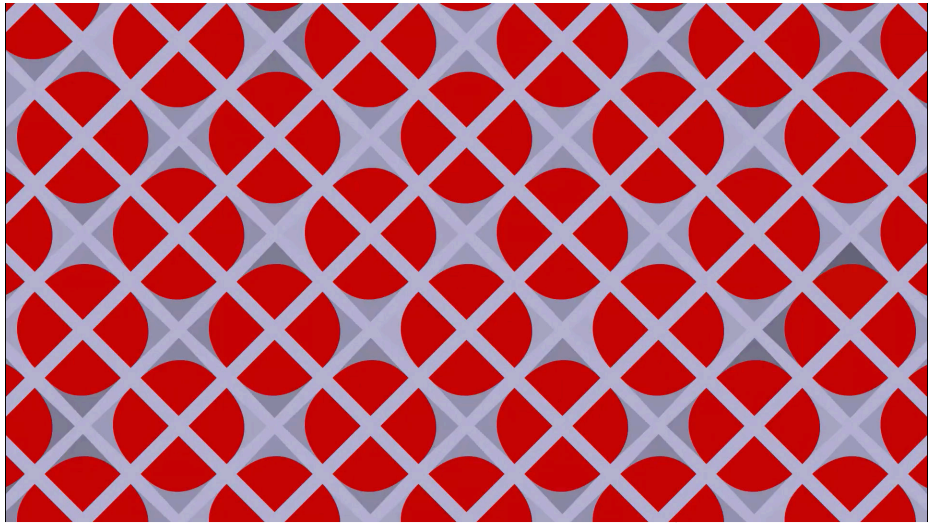
Grid as Matrix An infinite number of patterns can be created from a common grid. In the simplest patterns, each cell is turned on or off. Larger figures take shape as neighboring clusters fill in.

More complex patterns occur when the grid serves to locate forms without dictating their outlines or borders. Jason Okutake, MFA Studio.





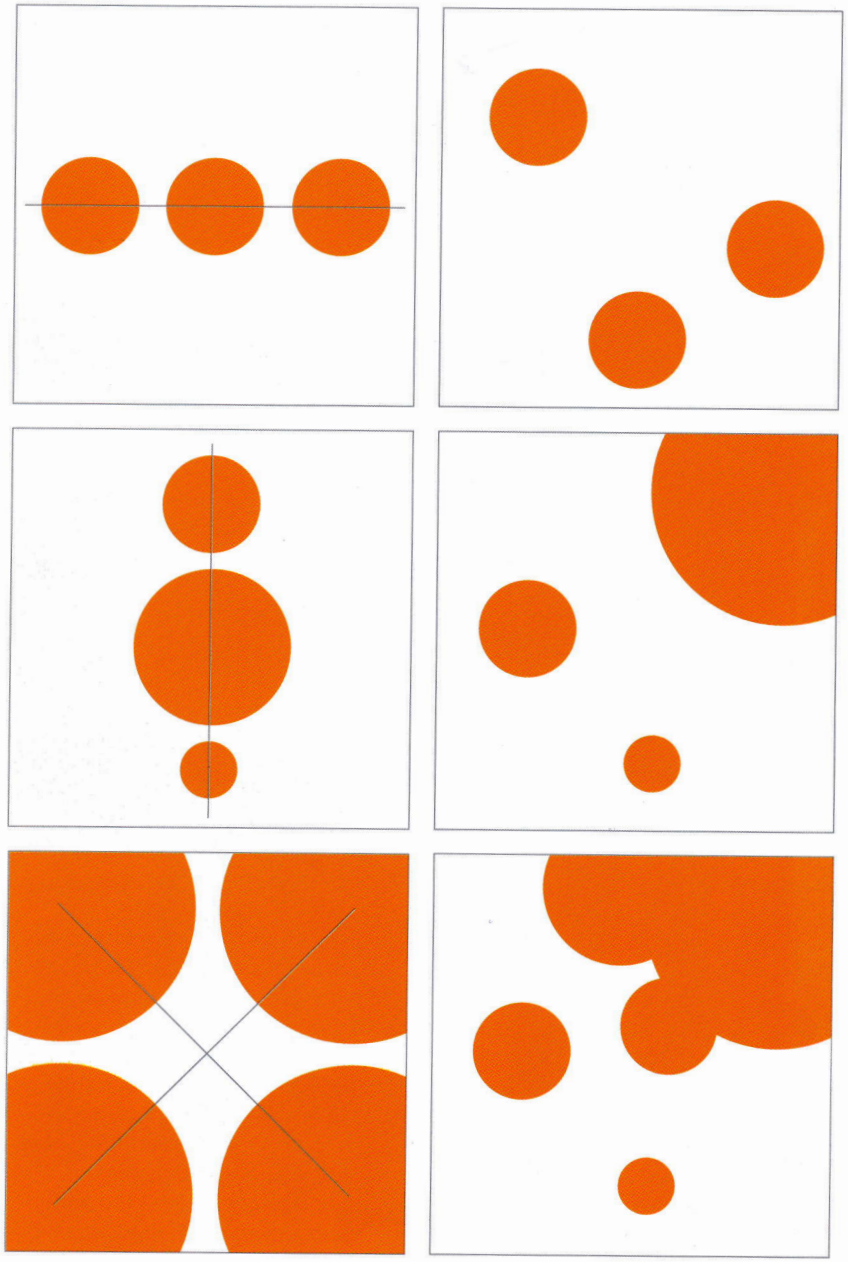




DESIGN PRINCIPLE

BALANCE

Symmetry & Asymmetry



Symmetry and Asymmetry
Symmetry can be left to right, top to bottom, or both. Many natural organisms have a symmetrical form. The even weighting of arms and legs helps insure a creature's safe mobility; a tree develops an even distribution of weight around its core to stand erect; and the arms of a starfish radiate from the center.

Symmetry is not the only way to achieve balance, however. Asymmetrical designs are generally more active than symmetrical ones, and designers achieve balance by placing contrasting elements in counterpoint to each other, yielding compositions that allow the eye to wander while achieving an overall stability.

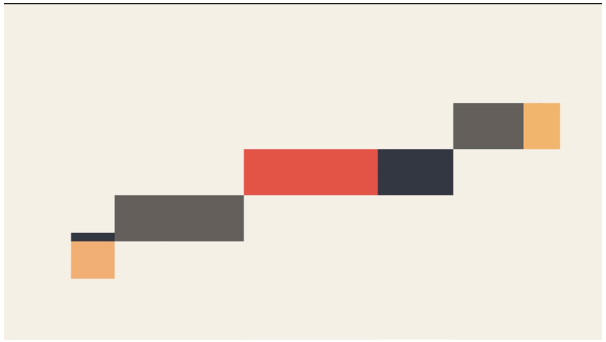
Symmetry The studies above demonstrate basic symmetrical balance. Elements are oriented along a common axis; the image mirrors from side to side along that axis. The configurations shown here are symmetrical from left to right and/or from top to bottom.

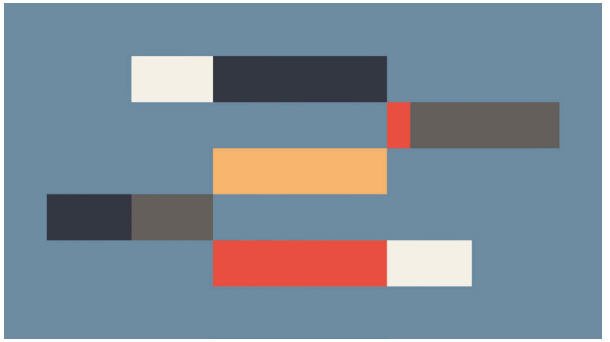
Asymmetry These studies use asymmetry to achieve compositional balance. Elements are placed organically, relying on the interaction of form and negative space and the proximity of elements to each other and to the edges of the field, yielding both tension and balance.

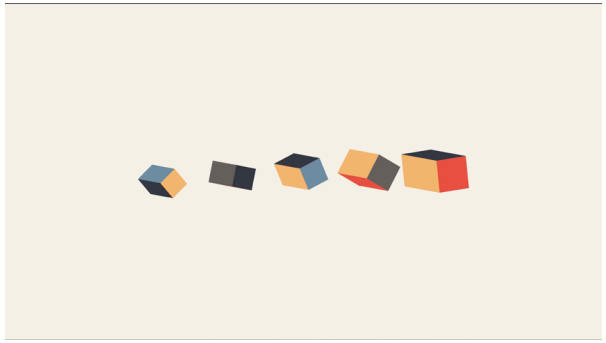
Symmetry and Asymmetry The designer has cropped a symmetrical form in order to create an asymmetrical composition. A rhythm of repeated elements undulates across the surface. The larger ornamental form has been shifted dramatically off center, yielding dynamic balance. Jeremy Botts, MFA Studio.

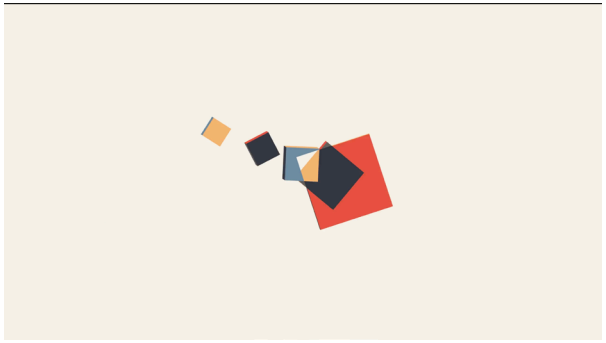
Type

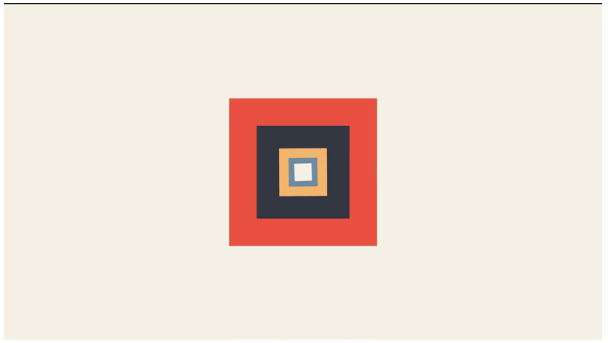

ready
16 people
HAVE LISTENED TO HER TEARS
CHOKE IN HER SLEEP
AS SHE LAY BESIDE HIS CORPSE
HAVE STOOD AT NIGHT
BESIDE HIS BROTHERS GRAVE
OR
HAVE DRAGGED HIM
HALF DEAD
ACROSS THE FROZEN GROUND
HEARD HIS MOTHER SCREAM
AS SHE LEARNED
THAT HER SON WAS AT LAST
I'm
not
going
to
thanks f
HEY
Giorgio Napolitano
Dick Cheney
Fidel Castro
Stephen Harper
Pope Benedict XVI
Alvaro Uribe
Queen Elizabeth II
Asif Ali Zardari
Pratibha Patil
and
I'm
not
going
to
follow complex
issues
programs
SPAWNING GOVERNMEI
BY CREATED
they themselves
most cases that
RESPONDTO CRISIS
INVARIABLY
N
E
W
THEY'RE
CUNNING
BUGGERS,
HUMANS.
I'm
not
going
to
read the
newspaper
50
went
inside of
HERBERT
GLERBETT.
POUNDS OF
of SOME
strange THING
that does not
SMILE.
and
I'm
not
going
to
vote

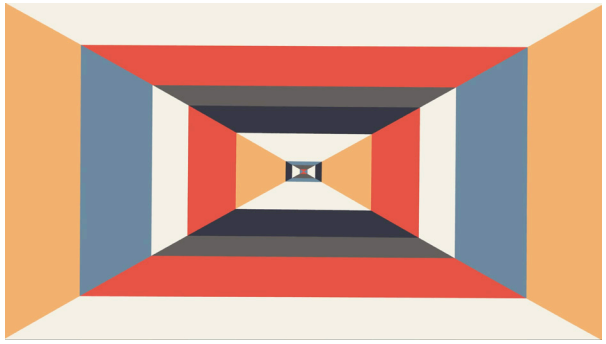


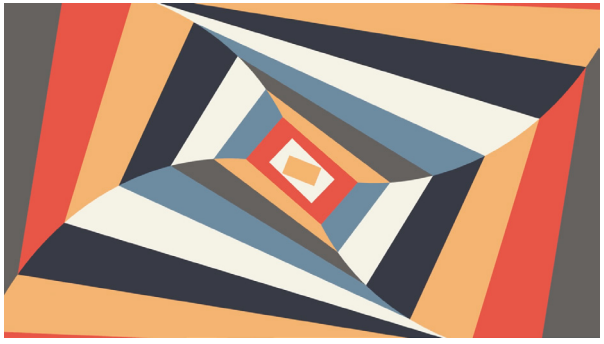


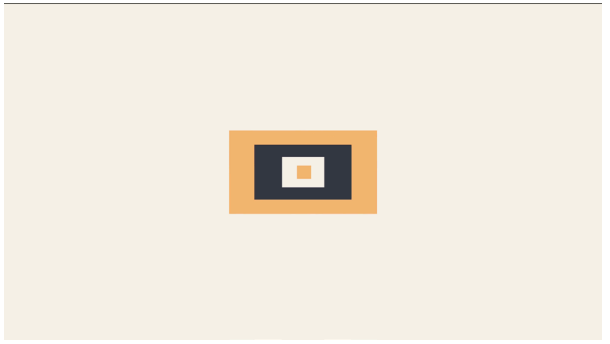


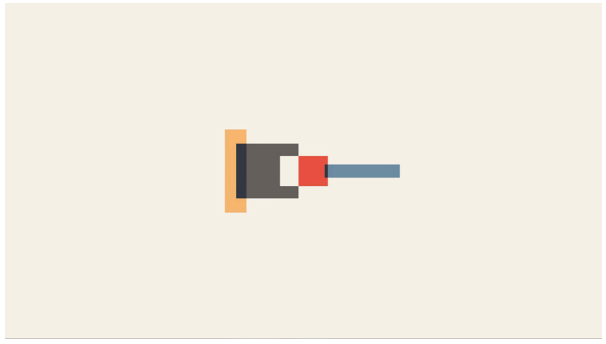


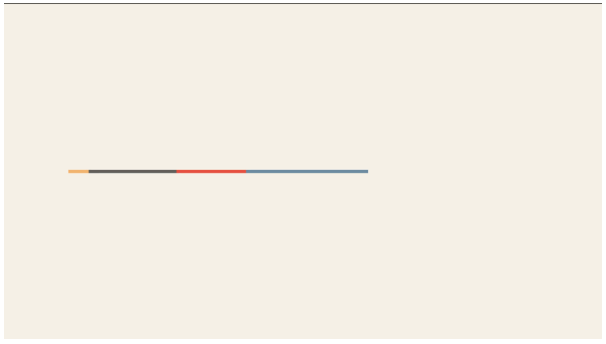


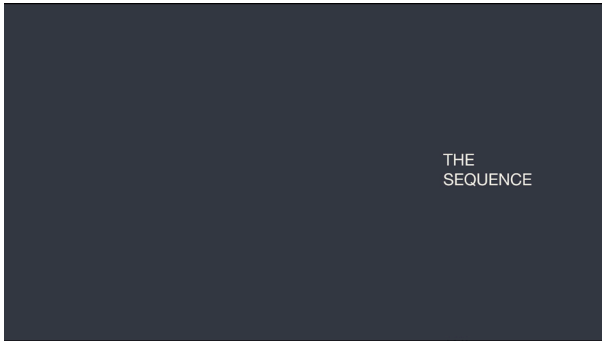








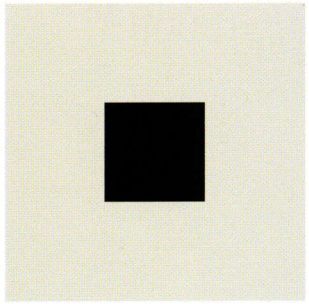



THE
SEQUENCE

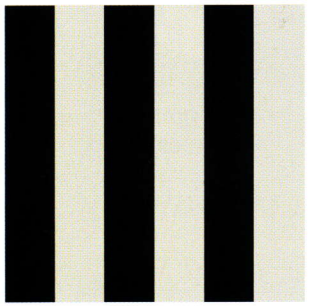
DESIGN PRINCIPLE

FIGURE/GROUND

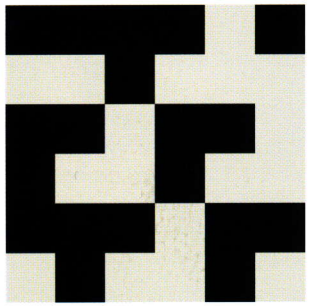
Relationships



Stable



Reversible



Ambiguous

Stable, Reversible, Ambiguous
A stable figure/ground relationship exists when a form or figure stands clearly apart from its background. Most photography functions according to this principle, where someone or something is featured within a setting.

Reversible figure/ground occurs when positive and negative elements attract our attention equally and alternately, coming forward, then receding, as our eye perceives one first as dominant and next as subordinate. Reversible figure ground motifs can be seen in the ceramics, weaving, and crafts of cultures around the globe.

Images and compositions featuring ambiguous figure/ground challenge the viewer to find a focal point. Figure is enmeshed with ground, carrying the viewer's eye in and around the surface with no discernable assignment of dominance. The Cubist paintings of Picasso mobilize this ambiguity.

Interwoven Space
Designers, illustrators, and photographers often play with figure/ground relationships to add interest and intrigue to their work. Unlike conventional depictions where subjects are centered and framed against a background, active figure/ground conditions churn and interweave form and space, creating tension and ambiguity.

Form and Counterform Sculpture—like buildings in a landscape—displaces space, creating an active interplay between the form and void around it. Here, the distilled shapes and taut tension pay homage to Henry Moore, with whom this artist studied in the 1930s. Reuben Kramer, 1937. Photographed by Dan Meyers.

Interplay & Minimalism

Optical Interplay This mark for Vanderbilt University employs a strong contrast between rigid form and organic counterform. The elegant oak leaf alternately sinks back, allowing the letterform to read, and comes forward, connoting growth, strength, and beauty. Malcolm Grear, Malcolm Grear Designers.

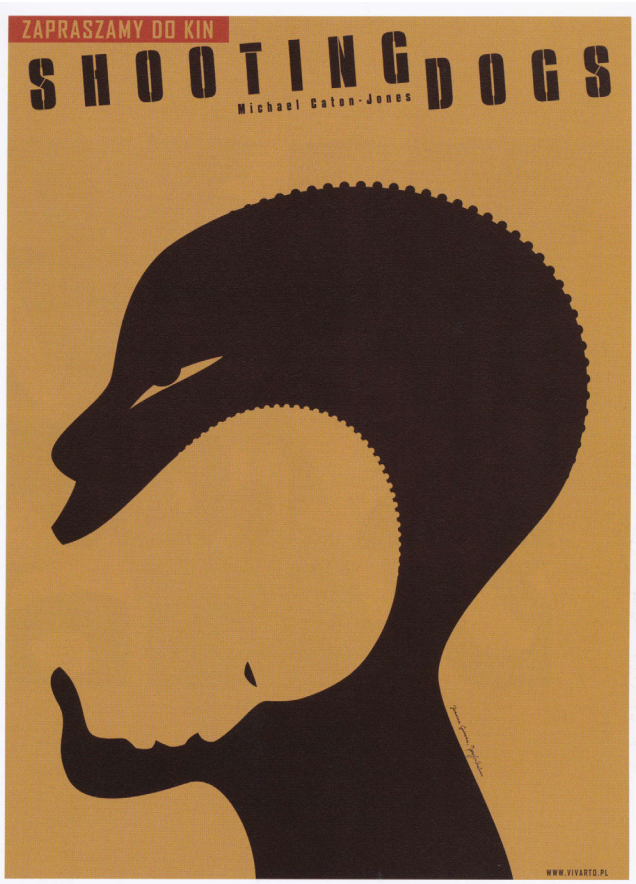
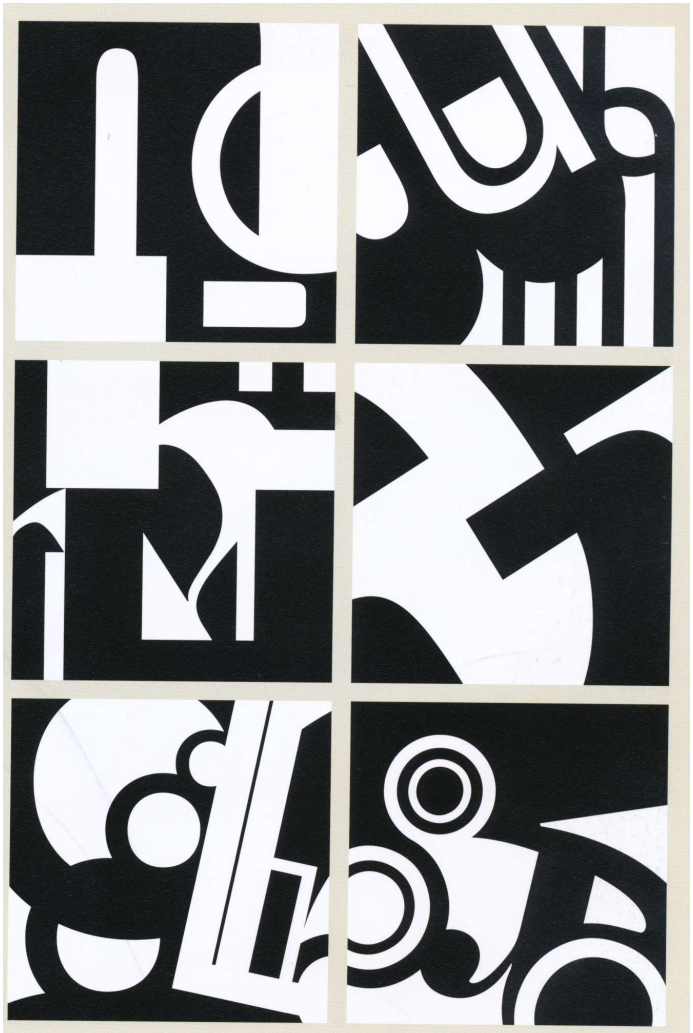


Figure Inside of Figure This poster reveals its subject at second glance. One head takes form as the void inside the other. The tension between figure and ground acquires an ominous energy. Joanna Górska and Jerzy Skakun, Homework.

Artful Reduction A minimal stack of carefully shaped forms, in concert with exacting intervals of spaces, instantly evokes this sculptural landmark. Malcolm Grear, Malcolm Grear Designers.

Positive & Negative Space

Letterform Abstraction In this introduction to letterform anatomy, students examined the forms and counterforms of the alphabet in many font variations, eventually isolating just enough of each letter to hint at its identity. Each student sought to strike a balance between positive and negative space. Typography I. Jennifer Cole Phillips, faculty.



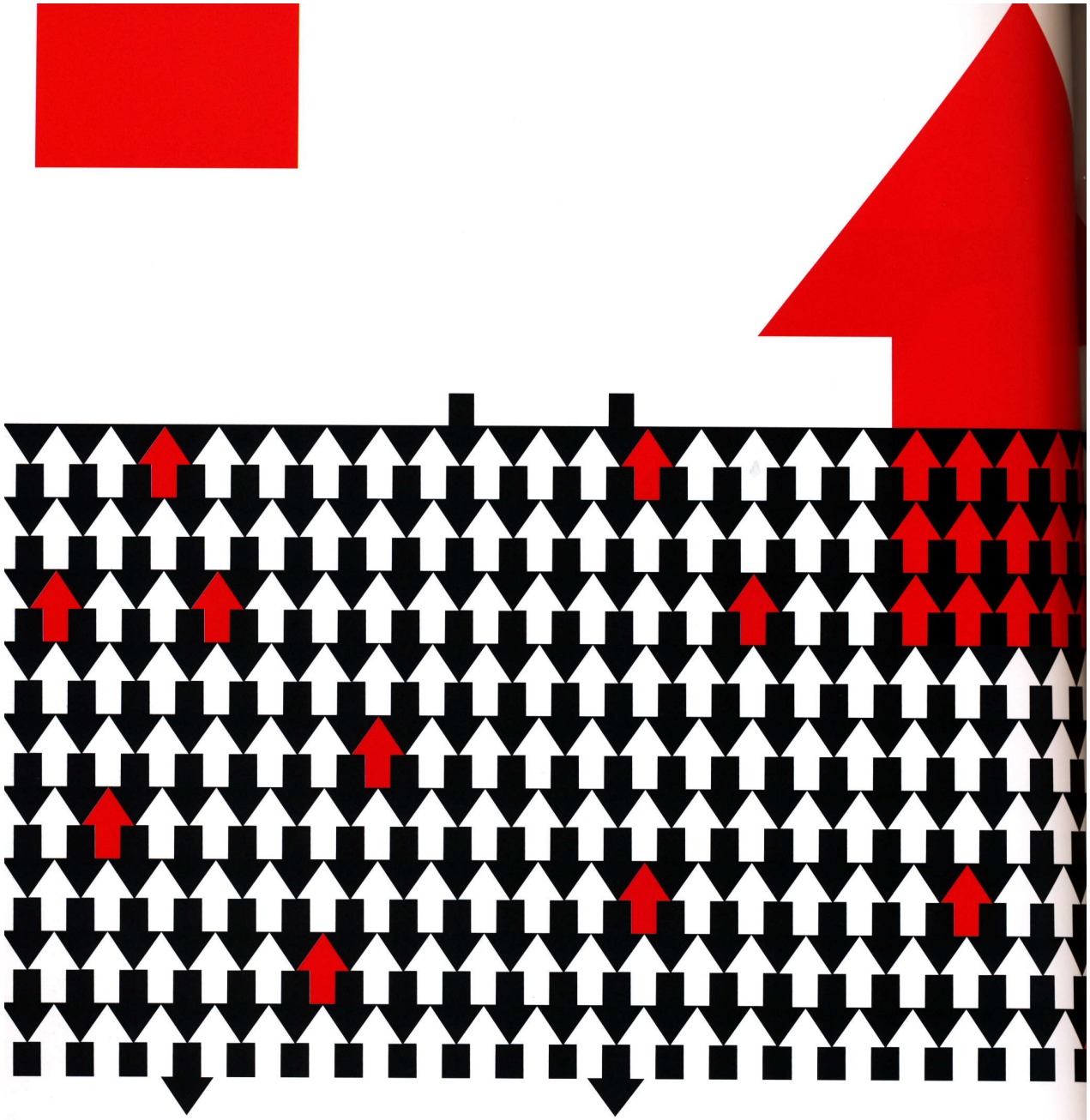
Contrast and Composition. In this project, students explored principles of visual contrast, homing in on letterform details to illuminate unique anatomical and stylistic features. Each study focuses on one pair of contrasting letterforms, which the designer could crop, combine, repeat, rotate, enlarge, and reduce. The final designs celebrate formal differences as well as distribute positive and negative space into fluid, balanced compositions. Typography I. Jennifer Cole Phillips, faculty.

Dynamic

Counterspace

Counter Hand The simple device of cut white paper held against a contrasting ground defines the alphabet with quirky style and spatial depth. FWIS Design.

Rhythm & Pattern

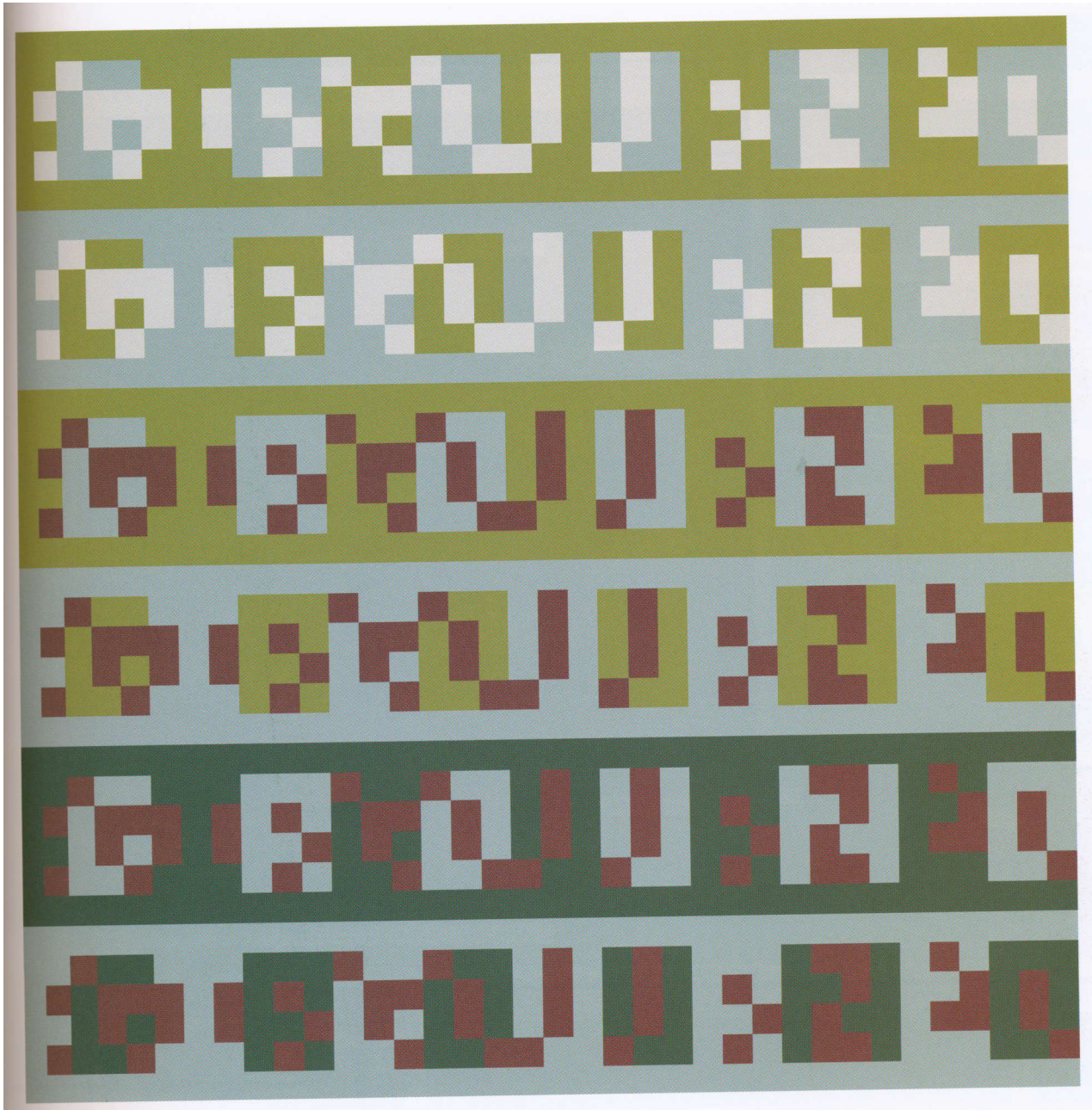


Figure/Ground Battalion These marching positive and negative arrows commingle and break away from the pack. The dynamic use of scale, direction, rhythm, and color ushers the viewer's eye in and around the composition. Superforms take shape out of the crowd. Yong Seuk Lee, MFA Studio.

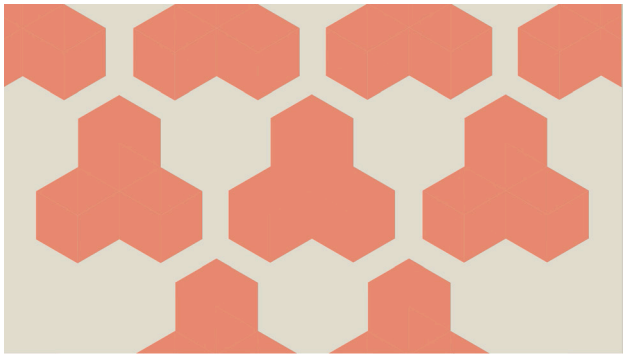
Optical Interplay

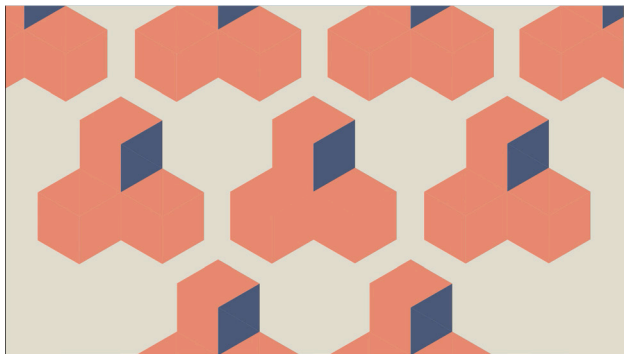
Seeing Jesus Simple stitches spell out a series of letters, which take form as the viewer's eye allows the background to move forward. The light stitches become counterforms for the dark letters. Needlepoint: Ralph Emerson Pierce (1912–1992). Photograph: Jeremy Botts, MFA Studio.

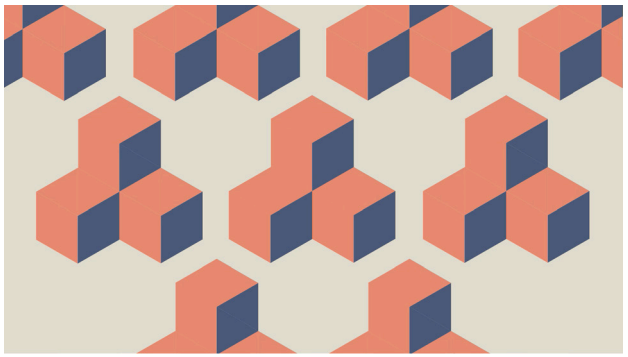
Optical Interplay

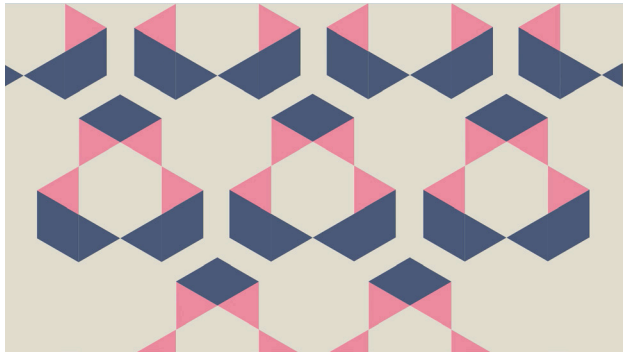


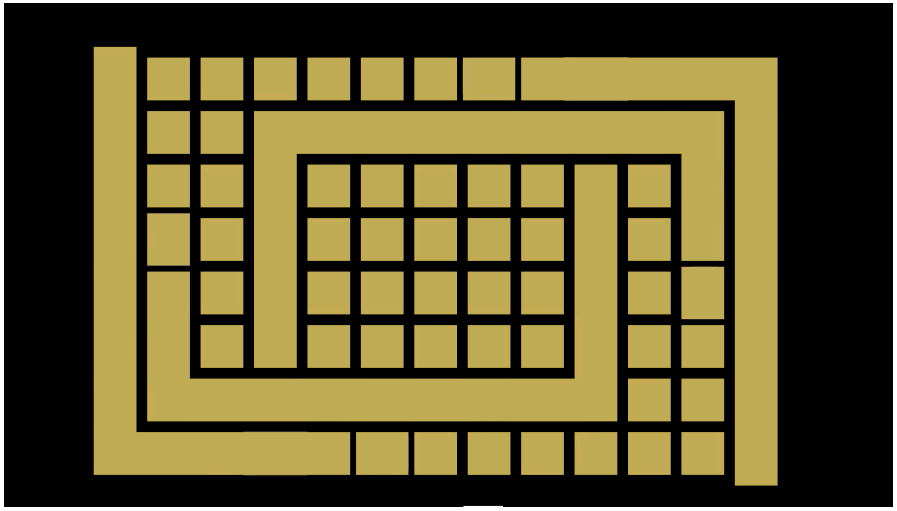
Inspired by Jesus The designer has interwoven the words "figure" and "ground" across each horizontal band. One word serves as the background or frame for the other, forcing the eye to shuttle between two conflicting readings. This complex study was inspired by the needlework at left. Jeremy Botts, MFA Studio.

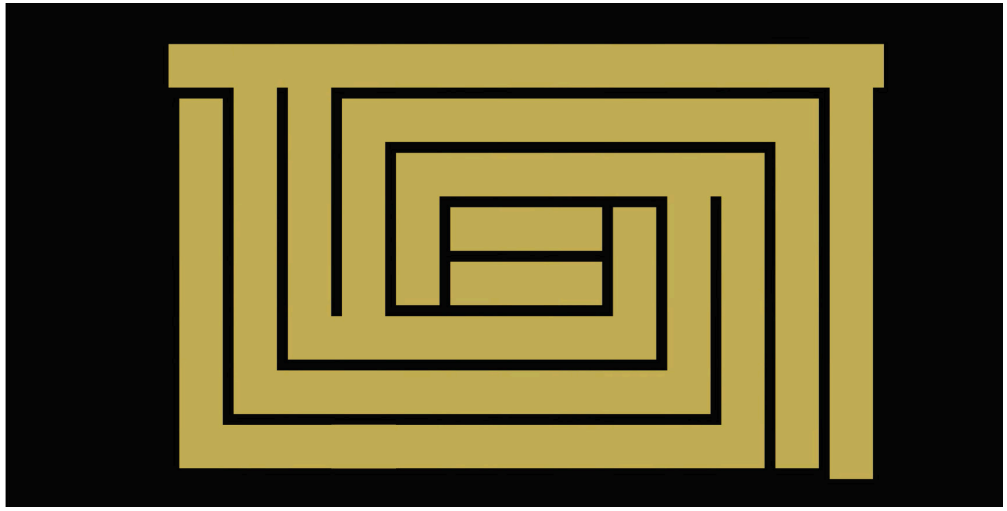


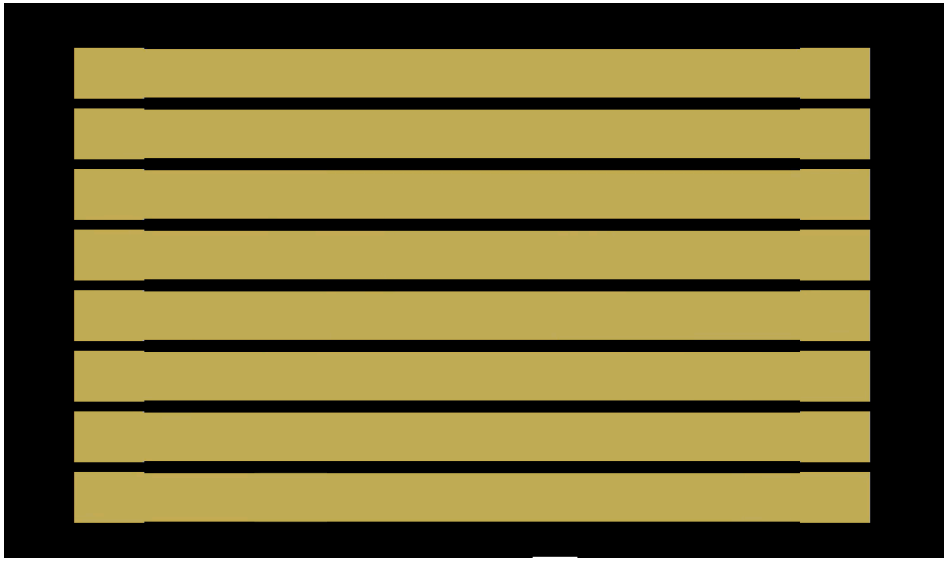


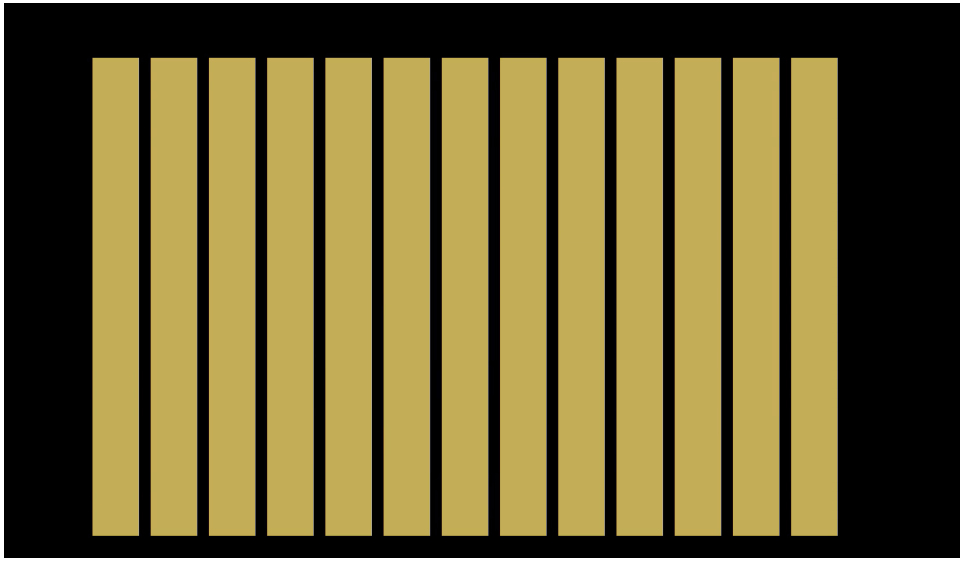












FORMAL CHARACTERISTIC

SHAPE

Point *(dot)*

•

x = 4.5521 in
y = 0.997 in

Point

A point marks a position in space. In pure geometric terms, a point is a pair of x, y coordinates. It has no mass at all. Graphically, however, a point takes form as a dot, a visible mark. A point can be an insignificant fleck of matter or a concentrated locus of power. It can penetrate like a bullet, pierce like a nail, or pucker like a kiss. Through its scale, position, and relationship to its surroundings, a point can express its own identity or melt into the crowd.

A series of points forms a line. A mass of points becomes texture, shape, or plane. Tiny points of varying size create shades of gray.

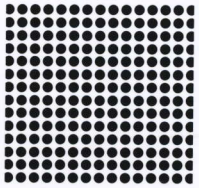
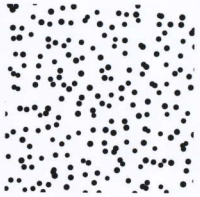
The tip of an arrow points the way, just as the crossing of an X marks a spot.

In typography, the point is a period—the definitive end of a line. Each character in a field of text is a singular element, and thus a kind of point, a finite element in a series.

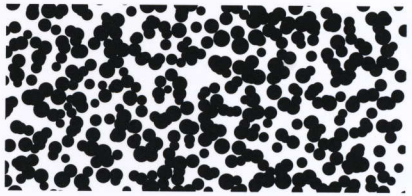
end of a line.

In typography, each character in a field of text is a point, a finite element represented by a single key stroke. The letter occupies a position in a larger line or plane of text. At the end of the line is a period. The point is a sign of closure, of finality. It marks the end.


Jason Okutake

Ryan Gladhill



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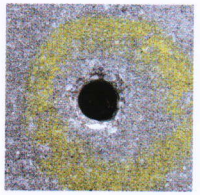
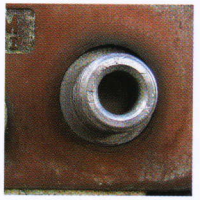
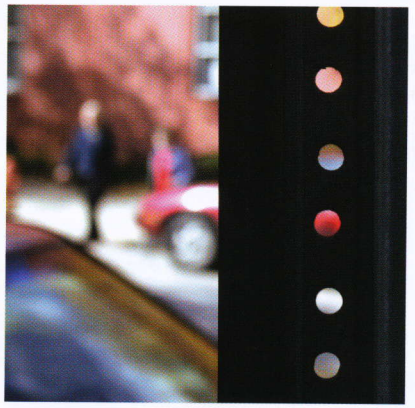


Lauretta Dolch




Lauretta Dolch
Summer Underwood



Robert Ferrell

Line

length = .9792 in

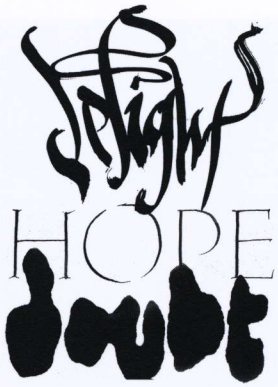
Line
A line is an infinite series of points. Understood geometrically, a line has length, but no breadth. A line is the connection between two points, or it is the path of a moving point.

A line can be a positive mark or a negative gap. Lines appear at the edges of objects and where two planes meet.

Graphically, lines exist in many weights; the thickness and texture as well as the path of the mark determine its visual presence. Lines are drawn with a pen, pencil, brush, mouse, or digital code. They can be straight or curved, continuous or broken. When a line reaches a certain thickness, it becomes a plane. Lines multiply to describe volumes, planes, and textures.

A graph is a rising and falling line that describes change over time, as in a waveform charting a heart beat or an audio signal.

In typographic layouts, lines are implied as well as literally drawn. Characters group into lines of text, while columns are positioned in blocks that are flush left, flush right, and justified. Imaginary lines appear along the edges of each column, expressing the order of the page.



Jeremy Botts

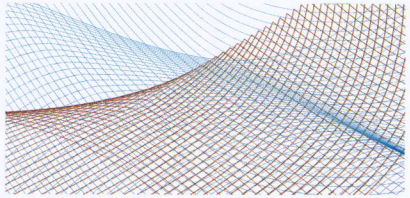
Lines express emotions.

Josh Sims
Bryan McDonough

Alex Ebright
Justin Lloyd

Digital Imaging.
Nancy Froehlich,
faculty.

Lines describe structure and edges.



Allen Harrison

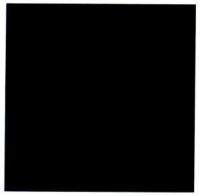
Lines turn and multiply to describe planes.

Type sits on a baseline.

Typographic alignment refers to the organization of text into columns with a hard or soft edge. A justified column is even along both the left and right sides.

The crisp edge of a column is implied by the even starting or ending points of successive lines of type. The eye connects the points to make a line. Such typographic lines are implied, not drawn.

Plane



width = 0.9792 in
height = 0.9792 in

Plane
A plane is a flat surface extending in height and width. A plane is the path of a moving line; it is a line with breadth. A line closes to become a shape, a bounded plane. Shapes are planes with edges. In vector-based software, every shape consists of line and fill. A plane can be parallel to the picture surface, or it can skew and recede into space. Ceilings, walls, floors, and windows are physical planes. A plane can be solid or perforated, opaque or transparent, textured or smooth.

A field of text is a plane built from points and lines of type. A typographic plane can be dense or open, hard or soft. Designers experiment with line spacing, font size, and alignment to create different typographic shapes.

In typography, letters gather into lines, and lines build up into planes. The quality of the plane—its density or opacity, its heaviness or lightness on the page—is determined by the size of the letters, the spacing between lines, words, and characters, and the visual character of a given typeface.

Hard, closed shape

In typography, letters gather into lines, and lines build up into planes. The quality of the plane—its density, its opacity, its weight on the page—is determined by the size of the letters, the spacing between lines, words, and characters, and the visual character of a given typeface.

Soft, open shape

Plane Letters A plane can be described with lines or with fields of color. These letterforms use ribbons of color to describe spatial planes. Kelly Horigan, Experimental Typography. Ken Barber, faculty.

Volume

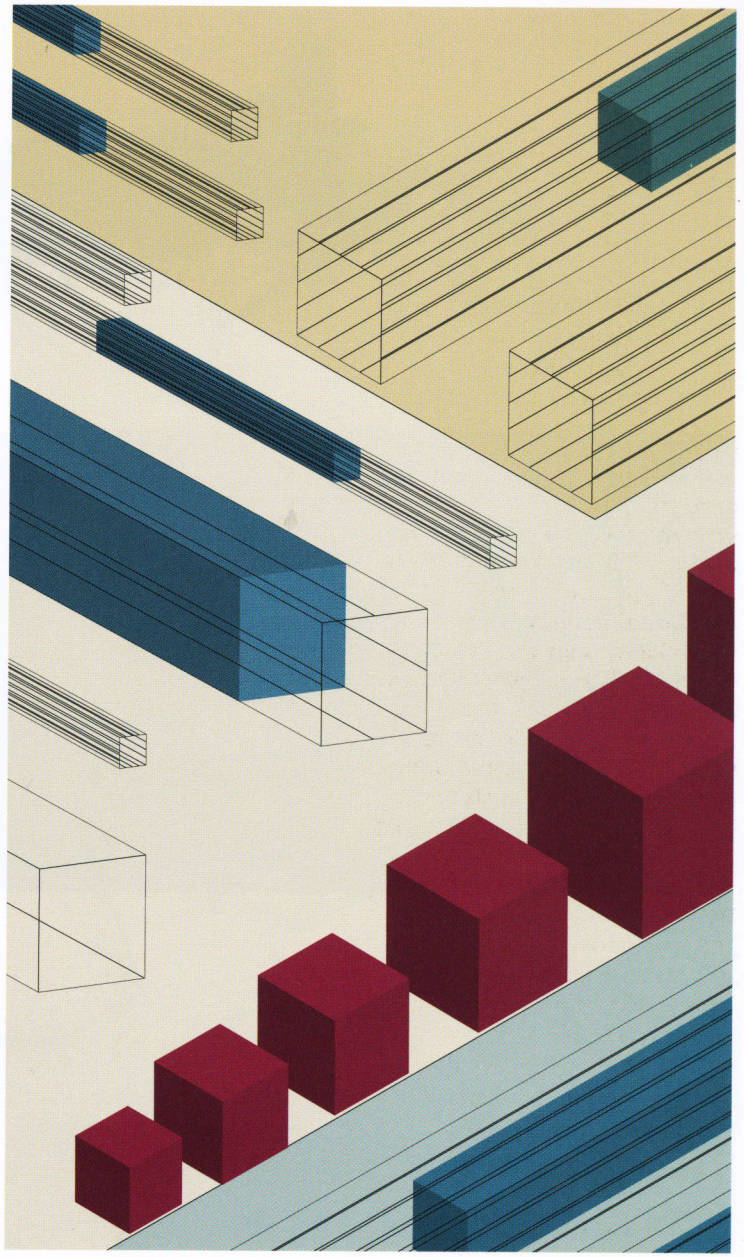
Parallel Lines Converge
Summer Underwood

Space and Volume
A graphic object that encloses three-dimensional space has volume. It has height, width, and depth. A sheet of paper or a computer screen has no real depth, of course, so volume is represented through graphic conventions.

Linear perspective simulates optical distortions, making near objects appear large as far objects become small, receding into nothing as they reach the horizon. The angle at which elements recede reflects the position of the viewer. Are the objects above or below the viewer's eye level? Camera lenses replicate the effects of linear perspective, recording the position of the camera's eye.

Axonometric projections depict volume without making elements recede into space. The scale of elements thus remains consistent as objects move back into space. The result is more abstract and impersonal than linear perspective.

Architects often use axonometric projections in order to keep a consistent scale across the page. Digital game designers often use this technique as well, creating maps of simulated worlds rather than depicting experience from the ground.



Projection Study This idealized landscape uses axonometric projection, in which scale is consistent from the front to back of the image. As seen on a map or computer game, this space implies a disembodied, godlike viewer rather than a physical eye positioned in relation to a horizon. Visakh Menon, MFA Studio.

Form

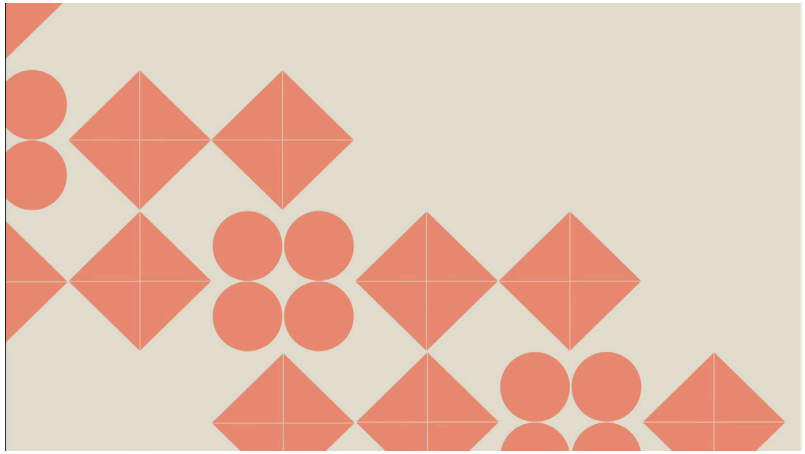
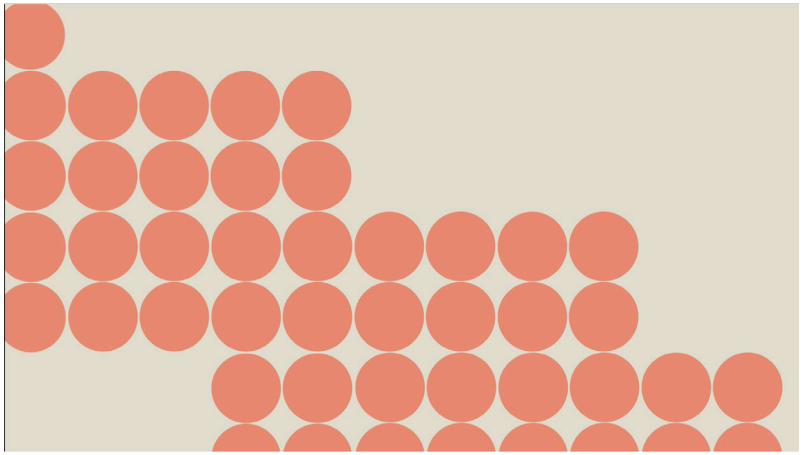
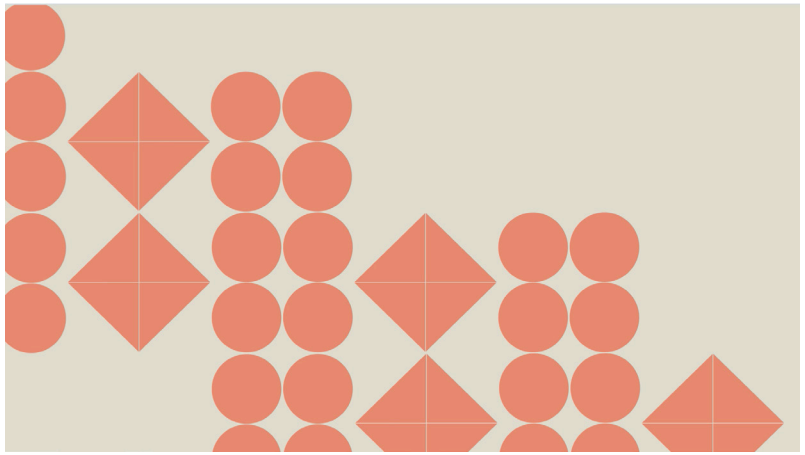
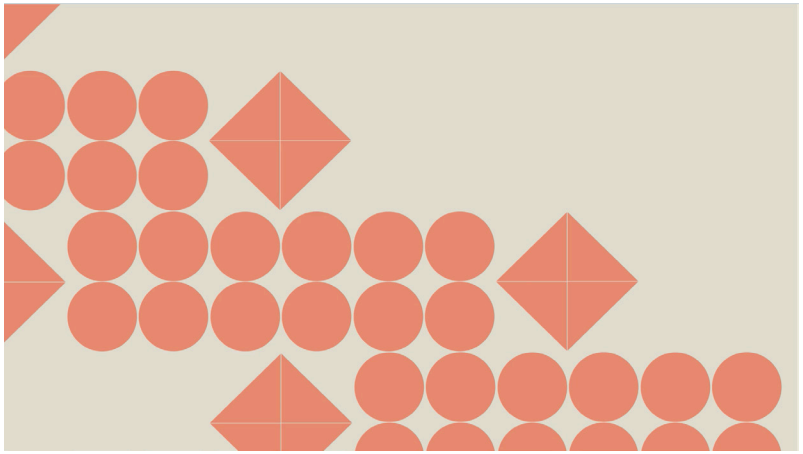
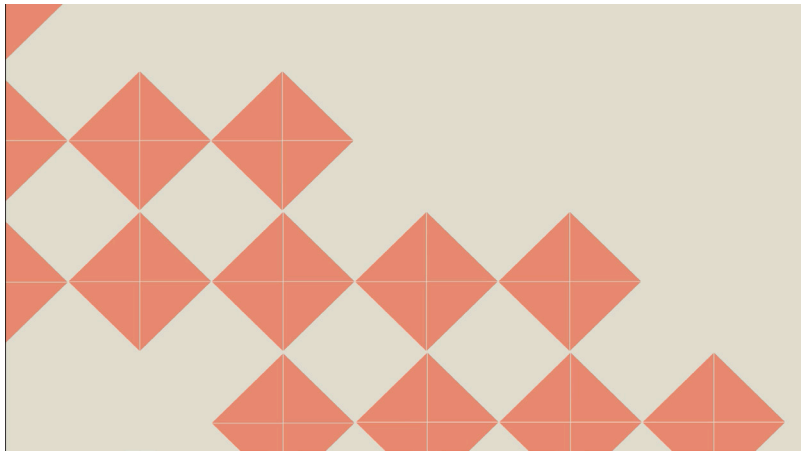
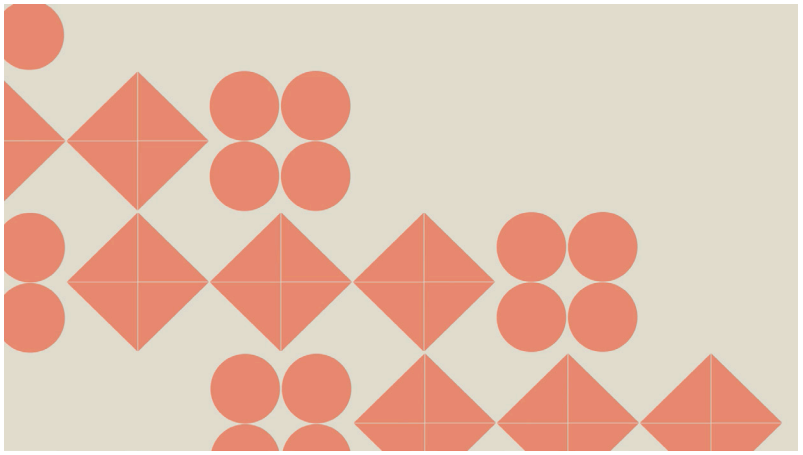

FUEL TV
DAMN GRAVITY

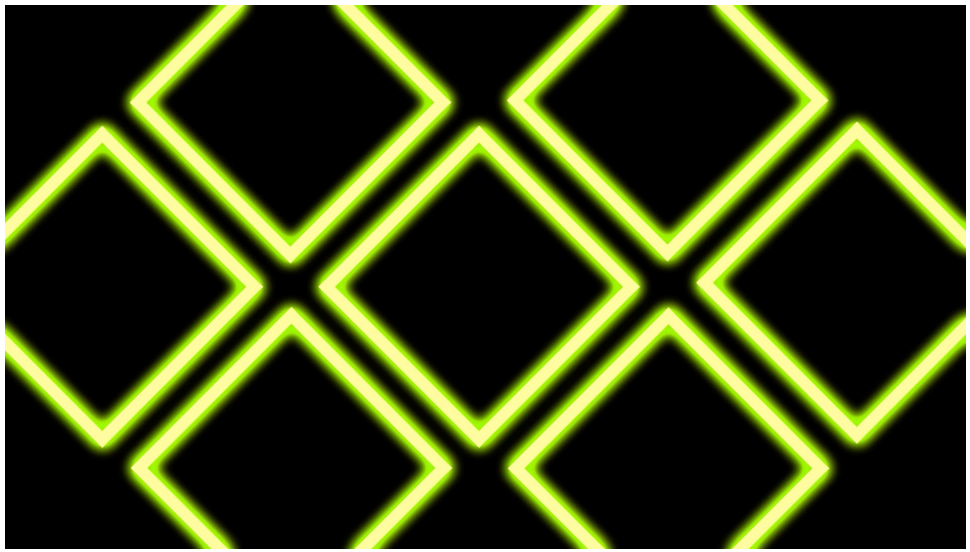

TCM
UNDERGROUND
LATE NIGHT FRIDAYS

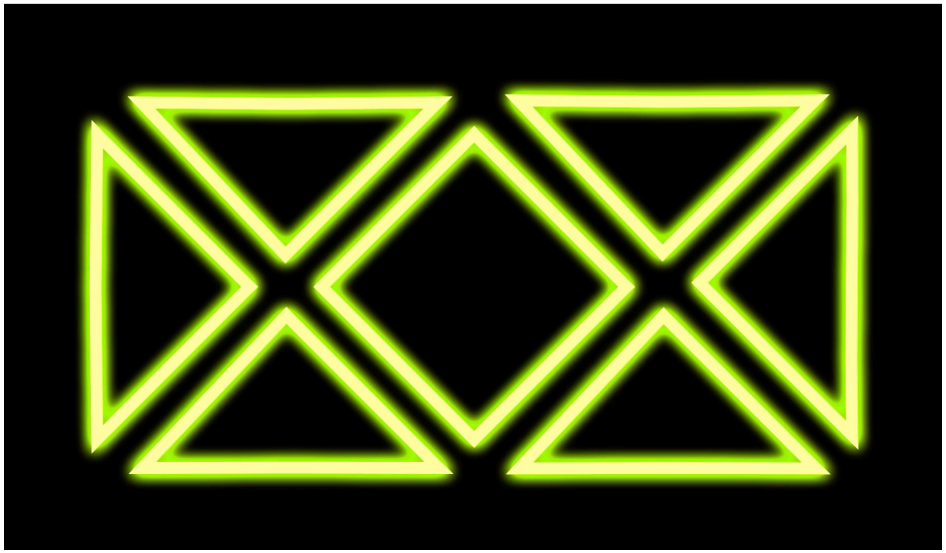

SPIKE

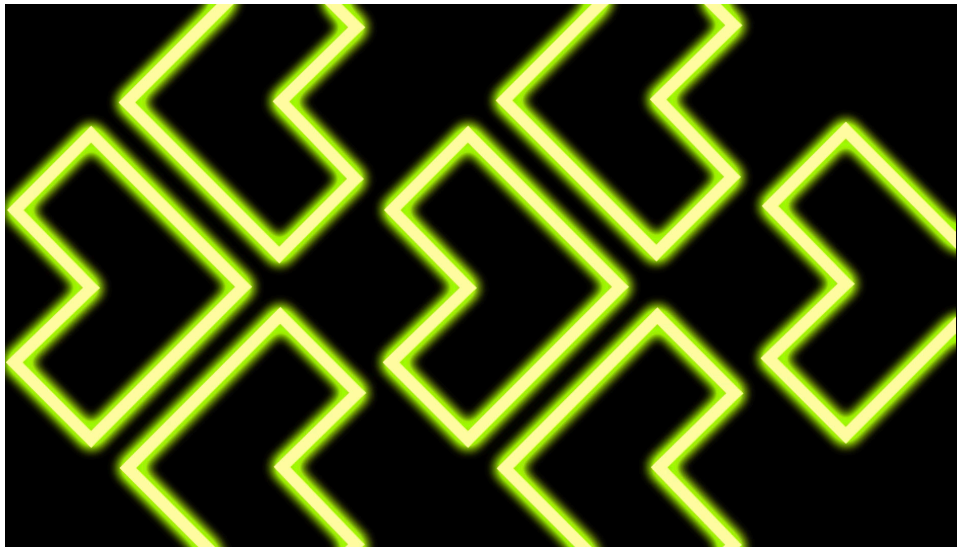

NOW
SHOWING

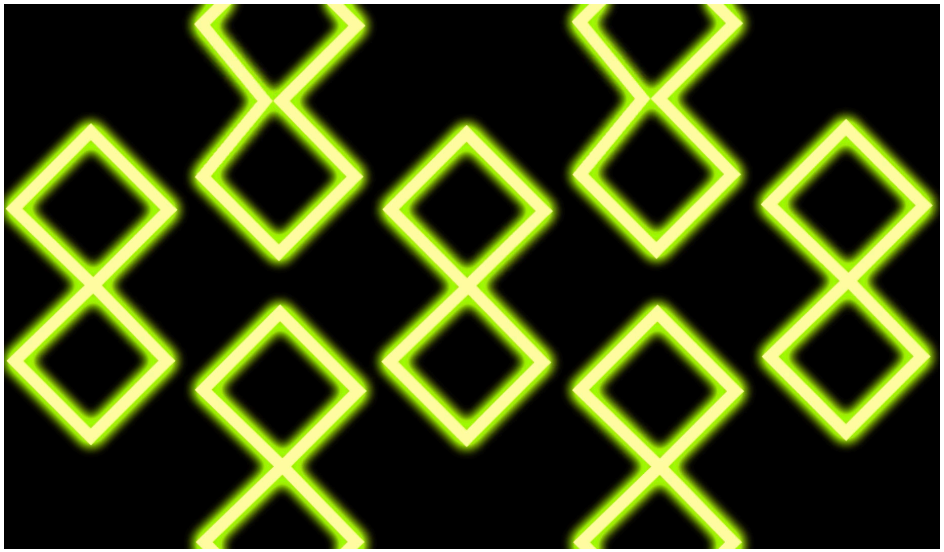

usa
characters welcome





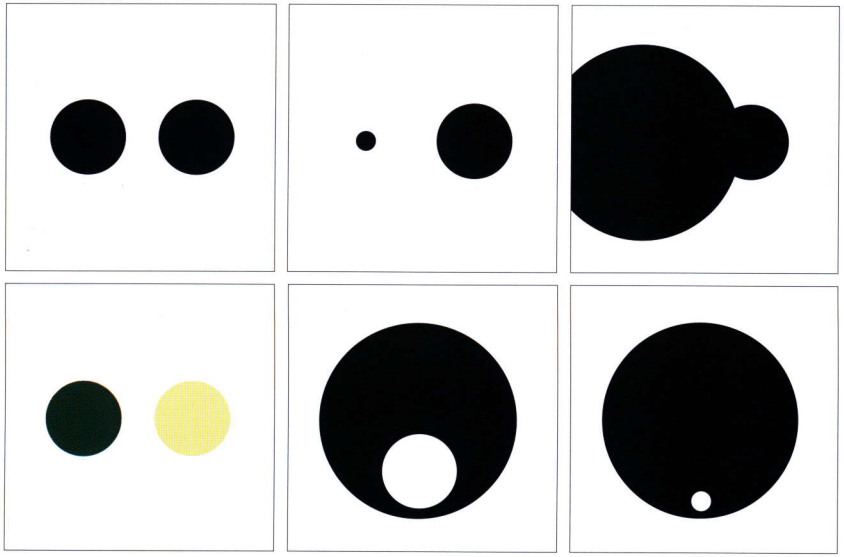




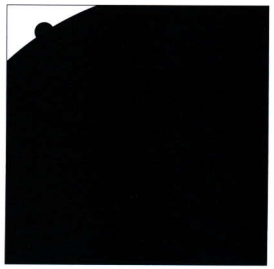
FORMAL CHARACTERISTIC

SCALE

Relative



Scale is Relative
A graphic element can appear larger or smaller depending on the size, placement, and color of the elements around it. When elements are all the same size, the design feels flat. Contrast in size can create a sense of tension as well as a feeling of depth and movement. Small shapes tend to recede; large ones move forward.



Cropping to Imply Scale
The larger circular form seems especially big because it bleeds off the edges of the page.

Familiar Objects, Familiar Scale We expect some objects to be a particular scale in relation to each other. Playing with that scale can create spatial illusions and conceptual relationships. Gregory May, MFA Studio.

Depth & Motion

Krista Quick, Nan Yi, Julie Diewald

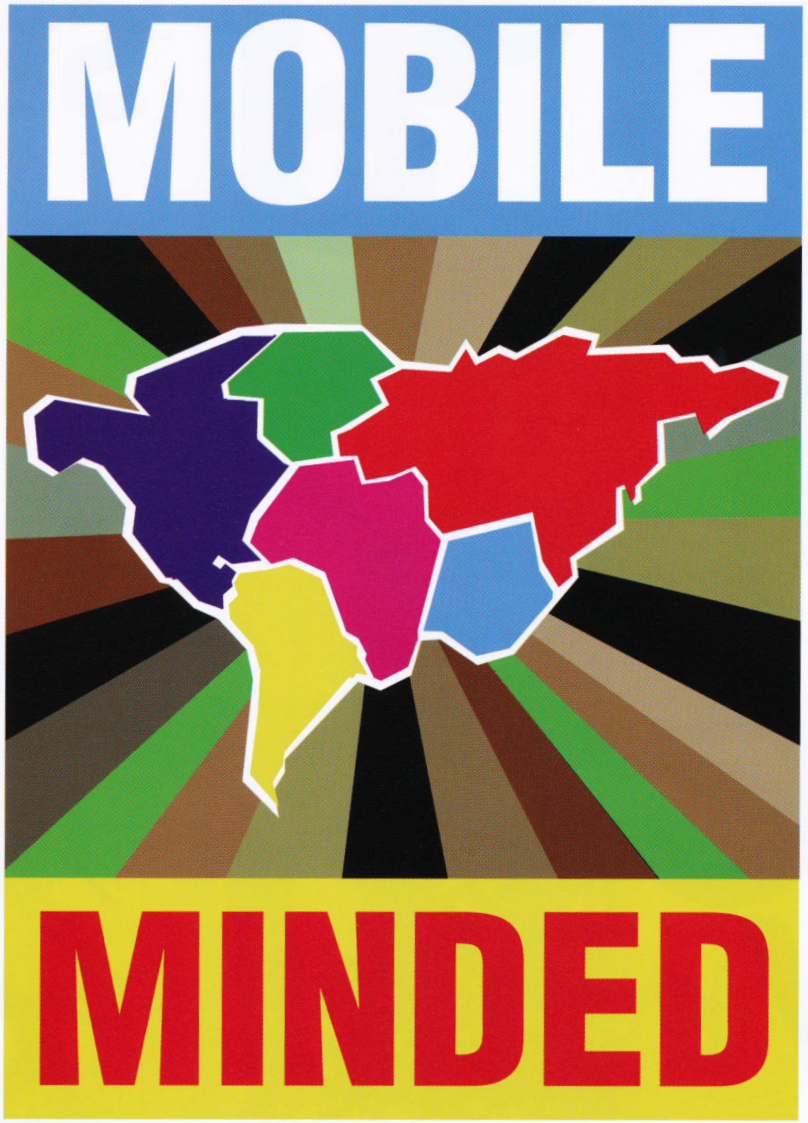
Jie Lian, Sueyun Choi, Ryan Artell

Jenn Julian, Nan Yi, Sueyun Choi

Scale, Depth, and Motion In the typographic compositions shown here, designers worked with one word or a pair of words and used changes in scale as well as placement on the page to convey the meaning of the word or word pair. Contrasts in scale can imply motion or depth as well as express differences in importance.

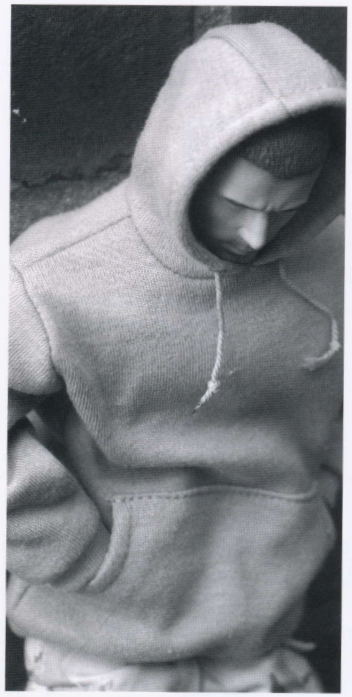
Typography I and Graphic Design I. Ellen Lupton and Zvezdana Rogic, faculty.

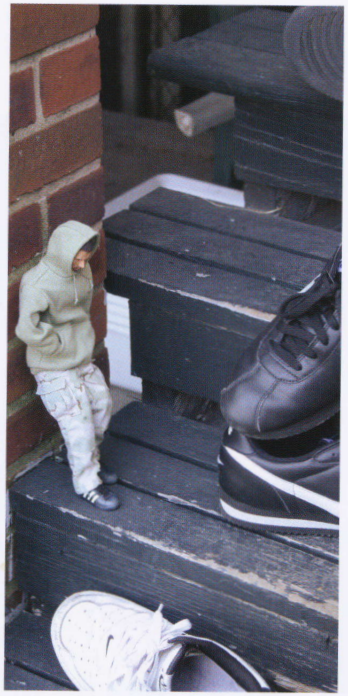
Contrast

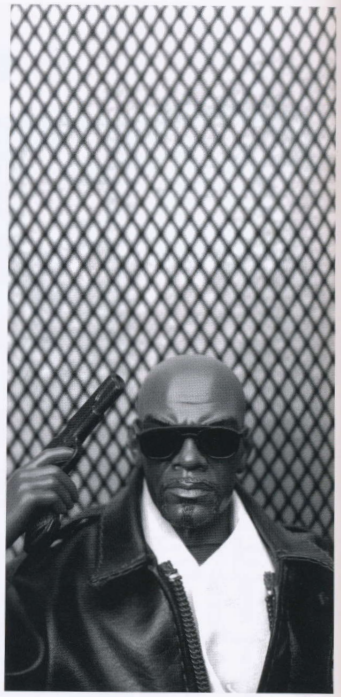


Big Type, Small Pages In this book designed by Mieke Gerritzen, the small trim size of the page contrasts with the large-scale type. The surprising size of the text gives the book its loud and zealous voice. The cover is reproduced here at actual size (1:1 scale). Mieke Gerritzen and Geert Lovink, *Mobile Minded*, 2002.

Perspective



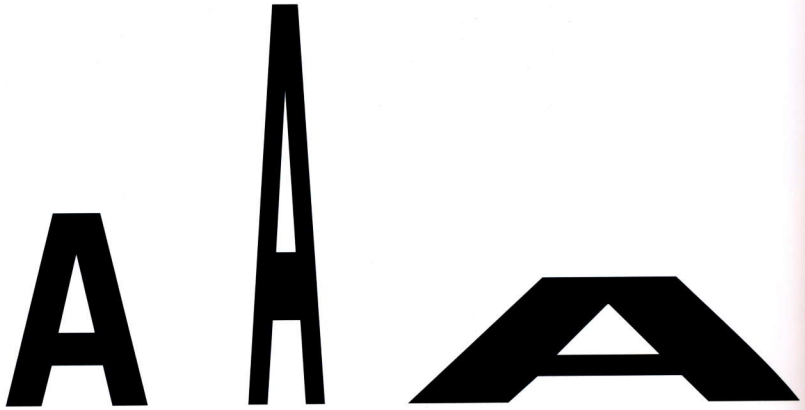




Ambiguous Scale These portraits of toy action figures play with the viewer's expectations about scale. Spatial cues reveal the actual scale of the figures; cropping out recognizable objects keeps the illusion alive. Yong Seuk Lee, MFA Studio. Abbott Miller, faculty.

Point of View Photographing small objects up close and from a low vantage point creates an illusion of monumentality. Kim Bentley, MFA Studio. Abbott Miller, faculty.

Proportional



Scaling Letterforms If the horizontal and vertical dimensions of a letter are scaled unevenly, the resulting form looks distorted. With vertical scaling, the horizontal elements become too thick, while vertical elements get too skinny.

With horizontal scaling, vertical elements become disproportionately heavy, while horizontal elements get thin.

Scale is a Verb

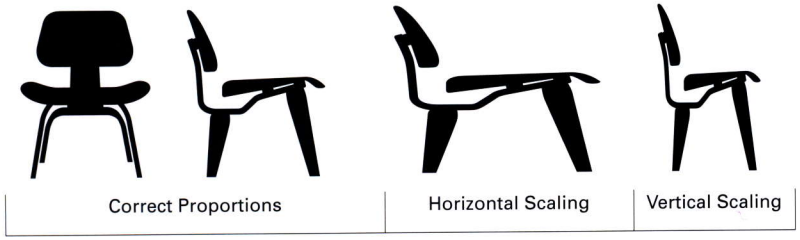
To scale a graphic element is to change its dimensions. Software makes it easy to scale photographs, vector graphics, and letterforms. Changing the scale of an element can transform its impact on the page or screen. Be careful, however: it's easy to distort an element by scaling it disproportionately.

Vector graphics are scalable, meaning that they can be enlarged or reduced without degrading the quality of the image. Bitmap images cannot be enlarged without resulting in a soft or jaggy image.

In two-dimensional animation, enlarging a graphic object over time can create the appearance of a zoom, as if the object were moving closer to the screen.

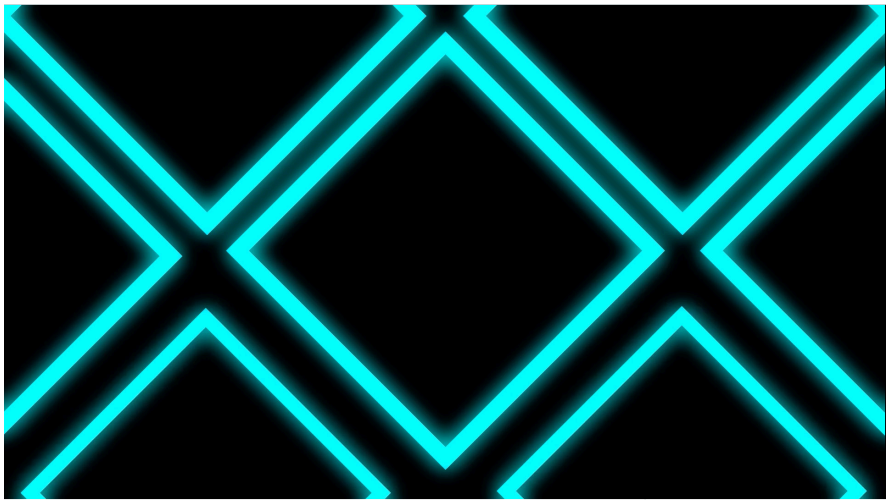
AAAAAAAAAAA

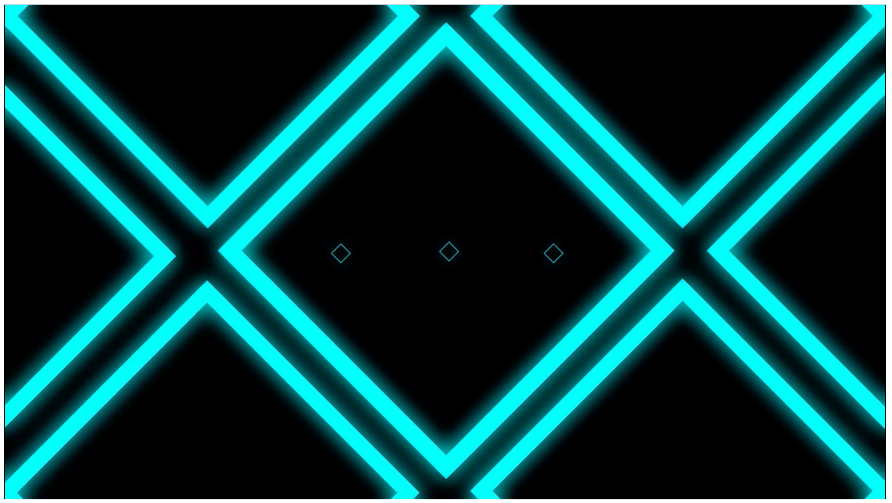
Full-Range Type Family Many typefaces include variations designed with different proportions. The Helvetica Neue type family includes light, medium, bold, and black letters in normal, condensed, and extended widths. The strokes of each letter appear uniform. That effect is destroyed if the letters are unevenly scaled.

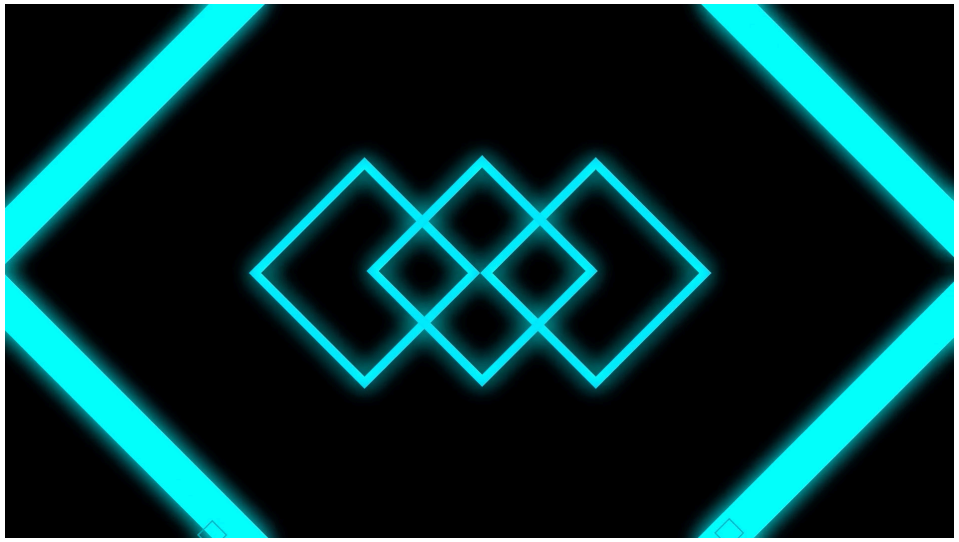


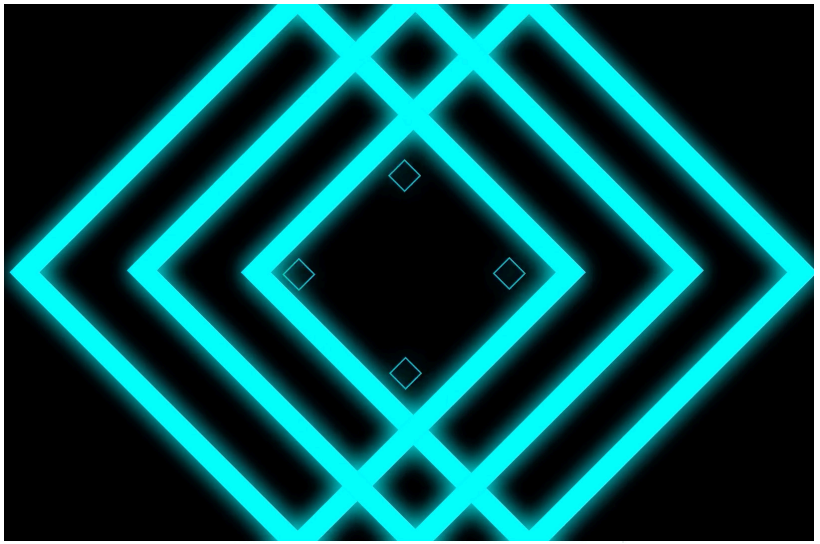
Scaling Images and Objects Uneven scaling distorts images as well as typefaces. Imagine if you could scale a physical object, stretching or squashing it to make it fit into a particular space. The results are not pretty. Eric Karnes.

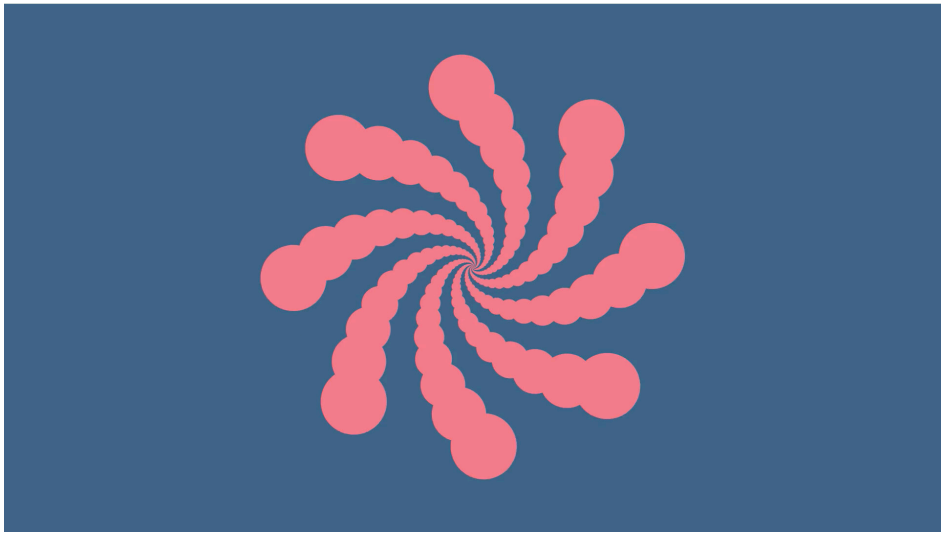
Extreme Heights In the poster at right for a lecture at a college, designer Paul Sahre put his typography under severe pressure, yielding virtually illegible results. (He knew he had a captive audience.) Paul Sahre.

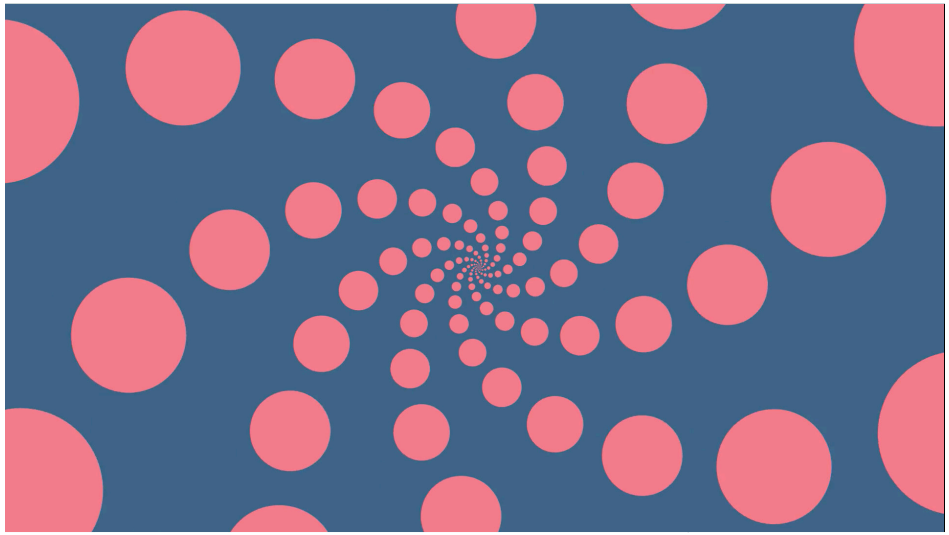


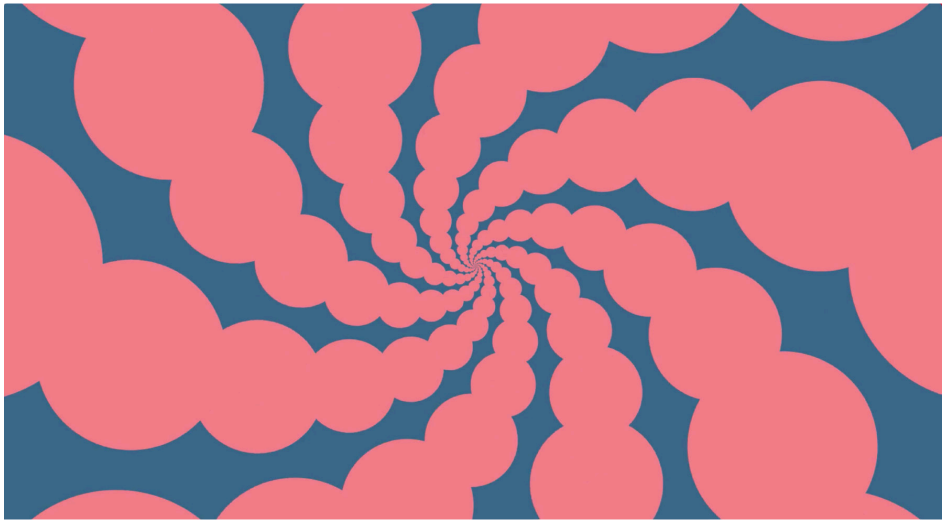


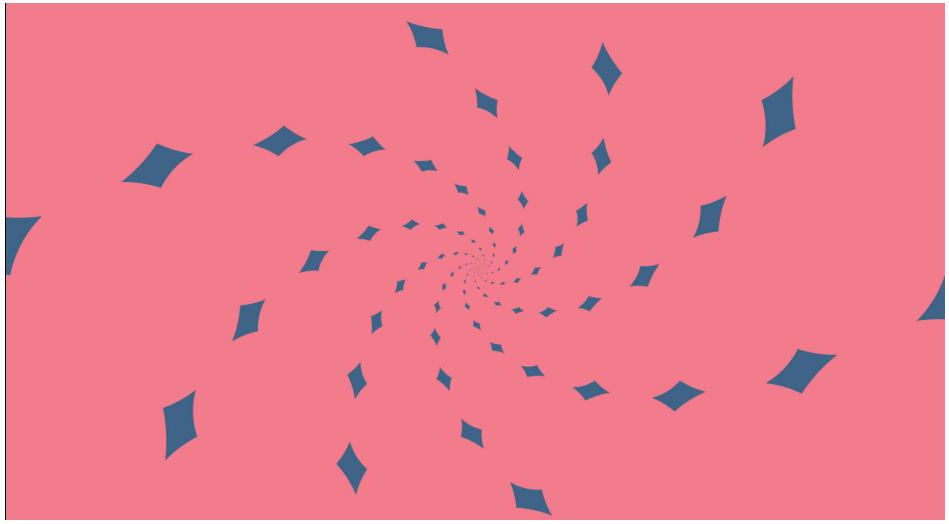










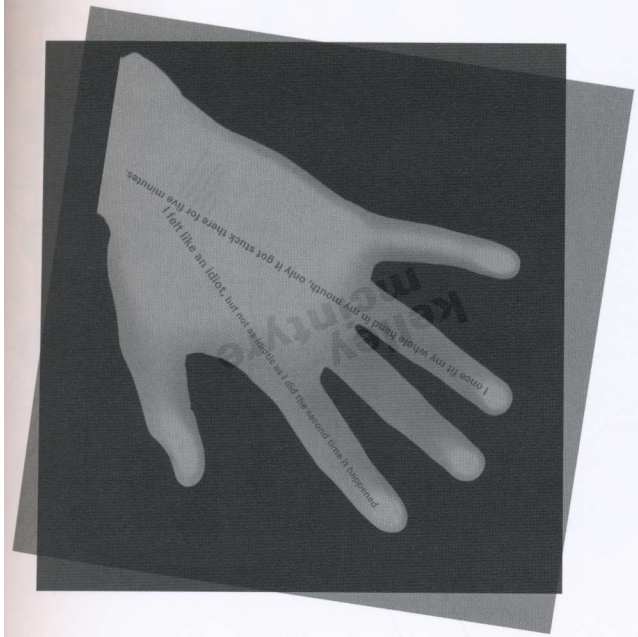


FORMAL CHARACTERISTIC

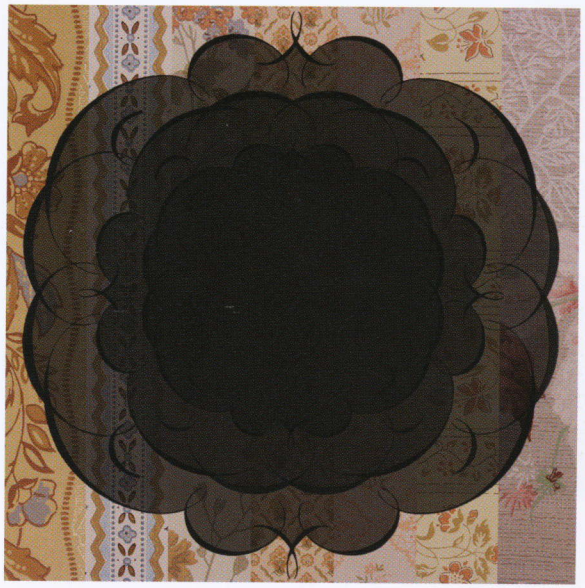
TRANSPARENCY

Relationships

Opposites Attract Transparency serves to build relationships between images. Here, male and female mix and overlap. Jason Okutake, MFA Studio.



Life Lines Transparent layers of text and image intersect. Kelley McIntyre, MFA Studio.



Wall Flowers Transparent layers build up to make a dense frame or cartouche. Jeremy Botts, MFA Studio.

Physical

Water Jason Okutake

Physical Transparency
No material is wholly transparent. Ripples disturb the transparency of water, while air becomes thick with smoke or haze. Glass can be tinted, mirrored, cracked, etched, scratched, frosted, or painted to diminish its transparency. The reflective character of glass makes it partially opaque, an attribute that changes depending on light conditions.

A solid material such as wood or metal becomes transparent when its surface is perforated or interrupted. Venetian blinds shift from opaque to transparent as the slats slant open. Adjusting the blinds changes their degree of transparency.

Tree Jeremy Botts

Veil Nancy Froehlich

Ribbon Yue Tuo

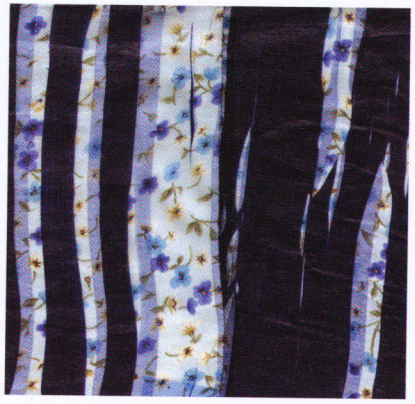
Graphic

Macmillan Company Building, New York, 1924. This early skyscraper employs vertical elements that span the upper stories of the building. The horizontal elements sit back behind the vertical surface, establishing a second plane that appears to pass continuously behind the front plane, like the threads in a plaid fabric. Architects: Carrère and Hastings with Shreve and Lamb. Vintage photograph.

Graphic Transparency
Designers can translate the effects of physical transparency into overlapping layers of lines, shapes, textures, or letterforms. We call this phenomenon "graphic transparency." Just as in physical transparency, two or more surfaces are visible simultaneously, collapsed onto a single surface. A field of text placed over an image is transparent, revealing parts of the image through its open spaces.

The compression of multiple graphic forms into a shallow space has been part of the vocabulary of architecture and decorative design for hundreds of years. Traditional patterns such as plaid use colored thread to build up intersecting fields of color. Linear elements in classical and modern architecture, such as columns and moldings, often appear to pass through each other.[1]

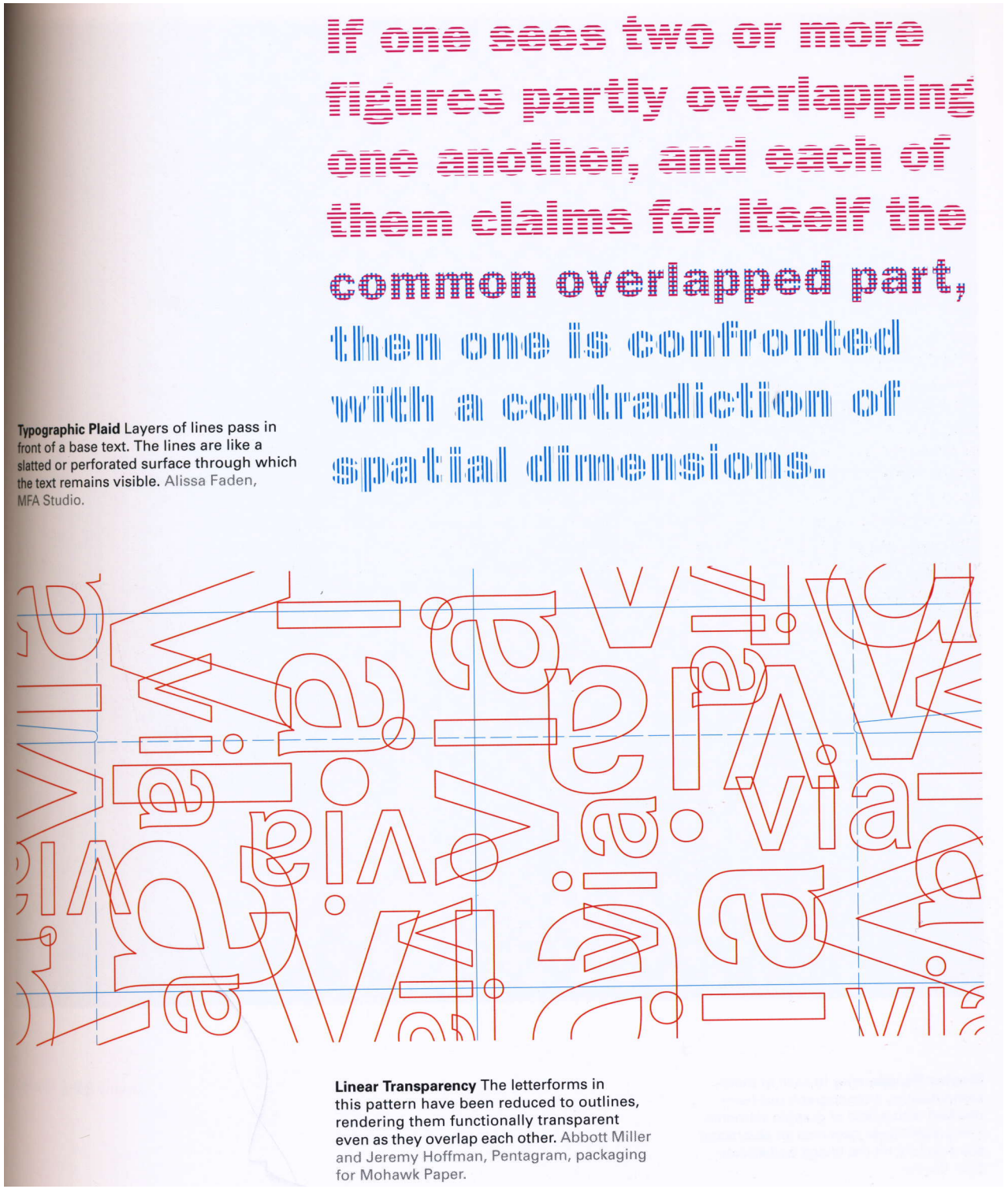
Plaid Fabric Traditional plaid fabrics are made by weaving together bands of colored thread over and under each other. Where contrasting colors mix, a new color appears. The horizontal and vertical stripes literally pass through each other on the same plane. Lee Jofa, *Carousel*, plaid fabric, cotton and rayon.



Over-Dyed Fabric To create this non-traditional print, fashion designer Han Feng bunched and folded a delicate floral print and then dyed it, creating long irregular stripes that sit on top of the floral pattern. The result is two competing planes of imagery compressed onto a single surface. Han Feng, polyester fabric.

1. On transparency in architecture, see Colin Rowe and Robert Slutzky, "Transparency: Literal and Phenomenal (Part 2)," in Joan Ockman, ed., *Architecture Culture, 1943–1968: A Documentary Anthology* (New York: Rizzoli, 1993), 205–25.

Type

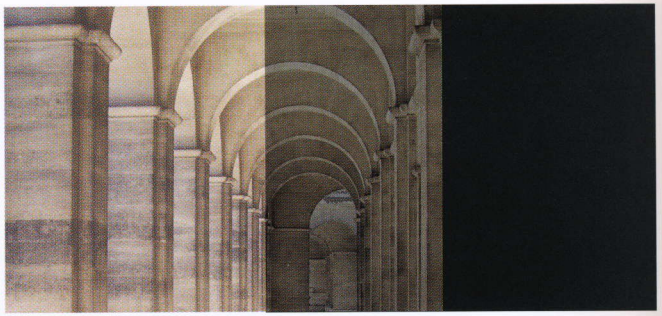


Typographic Plaid Layers of lines pass in front of a base text. The lines are like a slatted or perforated surface through which the text remains visible. Alissa Faden, MFA Studio.

Linear Transparency The letterforms in this pattern have been reduced to outlines, rendering them functionally transparent even as they overlap each other. Abbott Miller and Jeremy Hoffman, Pentagram, packaging for Mohawk Paper.

Digital

100 percent opacity



50 percent opacity. Fade-to-black is a standard transition in film and video.

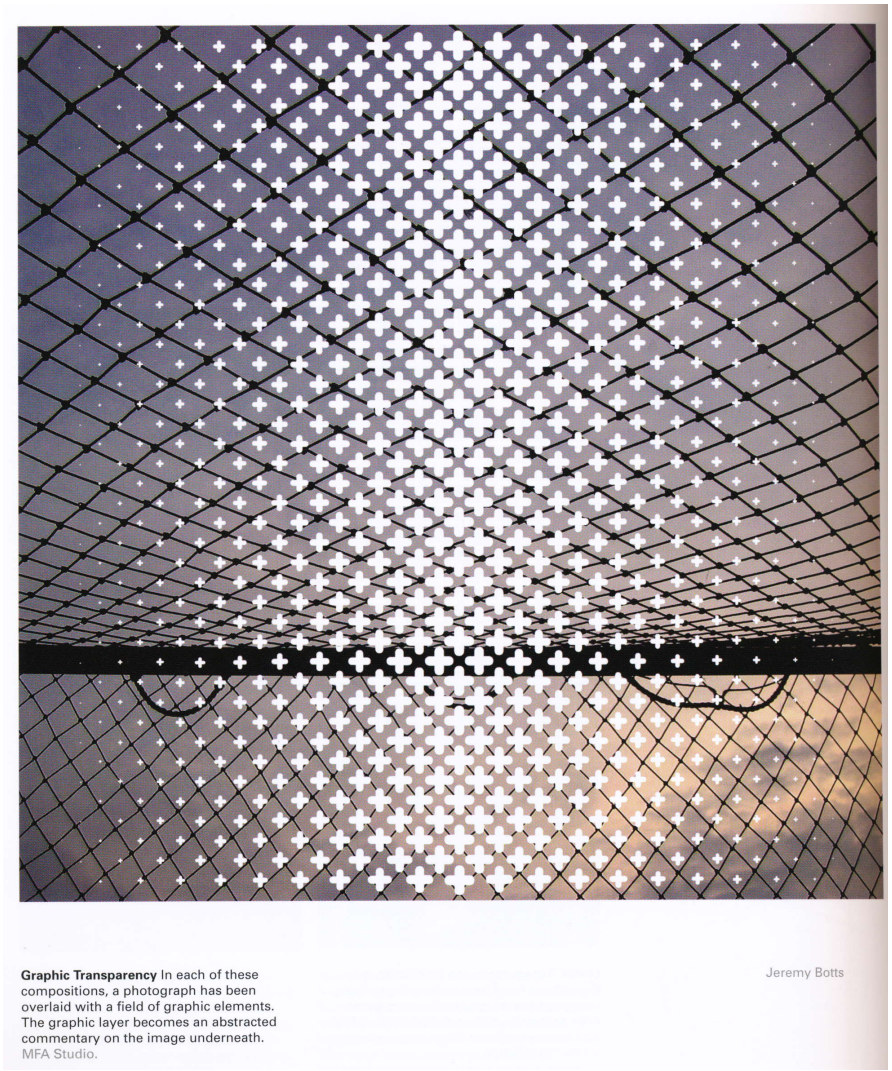
Digital Transparency
Imaging software allows designers to alter the opacity of nearly any graphic element, including type, photographs, and moving images. To do this, the software employs an algorithm that multiplies the tonal values of one layer against those of another, generating a mix between the two layers. To make any image transparent involves compromising its intensity, lowering its overall contrast.

Transparency is used not only to mix two visual elements, but also to make one image fade out against its background. In video and animation, such fades occur over time. The most common technique is the fade-to-black, which employs the default black background. The resulting clip gradually loses intensity while becoming darker. Video editors create a fade-to-white by placing a white background behind the clip. The same effects are used in print graphics to change the relationship between an image and its background.

Transparent type, opaque image

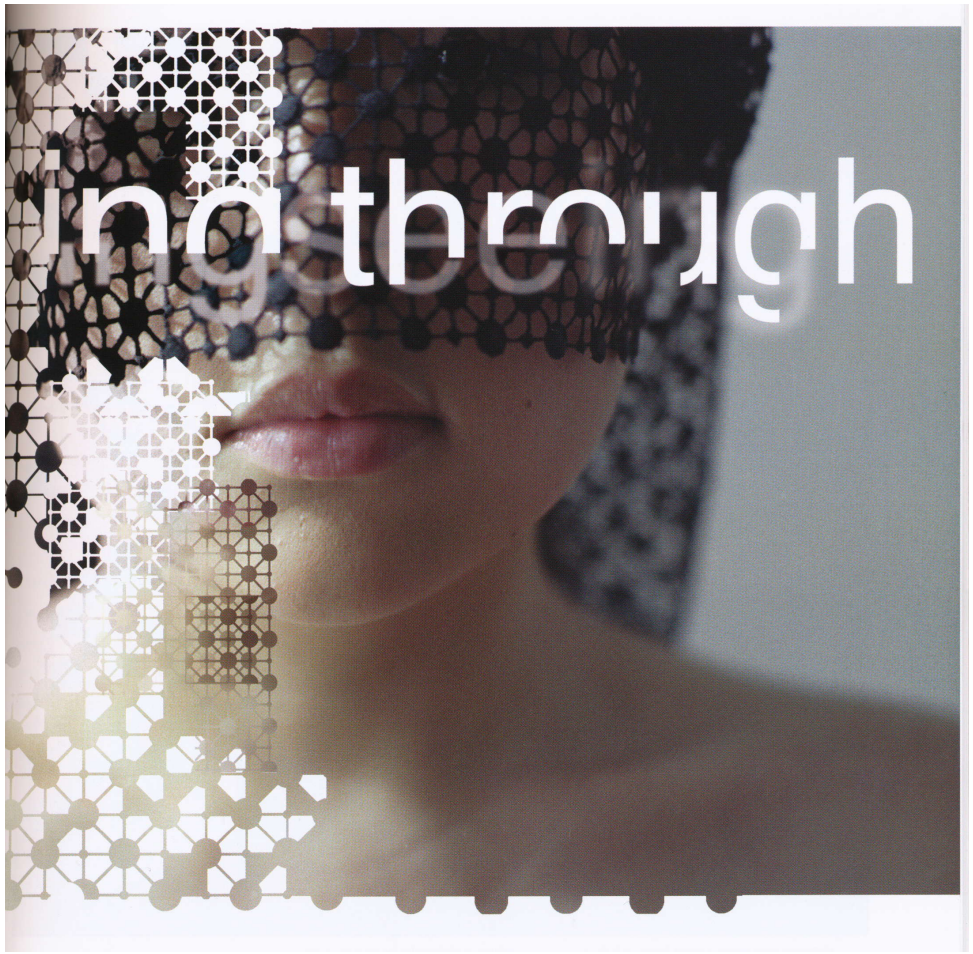
Transparency in type and image

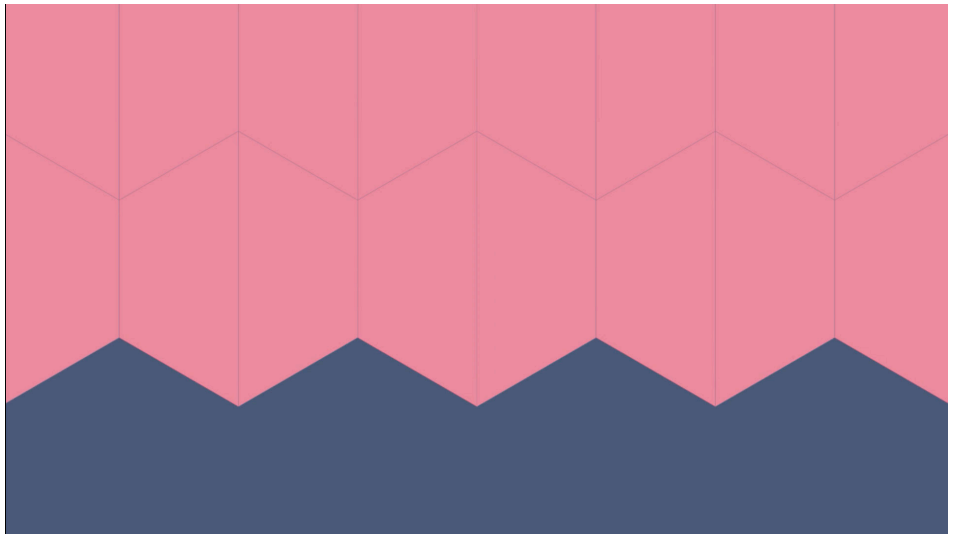
Levels & Layers

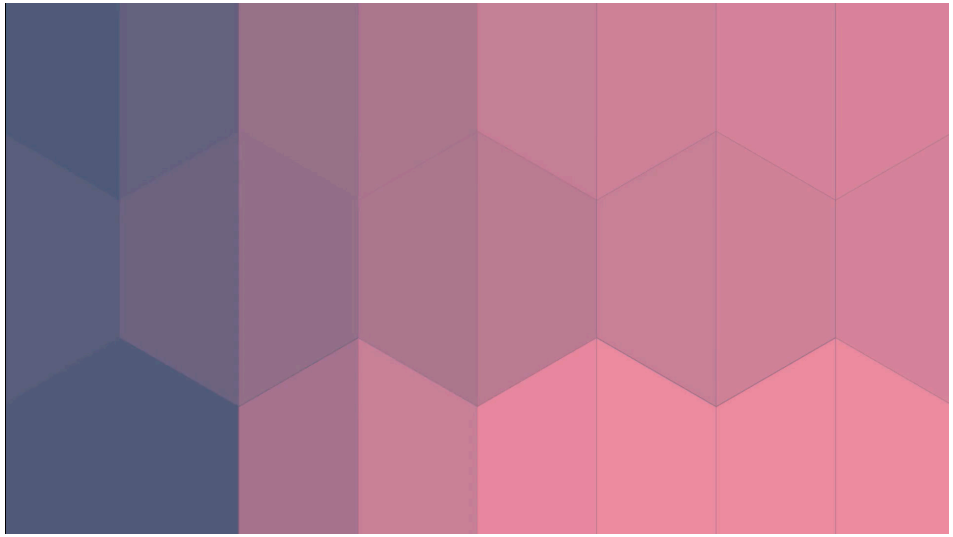


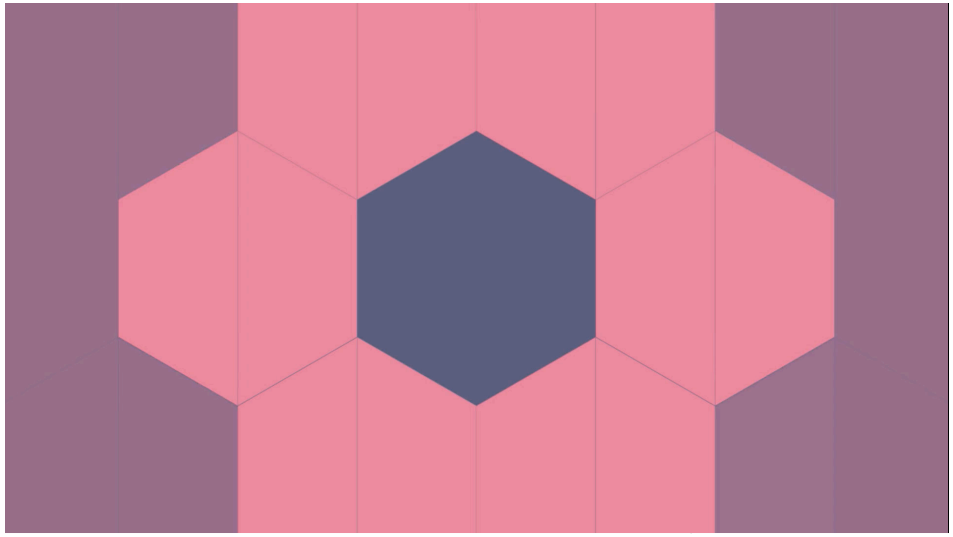
Graphic Transparency In each of these compositions, a photograph has been overlaid with a field of graphic elements. The graphic layer becomes an abstracted commentary on the image underneath. MFA Studio.

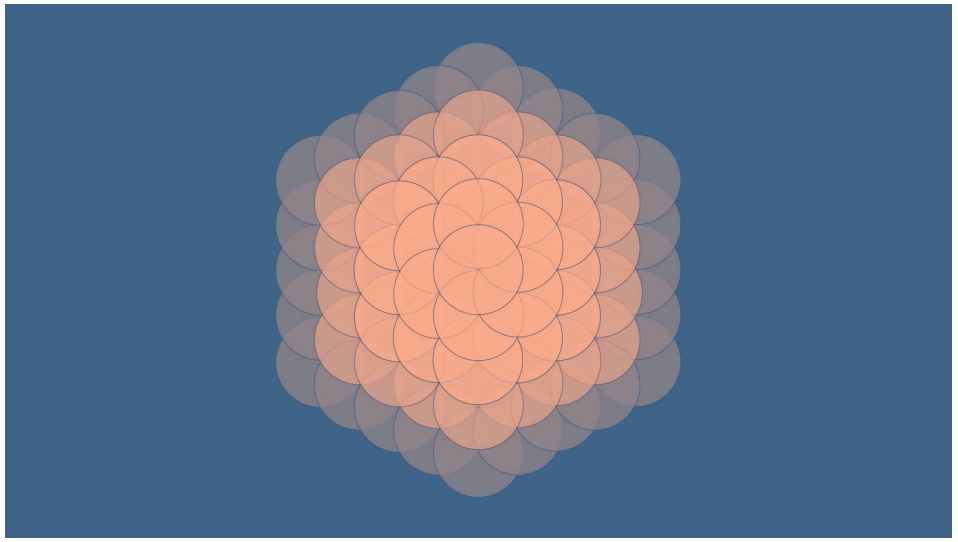
Jeremy Botts

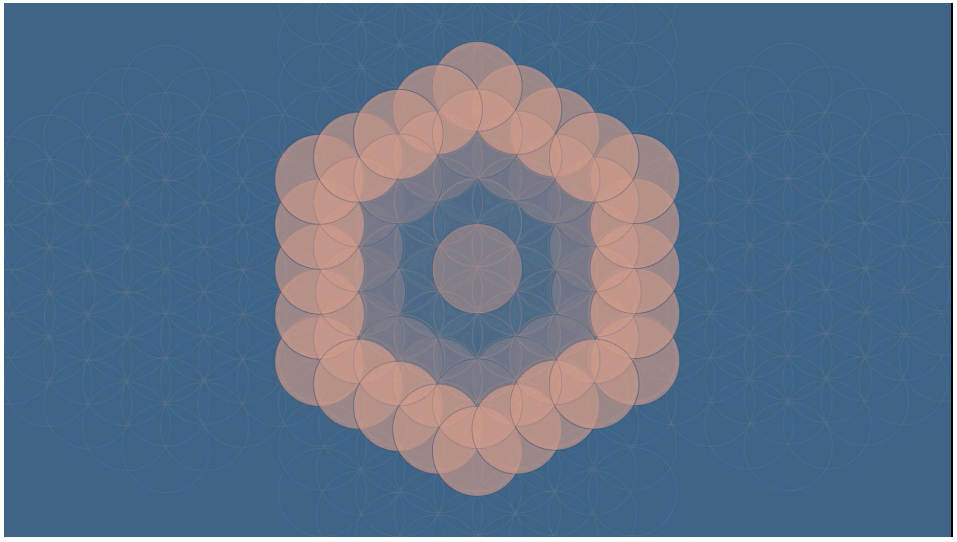


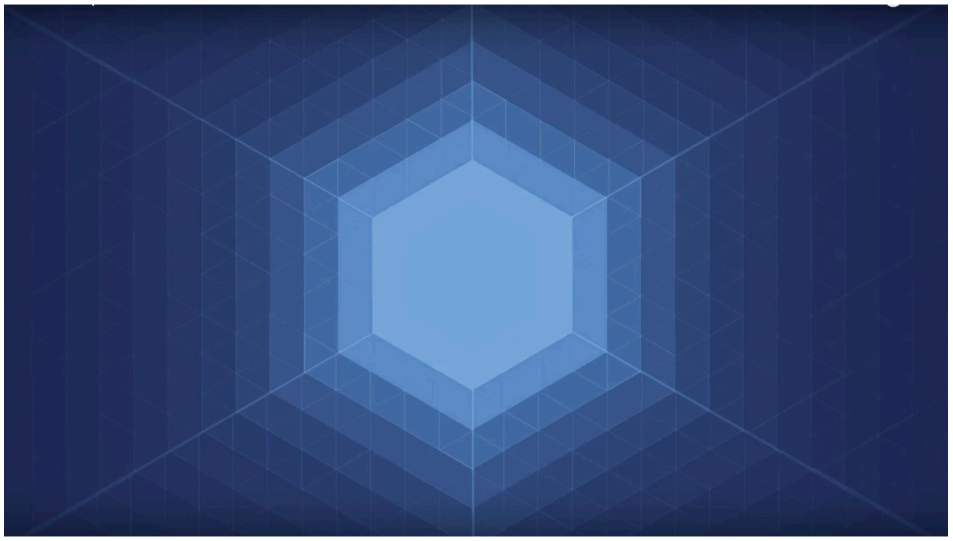


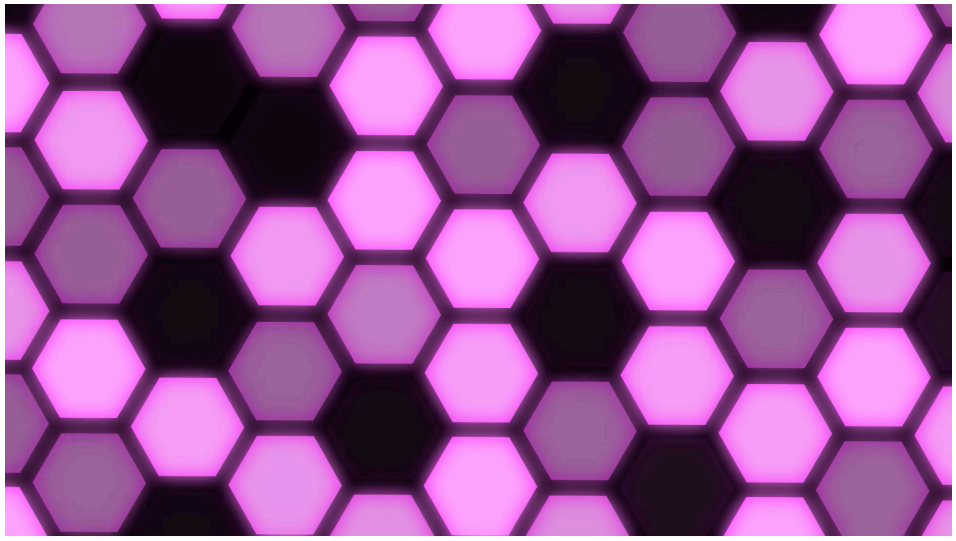


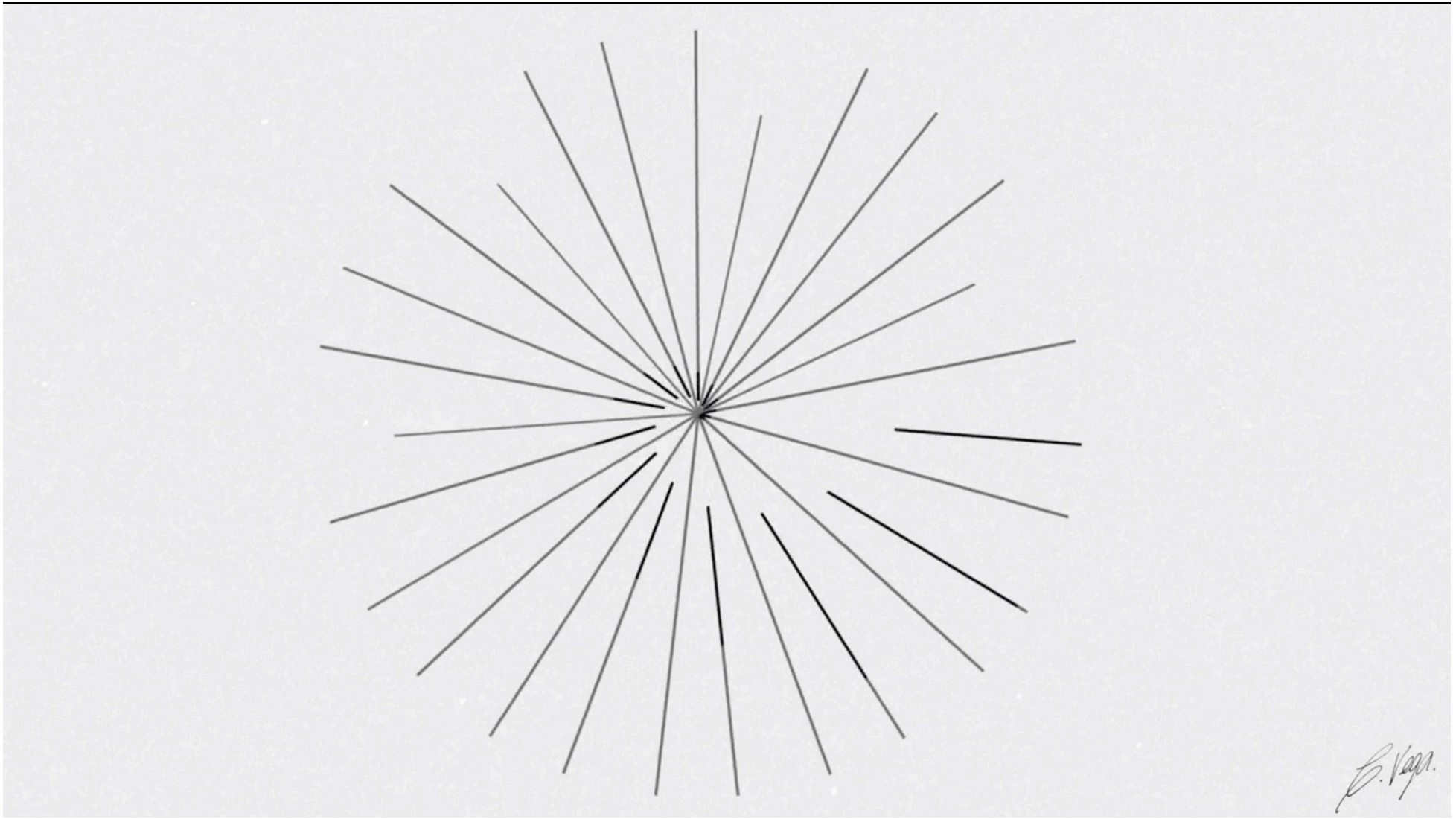


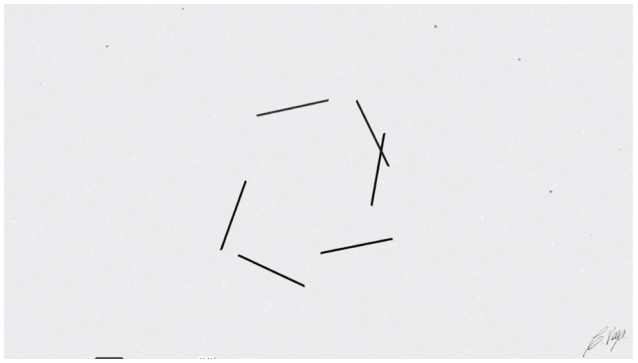


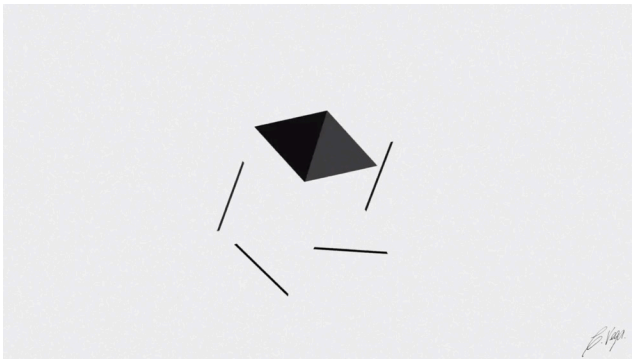


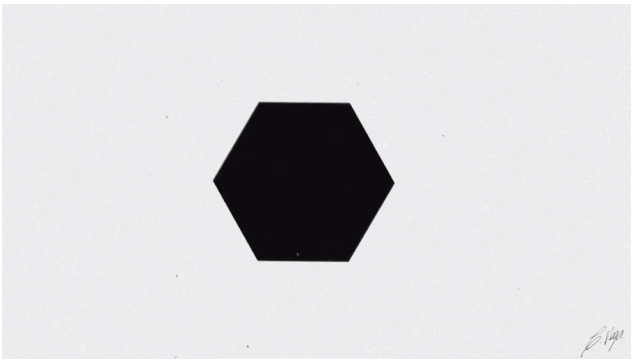


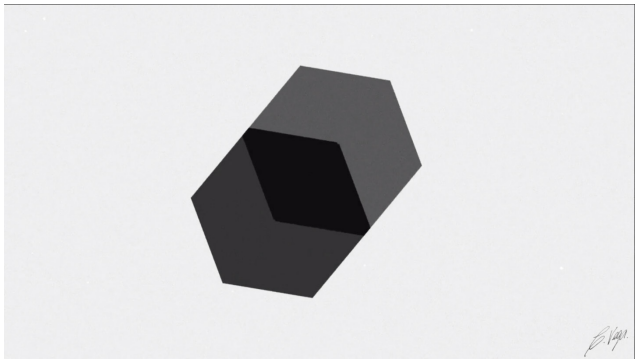
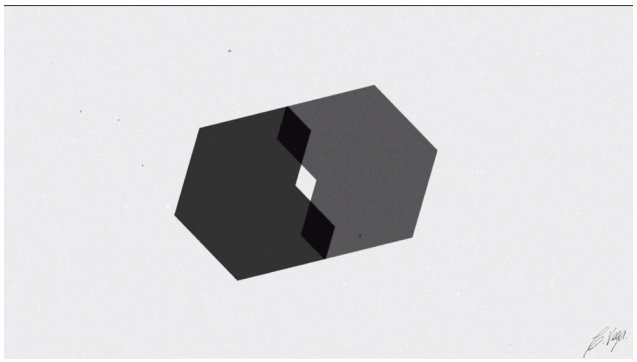
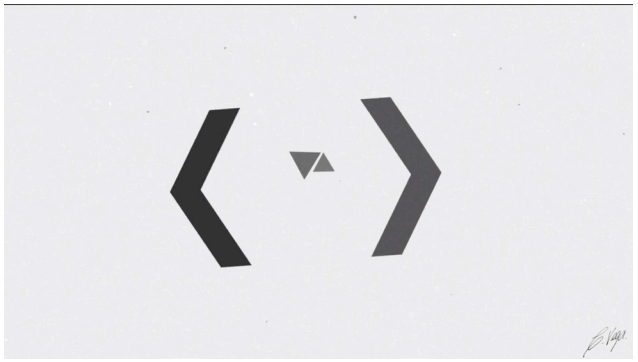
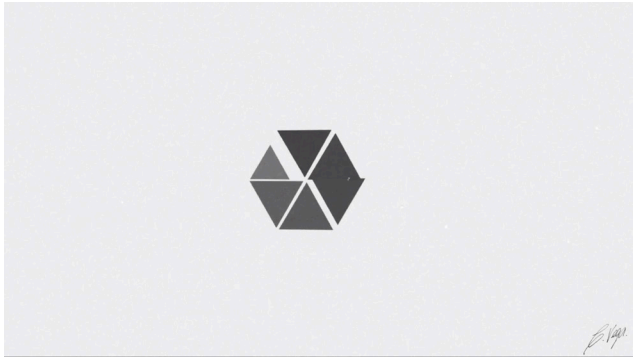
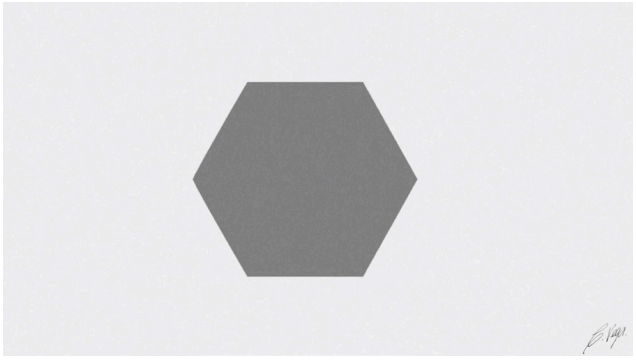
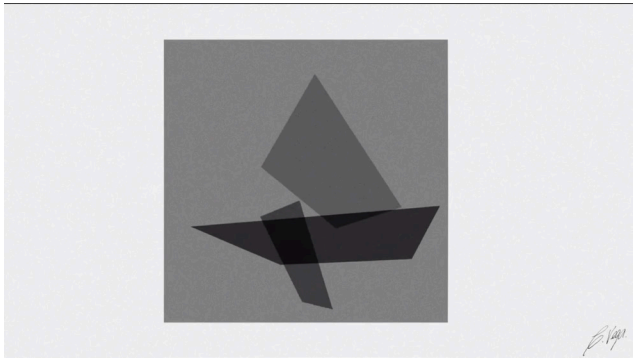
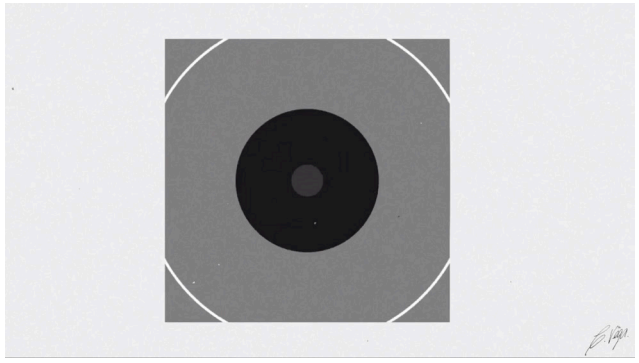
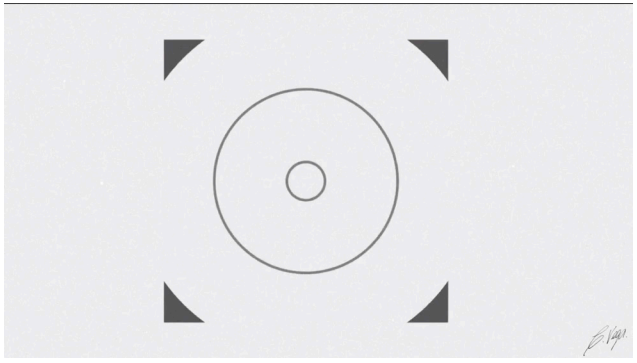
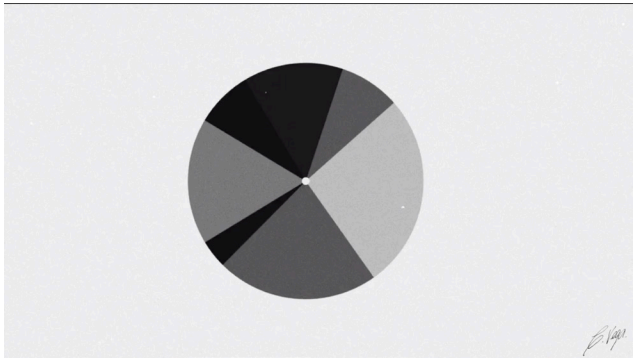
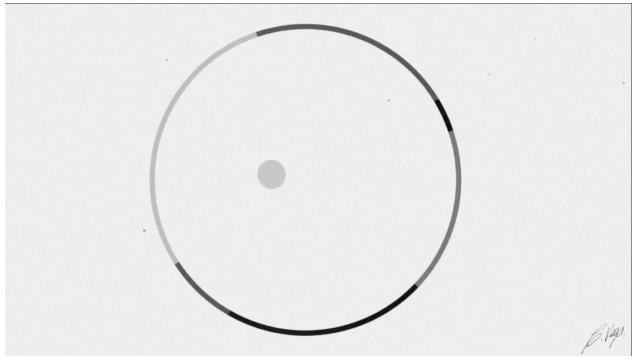
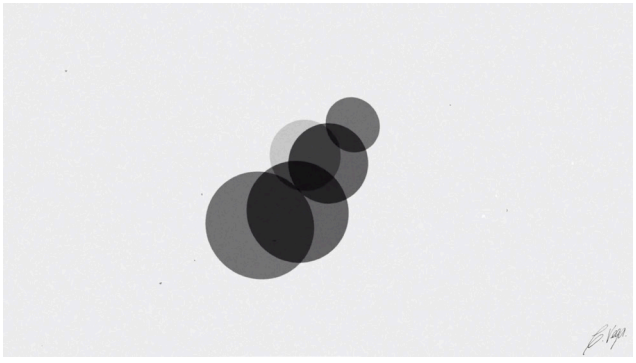
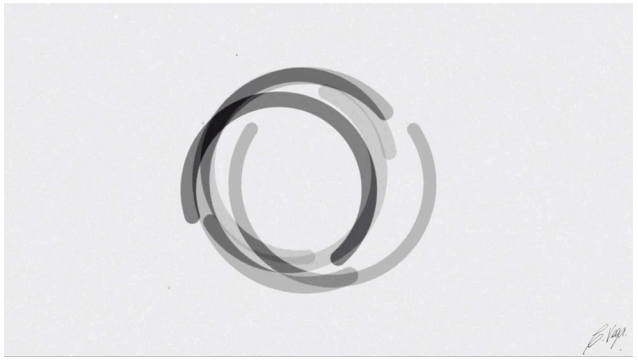








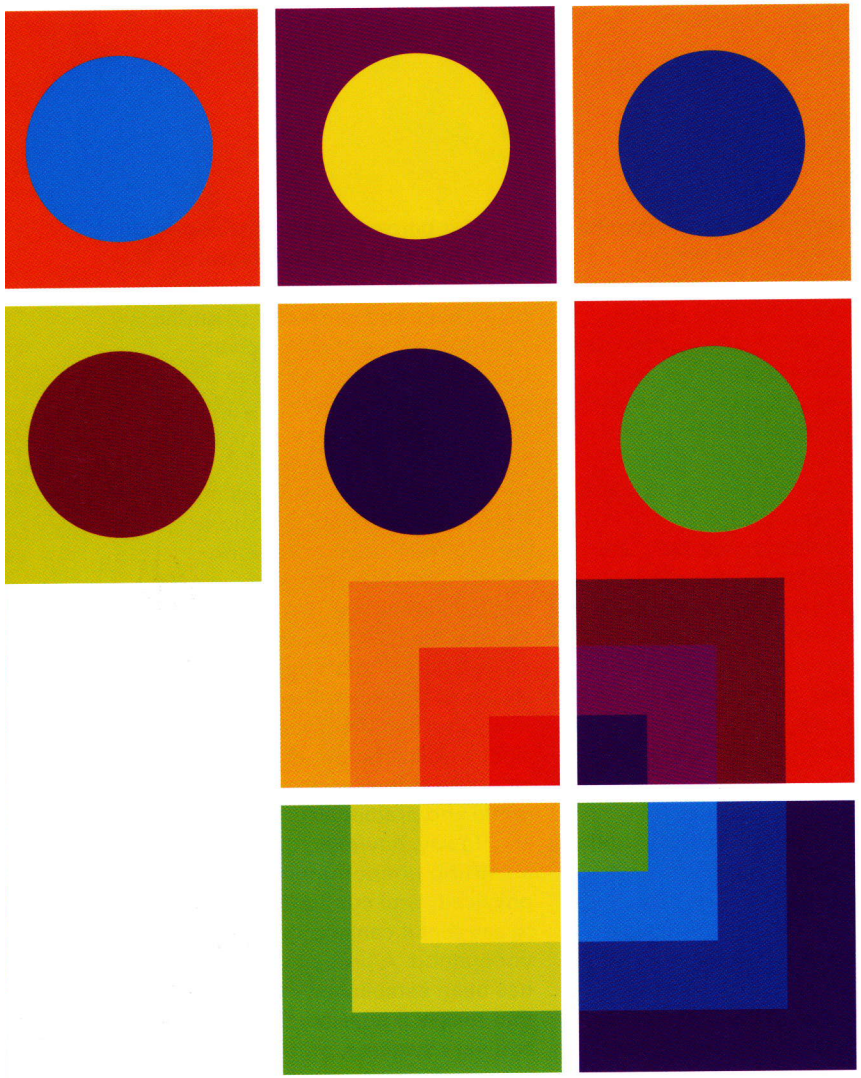


FORMAL CHARACTERISTIC

COLOR

Color Theory



Complementary and Analogous Colors
This diagram shows combinations of primary, secondary, and tertiary colors.
Robert Lewis, MFA Studio.

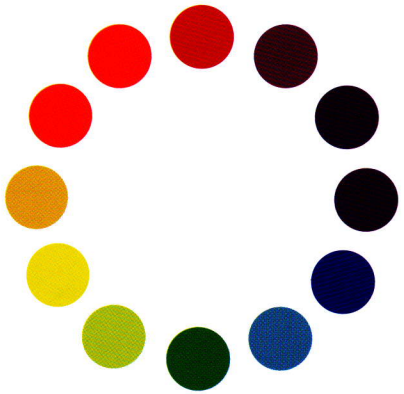
Basic Color Theory

In 1665 Sir Isaac Newton discovered that a prism separates light into the spectrum of colors: red, orange, yellow, green, blue, indigo, and violet. He organized the colors around a wheel very much like the one artists use today to describe the relationships among colors.[1]

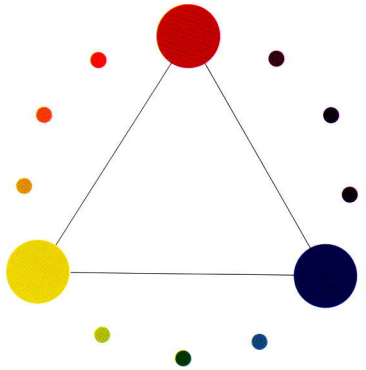
Why is the color wheel a useful design tool? Colors that sit near each other on the spectrum or close together on the color wheel are analogous. Using them together provides minimal color contrast and an innate harmony, because each color has some element in common with others in the sequence. Analogous colors also have a related color temperature. Two colors sitting opposite each other on the wheel are complements. Each color contains no element of the other, and they have opposing temperatures (warm versus cool). Deciding to use analogous or contrasting colors affects the visual energy and mood of any composition.

1. On basic color theory and practice, see Tom Fraser and Adam Banks, *Designer's Color Manual* (San Francisco: Chronicle Books, 2004).

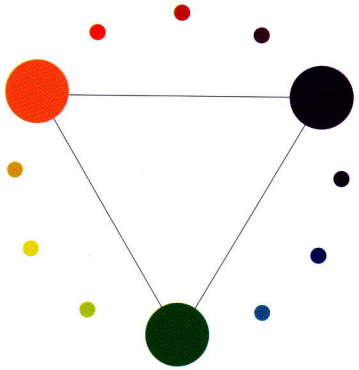
Color Wheel



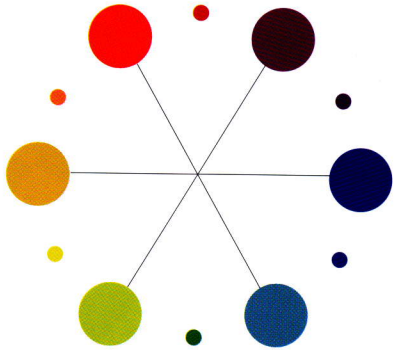
The Color Wheel
This basic map shows relationships among colors. Children learn to mix colors according to this model, and artists use it for working with pigments (oil paint, watercolor, gouache, and so on).



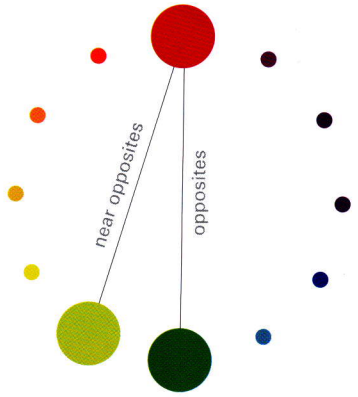
Primary Colors
Red, yellow, and blue are pure; they can't be mixed from other colors. All of the other colors on the wheel are created by mixing primary colors.



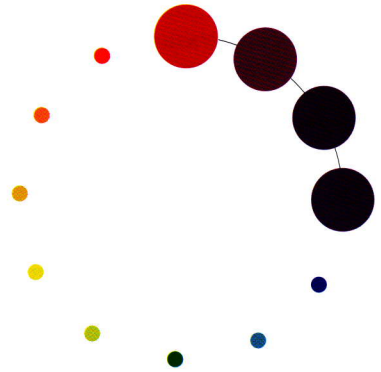
Secondary Colors
Orange, purple, and green each consist of two primaries mixed together.



Tertiary Colors
Colors such as red orange and yellow green are mixed from one primary and one secondary color.



Complements
Red/green, blue/orange, and yellow/purple sit opposite each other on the color wheel. For more subtle combinations, choose "near opposites," such as red plus a tertiary green, or a tertiary blue and a tertiary orange.



Analogous Colors
Color schemes built from hues that sit near to each other on the color wheel (analogous colors) have minimal chromatic differences.

Graduated Color Wheel Each hue on the color wheel is shown here in a progressive series of values (shades and tints). Note that the point of greatest saturation is not the same for each hue. Yellow is of greatest intensity toward the lighter end of the value scale, while blue is more intense in the darker zone.

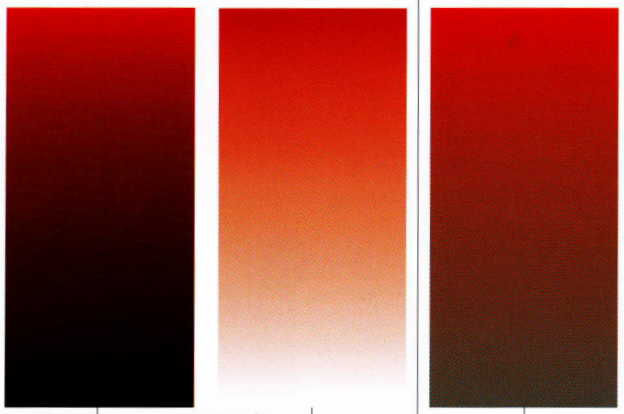
Use the graduated color wheel to look for combinations of colors that are similar in value or saturation, or use it to build contrasting relationships. Robert Lewis, MFA Studio.

Terminology

Hue is the place of the color within the spectrum. A red hue can look brown at a low saturation, or pink at a pale value.

Intensity is the brightness or dullness of a color. A color is made duller by adding black or white, as well as by neutralizing it toward gray (lowering its saturation).

Value is the light or dark character of the color, also called its luminance, brightness, lightness, or tone. Value is independent of the hue or intensity of the color. When you convert a color image to black and white, you eliminate its hue but preserve its tonal relationships.



Shade is a variation of a hue produced by the addition of black.

Tint is a variation of a hue produced by the addition of white.

Saturation (also called chroma) is the relative purity of the color as it neutralizes to gray.

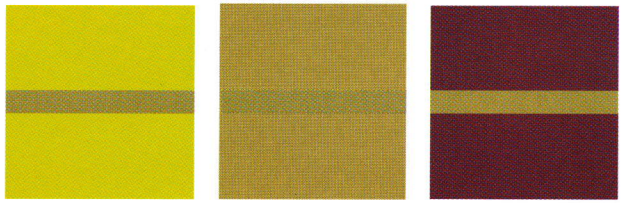
Aspects of Color

Every color can be described in relation to a range of attributes. Understanding these characteristics can help you make color choices and build color combinations. Using colors with contrasting values tends to bring forms into sharp focus, while combining colors that are close in value softens the distinction between elements.

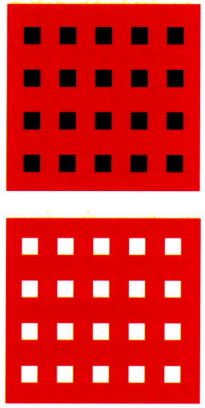
These colors are close in value and intensity, and just slightly different in hue.

These colors are close in hue and value but different in intensity.

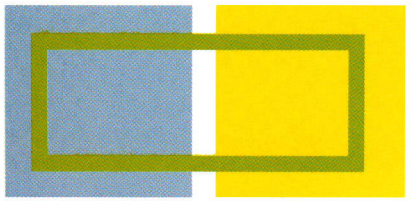
Optical Effects



One Color, Different Effects The neutral tone passing through these three squares of color is the same in each instance. It takes on a slightly different hue or value depending on its context.



Bezold Effect Johann Friedrich Wilhelm von Bezold was a German physicist working in the nineteenth century. Fascinated with light and color, he also was an amateur rug maker. He noticed that by changing a color that interwove with other colors in a rug, he could create entirely different results. Adding a darker color to the carpet would create an overall darker effect, while adding a lighter one yielded a lighter carpet. This effect is known as optical mixing.



Vibration and Value When two colors are very close in value, a glowing effect occurs; on the left, the green appears luminous and unstable. With a strong value difference, as seen on the right, the green appears darker.

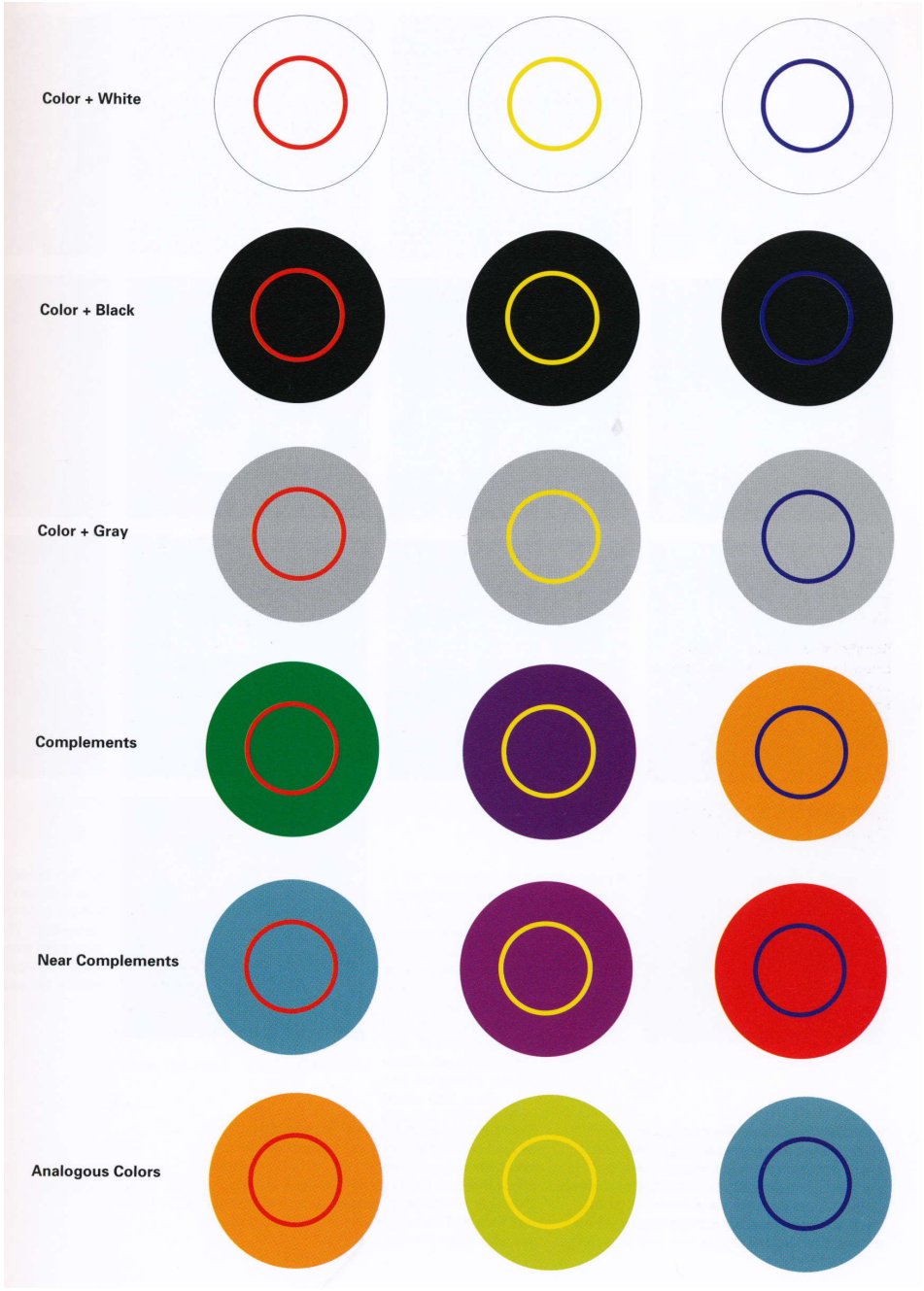
Interaction of Color

Josef Albers, a painter and designer who worked at the Bauhaus before emigrating the United States, studied color in a rigorous manner that influenced generations of art educators.[2] Giving his students preprinted sheets of colored paper with which to work, he led them to analyze and experience how the perception of color changes in relation to how any given color is juxtaposed with others.

Colors are mixed in the eye as well as directly on the painter's palette or the printing press. This fact affects how designers create patterns and textures, and it is exploited in digital and mechanical printing methods, which use small flecks of pure hue to build up countless color variations.

Designers juxtapose colors to create specific climates and qualities, using one color to diminish or intensify another. Understanding how colors interact helps designers control the power of color and systematically test variations of an idea.

2. See Josef Albers, *Interaction of Color* (1963; repr., New Haven: Yale University Press, 2006).



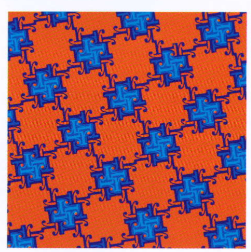
Emphasis & Juxtaposition

Joanna Marshall

Neutral earth tones combine to make a quiet overall pattern, while a palette with strong contrasts of value and hue yields a more linear effect.

Katie Evans

By changing the colors of background and foreground elements, completely new forms appear and disappear.



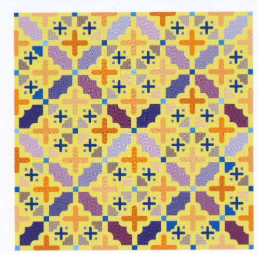
Elizabeth Tipson

Ellen Kling

Colors close in value but different in hue create a vibrant yet soft effect. The effect becomes even softer when analogous colors are used.

Anna Eshelman

The similarly muted hues of olive and brown sit back, allowing a pale yellow pattern to come forward. Next, gradations of yellow, orange, and red weave through a green background of equivalent value, causing the dark blue shapes to command attention.



Anna Eshelman

Julie Diewald

In the first color study above, the complementary orange and blue squares vibrate against each other, while the analogous yellow and green play a more passive role. In the second study, the dark blue and burgundy tones frame and push forward the brighter blues in the center.

Anna Eshelman

The muted neutral hues allow the forms to gently commingle, while contrasting hues and values break the elements apart.

Selective Emphasis These studies use typographic pattern to explore how color alters not just the mood of a pattern, but the way its shapes and figures are perceived. Color affects both the parts and the whole. Each study begins with a black and white pattern built from a single font and letterform.

Experiments with hue, value, and saturation, as well as with analogous, complementary, and near complementary color juxtapositions, affect the way the patterns feel and behave. Through selective emphasis, some elements pull forward and others recede. Typography I. Jennifer Cole Phillips, faculty.