

Visual Information Design

Prof. James A. Landay
Computer Science Department
Stanford University

Autumn 2024
October 23, 2024

* Based on slides by Luke Vink, Scott Klemmer, and James Landay

Hall of Fame or Shame?



OFFICIAL BALLOT, GENERAL ELECTION
PALM BEACH COUNTY, FLORIDA
NOVEMBER 7, 2000

OFFICIAL BALLOT, GENERAL ELECTION
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NOVEMBER 7, 2000

Palm Beach, Florida
Ballot 2000

ELECTORS FOR PRESIDENT AND VICE PRESIDENT (A vote for the candidates will actually be a vote for their electors.) (Vote for Group)	(REPUBLICAN) GEORGE W. BUSH - PRESIDENT DICK CHENEY - VICE PRESIDENT	3 →
	(DEMOCRATIC) AL GORE - PRESIDENT JOE LIEBERMAN - VICE PRESIDENT	5 →
	(LIBERTARIAN) HARRY BROWNE - PRESIDENT ART OLIVIER - VICE PRESIDENT	7 →
	(GREEN) RALPH NADER - PRESIDENT WINONA LaDUKE - VICE PRESIDENT	9 →
	(SOCIALIST WORKERS) JAMES HARRIS - PRESIDENT MARGARET TROWE - VICE PRESIDENT	11 →
	(NATURAL LAW) JOHN HAGELIN - PRESIDENT NAT GOLDHABER - VICE PRESIDENT	13 →

← 4	(REFORM) PAT BUCHANAN - PRESIDENT EZOLA FOSTER - VICE PRESIDENT
← 6	(SOCIALIST) DAVID McREYNOLDS - PRESIDENT MARY CAL HOLLIS - VICE PRESIDENT
← 8	(CONSTITUTION) HOWARD PHILLIPS - PRESIDENT J. CURTIS FRAZIER - VICE PRESIDENT
← 10	(WORKERS WORLD) MONICA MOOREHEAD - PRESIDENT GLORIA La RIVA - VICE PRESIDENT
	WRITE-IN CANDIDATE To vote for a write-in candidate, follow the directions on the long stub of your ballot card.

Hall of Shame!



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Palm Beach, Florida
Ballot 2000

Eye drawn to the
wrong holes

If only 1% error rate,
can still change a
close election

One Possible Redesign

1		OFFICIAL BALLOT, GENERAL ELECTION PALM BEACH COUNTY, FLORIDA NOVEMBER 7, 2000		A		OFFICIAL BALLOT, GENERAL ELECTION PALM BEACH COUNTY, FLORIDA NOVEMBER 7, 2000		1 - R	
REPUBLICAN	GEORGE W. BUSH • PRESIDENT AND DICK CHENEY • VICE PRESIDENT	3	➔	○		<p>ELECTORS FOR PRESIDENT AND VICE PRESIDENT</p> <p>(A vote for the candidates will actually be a vote for their electors.)</p> <p>(Vote for Group)</p>			
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LIBERTARIAN	HARRY BROWNE • PRESIDENT AND ART OLIVIER • VICE PRESIDENT	5	➔	○					
GREEN	RALPH NADER • PRESIDENT AND WINONA LaDUKE • VICE PRESIDENT	6	➔	○					
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WORKERS WORLD	MONICA MOOREHEAD • PRESIDENT AND GLORIA La RIVA • VICE PRESIDENT	12	➔	○					
WRITE-IN CANDIDATE	To vote for a write-in candidate, follow the directions on the long stub of your ballot card.								

William Lidwell, Kritina Holden, and Jill Butler *Universal Principles of Design*

Visual Information Design

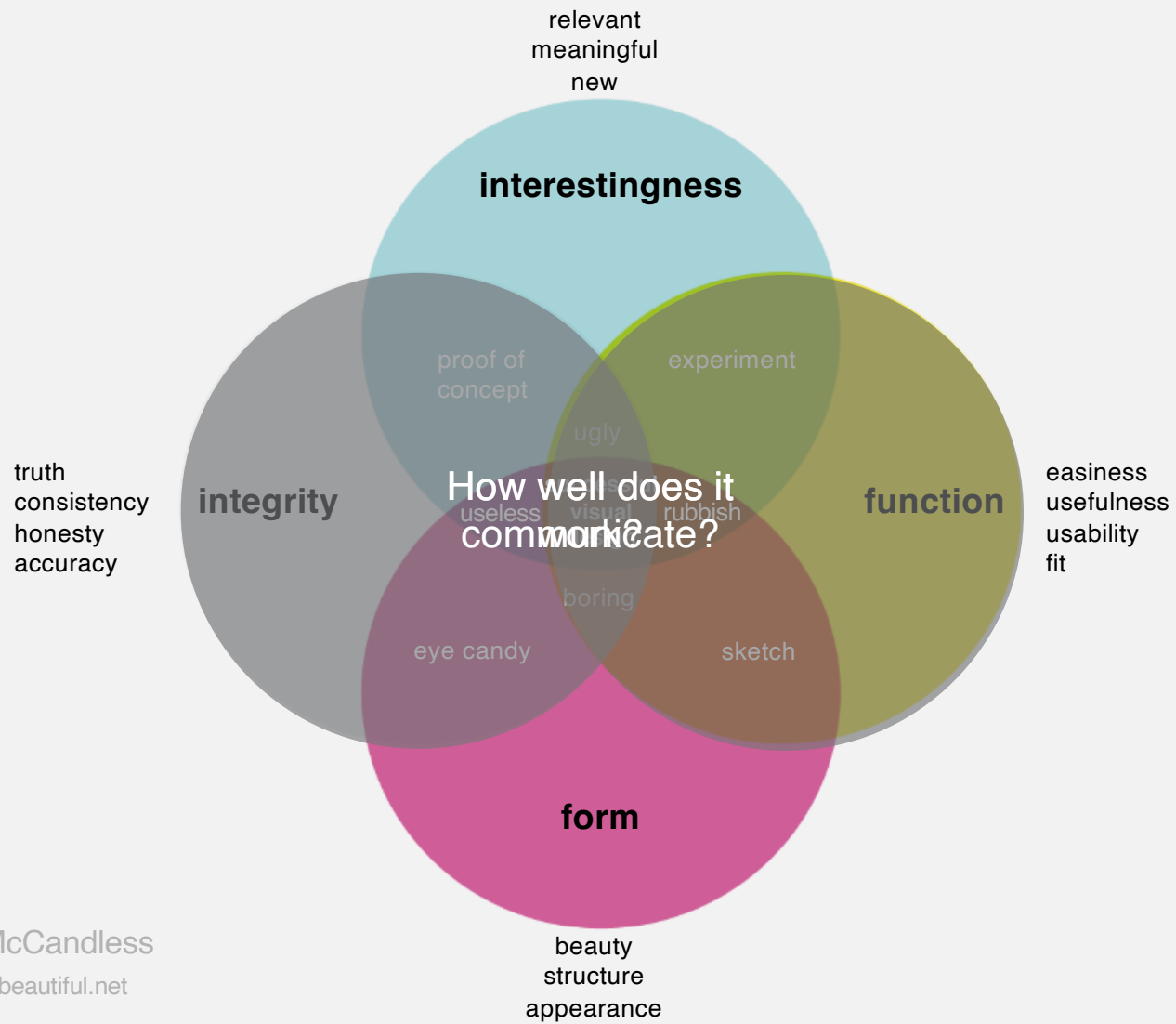
Prof. James A. Landay
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Outline

- Good Form
 - visual hierarchy, layout, proximity, small multiples & space
 - typography, grids & icons
- Team Break
- Color
- Group mood board exercise
- “Interesting Design”



Based on David McCandless
<http://www.informationisbeautiful.net>

The Art of Balance

Promotion & demotion of important objects

First Question for any design

➤ *What are the most important things?*

Information should be prioritized based on its importance to the user

Visual Hierarchy and Reading Order

Strong visual hierarchies guide visual & logical progression by showing what is important.



Weak visual hierarchies provide little or no guidance about what is important.



source: <http://52weeksofux.com/post/443828775/visual-hierarchy>

NETFLIX

Browse ▾

Kids

DVD

Search



Jenny ▾

NETFLIX ORIGINAL

KONG KING OF THE APES

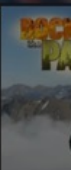
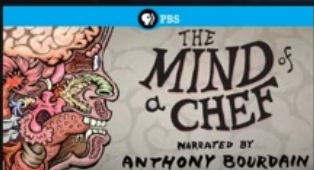
Watch Season 1 Now

He's the biggest hero the world has ever seen. But even Kong will need help to stop this army of high-tech beasts!

▶ PLAY

+ MY LIST

Continue Watching for Jenny



The First Read: Reading order pillars



1. size
2. color
3. layout
4. spacing
5. style

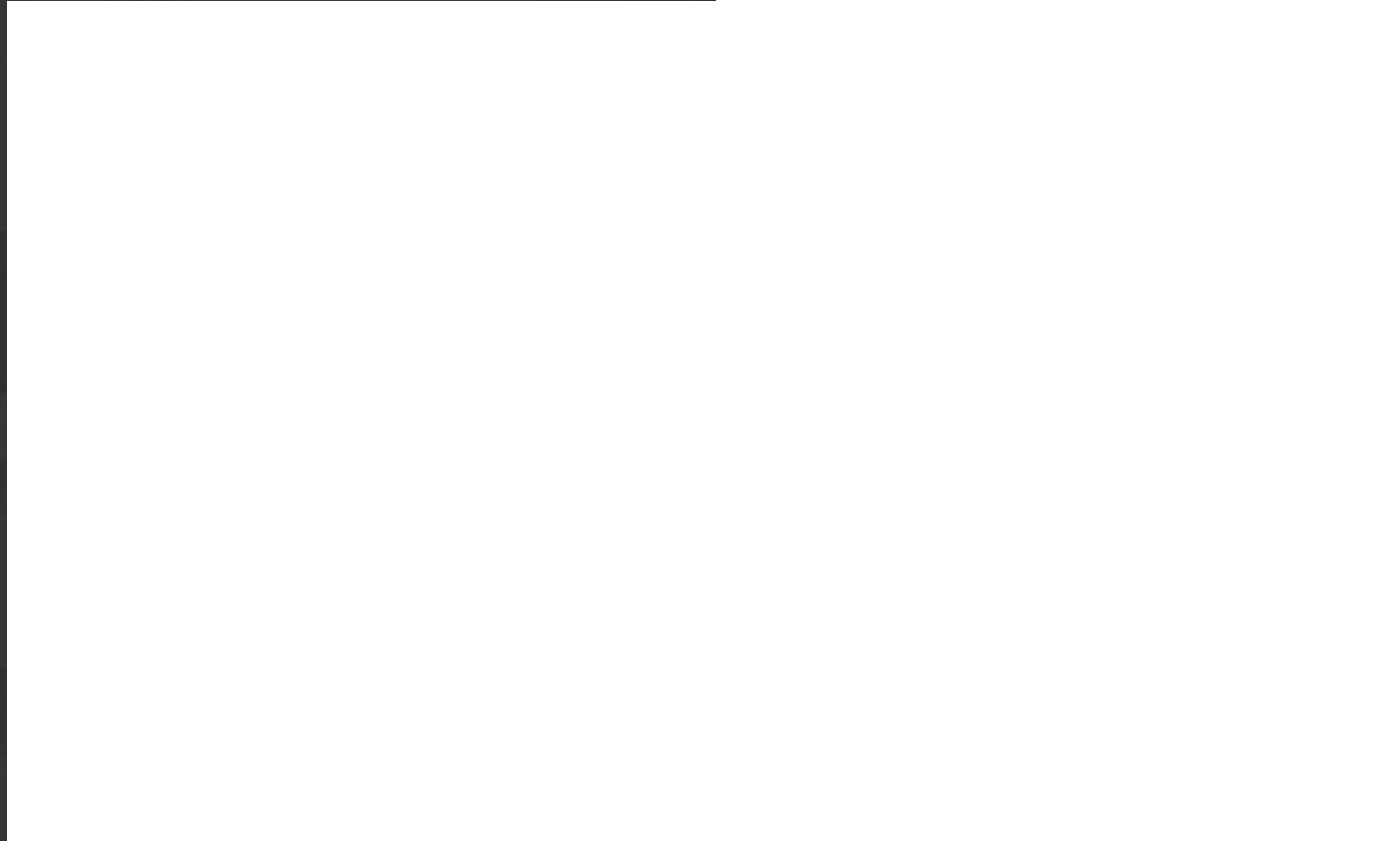
source: <http://thenextweb.com/dd/2015/04/30/the-5-pillars-of-visual-hierarchy-in-web-design/#gref>

Using Proximity to Indicate Relationships

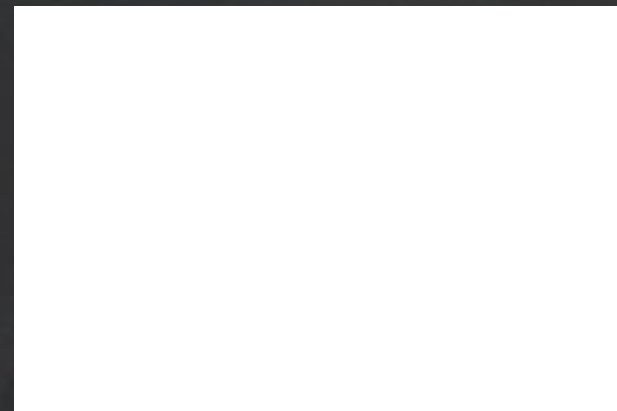
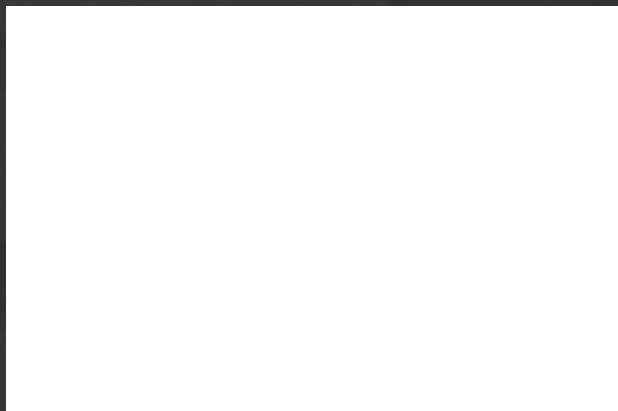
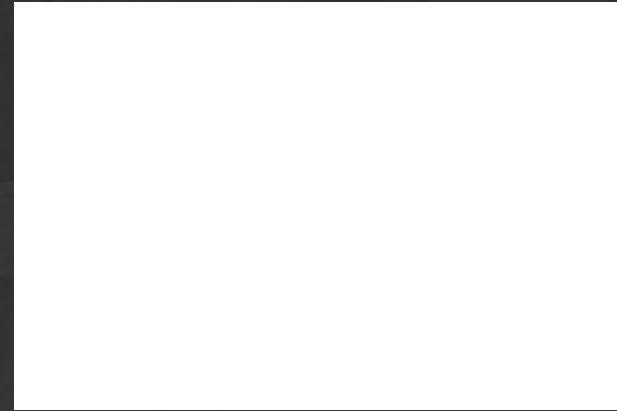
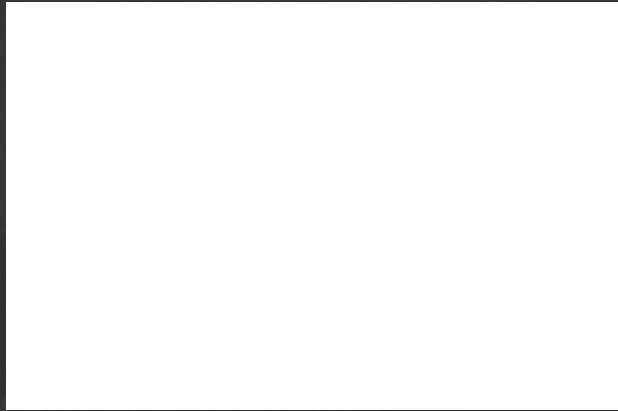
Gestalt Psychology in information design

Information blocks should be **grouped together if related**, but unrelated elements should be located at some distance from each other.

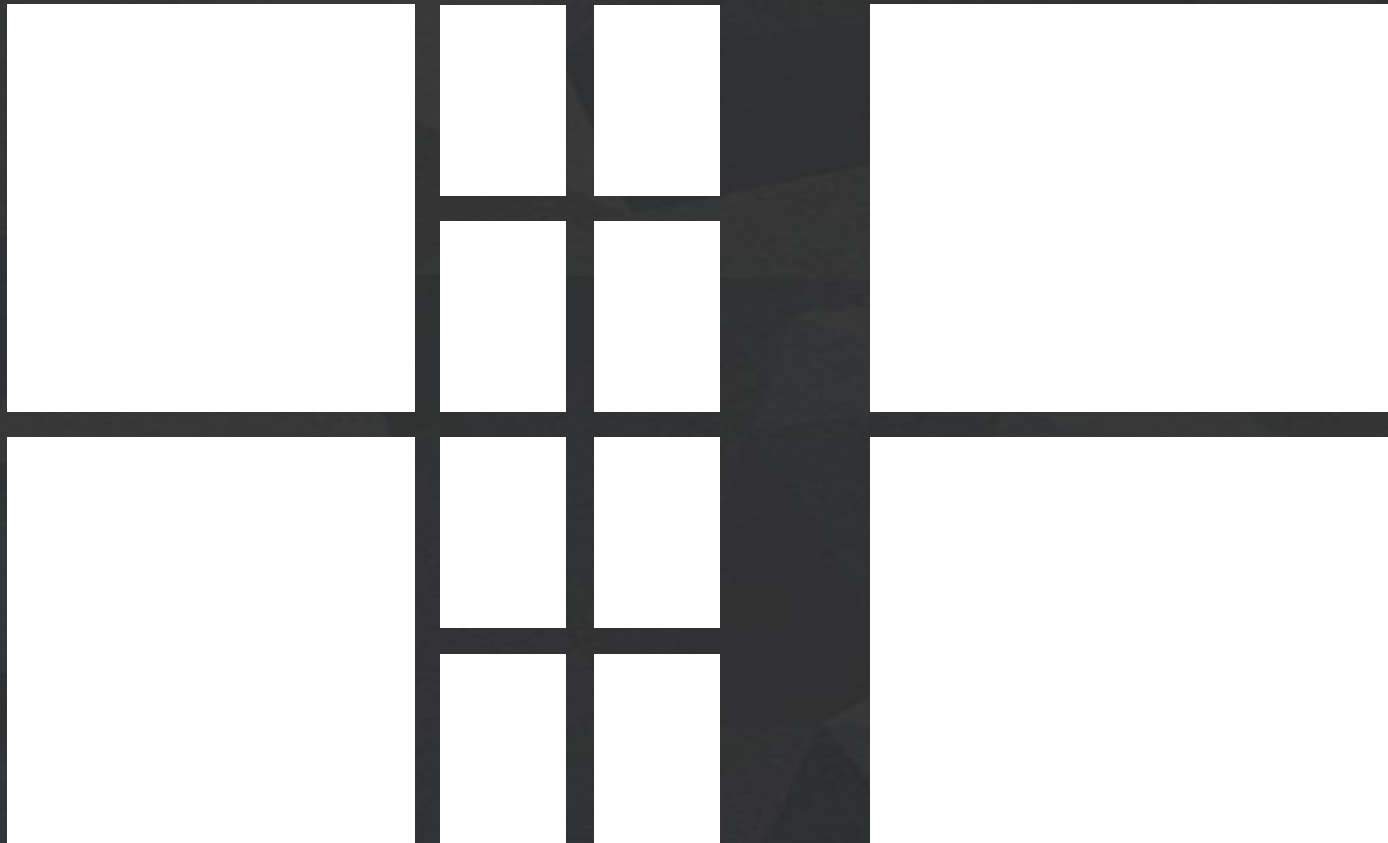
Using Proximity to Indicate Relationships



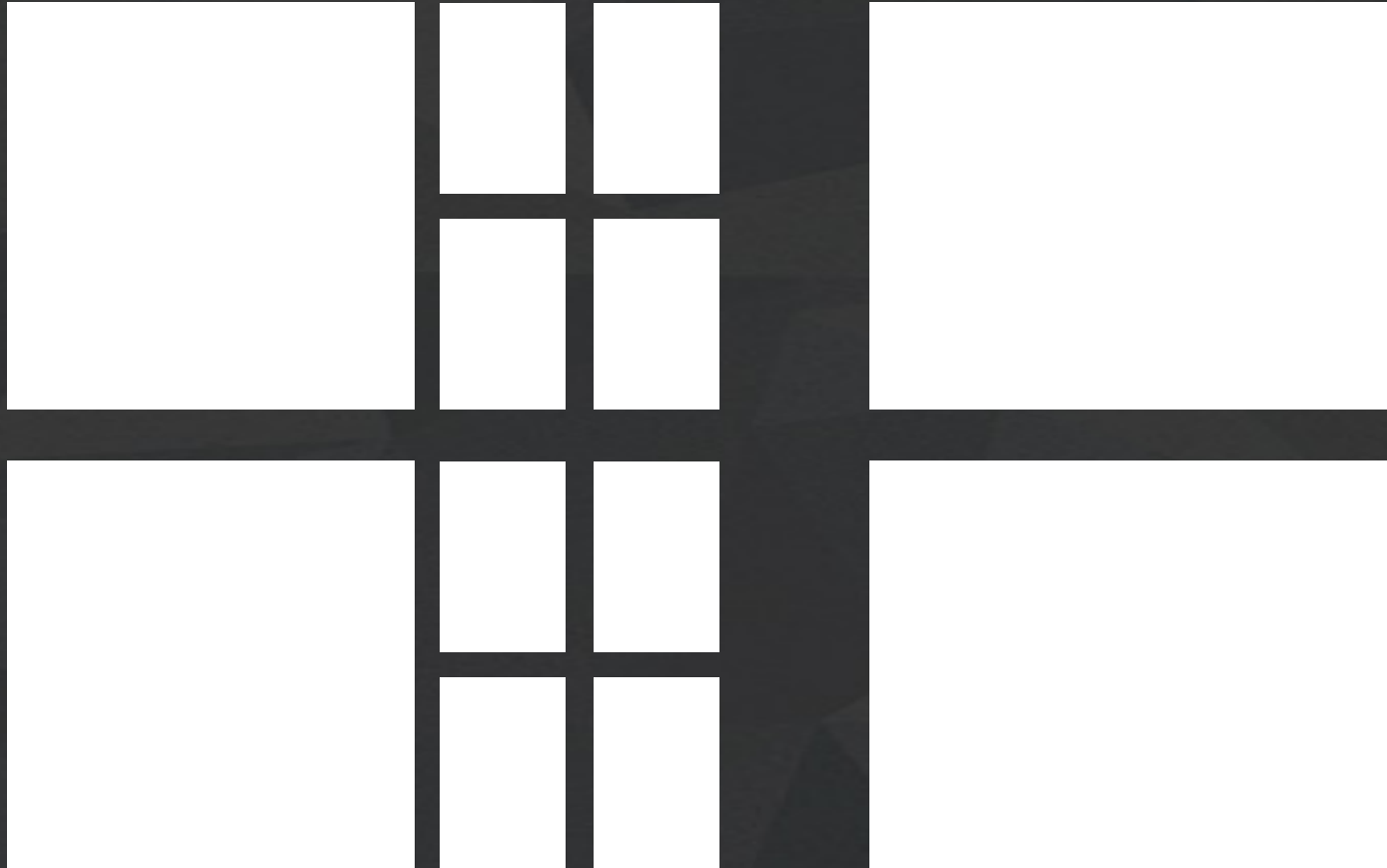
Using Proximity to Indicate Relationships



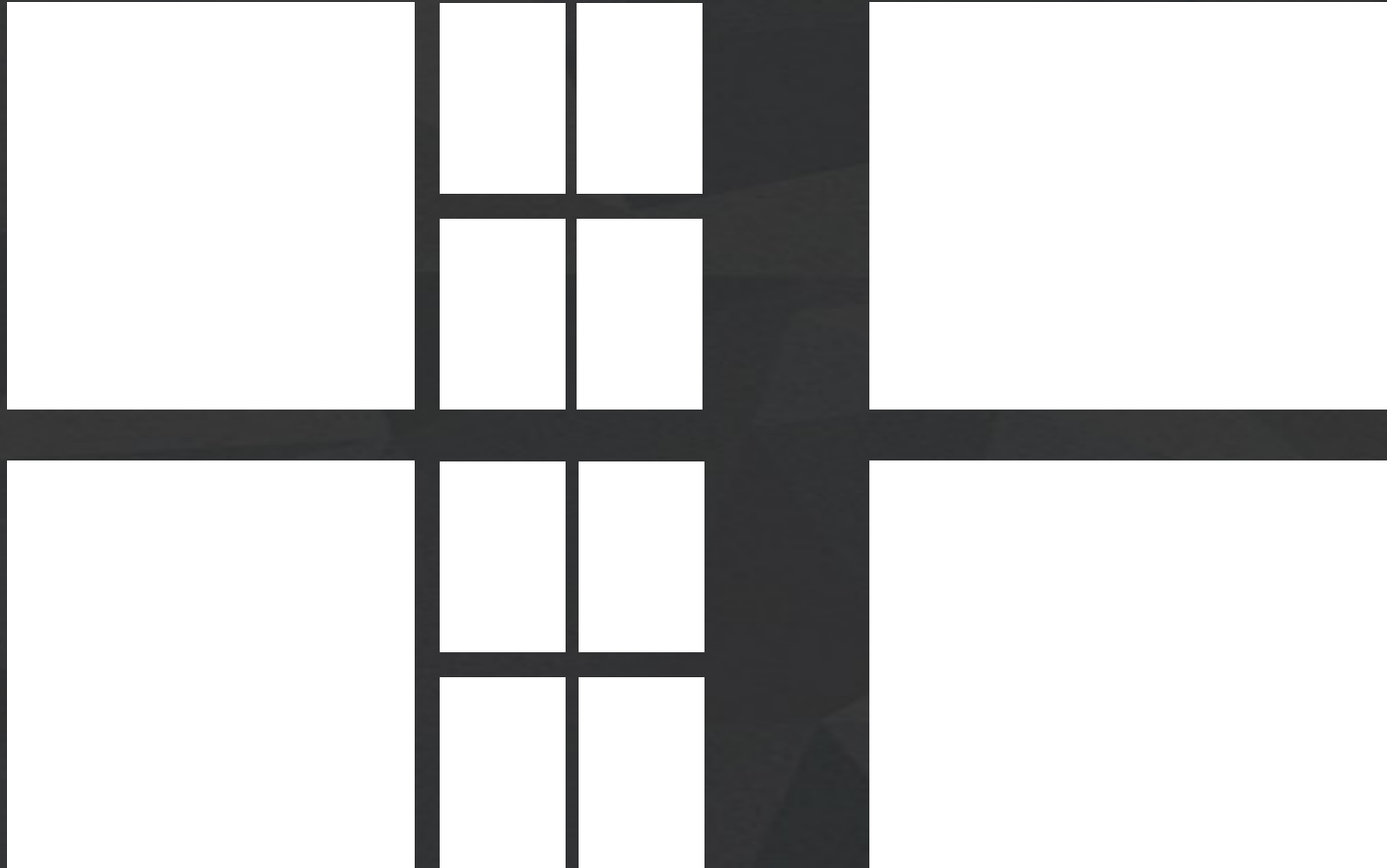
Using Proximity to Indicate Relationships



Using Proximity to Indicate Relationships



Using Proximity to Indicate Relationships



Using Proximity to Indicate Relationships



Small Multiples

- Economy of line
- Similarities enable us to notice differences

IMAGE REMOVED

Image 1:

Japanese book for children on t-shirt colors that match

The shirts are all the same. The only difference is the colors! The difference that matters here.

Image 2:]

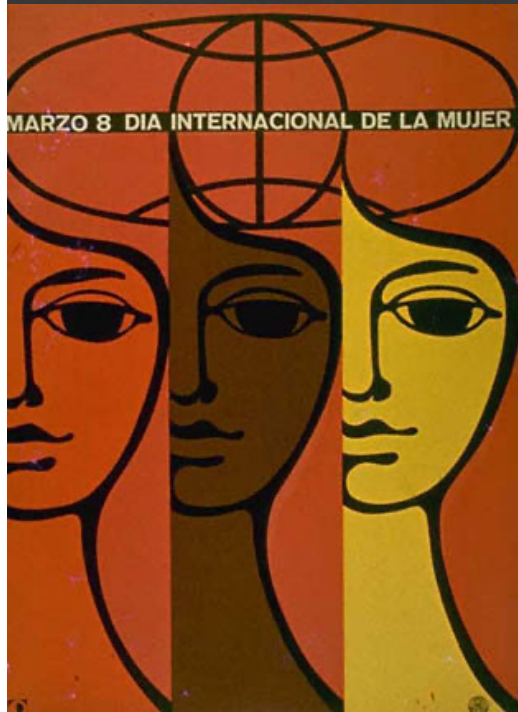
Person holding semaphores to guide in a plane to the gate.

The person is gray... just enough to tell us there is a person. The important thing is that they are holding lights and what they are doing with the lights (the important information is bright – red & yellow)

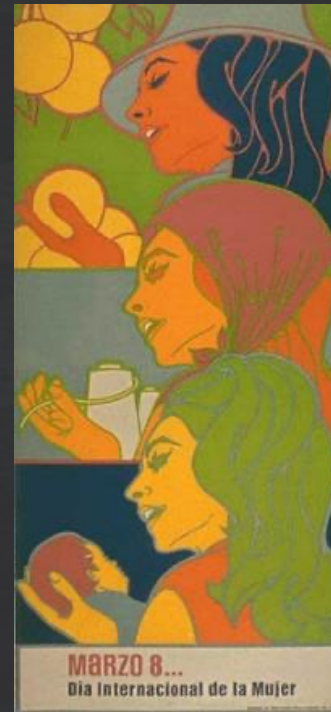
Images from Edward Tufte's *Envisioning Information*

International Women's Day

SMALL MULTIPLES



Echeverria, Heriberto 1971
March 8 - International Women's Day

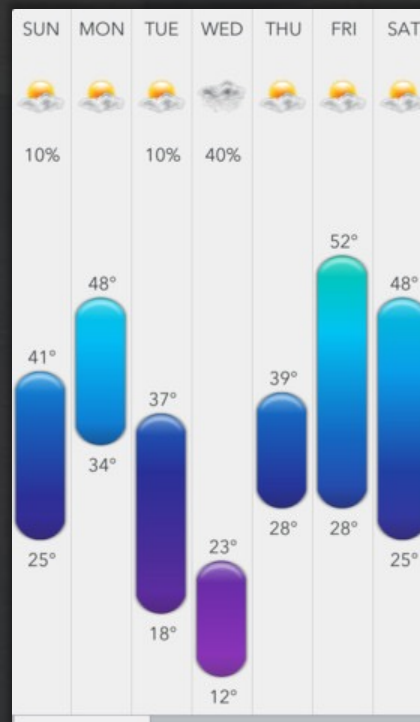


Diaz, Estela 1974
March 8 - International Women's Day

Revolucion!: Cuban Poster Art by Lincoln Cushing
<http://www.amazon.com/Revolucion-Cuban-Poster-Lincoln-Cushing/dp/0811835820>

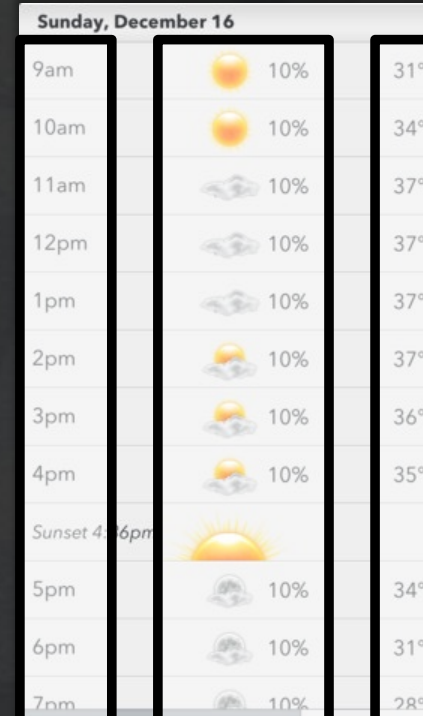
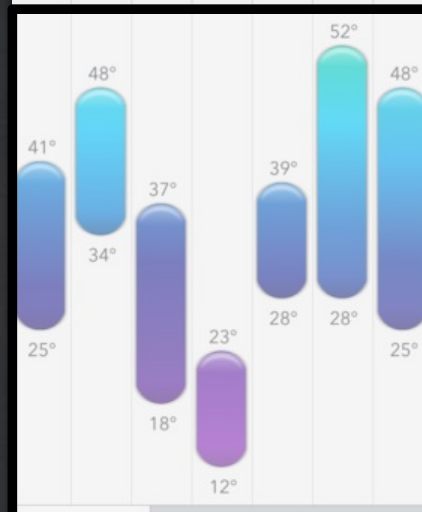
Proximity & Small Multiples in Use

Today Weather iOS App



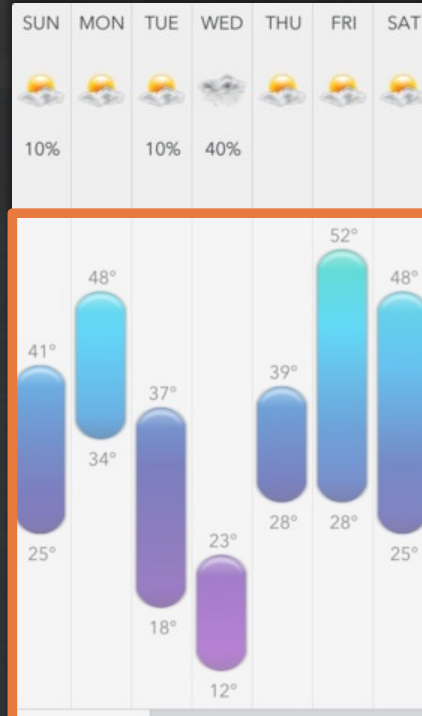
Proximity & Small Multiples in Use

Today Weather iOS App



Proximity & Small Multiples in Use

Today Weather iOS App



Using Blank / White Space as an Object

- White space can be used to suggest importance or prestige
- The more space around a group, the more valuable it should be for the user
- Think of whitespace as an “element” – consider its position

A higher plain

White Space = Value

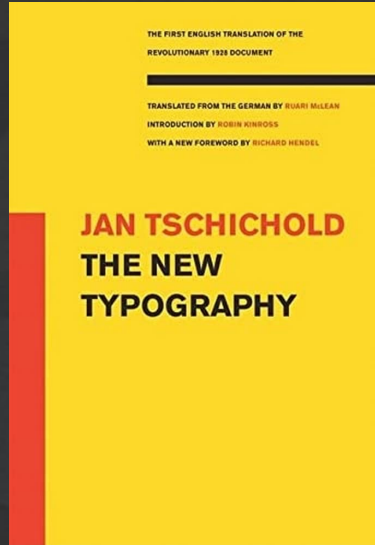


What Are The Important Things Here?

The screenshot shows the SF Weekly website homepage. At the top, there are navigation links for 'Browse Voice Nation', 'Most Popular', and 'Most Recent'. On the right, there are links for 'Sign up' and 'Log in'. The main header features the 'SF WEEKLY' logo, a 'SF WEEKLY iPhone App' download button, and a 'DOWNLOAD FOR FREE! CLICK HERE' button. Below the header is a search bar and navigation tabs for 'News', 'Music', 'Calendar', 'Restaurants', 'Arts', 'Movies', 'The Ads', and 'Classifieds'. The main content area is divided into several sections: 'Dish' event (Sunday October 2nd, 1:00PM to 4:00PM), 'Headlines' (Top News Stories), 'Daily Blogs' (Prude Community Panicked by SF Nude Protest, Obama Talks Jobs At LinkedIn, DA's Office to Appeal Judge's Order Unsealing DNA...), 'Slideshows' (Erotic Art Exhibition at Artist's Alley (NSFW)), and 'Today's Deal in SF' (Salsa Lessons for \$25). On the right side, there are several promotional banners, including 'THE GALLERIA SAN FRANCISCO DESIGN CENTER', 'OVER 35 CULINARY DELIGHTS RESTAURANTS IN SAN FRANCISCO', 'EAT DRINK enjoy', and 'CLICK HERE FOR TICKETS!'. The bottom of the page features a footer with the text 'Autumn 2024' and '26'.

Jan Tschichold's Revolution

Champion of Modernist Typography



Die Neue Typographie
Berlin, 1928



Bauhaus school
Dessau, 1925-26

Type Classifications

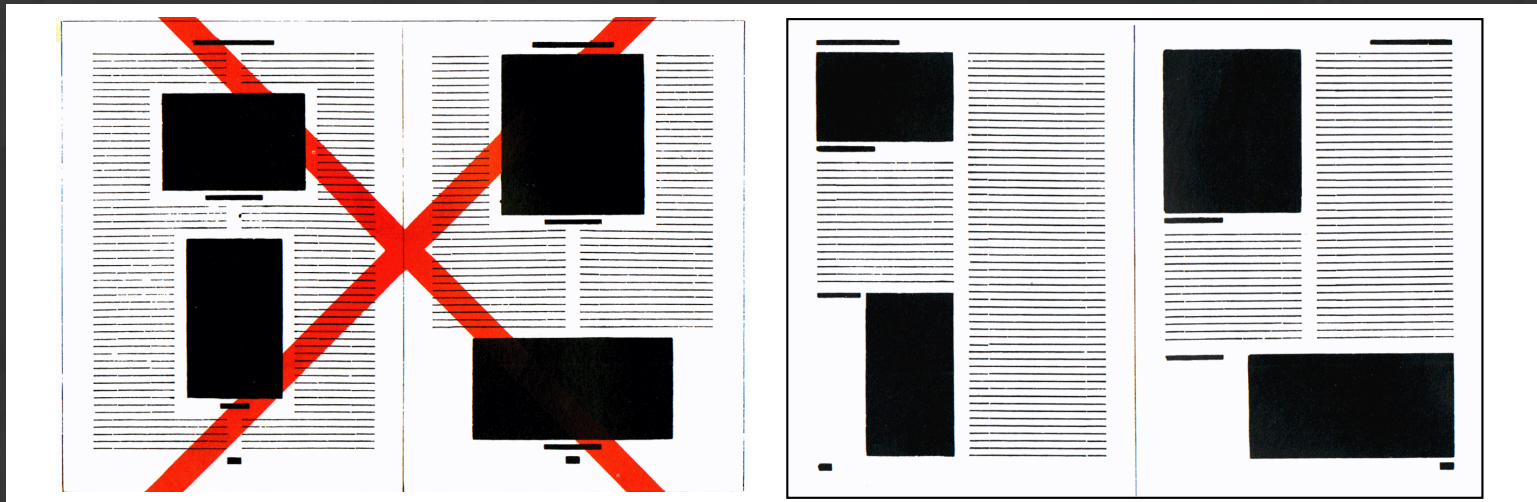
Typeface (Arial) vs Font (Arial Bold)

Serifs: Structural details in letters that (may) help the reader connect them

	Sans Serif	Serif
	Optima	Fenice Bold
Roman	answ	answ
Obliqued	<i>answ</i>	<i>answ</i>
True italic	<i>answ</i>	<i>answ</i>

Asymmetric Typography

JAN TSCHICHOLD

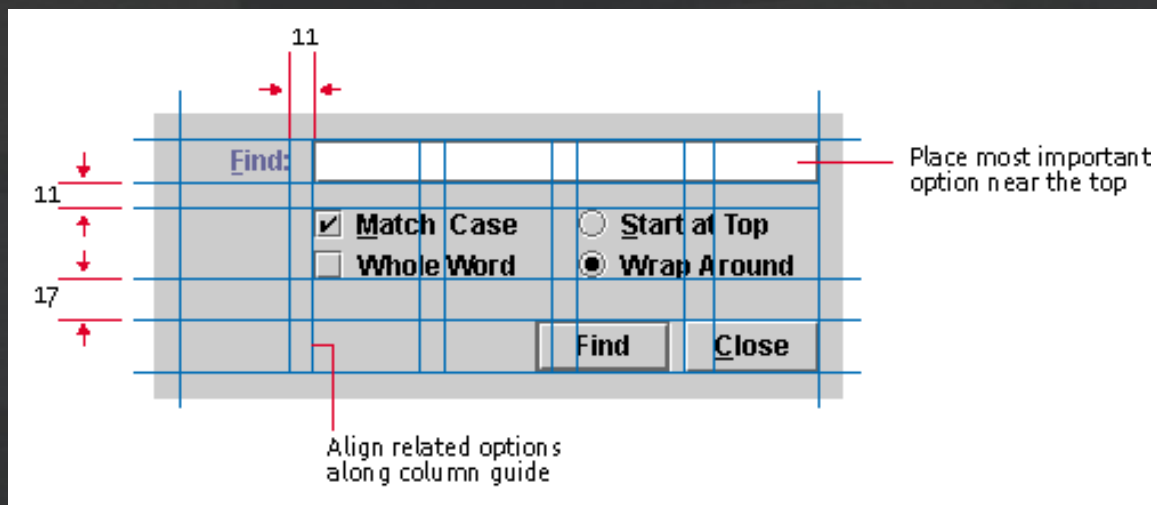


How blocks used to be arranged in magazines. Schematic, thoughtless centering of blocks (= ugly).

The same blocks, correctly arranged in the same type-area. Constructive, meaningful, and economical (= beautiful).

Grid Systems

- A key pattern for implementing rationality, modernism, asymmetry
- Note that no elements are “centered”



Java Look and Feel Design Guidelines

Iconography: Differences that Make a Difference



www.jensondesign.com/1+1=3.pdf

Administrivia

- Website
 - must be on web site by studio next week or grade will be docked
 - problem getting a web site up, talk to your CA now
- Design Systems Workshop
 - Video is online (linked on calendar). Watch it. It will help you for A6
- CS 194H
 - follow-on to CS147
 - ~~offered this Winter~~ *Not offered this academic year*

Administrivia

- Grading on Assignment #4: Concept Video

A4 Overall Grade: -: 0% ✓ -: 0% ✓ -: 0% ✓ : 45% ✓ +: 48% ✓ ++: 7%

Administrivia

- Midway team check-in survey (*required*)
 - due Sunday 10/27 at 11:59 PM
- <https://bit.ly/midway-team-checkin-24au>



TEAM BREAK

(FINISH LOW-FI PROTOTYPE OR SLIDES)



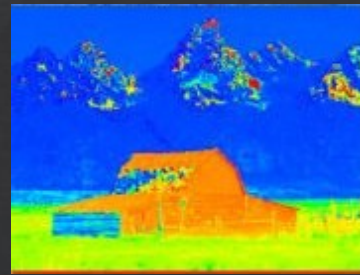
Color

Color Definitions (digital)

- Hue is gradation of color (i.e., name: “yellow”)
- Saturation is purity of the hue (vividness)
 - how much gray is mixed in
- Luminance is the brightness in an image



Photo



Hue



Saturation



Luminance

Color: Edward Tufte – by hue

IMAGE REMOVED

While it is certainly true that hues have a physical order via their wavelength, and that every kindergartener knows the rainbow ordering, our visual system has a very difficult time treating hue in an ordered way. As we see in this image, it is clear that each area is *different*, but none of the areas have an intuitive relationship between each other.

This is supposed to convey height above sea level.

Where is above ground? Where is below? What's the highest point? These questions are hard to answer.

This is how most computer scientist would design a map.

Color: Edward Tufte – by luminance

IMAGE REMOVED

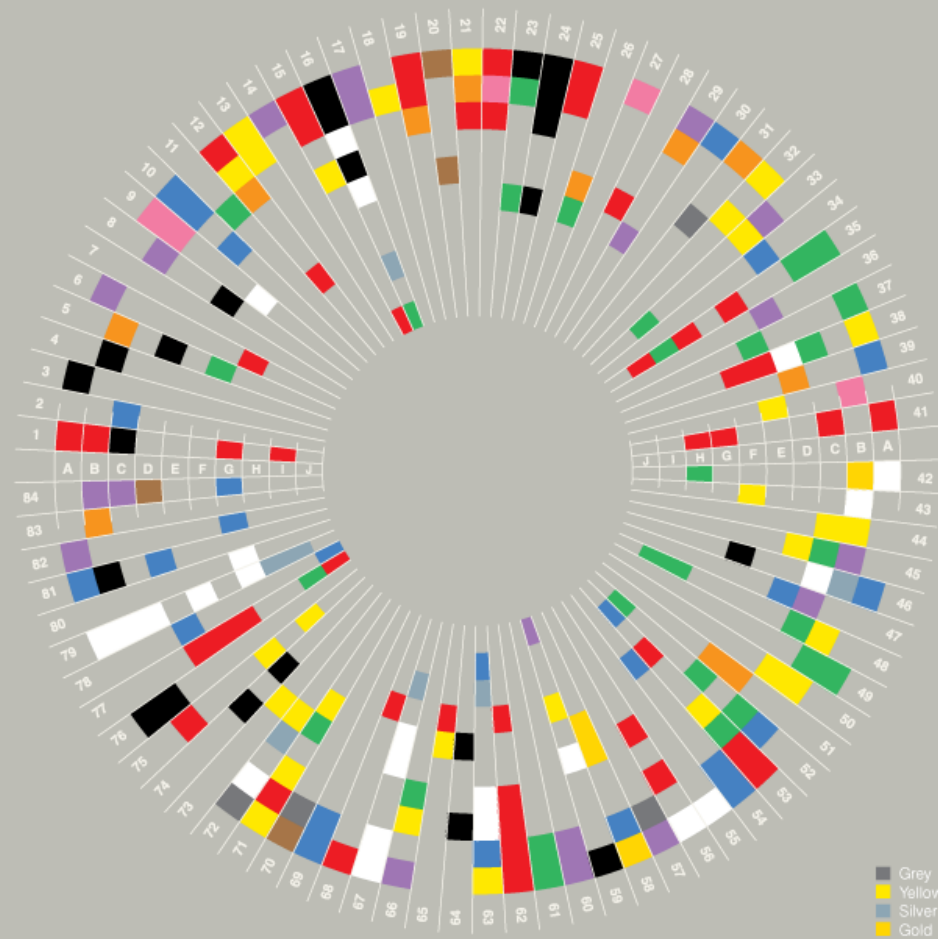
Color sets that vary primarily by luminance are much easier for us to order. This image uses two color sets: browns for height above the land, blues for depth below the ocean. The questions I mentioned before are now much easier to answer. The much more muted colors also much easier to read the information.

[Eastern Sea, not Japan Sea]

Cartographers have been doing this for 2000 years.

The key is to know: under water or not under water? Then, how far for each case? Our perception system can't use hue for how much! But, we can use intensity. As I go deeper, the color gets darker. Intensity is a great axis for presenting quantitative info.

Colours In Culture



- | | |
|----------------------|--------------------|
| A Western / American | F Asian |
| B Japanese | G Eastern European |
| C Hindu | H Muslim |
| D Native American | I African |
| E Chinese | J South American |

- | | |
|--------------------|---------------------|
| 1 Anger | 43 Holiness |
| 2 Art / Creativity | 44 Illness |
| 3 Authority | 45 Insight |
| 4 Bad Luck | 46 Intelligence |
| 5 Balance | 47 Intuition |
| 6 Beauty | 48 Religion |
| 7 Calm | 49 Jealousy |
| 8 Celebration | 50 Joy |
| 9 Children | 51 Learning |
| 10 Cold | 52 Life |
| 11 Compassion | 53 Love |
| 12 Courage | 54 Loyalty |
| 13 Cowardice | 55 Luxury |
| 14 Cruelty | 56 Marriage |
| 15 Danger | 57 Modesty |
| 16 Death | 58 Money |
| 17 Decadence | 59 Mourning |
| 18 Deceit | 60 Mystery |
| 19 Desire | 61 Nature |
| 20 Earthy | 62 Passion |
| 21 Energy | 63 Peace |
| 22 Erotic | 64 Penance |
| 23 Eternity | 65 Power |
| 24 Evil | 66 Personal power |
| 25 Excitement | 67 Purity |
| 26 Family | 68 Radicalism |
| 27 Femininity | 69 Rational |
| 28 Fertility | 70 Reliable |
| 29 Flamboyance | 71 Repels Evil |
| 30 Freedom | 72 Respect |
| 31 Friendly | 73 Royalty |
| 32 Fun | 74 Self-cultivation |
| 33 God | 75 Strength |
| 34 Gods | 76 Style |
| 35 Good Luck | 77 Success |
| 36 Gratitude | 78 Trouble |
| 37 Growth | 79 Truce |
| 38 Happiness | 80 Trust |
| 39 Healing | 81 Unhappiness |
| 40 Healthy | 82 Virtue |
| 41 Heat | 83 Warmth |
| 42 Heaven | 84 Wisdom |








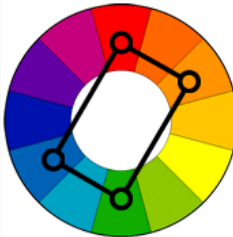

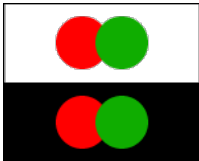

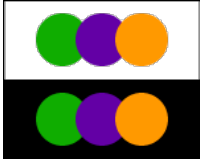


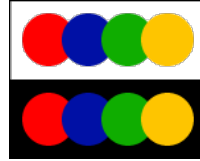
The Basics of the Color Wheel



Color *Harmonies*

“A pleasing arrangement of parts,
whether it be music, poetry, color,
or an ice cream sundae.”

Using Appropriate Color “Harmonies”

					
Complementary	Analogous	Triad	Split Complementary	Rectangle (Tetradic)	Square
					
					

Complimentary

Not so good for text

Christmas..maybe
Everyday use...

Not so much!

This color scheme must
be managed well so it is
not jarring. Bad with Text!!

Hard on the eyes



Complimentary (e.g., Children's Bedroom)



Analogous

Always easy on the eyes,
this type of color scheme
always looks “natural”



Analogous (e.g., Beyond Oil)



Split Complimentary

Often a good choice for beginners, because it is difficult to mess up.



Split Complimentary



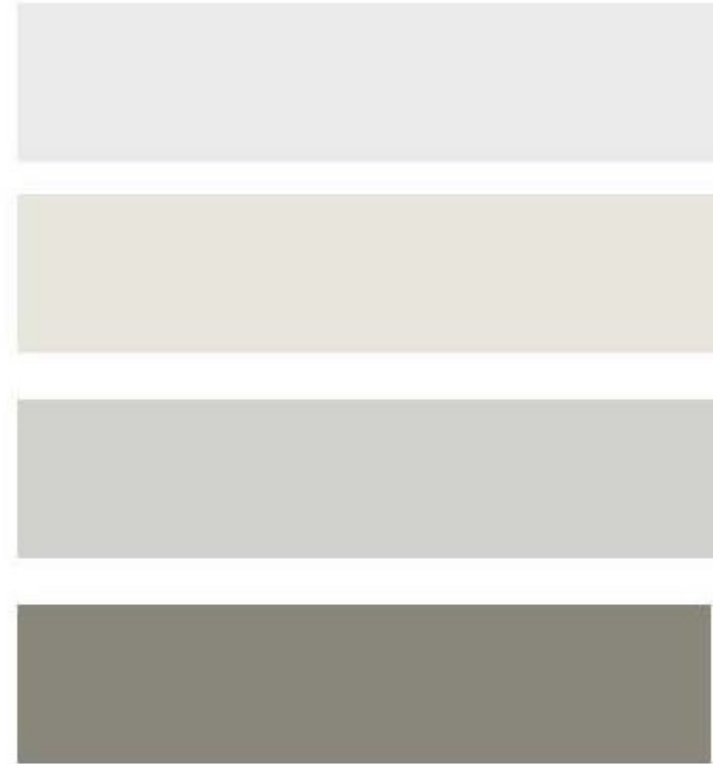
split-complementary



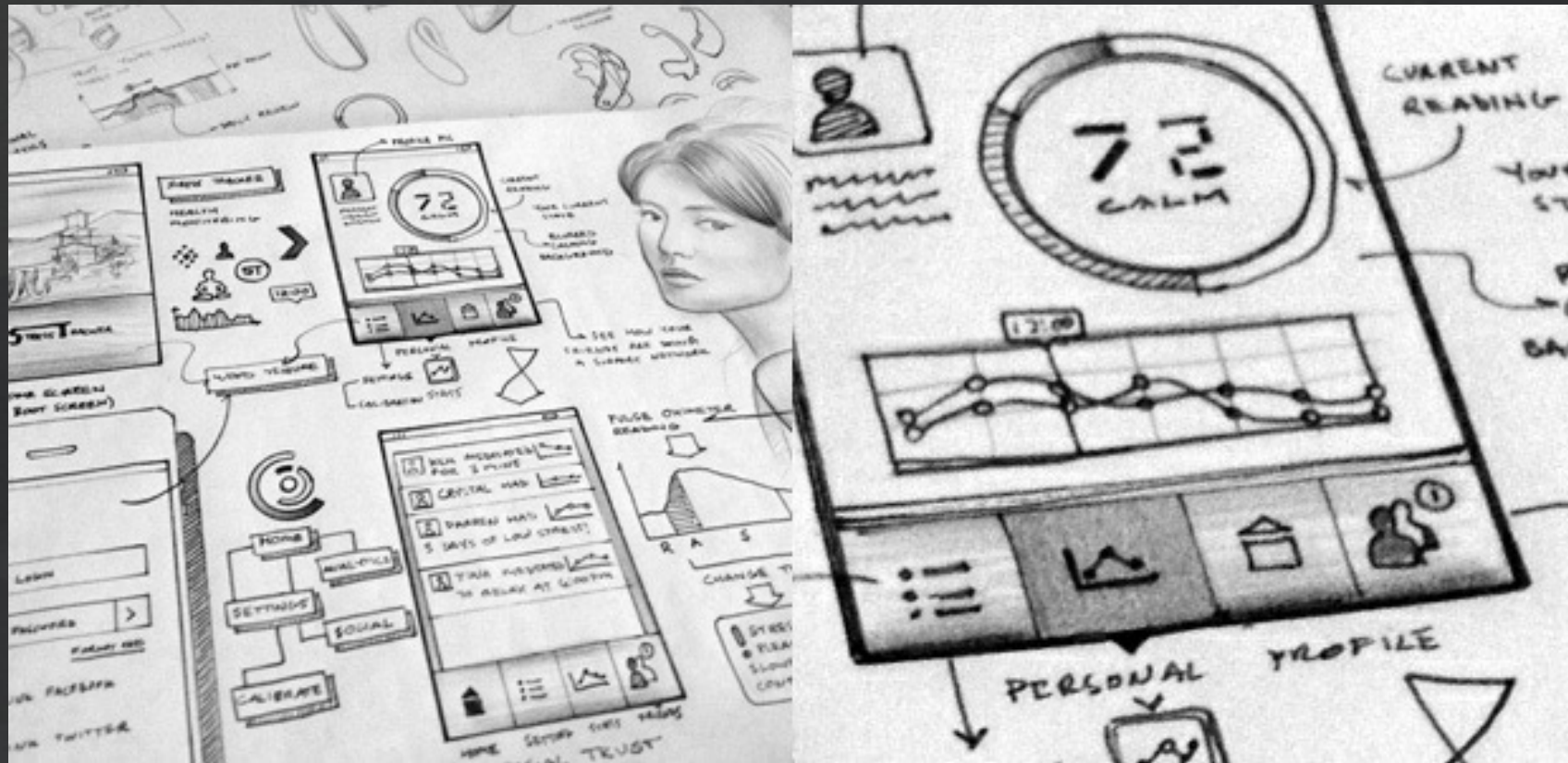
Monochromatic or Grayscale



monochromatic



Start with Greyscale



... then *accent* or *enhance* with color

Search

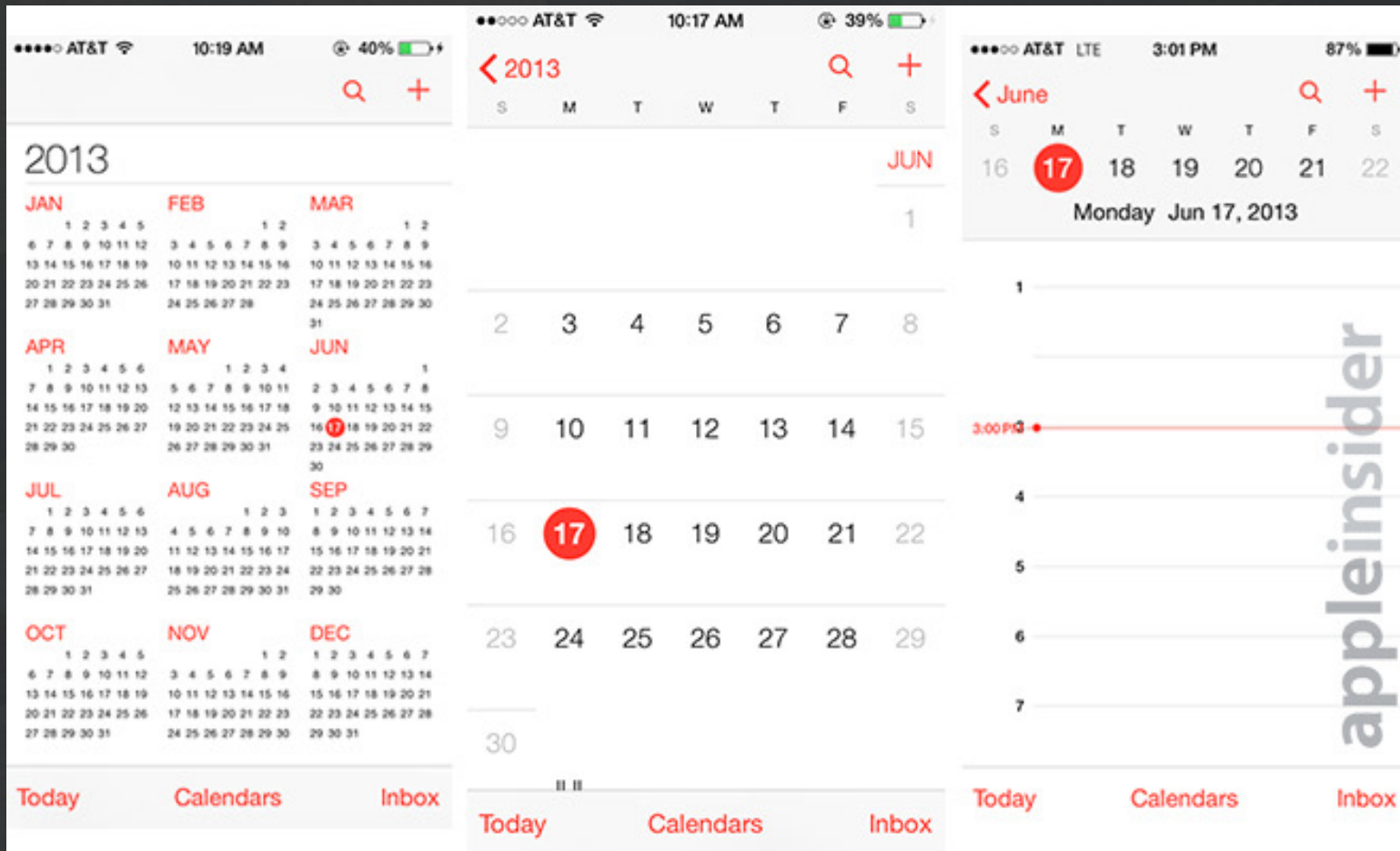


Cards Against
Humanity

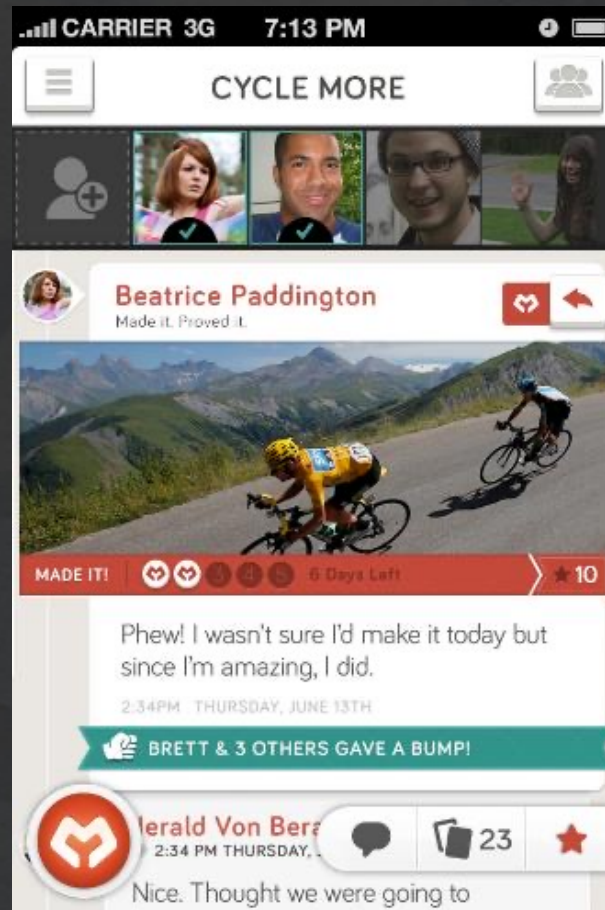


Advertisements via the Deck

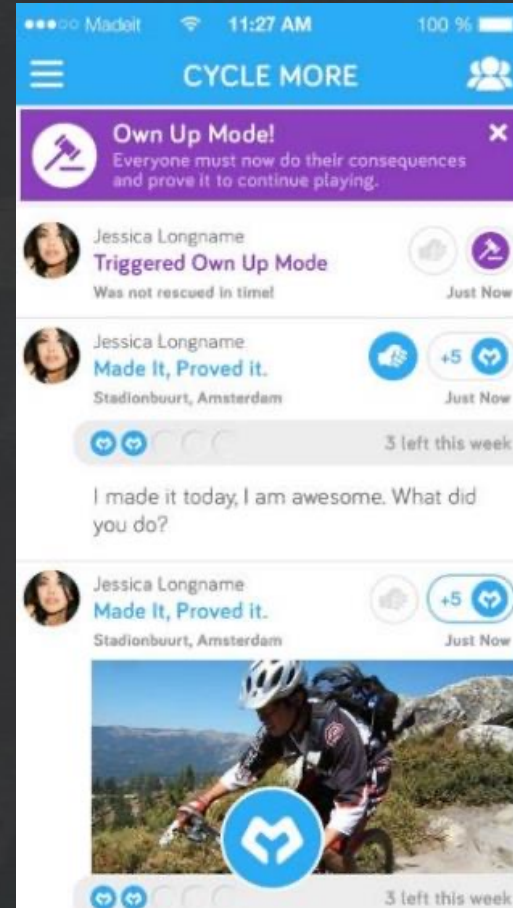
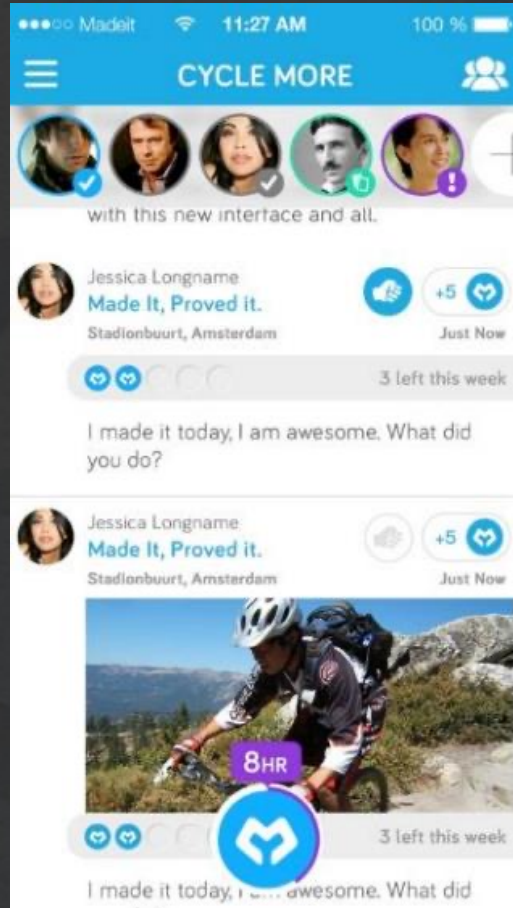
Action + Passive Colors

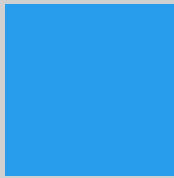


Poor Use of Color



Redesigned to Use 3 Actionable Colors





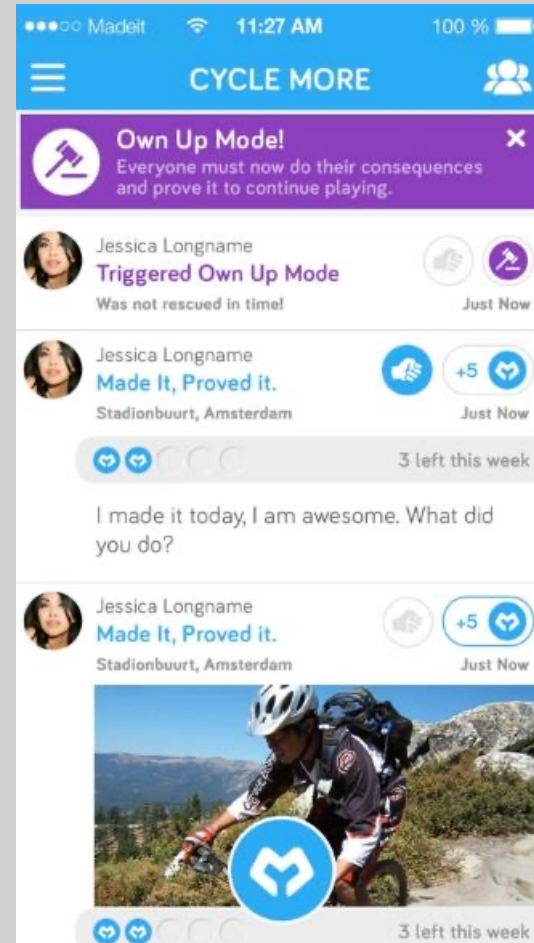
Action



Immediate



Analogous



Tools that help with color selection

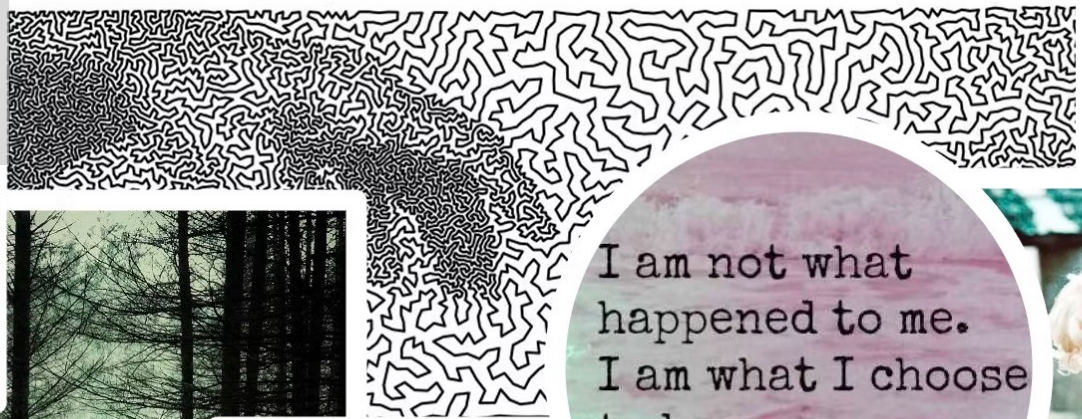
<https://coolors.co/>

<http://color.adobe.com/>

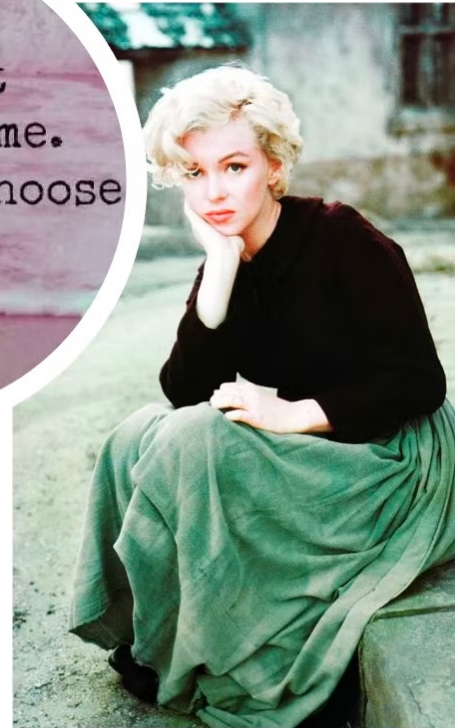
<http://www.colourlovers.com>

<https://paletton.com/>

Mood Boards



I am not what
happened to me.
I am what I choose
to become.



Mood Boards



Mood Boards – Team Exercise (10 min)

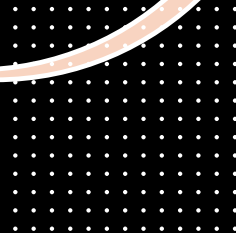
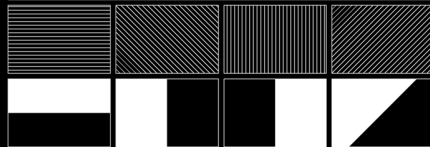


A sample example title

A subtitle for the card

15 July 2024

Color contrast is the difference in brightness between foreground and background colors. For accessibility purposes, aim for a 4.5:1 ratio between the foreground color (e.g. text, links, etc.) and the background color. This ratio ensures people with moderately low vision can tell the colors apart and see your content.



- **Define the Vibe:** Brainstorm **3-5 adjectives** that describe your design's feel (e.g., playful, modern) and write them down.
- **Search for Visuals:** Each team member finds images that reflect these adjectives using:
 - **Unsplash in Figma**
 - Optionally, try **Cosmos** for AI moodboards.
 - Use **WhatFont** to identify fonts on websites.
- **Build the Moodboard:** Combine images onto a single **team slide**.
- **Pick Colors:** Choose **primary** and **secondary colors** for your prototype from the moodboard images.
 - Use **Randoma11y** for high-contrast color combos.
- **Save & Share:** Copy your completed slide to the team folder: <https://bit.ly/cs147-mood-board>

Visual Design that is
Interesting
[the wow factor]

Non Conventional Layouts

- Hard to get right & easy to overdo!
- Try new shapes
 - circular charts
 - hexagonal objects
- Like all techniques (color, etc) – restrict unconventional layouts to the most important information

Wilfred Castillo: Tide Prediction: <http://www.wilfredcastillo.com/Tide-Prediction>



Dynamic Movement / Animation

- Hard to get right & easy to overdo!
- Animation is best used to connect information & create “flow”
- Like size, color & unusual shapes, animation draws attention to the eye & suggests importance

Metaphors (using the real world to describe info)

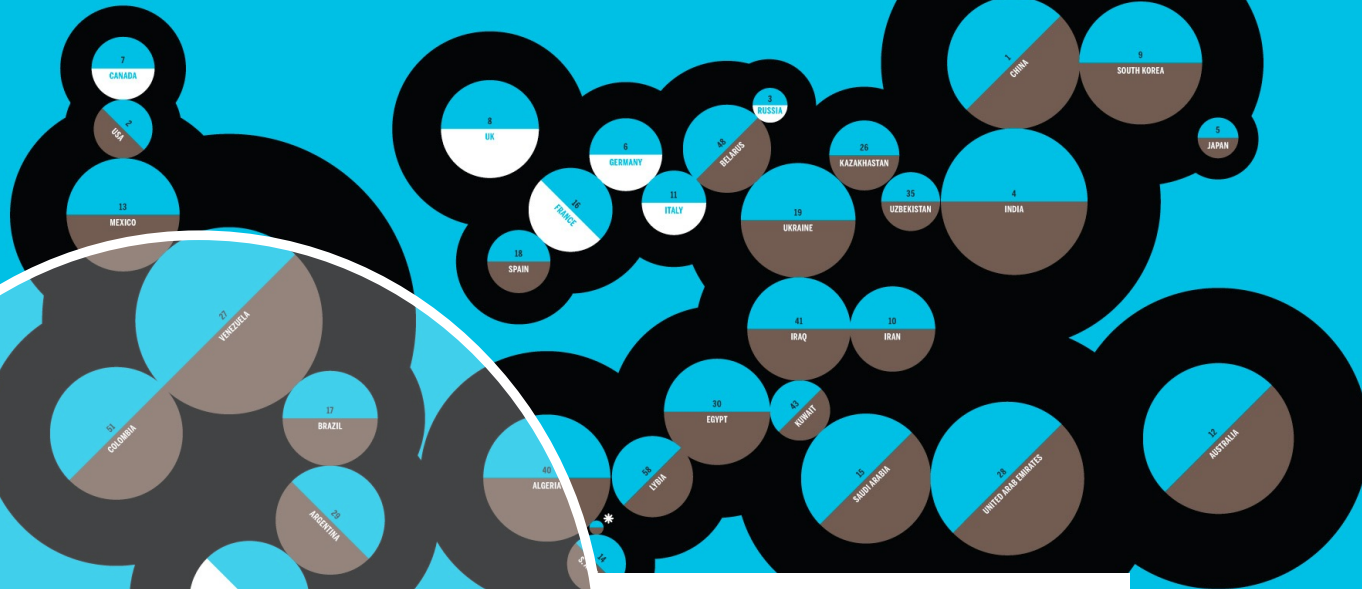
- Hard to get right & easy to overdo!
- Very useful to provide meaning and connect information to logic
- The more direct or specific a metaphor, the more contextually relevant it is to a generation or time



GLOBAL EMISSIONS

As the world gets closer to the COP15 Climate Change conference, it's important to look at from where the emissions around the world are coming. In the last year, some countries have started to clean up their act, while other countries continue to pump out carbon dioxide.

This is a look at the five highest emitters in each region of the world as of 2007 and whether they have increased or decreased both their total emissions in the from 2006 to 2007 and their ranking on the list of biggest emitters.



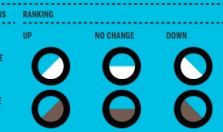
Metaphors

PERCENTAGE OF EMISSIONS INCREASE FROM 2006 TO 2007

NORTH AMERICA		CENTRAL & SOUTH AMERICA		EUROPE		EURASIA		AFRICA		MIDDLE EAST		ASIA & OCEANIA	
UNITED STATES	1.6	BRAZIL	3.7	GERMANY	-2.2	RUSSIA	-0.4	SOUTH AFRICA	1.4	IRAN	3	CHINA	7.2
CANADA	-1.6	VENEZUELA	14.2	UNITED KINGDOM	-3.8	UKRAINE	5.4	EGYPT	4.6	SAUDI ARABIA	6.8	INDIA	8.7
MEXICO	5.2	ARGENTINA	5.9	ITALY	-1.7	KAZAKHSTAN	1.9	NIGERIA (37) *	0.3	UNITED ARAB EMIRATES	10	JAPAN	0.7
		CHILE	-7.2	FRANCE	-2.9	UZBEKISTAN	1.4	ALGERIA	6.6	IRAQ	4.4	SOUTH KOREA	6.1
		COLOMBIA	4.9	SPAIN	1.7	BELARUS	3.2	LIBYA	2.7	KUWAIT	1.5	AUSTRALIA	9.2

ASIA EQUALS PRESENT INCREASE OR DECREASE OF EMISSIONS IN THE LAST YEAR

RANKING OF EMISSIONS IN THE LAST YEAR



The best designs **balance** the techniques you
have seen

and

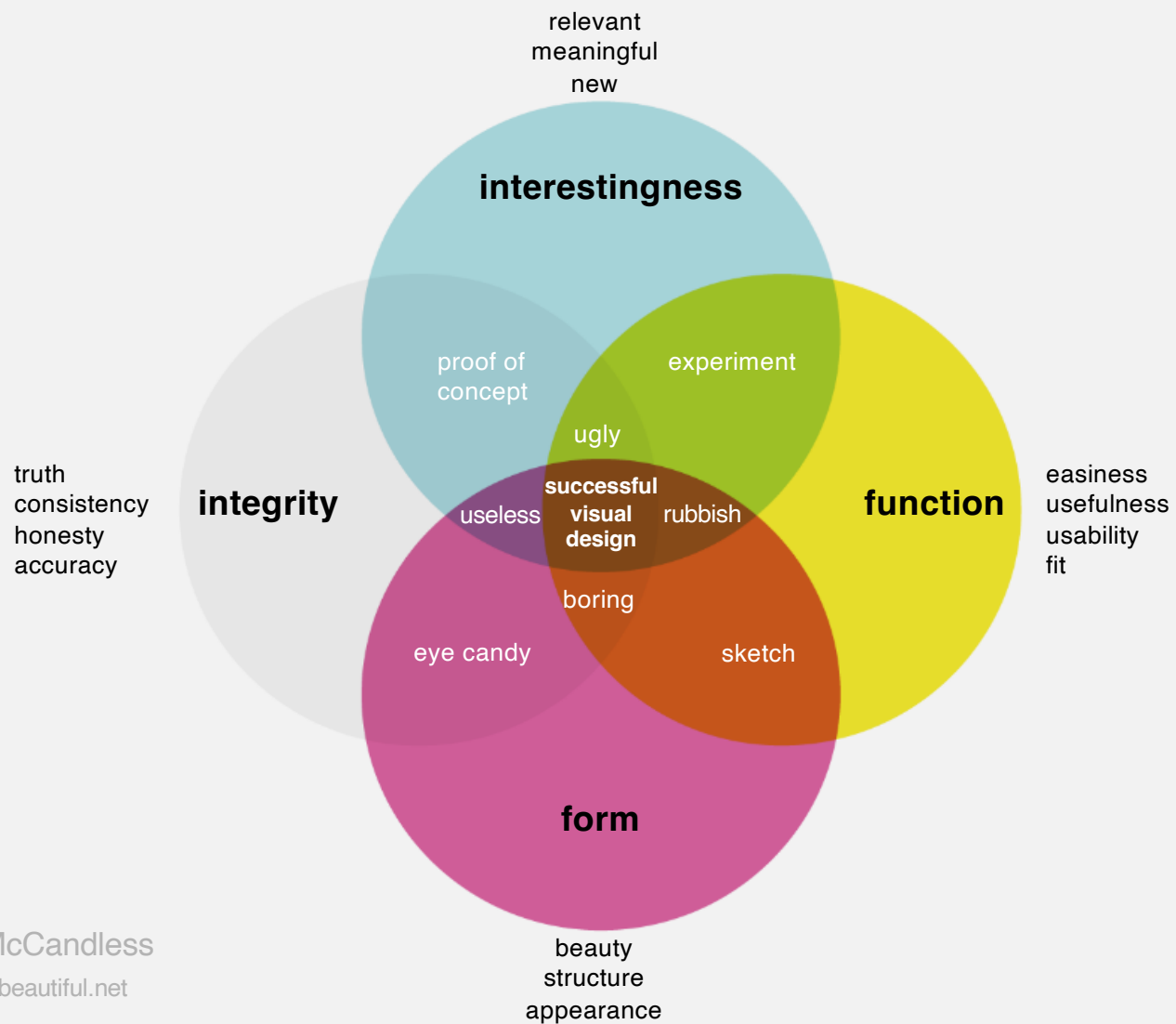
The **less** techniques used,
the easier it is to balance them

Overwhelming Use of Different Techniques

The screenshot displays the SF Weekly website homepage, characterized by a highly cluttered and multi-layered design. At the top, there are navigation links for 'Browse Voice Nation', 'Most Popular', and 'Most Recent', along with 'Sign up' and 'Log in' options. The main header features the 'SF WEEKLY' logo, a prominent 'SF WEEKLY iPhone App' download button, and a 'DOWNLOAD FOR FREE! CLICK HERE' banner. Below this is a search bar and a row of category links: 'News', 'Music', 'Calendar', 'Restaurants', 'Arts', 'Movies', 'The Ads', and 'Classifieds'. A secondary navigation bar includes 'BLOGS', 'COLUMNS', 'BEST OF', 'BARS + CLUBS', 'ARCHIVES', 'MOBILE', 'PROMOTIONS', and 'COUPONS/DEALS'. The main content area is divided into several sections: 'SF Dish' (SUNDAY OCTOBER 2, 1:00PM - 4:00PM), 'Headlines' (featuring 'The Top 25 Burgers in San Francisco' and 'Obama Talks Jobs at LinkedIn'), 'Top News Stories' (featuring 'Ready to Leave' and 'RANGER NOIR'), 'Daily Blogs' (featuring 'THE SNITCH' and 'ALLSHOOKDOWN'), and 'Slideshows' (featuring 'Prude Community Panicked by SF Nude Protest' and 'Obama Talks Jobs At LinkedIn'). A 'TODAY'S DEAL IN SF' section offers '\$25 for 4 Salsa Lessons (Reg \$60)'. The right sidebar contains promotional banners for 'THE GALLERIA SAN FRANCISCO DESIGN CENTER', 'OVER 35 CULINARY DELIGHTS RESTAURANTS IN SAN FRANCISCO', and 'EAT DRINK enjoy'. The bottom of the page features a 'CLICK HERE FOR TICKETS!' banner and a 'SFOODIE' logo. The overall design is visually overwhelming due to the high density of text, images, and interactive elements.

In other words,

Keep it Focused



Based on David McCandless
<http://www.informationisbeautiful.net>

Summary

- Start with **context** – what is the nature of the information?
What is the most important?
- Design first in grayscale to focus on **hierarchy**
- **Small changes** help us see key differences
 - e.g., small multiples
- Avoid clutter, focus on the **essence** of your tasks
- Use color properly – **not for ordering!**
- Only use **1-2 colors at a time**, unless absolutely necessary

Further Reading/Resources

- Kevin Mullet and Darrell Sano, *Designing Visual Interfaces*
- Edward Tufte's books and course
- Robin Williams, *The Non-Designer's Design Book*
- Typography
 - Jan Tschichold, *The New Typography*
 - Robert Bringhurst, *The Elements of Typographic Style*
- Typography on the web
 - <http://www.adobe.com/type/>
 - <http://www.microsoft.com/typography/>
- Elizabeth Lin's Art of Visual Design (online) course
 - <https://www.artofvisualdesign.com/>

Next Time

- Studio on Friday
 - present low-fi prototype/user study results – *key things learned*
 - work on sketching out new designs
- Mon
 - Conceptual Models & Interface Metaphors
 - Read
 - [“The Psychology of Everyday Things” \(Ch 1\)](#) from The Design of Everyday Things by Donald Norman

Exit Ticket

<https://tinyurl.com/cs147-2024au-exit-ticket-5-826>

