

# **Building User Interfaces**

# **Visual Design**

## **Cole Nelson**

# What we will learn today?

- Elements and principles of design
- Color, type, and images

# Elements of Design

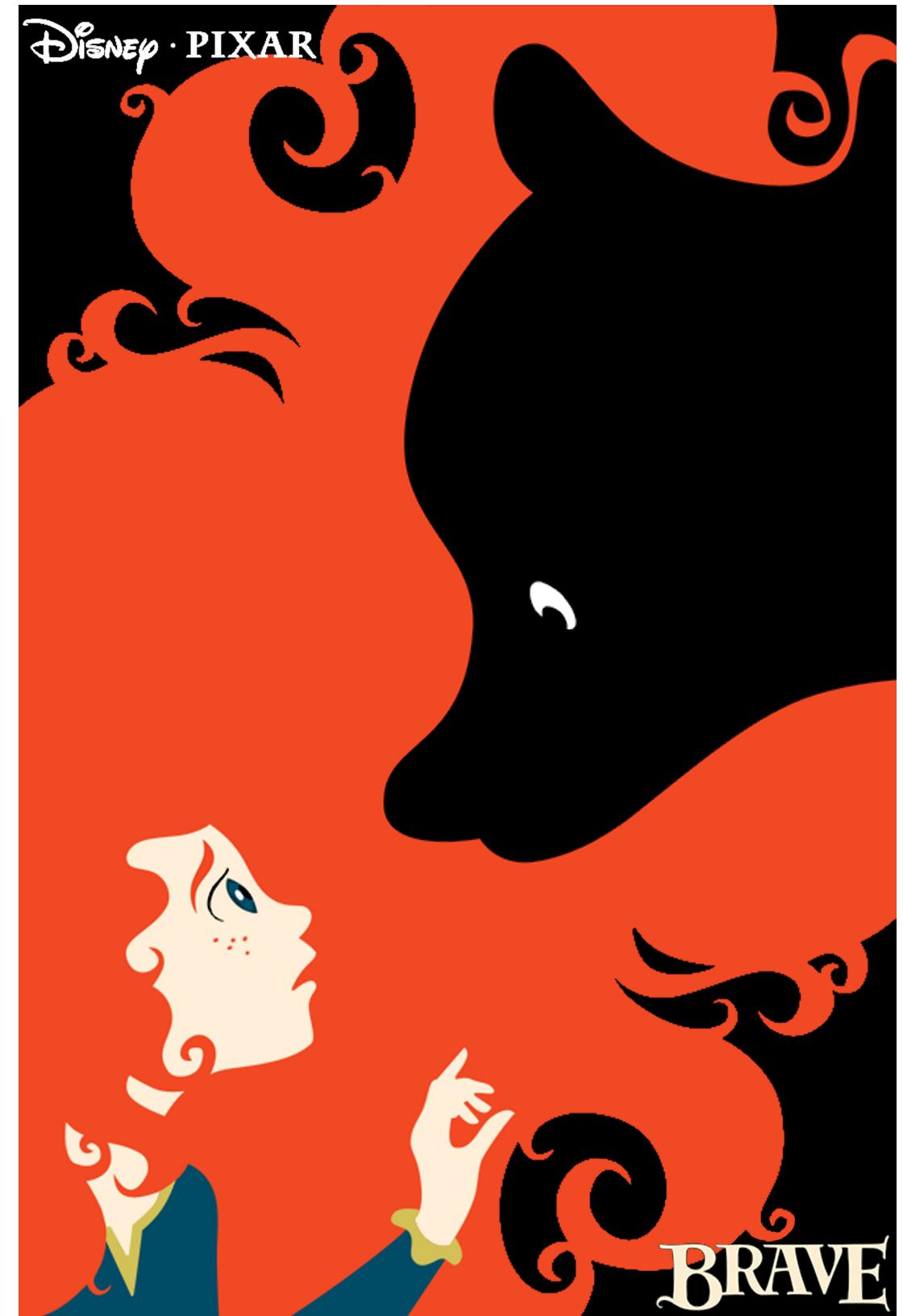
# Elements of Design

1. Space
2. Line
3. Shape
4. Size
5. Pattern
6. Texture
7. Value

# Space<sup>1</sup>

**Definition:** Space is the canvas on which visual elements are placed.

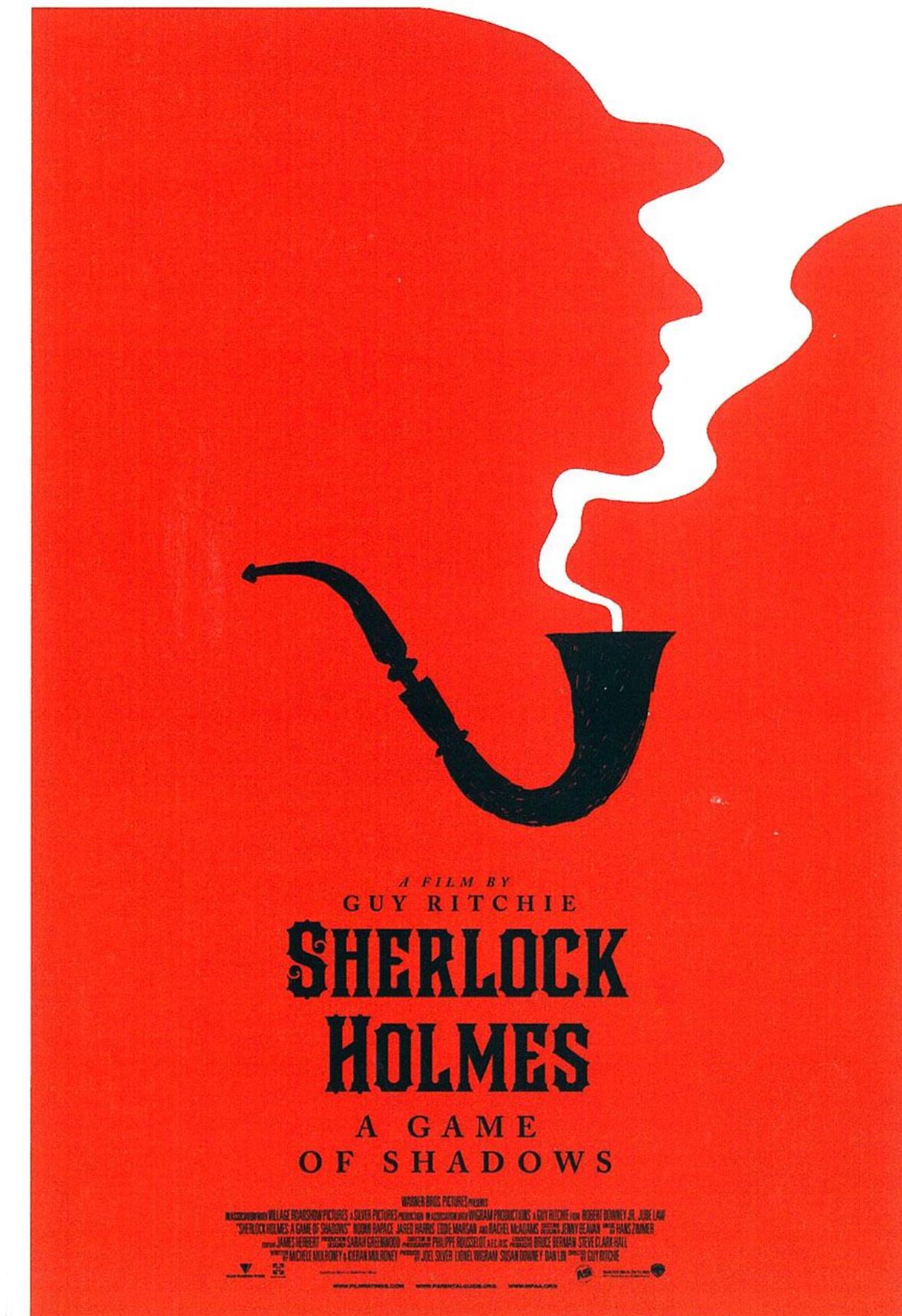
- Space can be *positive* or *negative*
- *Positive*: where the subject is positioned
- *Negative*: the space surrounding the subject
- Negative space can be used as positive



<sup>1</sup>Image sources: [this slide](#), next slide: [left](#), [right](#)

**Now data  
helps pinpoint  
more oil.**

In Venezuela, IBM deep computing processes seismic data, helping Tricon Geophysics pinpoint new oil and gas using 40% less energy. [ibm.com/smarterplanet](http://ibm.com/smarterplanet)



# Line<sup>2</sup>

**Definition:** The most primal design element that can divide space, call attention to, organize, and make up other elements.

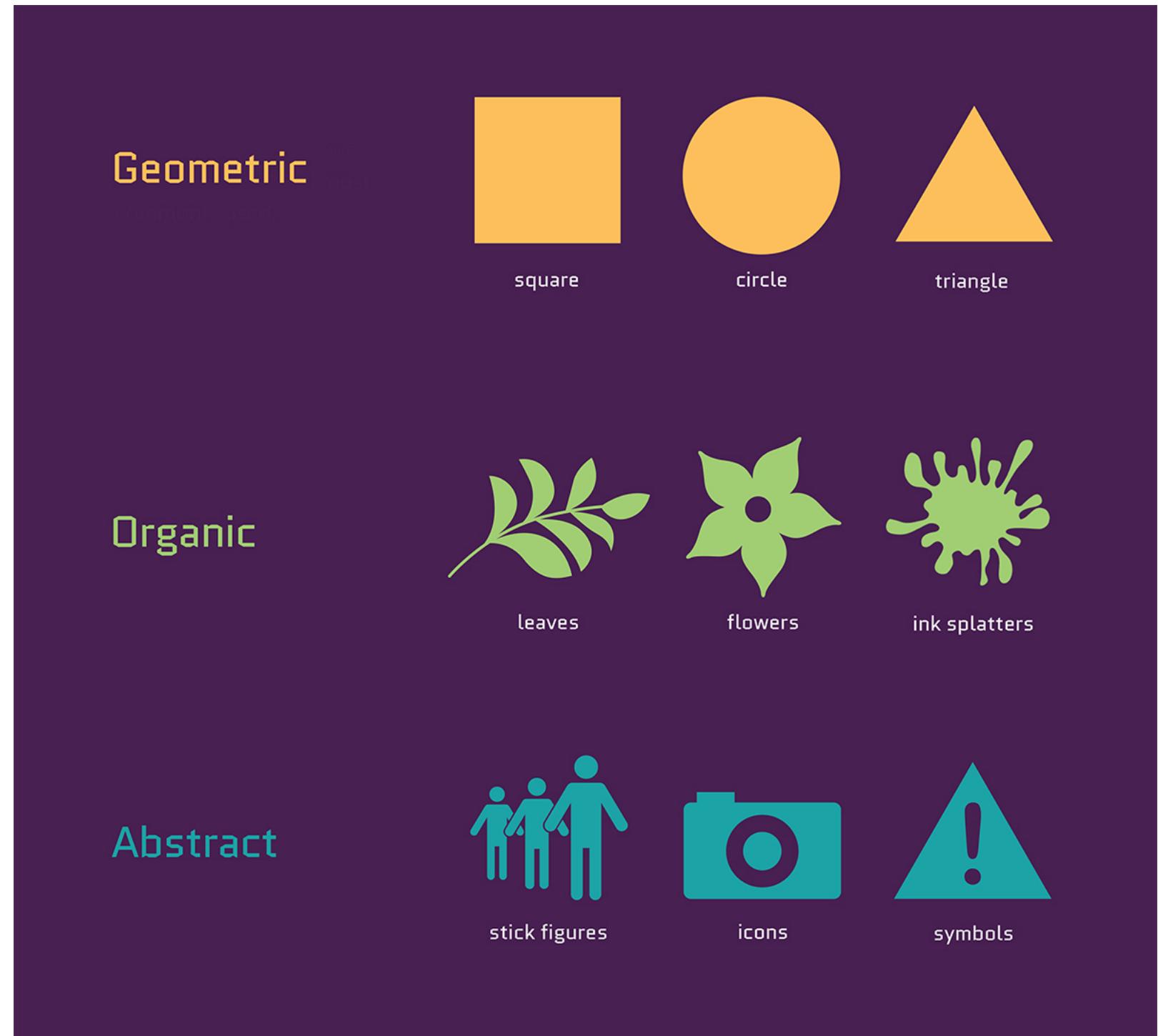


<sup>2</sup>[Image source](#)

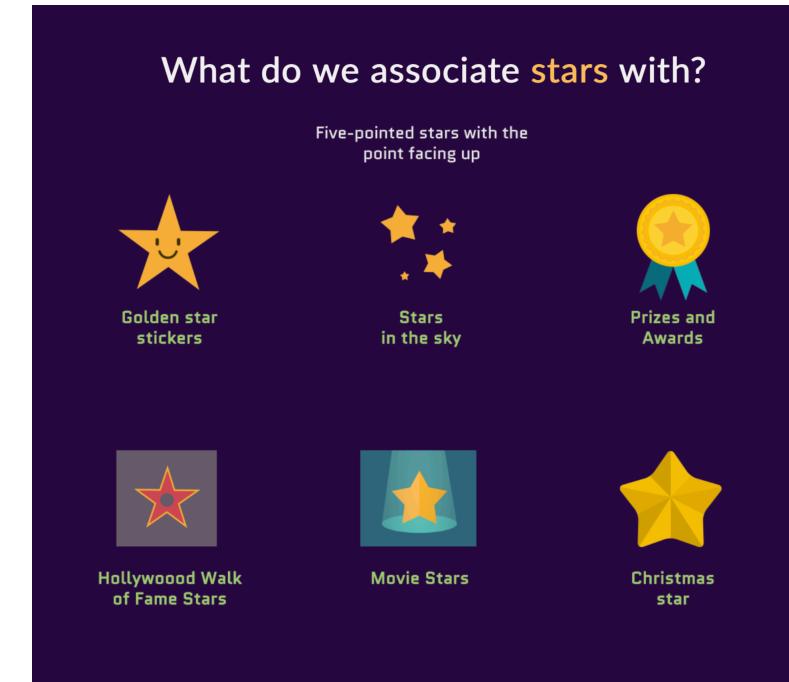
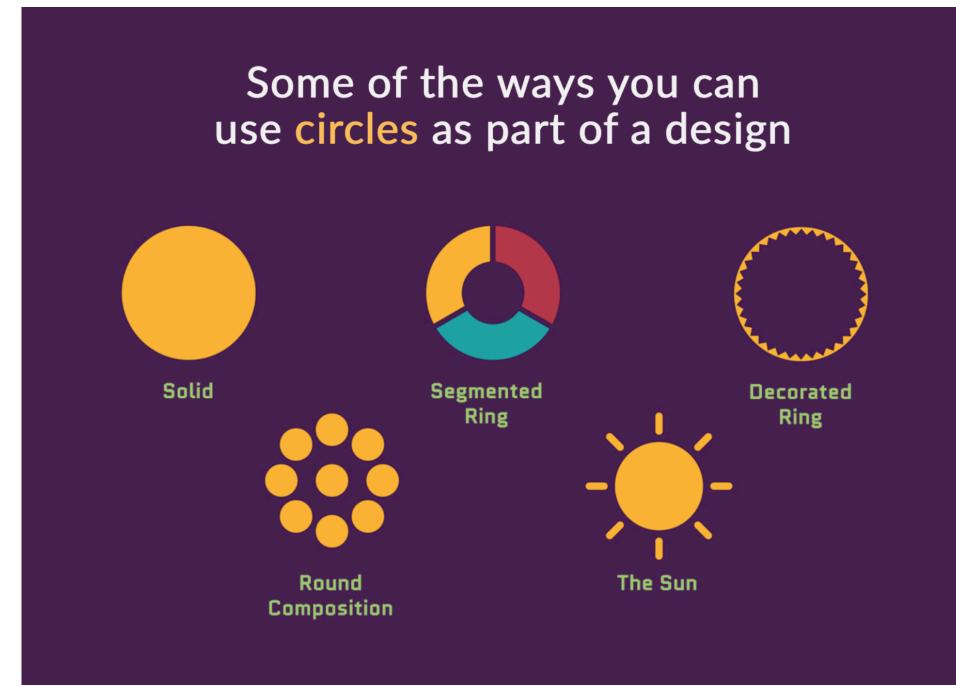
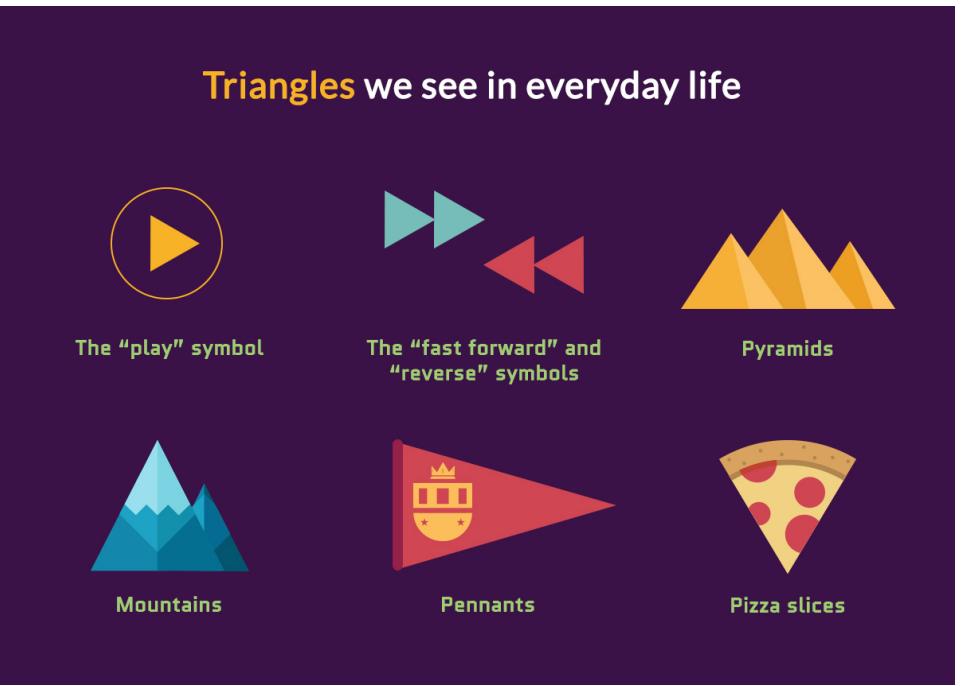
# Shape<sup>3</sup>

**Definition:** Space outlined by a contour.

- *Organic* vs. *inorganic* shapes



<sup>3</sup> Image sources: [this](#) & [next slides](#)



# Size<sup>4</sup>

**Definition:** Size, or *scale*, is the relative extent of the design elements such as shapes and lines.



<sup>4</sup>Image source

# Pattern<sup>5</sup>

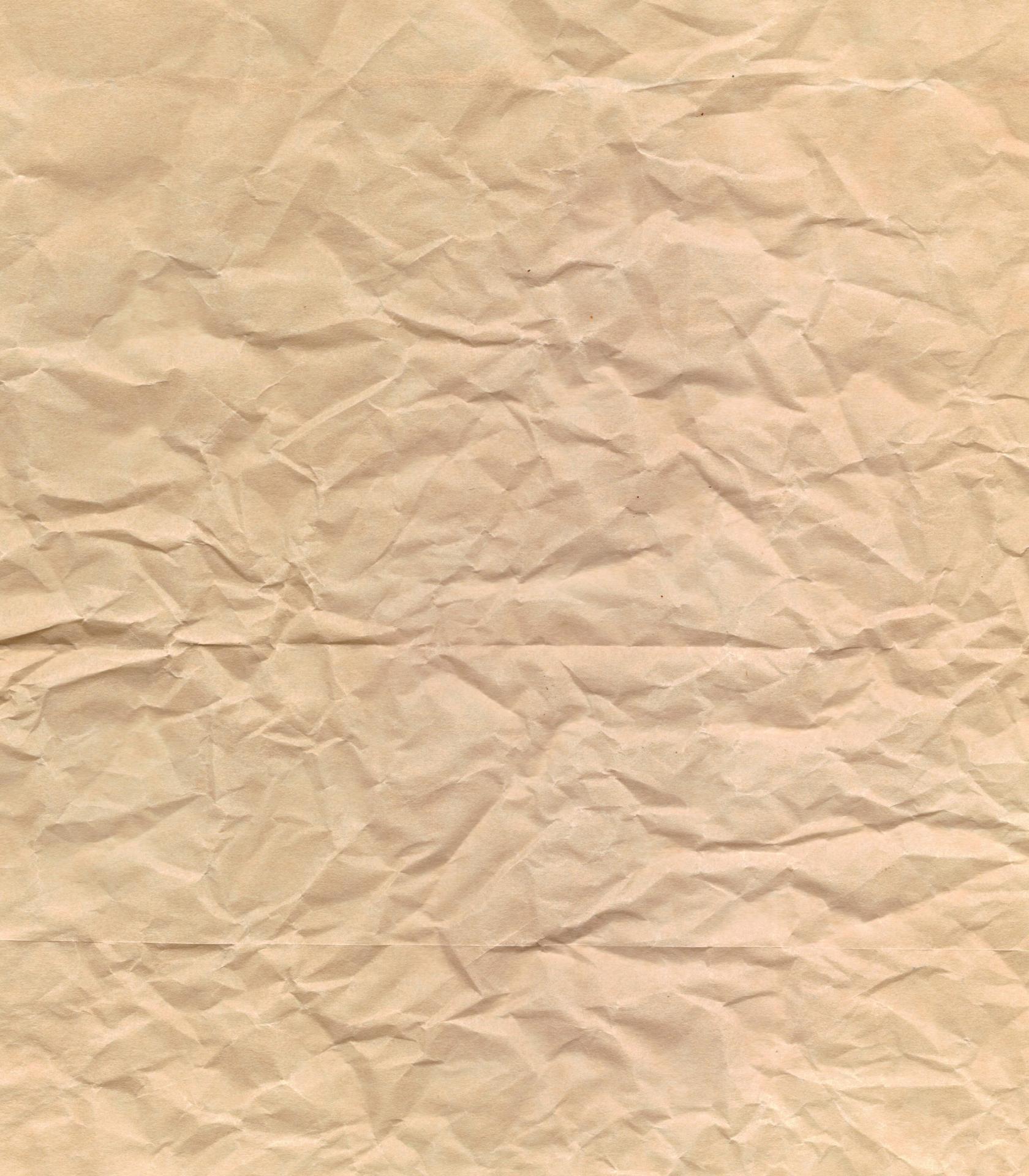
**Definition:** Pattern, or *repetition*, systematic duplication of other design elements such as shapes and lines.



<sup>5</sup> Image source

# Texture<sup>6</sup>

**Definition:** Tactile and visual quality of a shape or space made up of different colors, materials, and different structures.



<sup>6</sup>Image source

# Value<sup>7</sup>

**Definition:** The intensity in which a design element is expressed.



<sup>7</sup> Image source

# Principles of Design

# Principles of Design

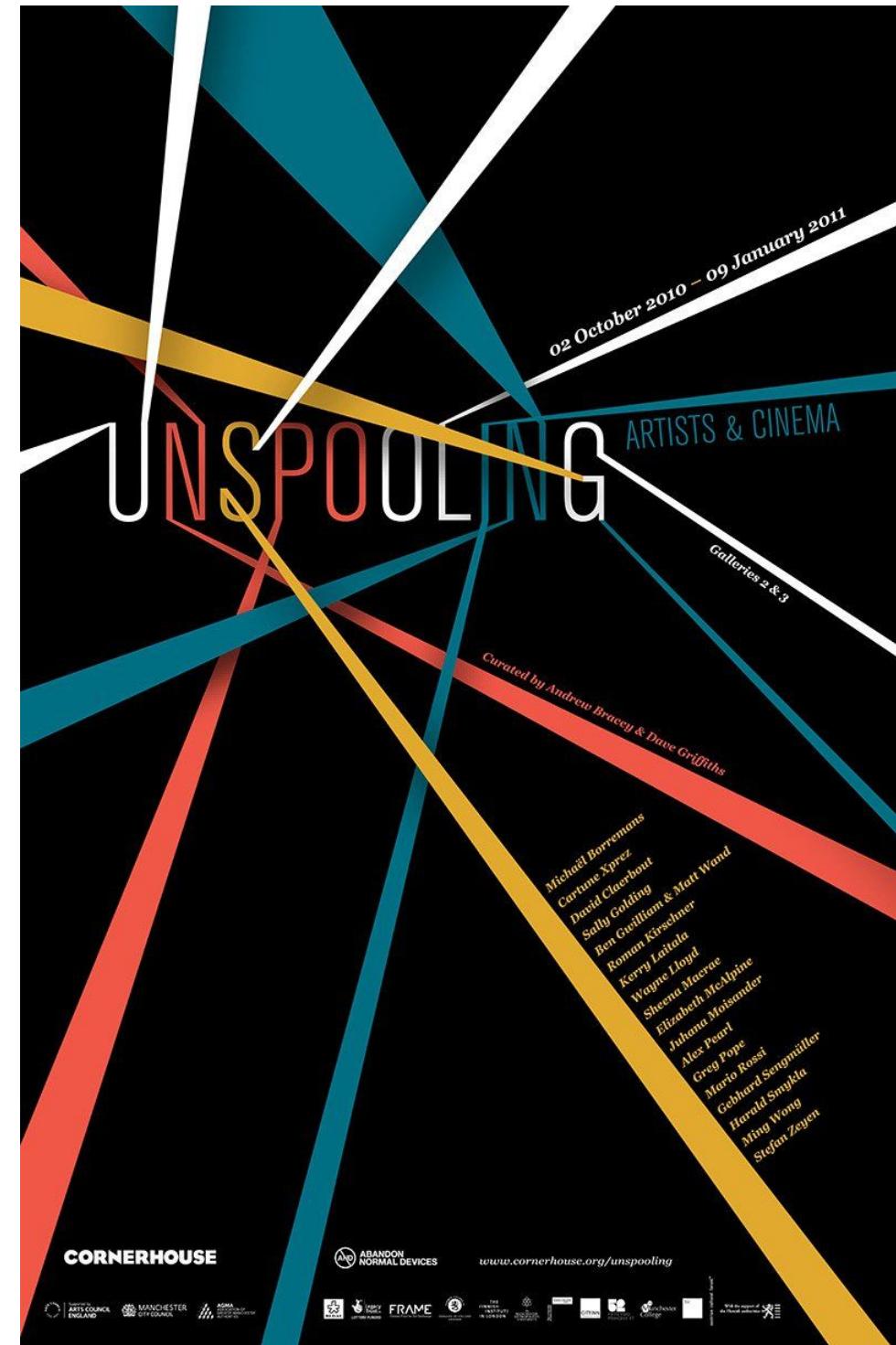
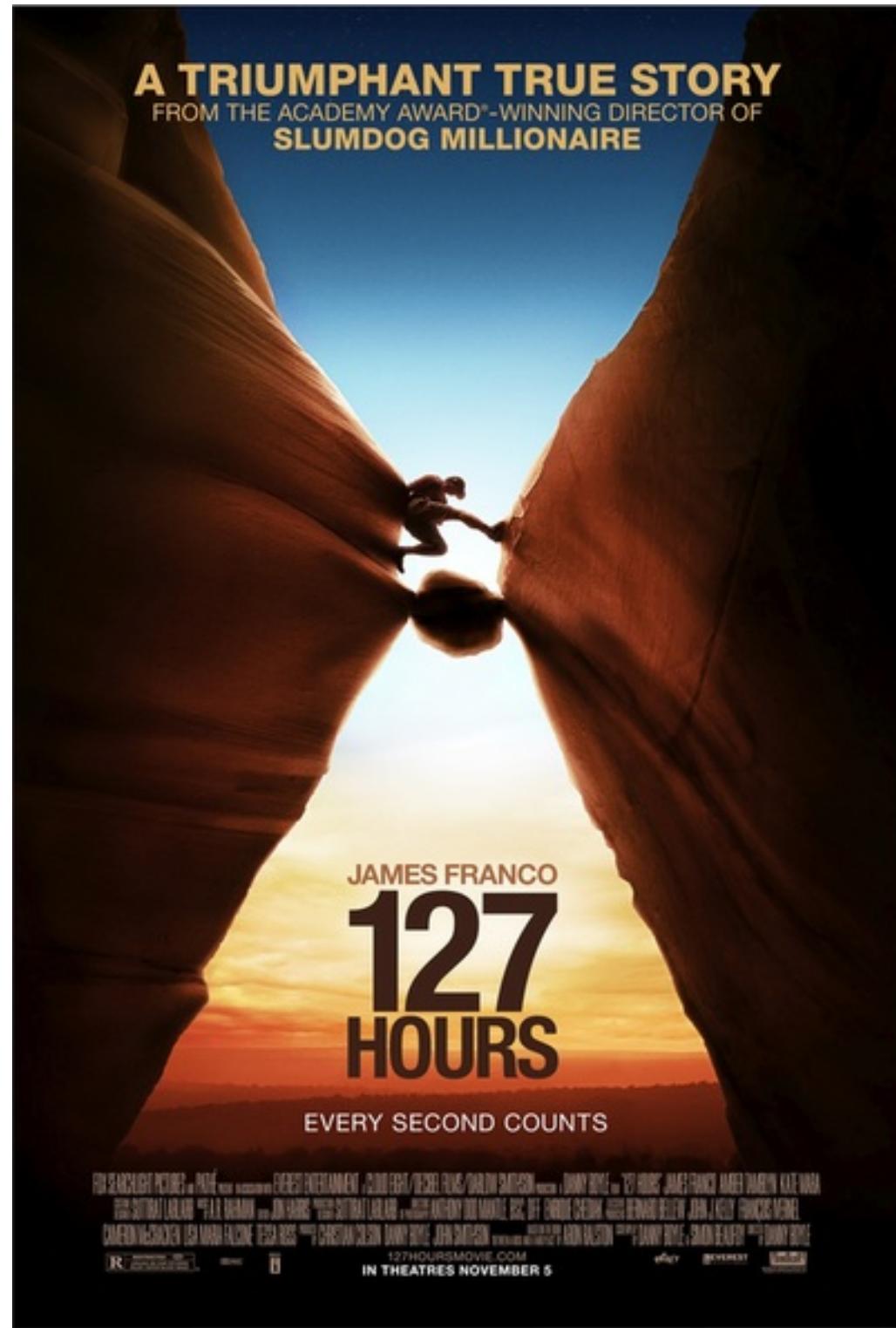
1. Focal Point
2. Contrast
3. Balance
4. Movement
5. Rhythm
6. Perspective
7. Unity

# Focal Point<sup>8</sup>

**Definition:** Focal point, or the area of visual interest, is where the design directs the attention of the viewer first.



<sup>8</sup>Images sources: [this slide](#), next slide: [left](#), [right](#)



# Contrast<sup>9</sup>

**Definition:** Contrast, is the juxtaposition of design elements that strikingly differ from each other to guide user attention and action.



<sup>9</sup> Image sources: [this slide](#), next slide: [left](#), [right](#)



# Balance<sup>10</sup>

**Definition:** The organization of design elements on a canvas to provide a sense of visual balance or imbalance.

*Pro Tip:* Balance can be achieved through *symmetry* or *asymmetry*.

**lively!** Goes like a greyhound with a hotfoot . . . curves 'round corners like a sports car . . . packs more power than you'll ever expect! No other small car gives you such terrific performance—up to 60 miles per gallon—and seats 4 in such easy comfort .

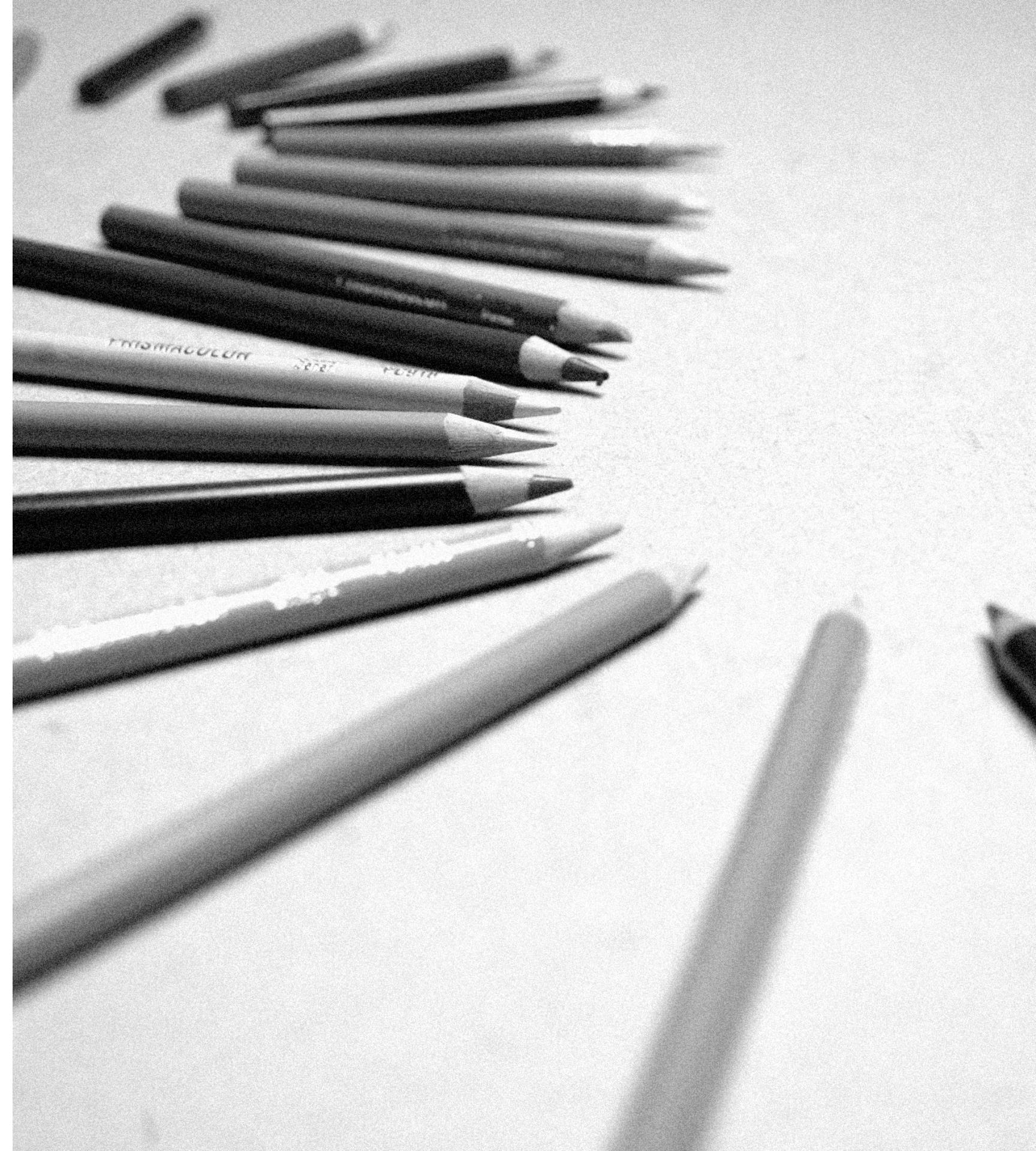
**Austin 850**



<sup>10</sup> [Image source](#)

# Movement<sup>11</sup>

**Definition:** The organization of design elements in a way that suggests a particular flow on the canvas to direct the user's attention in a particular pattern.



<sup>11</sup> [Image source](#)

# Rhythm<sup>12</sup>

**Definition:** Patterned use of design elements in a way that communicates movement or order.



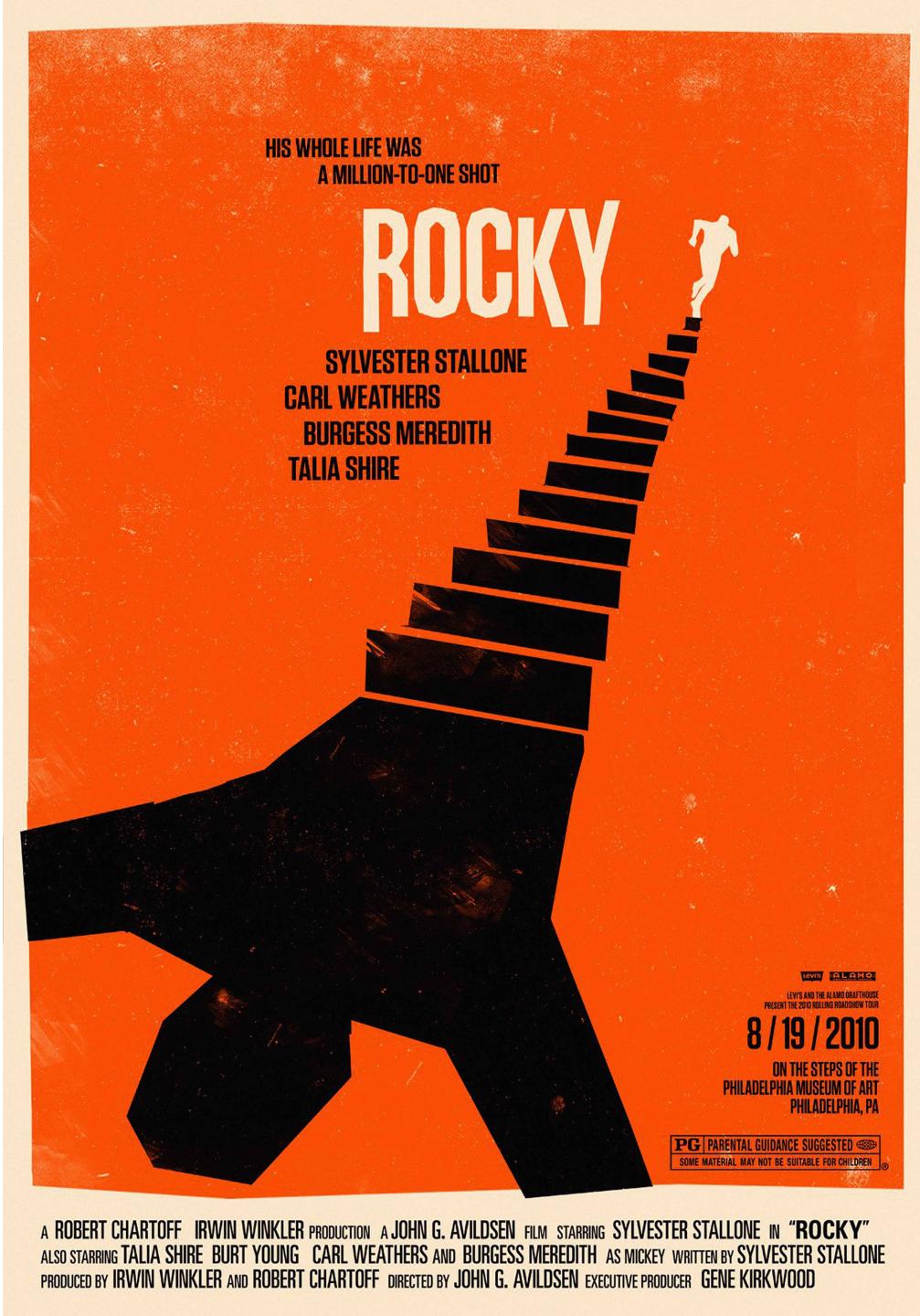
<sup>12</sup> [Image source](#)

# Perspective<sup>13</sup>

**Definition:** Creating a sense of horizon and movement along the depth axis of canvas.

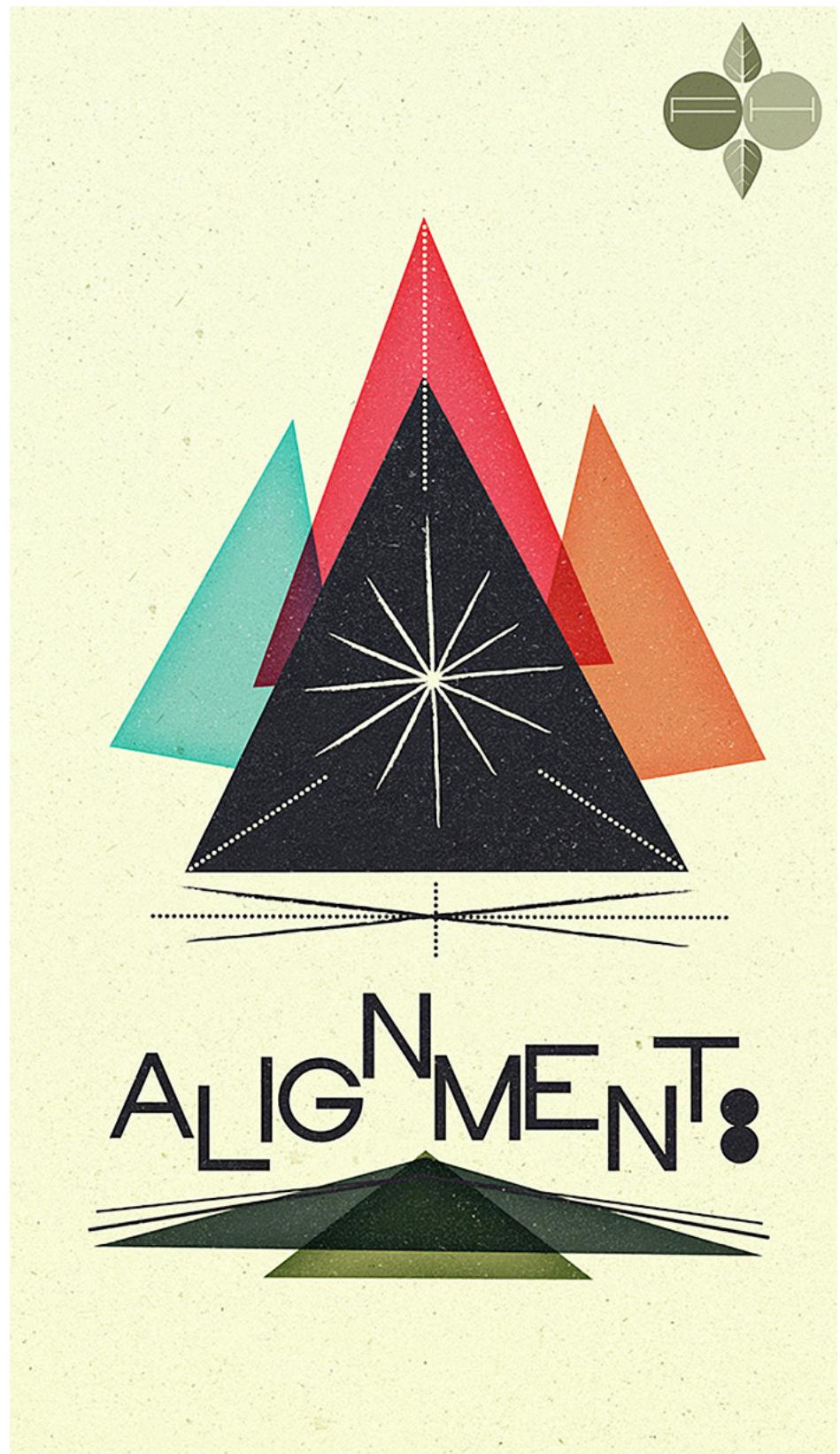


<sup>13</sup> Image sources: [this slide](#), next slide: [left](#), [right](#)



# Unity<sup>14</sup>

**Definition:** Unity reflects the holistic consistency in the use of design elements.



<sup>14</sup> Image sources: [this slide](#), next slide: [left](#), [right](#)



**This all sounds good. But how do we actually use these?**

# Some Strategies

- Create *cheat sheets*, and *checklists*
- Analyze existing designs using these tools to build visual analysis skills
- *Practice* designing using the principles
  - *Pro Tip:* Your canvas should have no elements that do not follow an overall principle

# In-class Design Exercise 1

Analyze an existing page using the design elements and principles

- What elements, principles can you see in use?
- What problems do you see that can be addressed using design principles?

The screenshot shows the homepage of the Wisconsin State Journal. At the top, there's a navigation bar with links for News, Sports, Food & Fun, Opinion, Obituaries, Politics, and Buy & Sell. On the right, there are buttons for Log In and Become a Member. Below the navigation is a weather widget showing 65° Fair. The main header features the "WISCONSIN STATE JOURNAL" logo with a small capitol building icon. Below the header, there are several news snippets and a prominent advertisement for Polo Ralph Lauren. A large headline in the center reads "Big Ten announces football returning Oct. 23-24". To the left, there's a local government news item about COVID-19 cases. On the right, there's a sidebar with a "#AloneTogether" campaign ad and a "Trending now" section with two numbered items.

madison.com

News Sports Food & Fun Opinion Obituaries Politics Buy & Sell

Log In Become a Member

WISCONSIN STATE JOURNAL

Wednesday, September 16, 2020 | Print Edition

65° Fair

Celebrity Birthdays: Sept. 15 LAST CHANCE SALE Get 90% off UNLIMITED digital! Subscribe today!

Get local and national politics updates delivered to you SUPPORT LOCAL NOW Click here for the latest updates from local businesses

the YMCA Collaborative Learning Program Register Now! Full-day child care and virtual learning support

JUST IN US outlines sweeping plan to provide free COVID-19 vaccines. Get the highlights.

Breaking News

# Big Ten announces football returning Oct. 23-24

Colten Bartholomew | Wisconsin State Journal

Daily COVID-19 testing, cardiac screening after positive tests are keys to conference's plan.

LOCAL EDUCATION

## Lake Mills Area School District stops in-person school, activities for rest of week due to COVID-19

Jeff Richgels | 42 min ago

The COVID-19 pandemic continues to affect the start of school, with the Lake Mills Area School District the latest to halt in-person school an...

LOCAL GOVERNMENT

## As COVID-19 cases surge, Gov. Tony Evers doesn't rule out extending mask order, other actions

Mitchell Schmidt | Wisconsin State Journal | 47 min ago

Evers said he is exploring the possibility of extending his statewide mask order, which is slated to expire Sept. 28.

## UW-Madison threatens 'more drastic action' as experts say COVID-19 outbreak impacting broader community

David Wahlberg | Wisconsin State Journal | 2 hrs ago

UW-Madison threatened "more drastic action" Tuesday if quarantines in two large dorms don't greatly reduce COVID-19 infections, as health experts said a campus coronavirus outbreak is putting the general public at risk with flu season nearing.

Global Connectivity

9 International Airports and 12 Seaports

DOMINICAN REPUBLIC FREE ZONES

Learn More

## In-class Design Exercise 2<sup>15</sup>

Consider the *last* product you purchased online. Design a product page with the following elements:

- Product photo
- Product description, reviews, similar items
- Action buttons: choose color, add to cart, add to wishlist



<sup>15</sup> Image sources: [this slide](#), elements/principles: [first](#), [second](#)



# The Elements of Design

(the tools to make art)

<b>Line</b>		Horizontal, vertical, diagonal, straight, curved, dotted, broken thick, thin.
<b>Shape</b>		2D (two dimensional)/ flat Geometric (square, circle, oval, triangle) Organic (all other shapes)
<b>Form</b>		3D (three dimensional), Geometric (cube, sphere, cone), Organic (all other forms such as: people, animals, tables, chairs, etc).
<b>Colour</b>		Refers to the wavelengths of light. Refers to hue (name), value (lightness/darkness), intensity (saturation, or amount of pigment), and temperature (warm and cool). Relates to tint, tone and shade.
<b>Value</b>		The lightness or darkness of an image (or part of an image).
<b>Texture</b>		The feel, appearance, thickness, or stickiness of a surface (for example: smooth, rough, silky, furry).
<b>Space</b>		The area around, within, or between images or parts of an image (relates to perspective). Positive and negative space.

# The Principles of Design

(how to use the tools to make art)

<b>Pattern</b>		A regular arrangement of alternated or repeated elements (shapes, lines, colours) or motifs.
<b>Contrast</b>		The juxtaposition of different elements of design (for example: rough and smooth textures, dark and light values) in order to highlight their differences and/or create visual interest, or a focal point.
<b>Emphasis</b>		Special attention/importance given to one part of a work of art (for example, a dark shape in a light composition). Emphasis can be achieved through placement, contrast, colour, size, repetition... Relates to focal point.
<b>Balance</b>		A feeling of balance results when the elements of design are arranged symmetrically or asymmetrically to create the impression of equality in weight or importance.
<b>Scale</b>		The relationship between objects with respect to size, number, and so on, including the relation between parts of a whole.
<b>Harmony</b>		The arrangement of elements to give the viewer the feeling that all the parts of the piece form a coherent whole.
<b>Rhythm/Movement</b>		The use of recurring elements to direct the eye through the image; the way the elements are organized to lead the eye to the focal area. The eye can be directed, for example, along edges and by means of shape and colour.
<b>Unity</b>		All parts of an image work together to be seen as a whole.
<b>Variety</b>		Using different elements in an image to create visual interest.

# LINE

A line is a mark between two points. There are various types of lines, from straight to squiggly to curved and more. Lines can be used for a wide range of purposes: stressing a word or phrase, connecting content to one another, creating patterns and much more.

# COLOR

Color is used to generate emotions, define importance, create visual interest and more. CMYK (cyan/magenta/yellow/black) is subtractive; RGB (red/green/blue) is additive.

Some colors are warm and active (orange, red); some are cool and passive (blue, purple).

There are various color types (primary to analogous) and relationships (monochromatic to triad) worth learning more about as well.

# TEXTURE

Texture relates to the surface of an object; the look or feel of it. Concrete has a rough texture; drywall has a smooth and subtle texture. Using texture in design is a great way to add depth and visual interest. Printed material has actual, textile texture while screen material has implied texture.

*paper leaf*

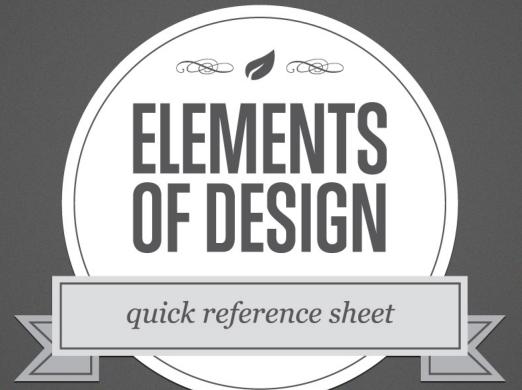
created by Paper Leaf Design. www.paper-leaf.com

# SHAPE



Height + width = shape. We all learned basic shapes in grade school - triangles, squares, circles and rectangles. Odd or lesser seen shapes can be used to attract attention.

There are three basic types of shape: geometric (triangles, squares, circles etc), natural (leaves, animals, trees, people), and abstracted (icons, stylized, graphic representations etc).

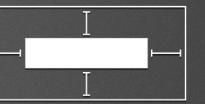


# SIZE

Size is how small or large something is: a small shirt vs. an extra large shirt, for example. Use size to define importance, create visual interest in a design (via contrasting sizes), attract attention and more.

# VALUE

Value is how light or how dark an area looks. A gradient, shown above, is a great way to visualize value - everything from dark to white, all the shades in-between, has a value. Use value to create depth and light; to create a pattern; to lead the eye; or to emphasize.

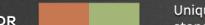


Space is the area around or between elements in a design. It can be used to separate or group information. Use it effectively to: give the eye a rest; define importance; lead the eye through a design and more.

# SPACE

# CONTRAST

## COLOR



## TONE/VALUE



## SIZE/SHAPE



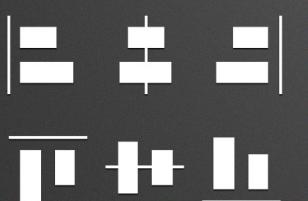
## DIRECTION



Unique elements in a design should stand apart from one another. One way to do this is to use contrast. Good contrast in a design - which can be achieved using elements like color, tone, size, and more - allows the viewer's eye to flow naturally.

To the left, you can see 4 ways to create contrast in your design.

# ALIGNMENT



Proper alignment in a design means that every element in it is visually connected to another element. Alignment allows for cohesiveness; nothing feels out of place or disconnected when alignment has been handled well.

# REPETITION

Repetition breeds cohesiveness in a design. Once a design pattern has been established - for example, a dotted border or a specific typographic styling - repeat this pattern to establish consistency.

The short version?

Establish a style for each element in a design and use it on similar elements.



# PRINCIPLES of DESIGN

*quick reference poster*

# PROXIMITY



Imagine how ridiculous it would be if the proximity icons on this graphic were located on the other side of this document.



a handy *paper leaf* resource



Proximity allows for visual unity in a design. If two elements are related to each other, they should be placed in close proximity to one another. Doing so minimizes visual clutter, emphasizes organization, and increases viewer comprehension.

# Key Components for UX Design

# Key Components for UX Design

We will focus on *type*, *color*, and *images*.

# Type

**Definition:** Printed letters and characters of language.

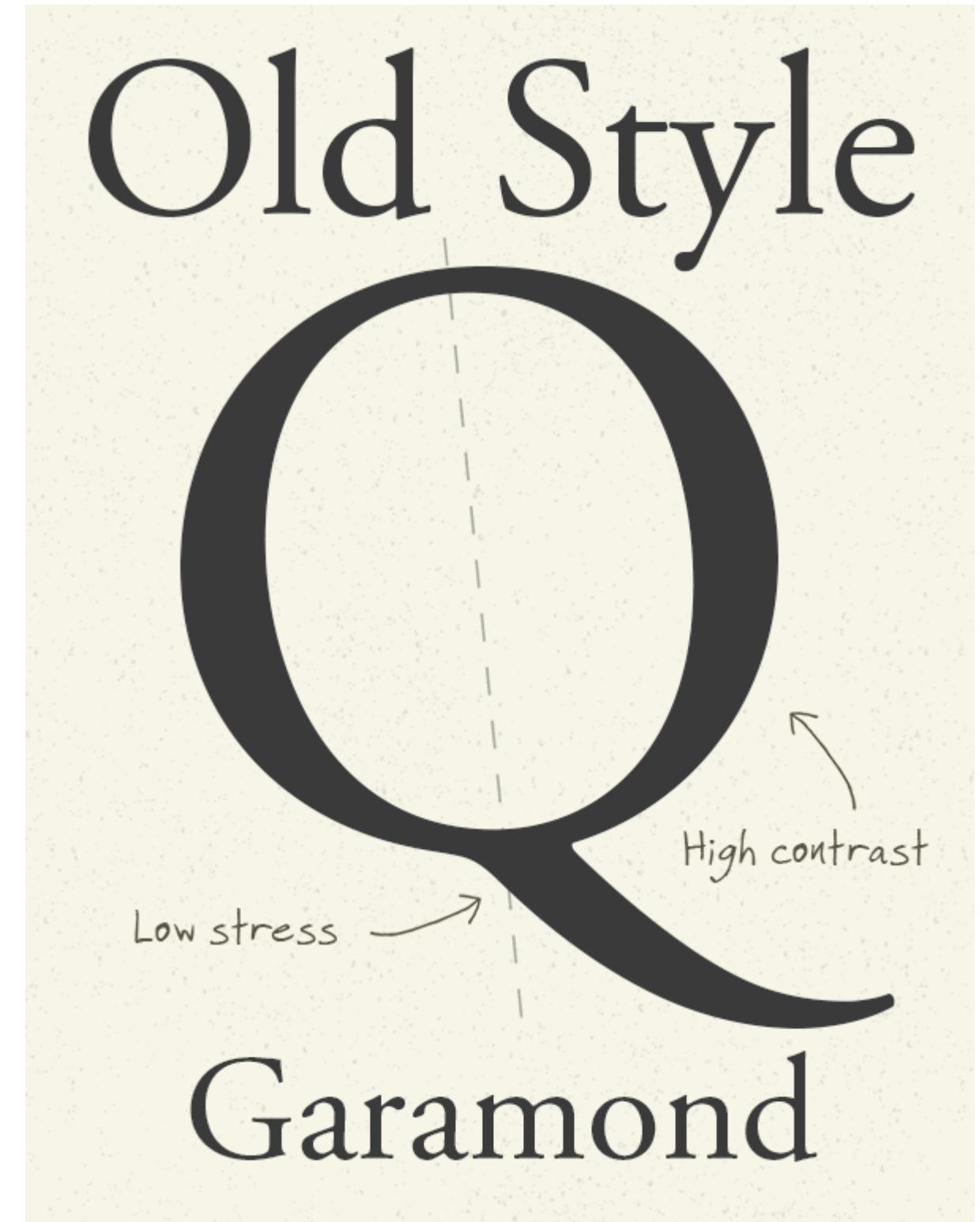
- A **font** is the style in which type is created.
- A **typeface** is a font family that includes fonts of different variations that follow the same style.
- A **glyph** is a particular character.

# Categories of Typefaces

1. Old style
2. Modern
3. Slab serif
4. Sans serif
5. Script
6. Decorative

# Old-style fonts

**Definition:** Old-style fonts have "serifs" at the tips of a glyph that taper closer to the tip.



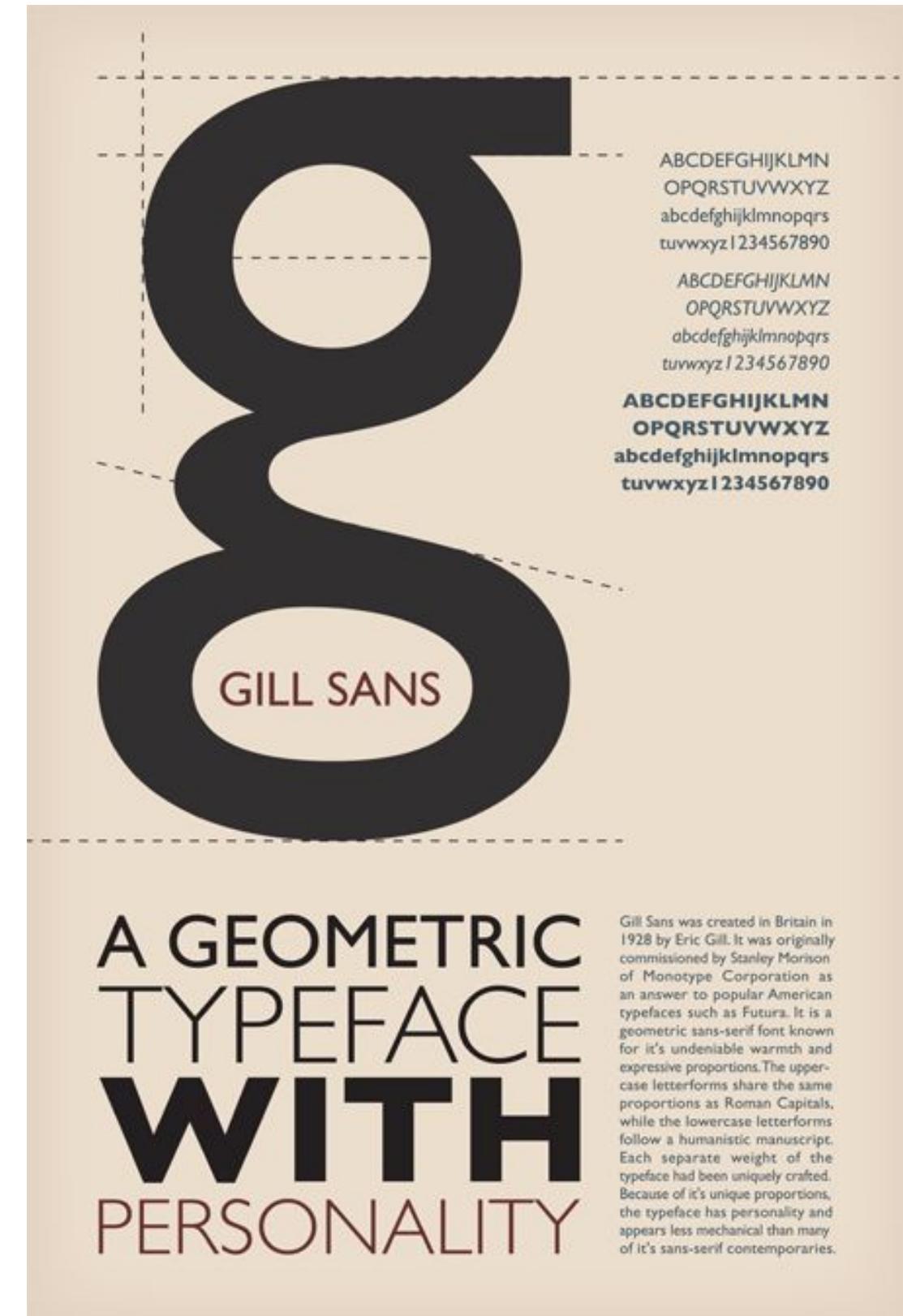
# Modern & slab-serif fonts

**Definition:** Modern and slab-serif fonts have very thin or very thick serifs.



# Sans-serif fonts

**Definition:** Sans-serif fonts lack the serif at the tips of the glyphs, and their strokes follow uniform weight.



# Script fonts

**Definition:** Script fonts simulate cursive writing where glyphs connect with each other at the downstroke.



# Decorative fonts

**Definition:** Decorative fonts are designed specifically to convey a particular context or elicit a particular feeling, e.g., "gothic."



orem ipsum dolor  
sit amet, consecetur adipiscing elit,  
sed do eiusmod tempor inci-  
didunt ut labore et dolore  
magna aliqua. Ut enim ad  
minim veniam, quis nostrud  
exercitation ullamco labo-  
ris nisi ut aliquip ex ea  
commodo consequat. Duis  
aute irure dolor in reprehend-  
erit in voluptate velit esse  
cillum dolore eu fugiat  
nulla pariatur. Excepteur  
sint occaecat cupidatat  
non proident, sunt in culpa  
qui officia deserunt mollit  
anim id est laborum.

Galdino Otten

# Font parameters

- **Style variations:** bold, italic, oblique
- **Caps:** all caps, small caps
- **Weight:** extra light, light, medium, bold

Muller™ Styles Overview  
**Weights**

Hairline & Hairline Italic

Antimon

Thin & Thin Italic

Beryllium

UltraLight & UltraLight Italic

Californium

Light & Light Italic

Sauerstoff

Regular & Italic

Dysprosium

Medium & Medium Italic

Unununium

Bold & Bold Italic

Quecksilber

ExtraBold & ExtraBold Italic

Kohlenstoff

Black & Black Italic

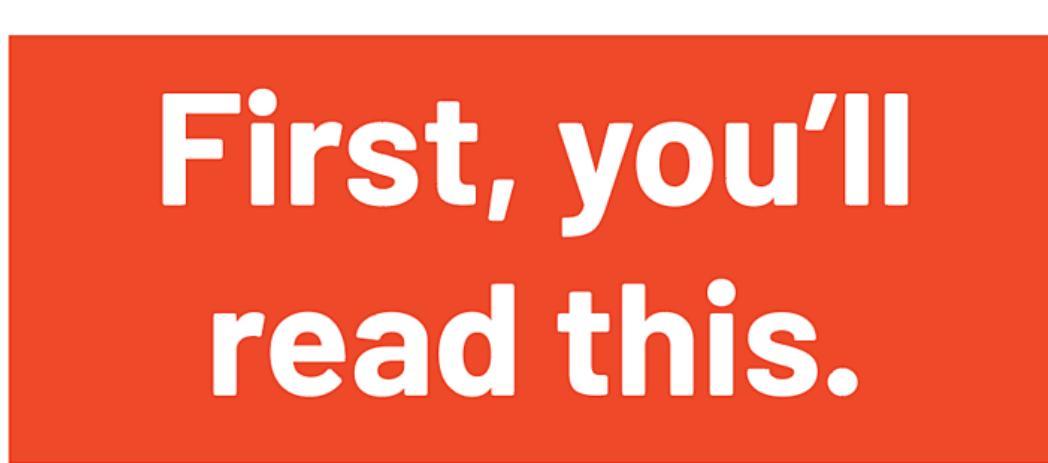
Wolfram

Heavy & Heavy Italic

Seaborgium

*Pro Tip:* Type alone can be used to achieve design principles, such as *hierarchy* and *movement*.

You'll probably see this last.



Then, you'll read this.

And then this.



*Pro tip:* For good typography, become familiar with *leading*, *tracking*, *kerning*, *widows*, *orphans*, *rags*, *rivers*.



kerning  
tracking  
leading  
point size  
typeface  
justification  
line width

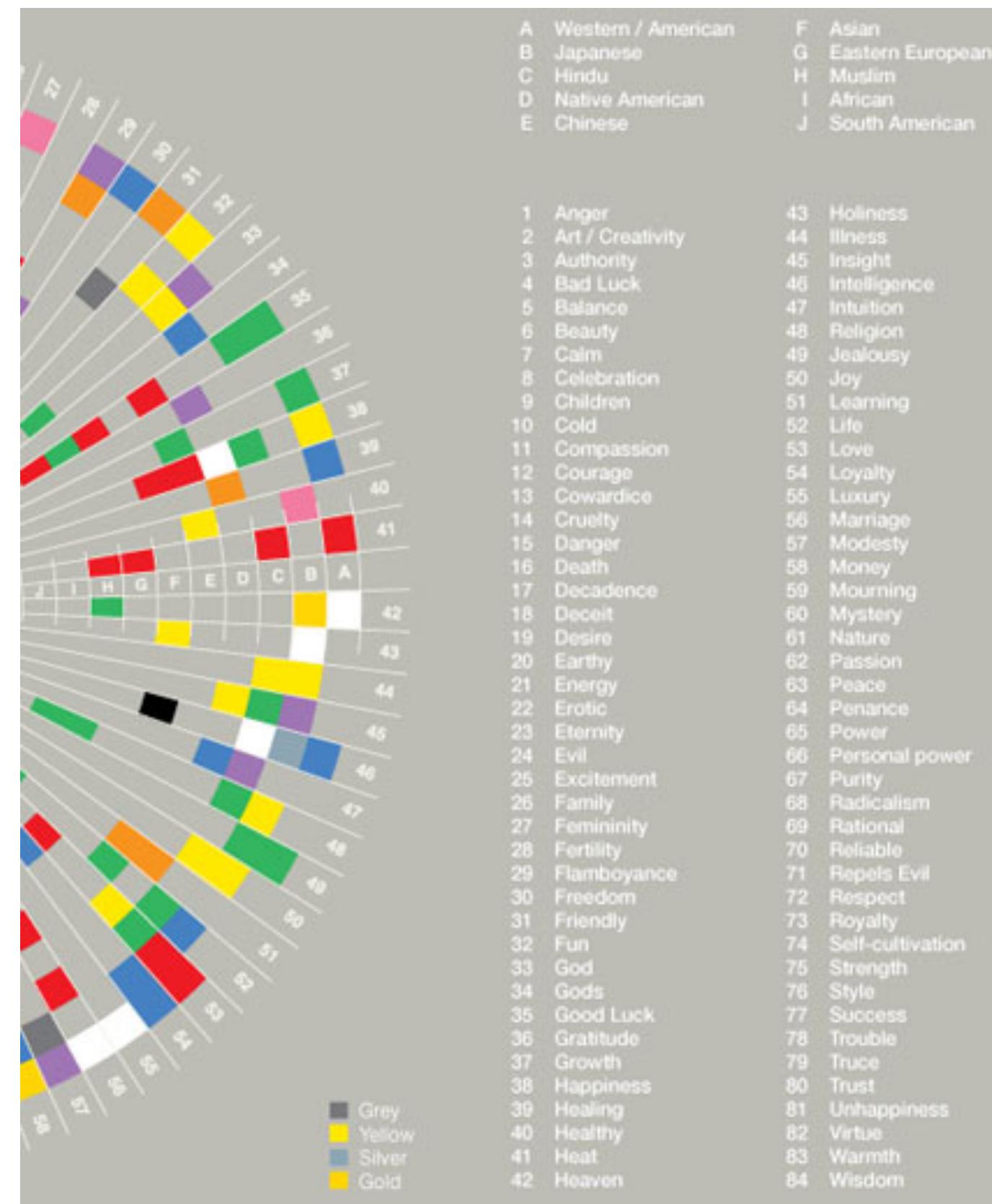
what is typography?

# Color

**Definition:** Human visual perception of light reflecting from an object.

- Creates emphasis
- Organizes content
- Evokes emotion

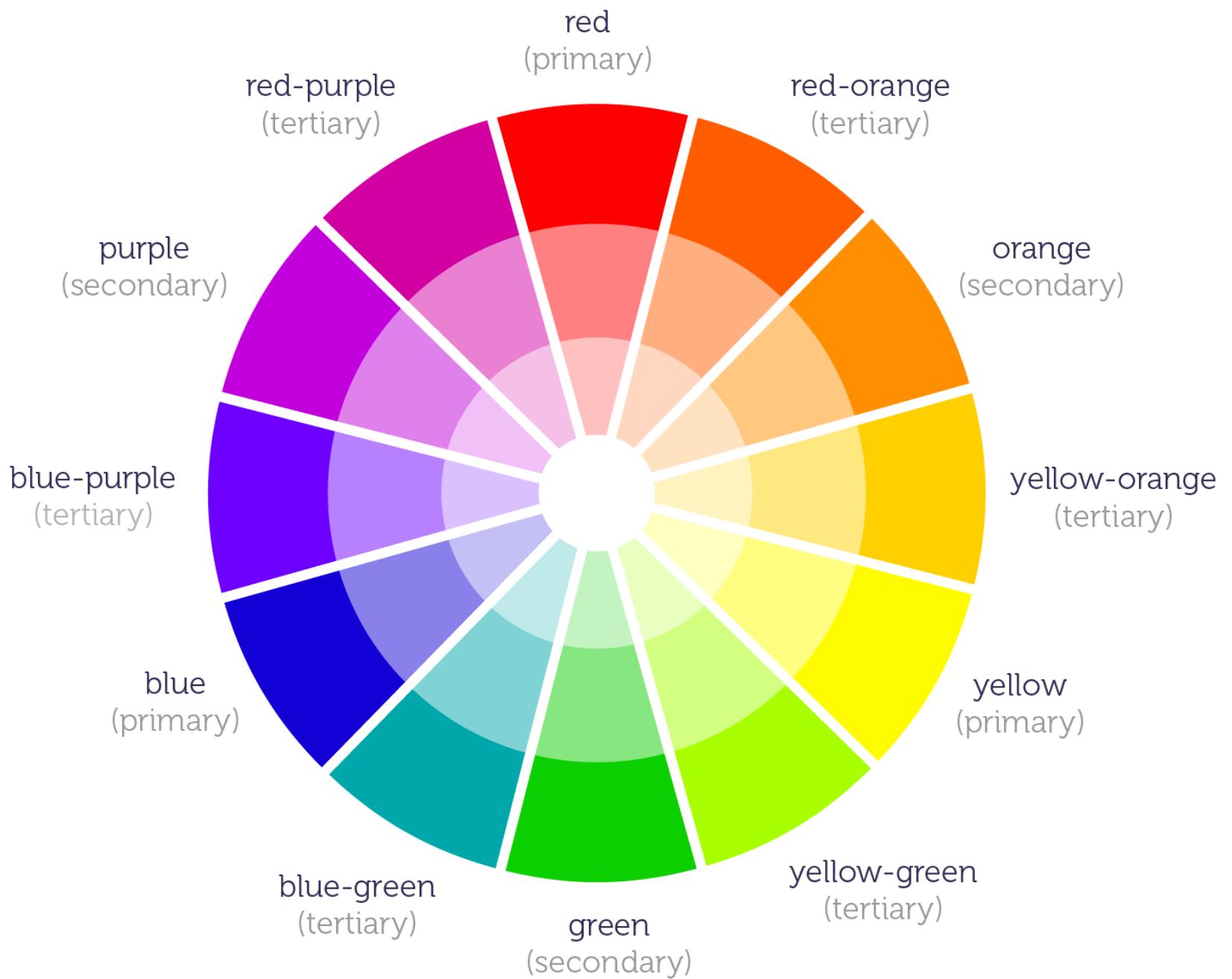


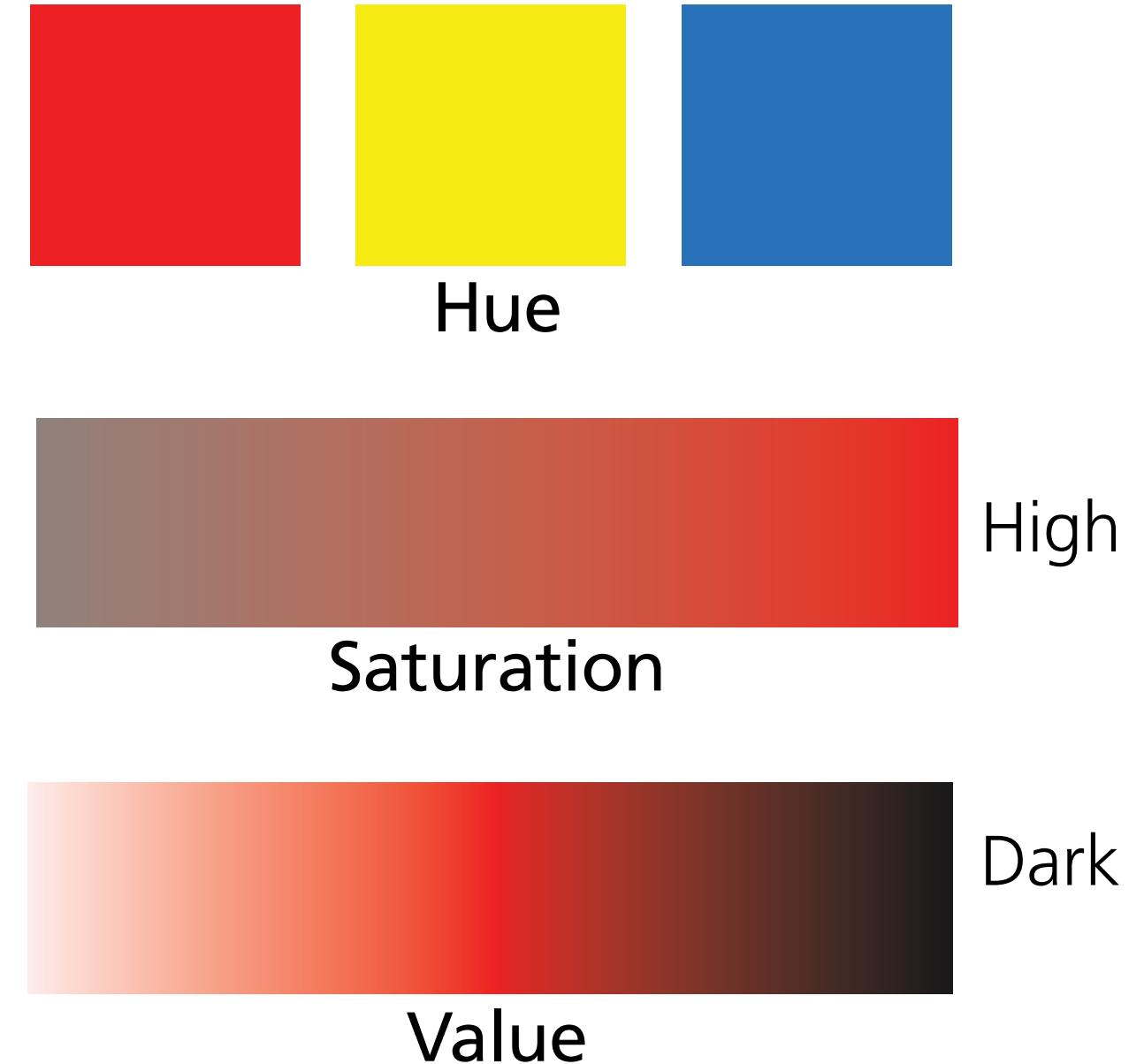
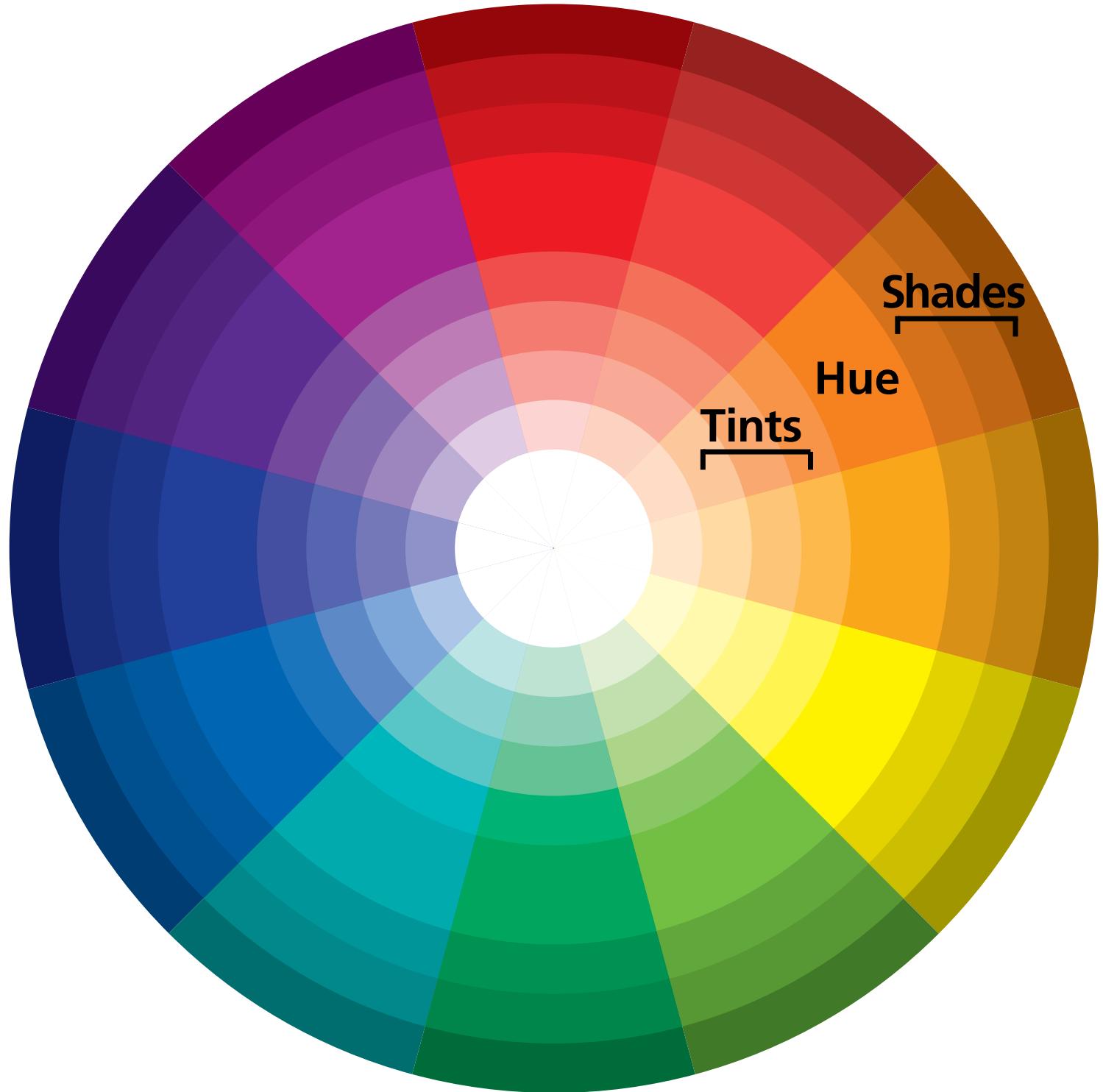


# The Color Wheel

- Primary, secondary, tertiary colors
- Tints, shades, tone
- Complementary colors
- Warm, cool colors

## The basic colors





# Color Palettes

1. Analogous
2. Complementary
3. Split Complementary
4. Triadic
5. Monochromatic
6. Achromatic

# UNDERSTANDING COLOR THEORY



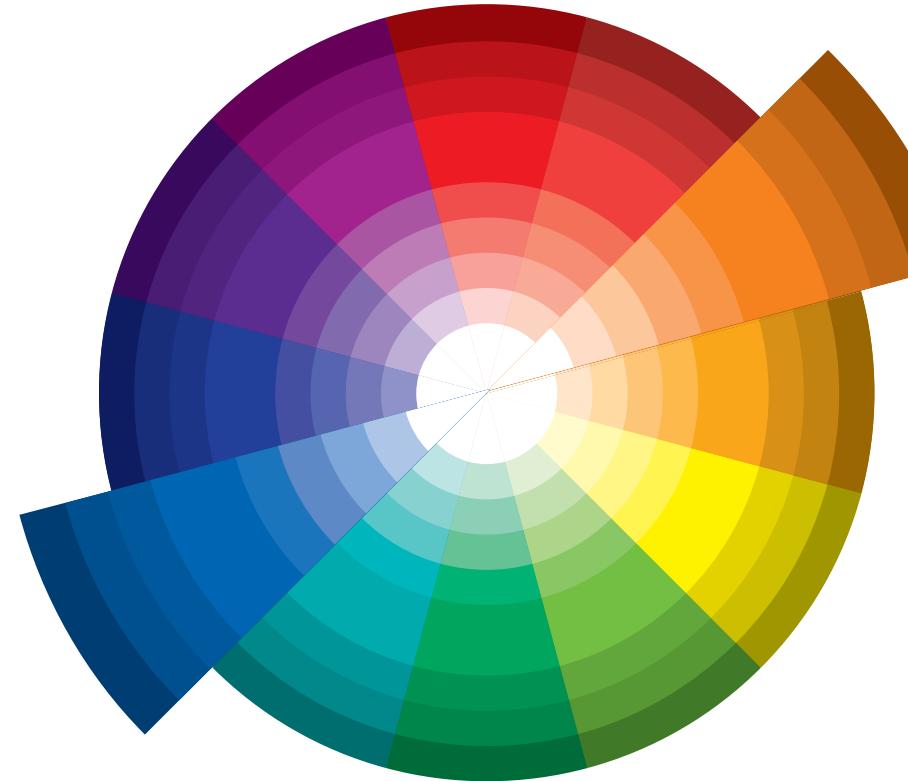
# ANALOGOUS



#1b75bb #00a9ac #8ccfb6

#adc5e6 #00888a #00888a

# COMPLEMENTARY



#1b75bb #fcc69a #c06615

#004f8f #1b75bb #f5821f

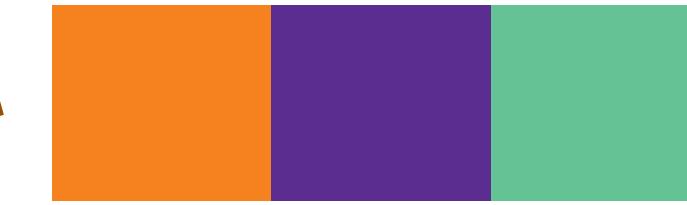
# SPLIT-COMPLEMENTARY



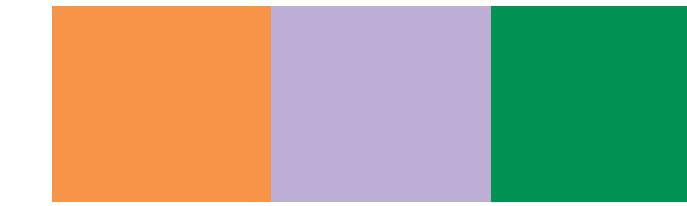
#004f8f #fcb94c #bb302d

#7da7d8 #ffd9a1 #f58d76

# TRIADIC



#f5821f #5c2d91 #65c194



#f79447 #bbaed5 #009252

# MONOCHROMATIC

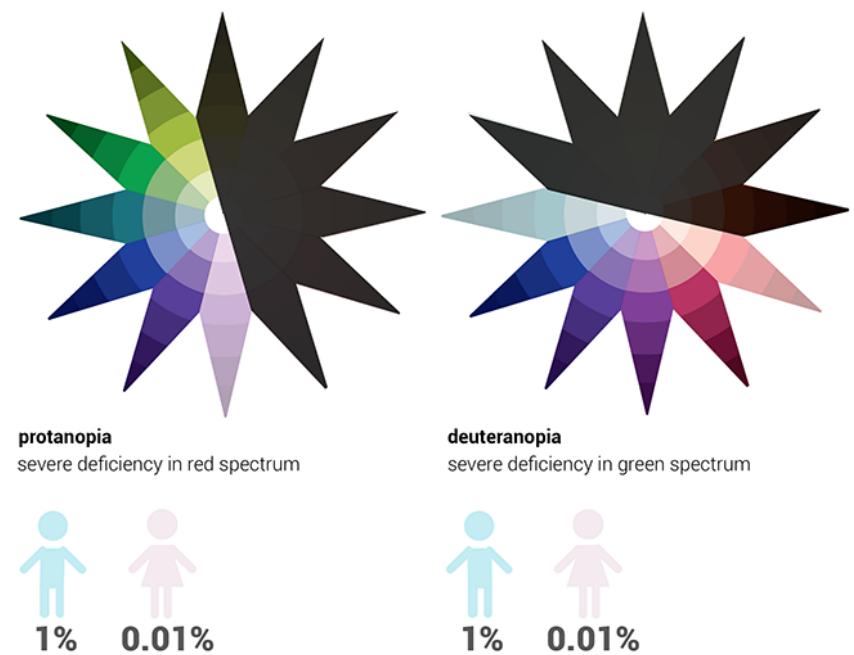
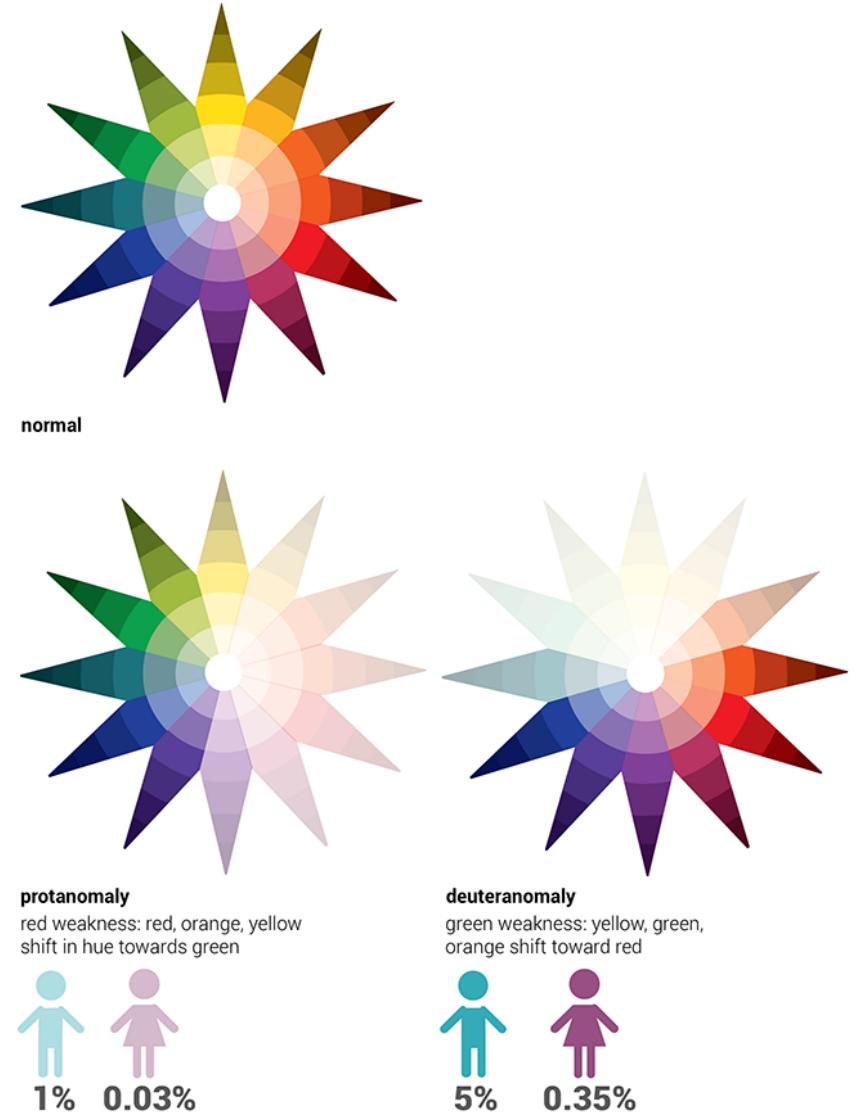


# ACHROMATIC



# Color Vision Deficiencies

- Affects 8% of males, 0.5% of females
- Consider alternatives
  - *Intensity* vs. *hue* for emphasis
  - *Size* of colored elements
  - *Proximity* of similar colors
- Use tools to check designs



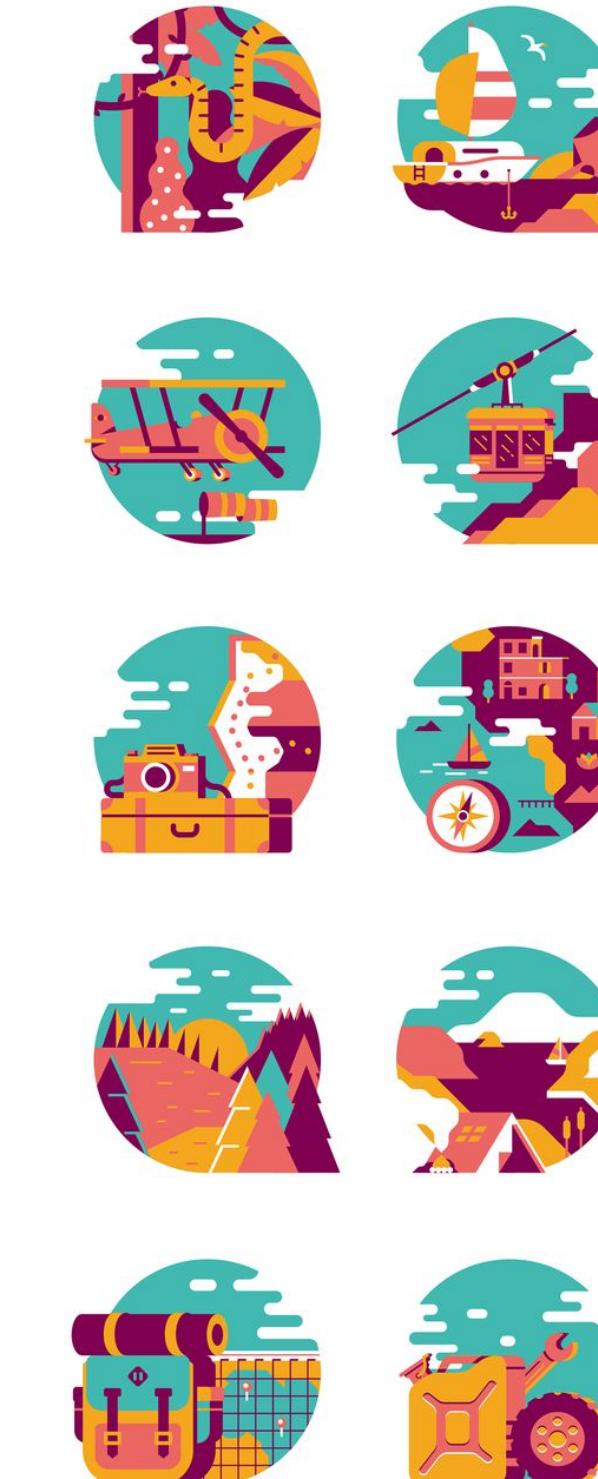
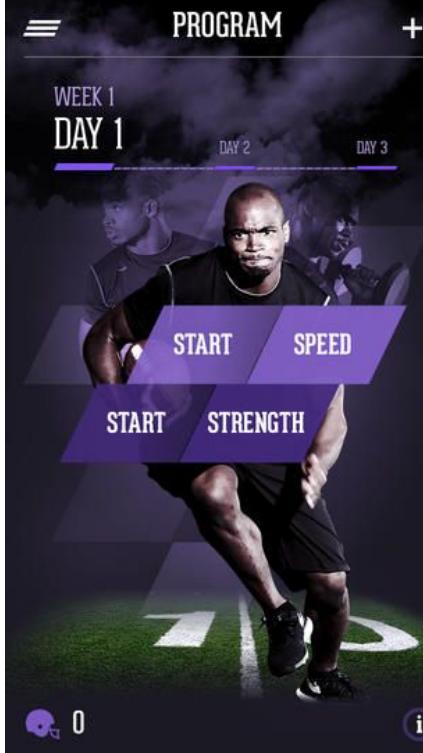
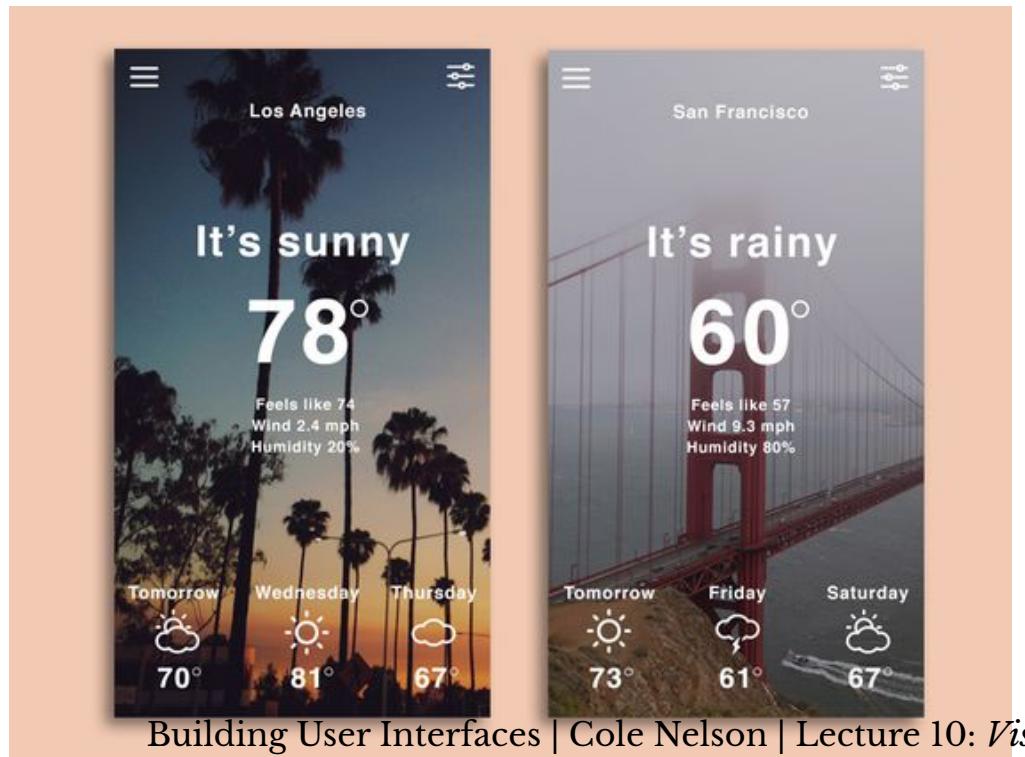
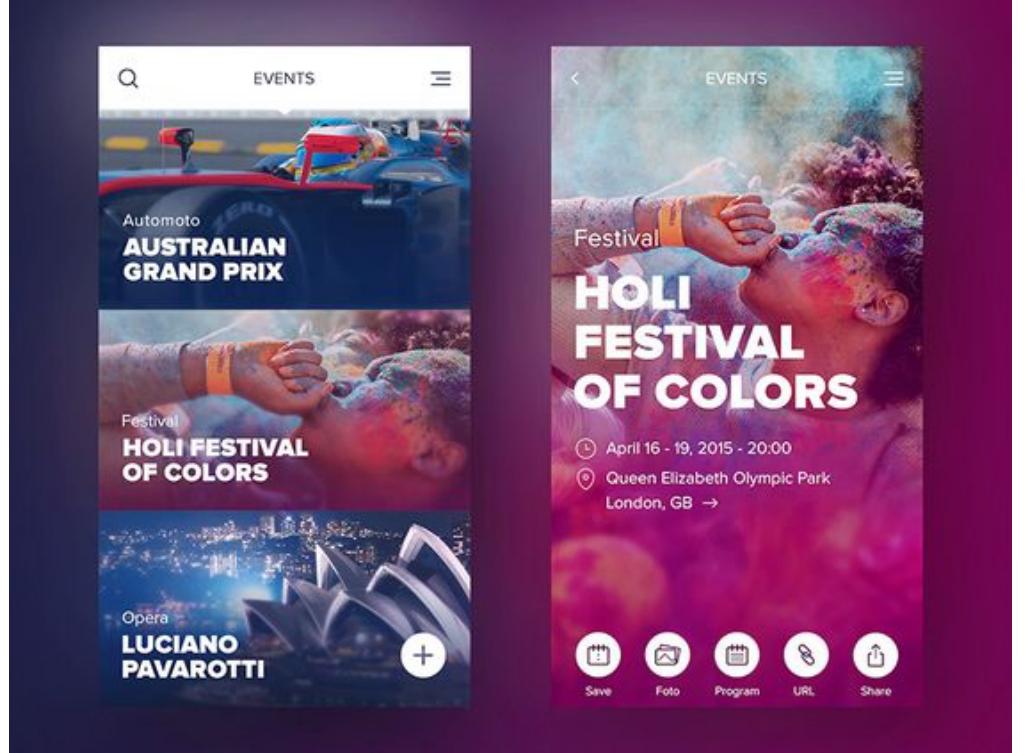
# Images

**Definition:** Photographs, illustrations, three-dimensional art, silhouettes, icons, dingbats, infographics, and simpler shapes that convey rich information or context.

TABLE 5.1. Graphic types to use for varied goals.

Instructional or Communication Purpose	Consider These Graphic Types
Depict concrete objects	Photograph 3-D graphic Illustration Clip art (particularly in diagrams and as game elements)
Tell a story or provide a scenario	Sequence of photographs Sequence of illustrations Timeline
Persuade an audience	Sequence of photos or illustrations to tell a story Photographs that evoke emotions Visualization of statistics and data
Explain unfamiliar or complex concepts and theories	Visual metaphor Diagram showing connections
Demonstrate a procedure	Show the steps in a sequence of photos or illustrations Flow chart Series of screen captures for software simulation
Explain a process	Diagram the stages or operations of the process Icons or simple illustrations to represent each component
Point out something specific	Arrow or pointed shape Highlight Outline of a circle
Depict components of a system	Illustrated object with labels Diagram of the structure
Make comparisons	Bar graph Pictograph Line graph with multiple lines Table (when specific values are important)
Demonstrate trends in data	Line graph Scatter plot
Organization of information	Various chart types (hierarchical, radial, etc.) Concept map
Demonstrate motion without animation	Show object moving along a path Illustrations with motion lines Illustrations with arrows or dashed lines depicting movement
History or changes over time	Timeline (these don't have to be arrows) Sequence of photos or illustrations

# RASTER GRAPHICS





◀ More Realistic

Less Realistic ▶



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- 3 Achieve your Goals

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Building User Interfaces | Cole Nelson | Lecture 10: Visual Design

**SNOW**

-6 ° SHANGHAI

23.08 · SHANGHAI DEC 31

**SANDSTORM**

-3 ° BEIJING

23.08 · BEIJING DEC 31

SUNDAY

23.08 · SUZHOU DEC 31

SUN

**live**

coming soon on App Store

**share**

coming soon on App Store

**wondr**



# Questions?