

Building User Interfaces

Visual Design

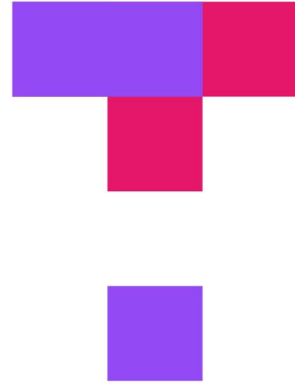
Professor Bilge Mutlu

What we will learn today?

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

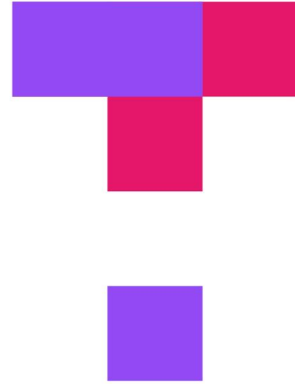
What are the raw materials that designers use?

TopHat Attendance



TOP HAT

TopHat Questions



TOP HAT

Elements of Design

building
blocks

Elements of Design

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

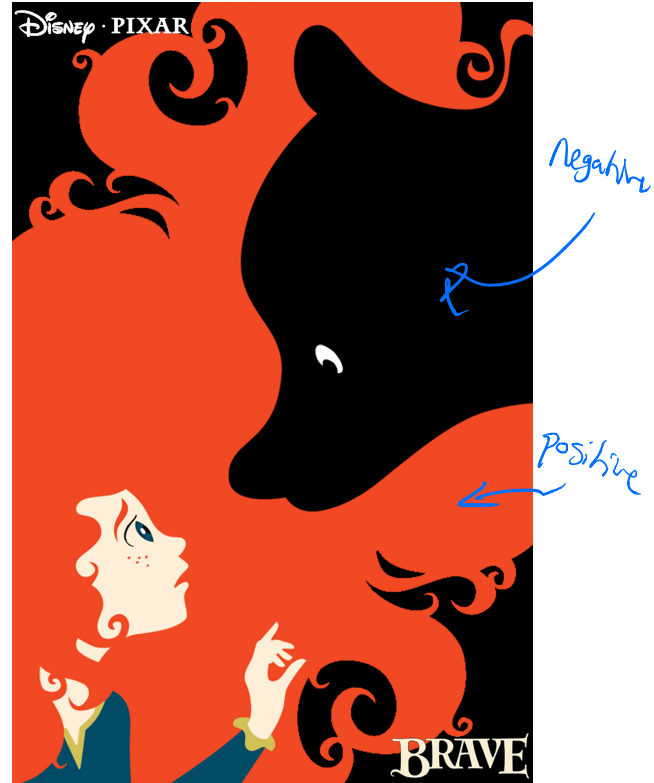
Space

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

>> Space can be *positive* or *negative*

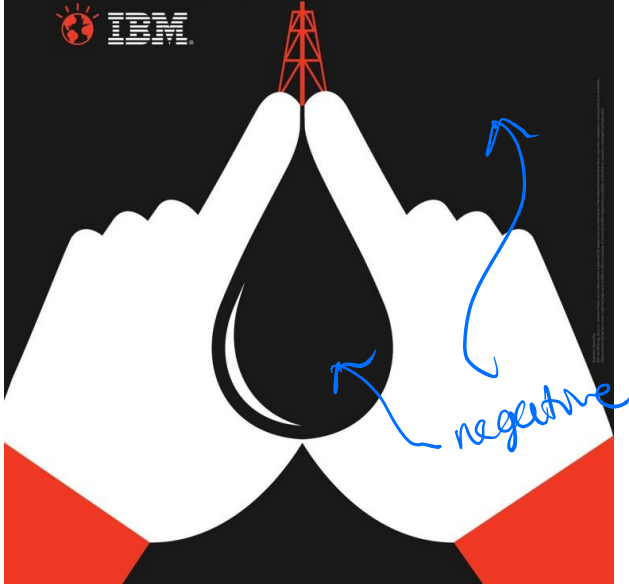
Positive → objects
take up positive
space

Negative → space that isn't
used by objects



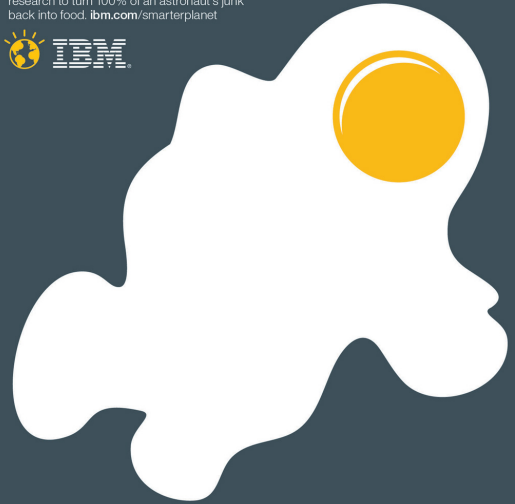
Now data helps pinpoint more oil.

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



Food is now prepared for space.

The European Space Agency is using smarter research to turn 100% of an astronaut's junk back into food. ibm.com/smarterplanet



Line

Most Primal

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



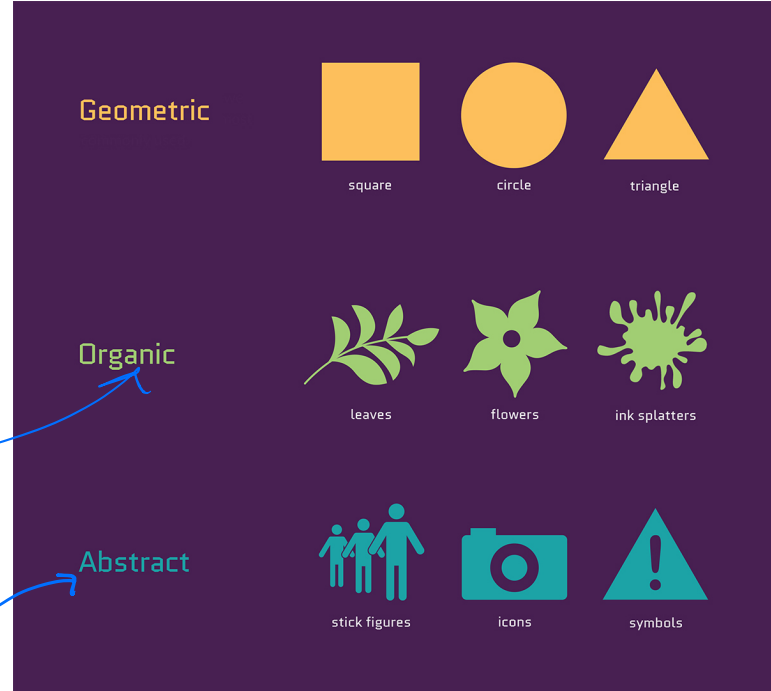
Shape

Definition: Space outlined by a contour.

>> *Organic vs. inorganic shapes*

Natural

Complex



Triangles we see in everyday life



The "play" symbol



The "fast forward" and "reverse" symbols



Pyramids



Mountains



Pennants



Pizza slices

Size

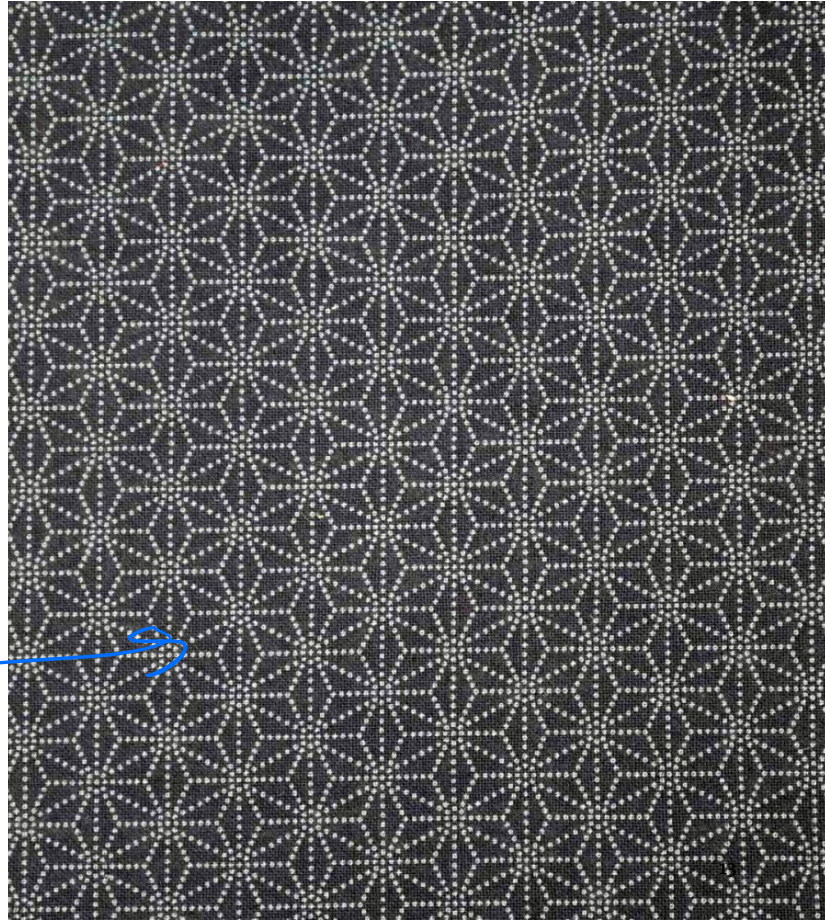
Definition: Size, or *scale*, is the relative extent of the design elements such as shapes and lines.



Pattern

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

*tiled
pattern*



Texture

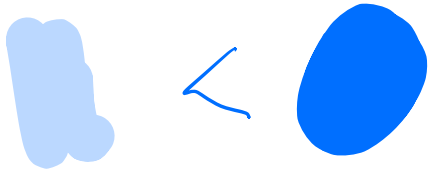
Definition: Tactile and visual quality of a shape or space made up of different colors, materials, and different structures.

*Almost like a
3D pattern*



Value

Definition: The intensity in which a design elements is expressed.



Questions about *Design Elements*?

Principles of Design

Turn elements
into something more
"how the use
elements"

Principles of Design

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

Focal Point

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

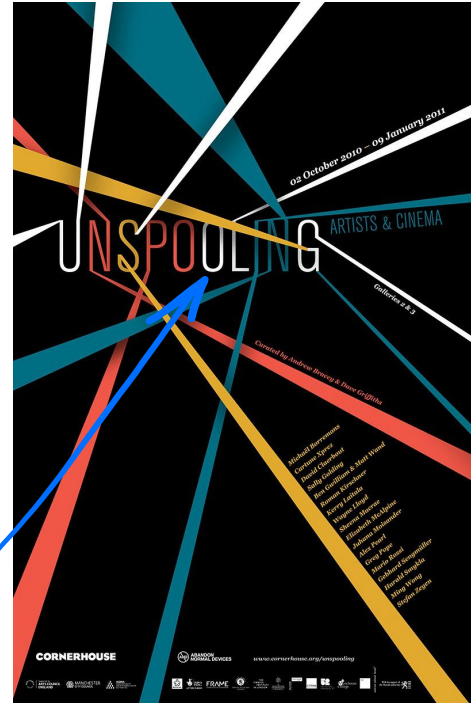
*Can be driven by
contrast / color / value / etc*





Note the highest contrast in value is at the center

Flow goes toward

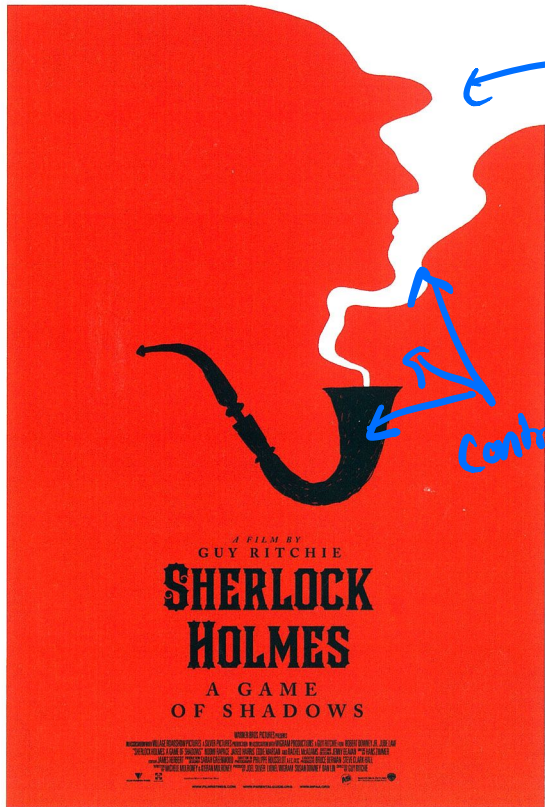


Contrast

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

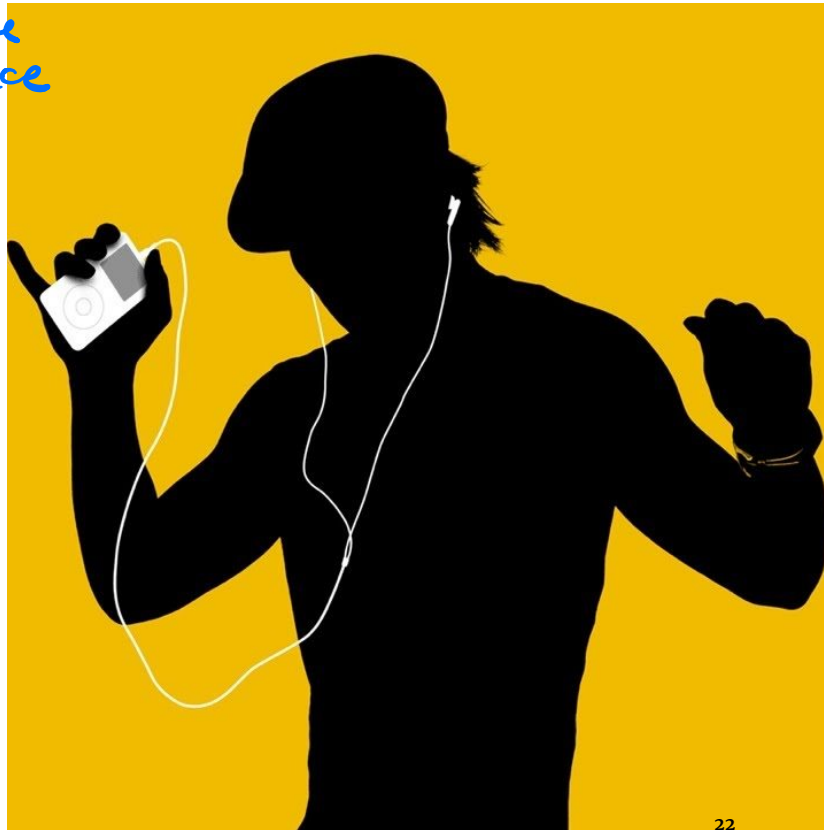
shapes / color / value





Negative Space

Contrast



Balance

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

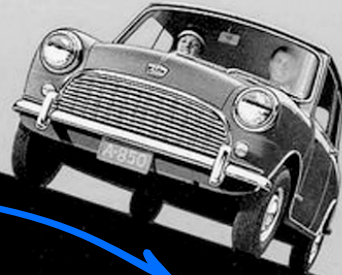
Pro Tip: Balance can be achieved through symmetry or asymmetry.

Imagine a scale

balances the other elements

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 .

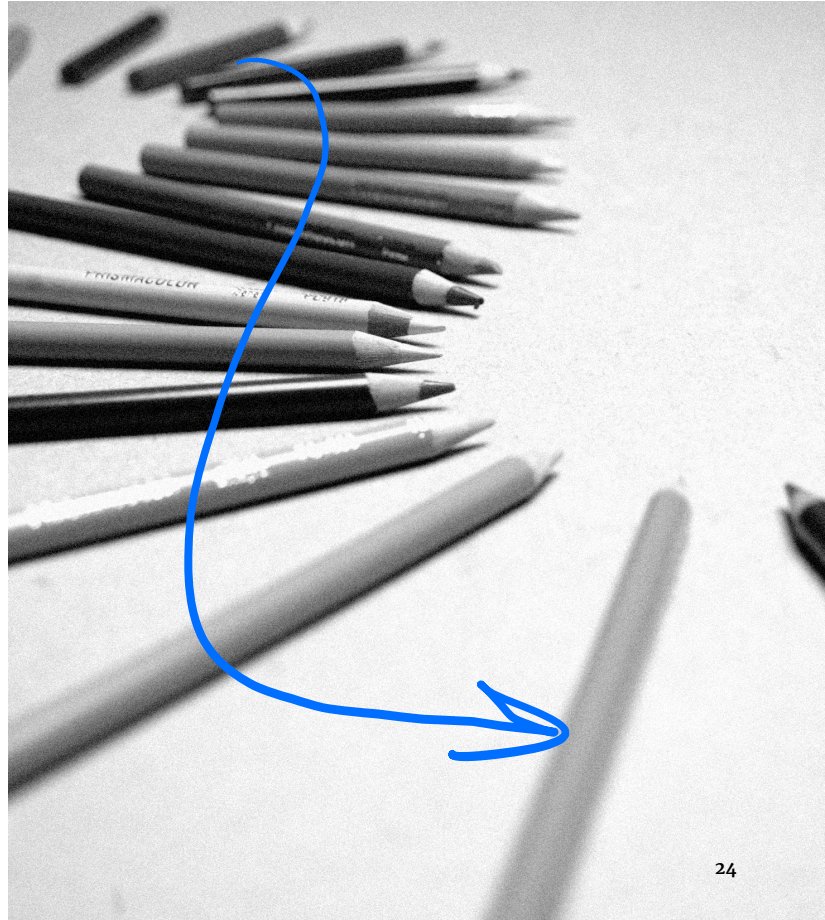
Austin 850



Movement

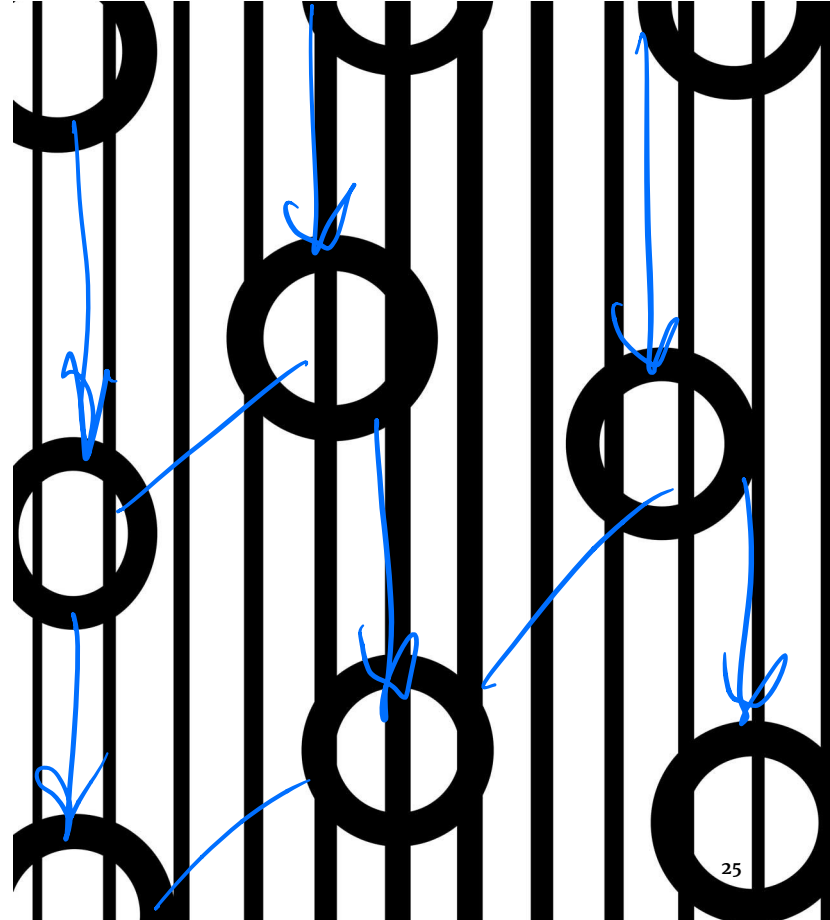
Definition: The organization of design elements in a way that suggests a particular flow on the canvas to direct the user's attention in a particular pattern.

*Flow: directs
the eye*



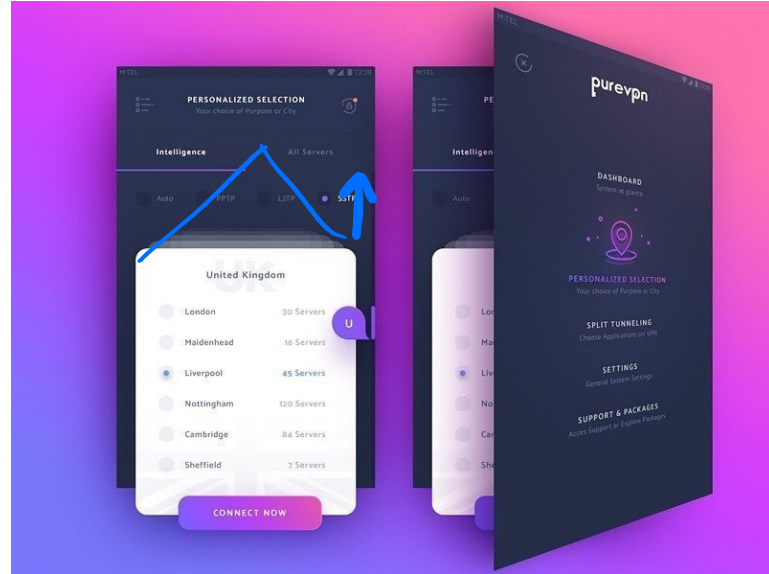
Rhythm

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



Perspective

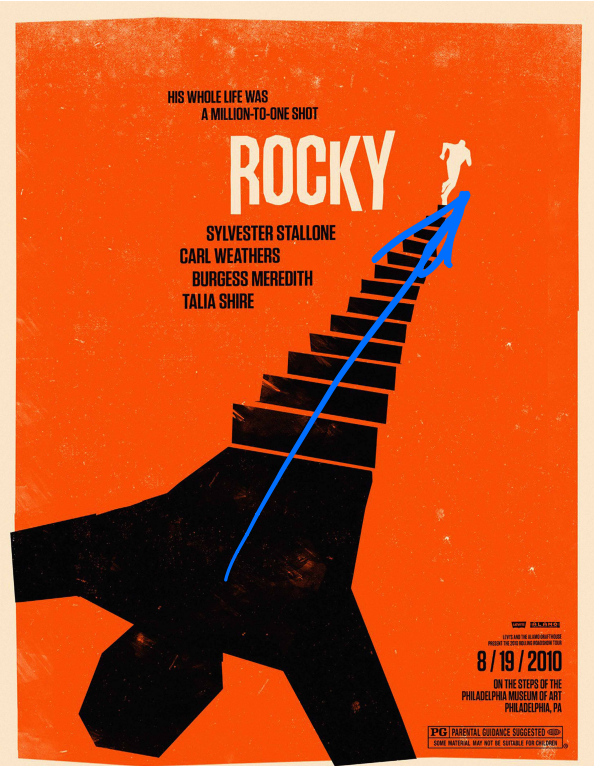
Definition: Creating a sense of horizon and movement along the depth axis of canvas.



MORRIS
 REALIST
 FRANKLIN
 TYPEDFACE
 MODERN
 CLASSIFICATION
 LINEAL
 GROTESQUE
 MILLER
 OVECEN
 TODUE

AMERICAN
 FOUNDEERS

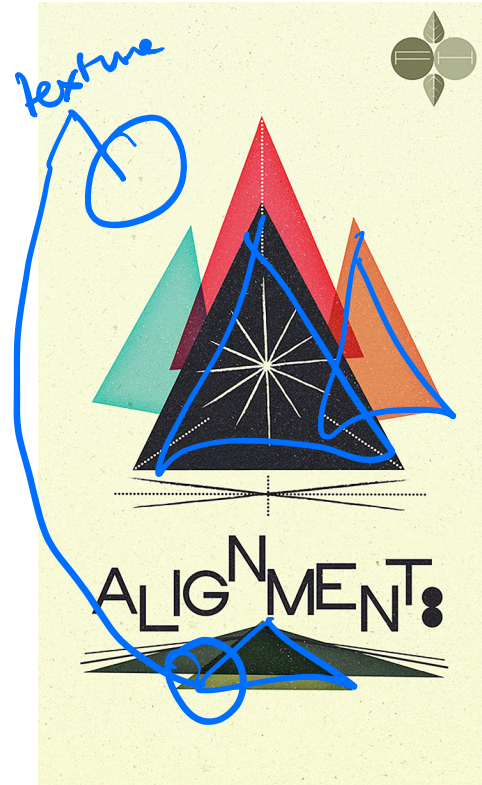
FRANKLIN
 GOTHIC

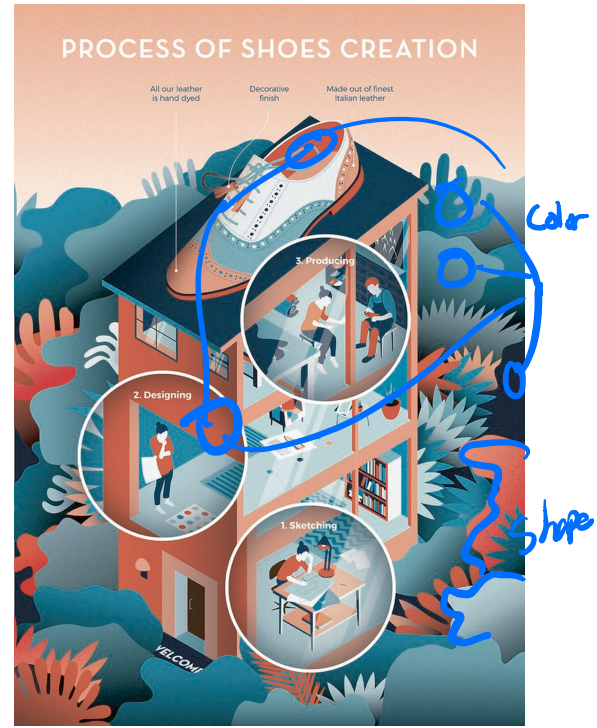


A ROBERT CHARTOFF IRWIN WINKLER PRODUCTION A JOHN G. AVILDSEN FILM STARRING SYLVESTER STALLONE IN "ROCKY"
 ALSO STARRING TALIA SHIRE BURT YOUNG CARL WEATHERS AND BURGESS MEREDITH AS MICKEY WRITTEN BY SYLVESTER STALLONE
 PRODUCED BY IRWIN WINKLER AND ROBERT CHARTOFF DIRECTED BY JOHN G. AVILDSEN EXECUTIVE PRODUCER GENE KIRKWOOD

Unity

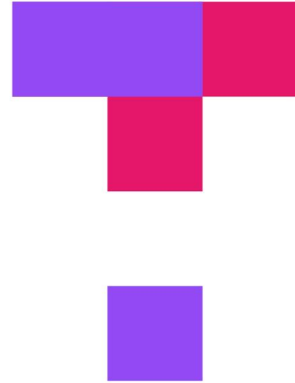
Definition: Unity reflects the holistic consistency in the use of design elements.





Questions about *Design Principles*?

TopHat Quiz



TOP HAT

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
 - >> 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?





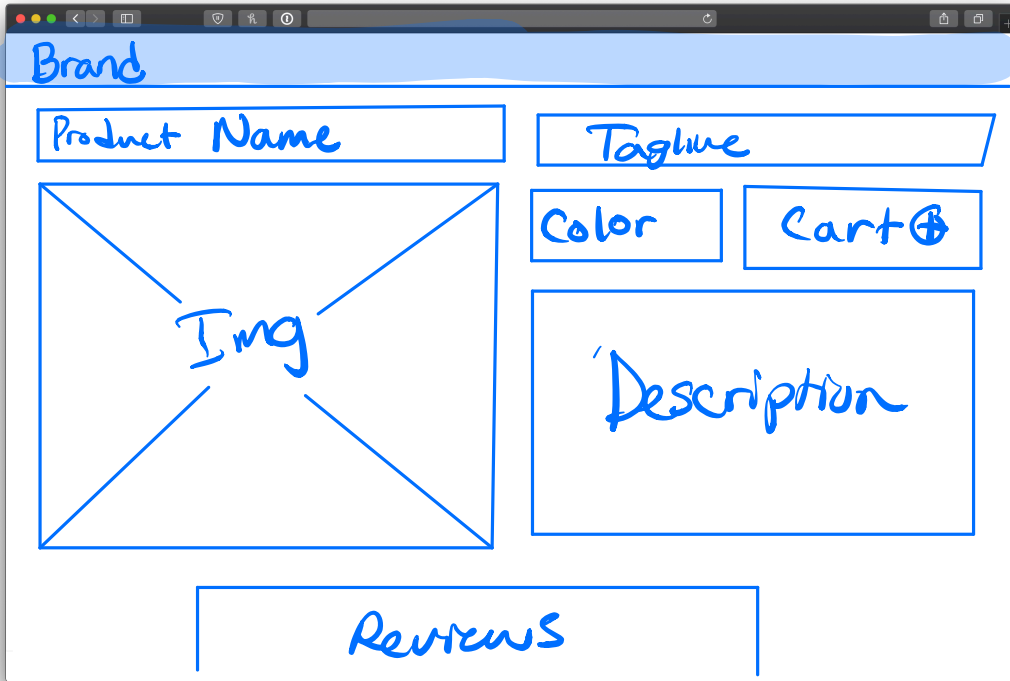
In-class Design Exercise 2








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

Place elements and annotate with your decisions





The Elements of Design (the tools to make art)		
Line		Horizontal, vertical, diagonal, straight, curved, dotted, broken thick, thin.
Shape		2D (two dimensional)/ flat Geometric (square, circle, oval, triangle) Organic (all other shapes)
Form		3D (three dimensional), Geometric (cube, sphere, cone), Organic (all other forms such as: people, animals, tables, chairs, etc).
Colour		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.
Value		The lightness or darkness of an image (or part of an image).
Texture		The feel, appearance, thickness, or stickiness of a surface (for example: smooth, rough, silky, furry).
Space		The area around, within, or between images or parts of an image (relates to perspective). Positive and negative space.

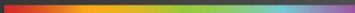
The Principles of Design (how to use the tools to make art)		
Pattern		A regular arrangement of alternated or repeated elements (shapes, lines, colours) or motifs.
Contrast		The juxtaposition of different elements of design (for example: rough and smooth textures, dark and light values) in order to highlight their differences and/or create visual interest, or a focal point.
Emphasis		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.
Balance		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.
Scale		The relationship between objects with respect to size, number, and so on, including the relation between parts of a whole.
Harmony		The arrangement of elements to give the viewer the feeling that all the parts of the piece form a coherent whole.
Rhythm/Movement		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.
Unity		All parts of an image work together to be seen as a whole.
Variety		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



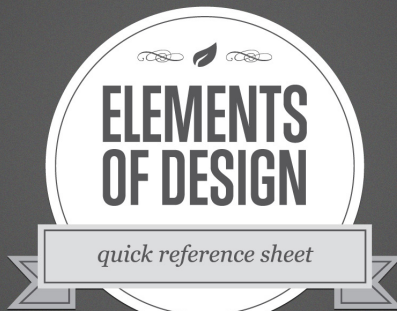
Texture relates to the surface of an object; the look or feel of it. Concrete has a rough texture; drywall has a smooth and subtle texture. Using texture in design is a great way to add depth and visual interest. Printed material has actual, textile texture while screen material has implied texture.

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, stylizations, 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

paper leaf

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

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.



Associated Concepts

- >> 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.

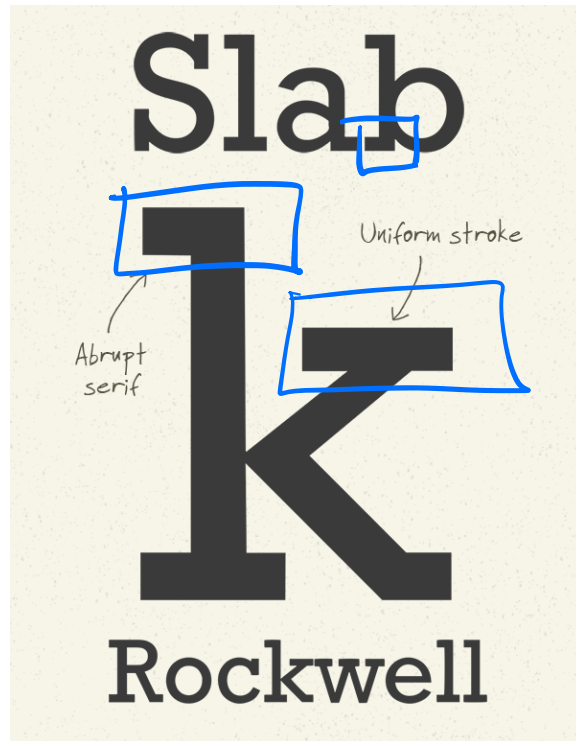
Used to be that people said these fonts to use on digital media, but high-resolution screens have changed this



Modern & slab-serif fonts

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

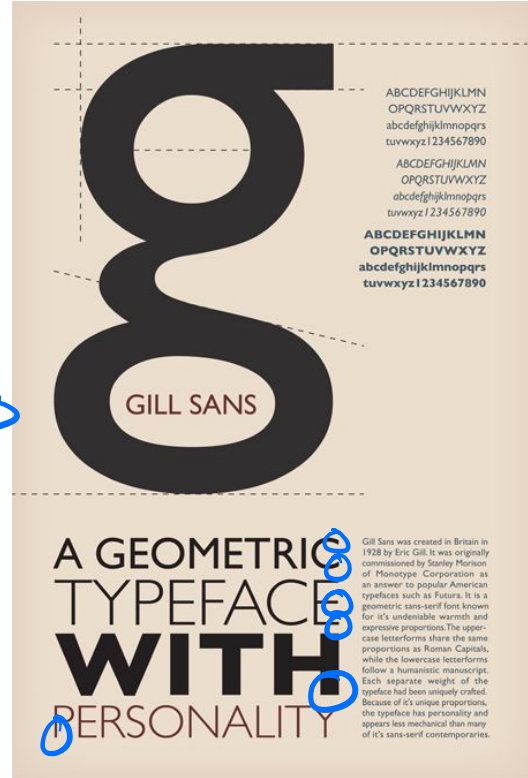
Usually has a tech connotation



Sans-serif fonts

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

*Modern Connotation
Created for headlines*



Script fonts

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

Creates visual
"free-hand"
style writing



brands / messages, but not
content

Decorative fonts

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

feeling
↑
medieval



Font parameters

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

Hubert Sauter
Weights

Thin & Thin Italic
Antimon

Thin & Thin Italic
Beryllium

Ultra light & Ultra light Italic
Californium

Light & Light Italic
Sauerstoff

Regular & Italic
Dysprosium

Medium & Medium Italic
Unununium

Bold & Bold Italic
Quecksilber

Extra bold & Extra bold Italic
Kohlenstoff

Black & Black Italic
Wolfram

Heavy & Heavy Italic
Seaborgium

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

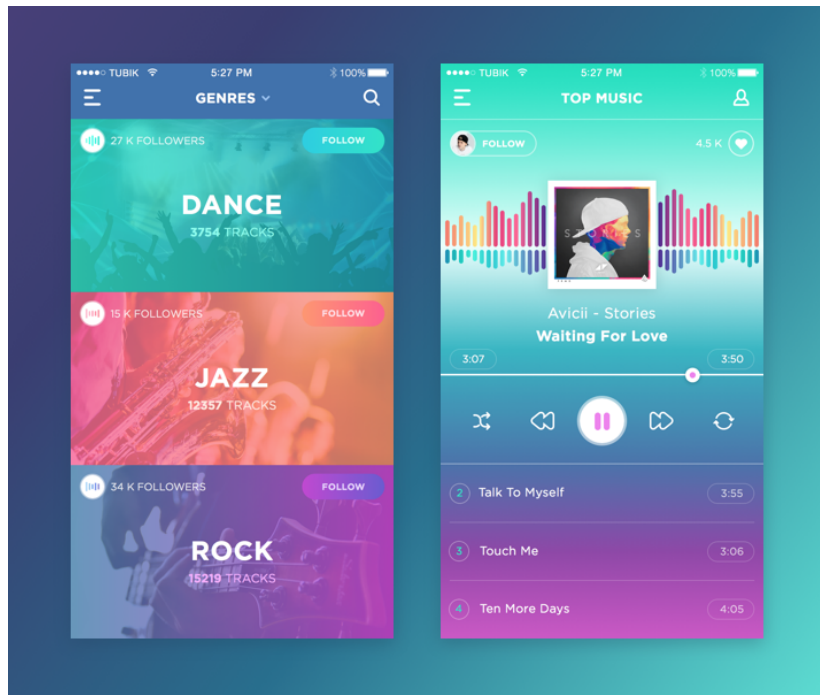


Questions about *Type*?

Color

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

- » Creates emphasis
- » Organizes content
- » Evokes emotion





Marketing Proposal
Digital Content Team
Client: UNIVERSITY OF WATERLOO Presented by: GEORGE ZANDER

Our Objectives

- ✓ To develop creative, high-impact executions that reach large groups of consumers and maximize viewership.
- ✓ To deliver cost-effective solutions to consumer communications that build a strong consumer relationship.

“ Don't settle: Don't finish crappy books. If you don't like the menu, leave the restaurant. If you're not on the right path, get off it. ”

Our Overview

Your marketing plan should start with an executive summary. The summary gives a quick overview of the main points of the plan.

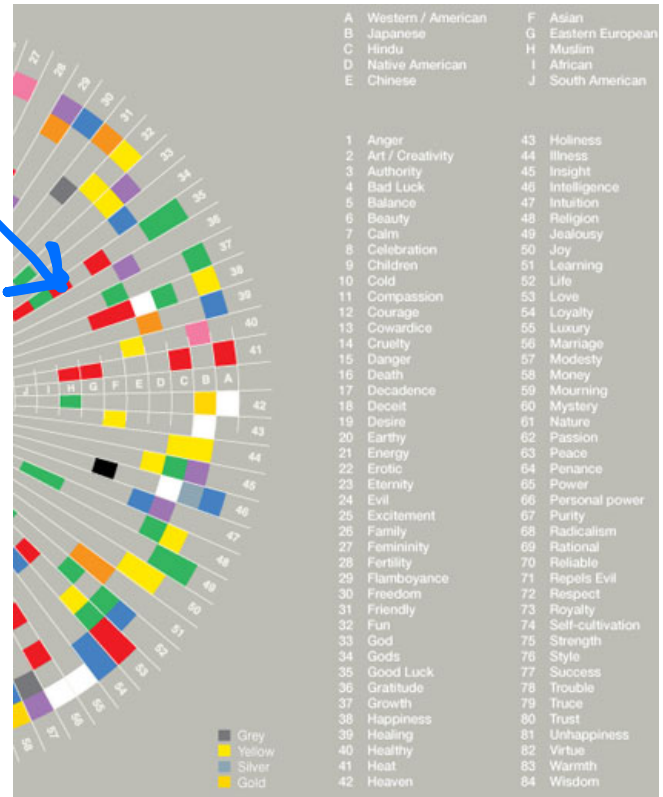
Although the executive summary appears at the beginning of the plan, you should write it last. Writing the summary is a good opportunity to check that your plan makes sense and that you haven't missed any important points.

COLORS CONVEY

Emotions

BLUE	TURQUOISE	GREEN	YELLOW
<ul style="list-style-type: none"> TRANQUILITY, SECURITY, INTEGRITY, PEACE, LOYALTY, TRUST, INTELLIGENCE COLDNESS, FEAR, MAJORITY 	<ul style="list-style-type: none"> SPIRITUAL, HEALING, PROTECTION, SOPHISTICATED ENVY, FEMININITY 	<ul style="list-style-type: none"> FRESHNESS, ENRICHMENT, NEW, MONEY, FERTILITY, HEALING, EARTH ENVY, JEALOUSY, GUILT 	<ul style="list-style-type: none"> BRIGHT, SUNNY, ENERGETIC, WARM, HAPPY, PEER, JOY, INTELLECT IRRESPONSIBLE, UNSTABLE
PURPLE	PINK	RED	ORANGE
<ul style="list-style-type: none"> ROYALTY, NOBILITY, SPIRITUALITY, LUXURY, AMBITION, WEALTH MYSTERY, MOODINESS 	<ul style="list-style-type: none"> HEALTHY, HAPPY, FEMININE, SWEET, COMMISSION, PLAYFUL WEAK, FEMININITY, IMMATURITY 	<ul style="list-style-type: none"> LOVE, PASSION, ENERGY, POWER, STRENGTH, HEAT, DESIRE ANGER, DANGER, WARNING 	<ul style="list-style-type: none"> COURAGE, CONFIDENCE, FRIENDLINESS, SUCCESS IGNORANCE, SLUGGISHNESS
BROWN	TAN	GOLD	SILVER
<ul style="list-style-type: none"> FRIENDLY, EARTH, OUTDOORS, LONGEVITY, CONSERVATIVE DOGMATIC, CONSERVATIVE 	<ul style="list-style-type: none"> DEPENDABLE, FLEXIBLE, CRISP, CONSERVATIVE BULL, BORN, CONSERVATIVE 	<ul style="list-style-type: none"> WEALTH, WISDOM, PROSPERITY, VALUABLE, TRADITIONAL ECOLOGICAL, SELF-RIGHTEOUS 	<ul style="list-style-type: none"> GLAMOROUS, HIGH TECH, GRACEFUL, SLEEK INDICATIVE, BULL, NON-COMMITAL
WHITE	GRAY	BLACK	
<ul style="list-style-type: none"> GOODNESS, INNOCENCE, PURITY, FRESH, EASY, CLEAN ISOLATION, PRISTINE, EMPHATIC 	<ul style="list-style-type: none"> SECURITY, RELIABILITY, INTELLIGENCE, SOLID GLOOMY, SAD, CONSERVATIVE 	<ul style="list-style-type: none"> PROTECTION, ELEGANCE, DRAMATIC, CLASSY, FORMALITY DEATH, EVIL, MYSTERY 	

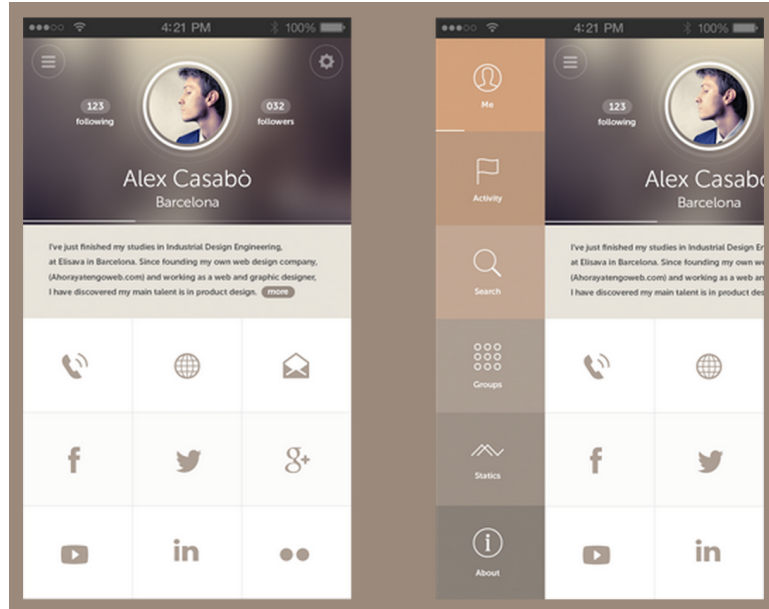
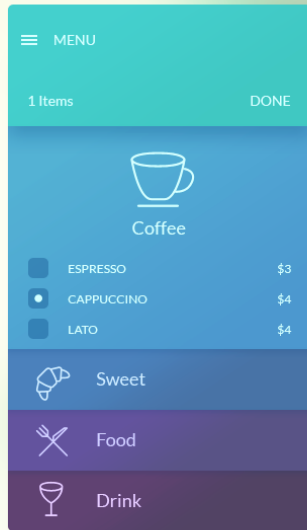
Culture Context

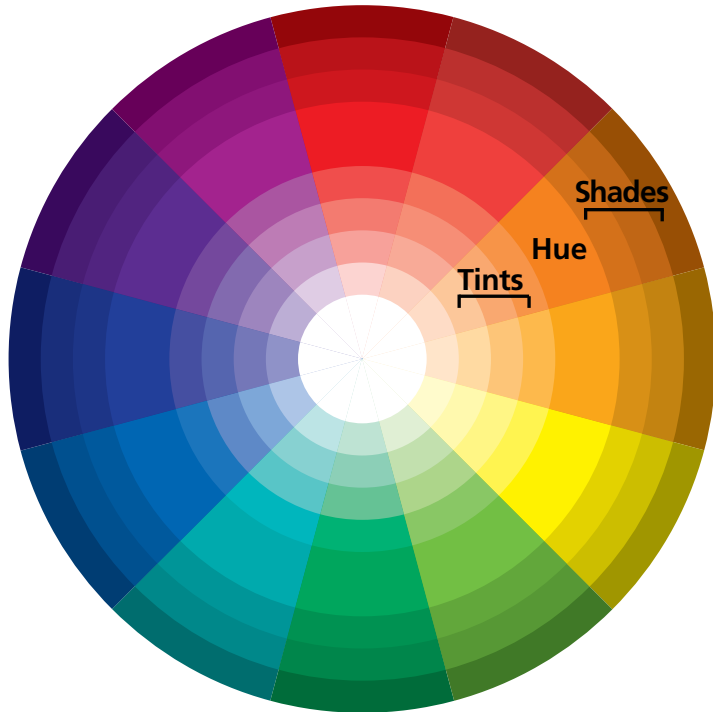


The Color Wheel

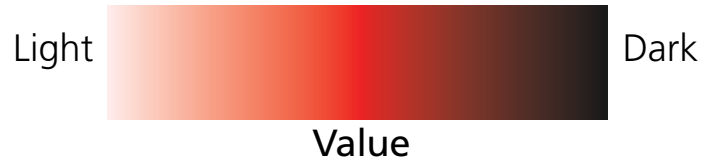
- >> Primary, secondary, tertiary colors
- >> Tints, hue, shades
- >> Complementary colors
- >> Warm, cool colors





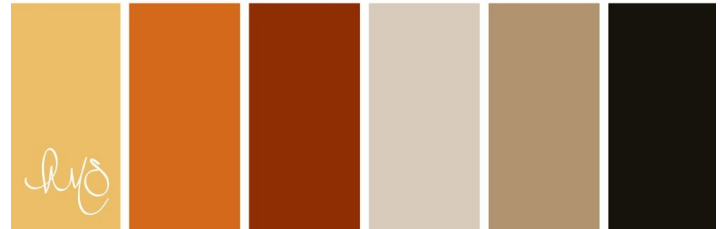


Hue



Color Palettes

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



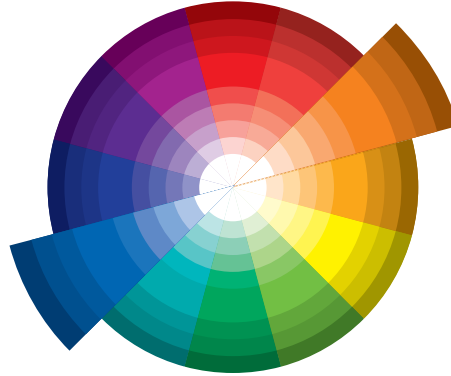
ANALOGOUS



#1b75bb #00a9ac #8ccfb6

#adc5e6 #00888a #00888a

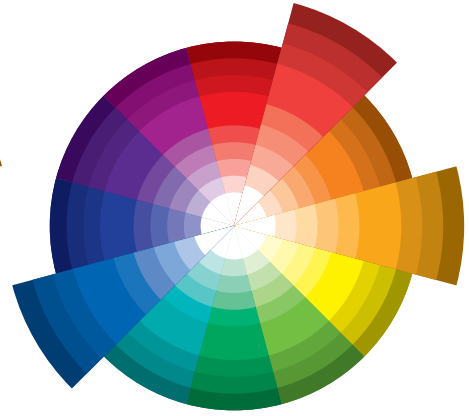
COMPLEMENTARY



#1b75bb #fcc69a #c06615

#004f8f #1b75bb #f5821f

SPLIT-COMPLEMENTARY



#004f8f #fcb94c #bb302d

#7da7d8 #ffd9a1 #f58d76

TRIADIC



#f5821f #5c2d91 #65c194

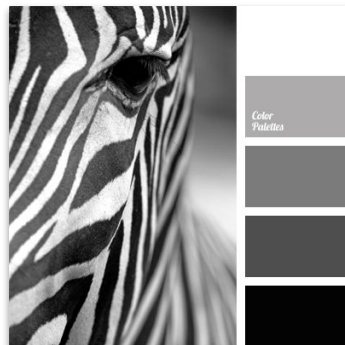


#f79447 #bbaed5 #009252

MONOCHROMATIC



ACHROMATIC



Color Vision Deficiencies¹

- >> 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



normal



protanomaly
red weakness: red, orange, yellow
shift in hue towards green



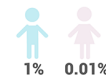
deuteranomaly
green weakness: yellow, green,
orange shift toward red



protanopia
severe deficiency in red spectrum



deuteranopia
severe deficiency in green spectrum



¹Dundas

Questions about *Color*?

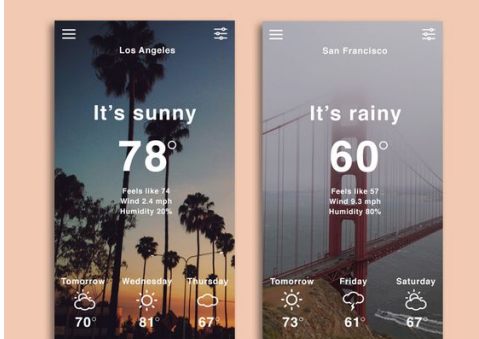
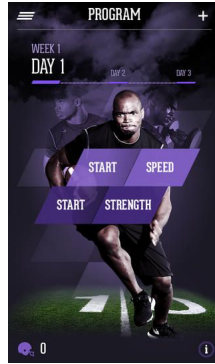
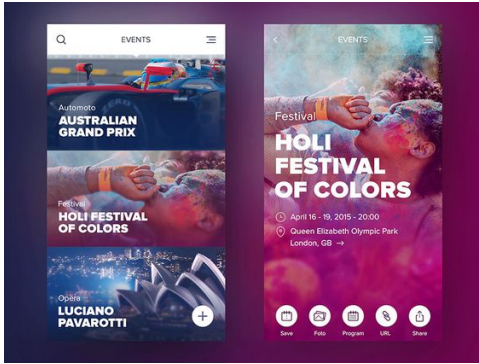
Images

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

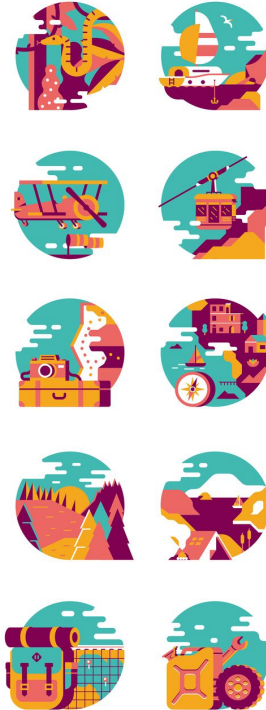
TABLE 5.1. Graphic types to use for varied goals.

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

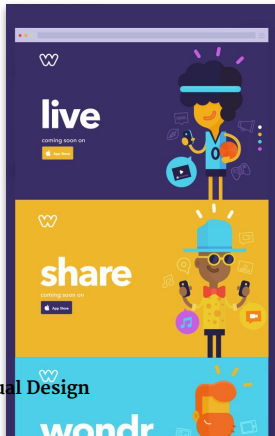
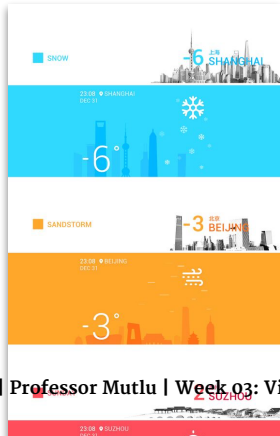
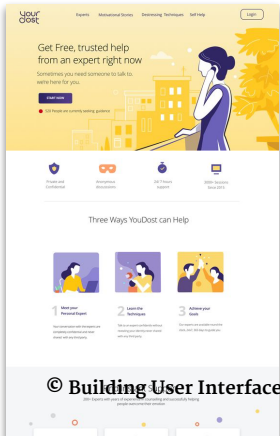
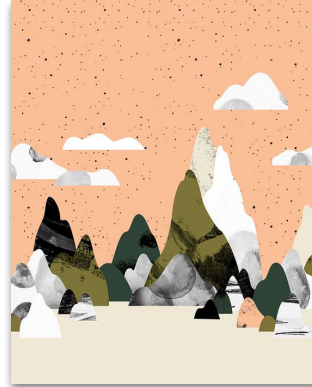


VECTOR GRAPHICS





◀ More Realistic Less Realistic ▶



Questions about *Images*?