Graphic Design and Gestalt Principles

CS160: User Interfaces

John Canny

Assignments

Update

Due next week

- Interactive Prototype (due Nov 5th)
  - Redesign interface based on low-fidelity feedback
  - Create first working implementation
    - Can include Wizard of Oz parts
    - Can include pre-coded functionality
- In class Presentations (Nov 5th & 7th)
  - 5 min presentation (short! be careful about timing)
  - Focus on showing prototype (live may not be best idea)
  - Feedback from class (you will need to provide feedback on each presentation on the wiki)

Presentation Schedule: 11/5/2012

Group 3

Group 5

Group 6

Group 7

Group 8

Group 11

Group 14

Group 16

Group 17

Group 19

Presentation Schedule: 11/7/2012

Group 1

Group 2

Group 4

Group 9

Group 10

Group 12

Group 13

Group 15

Group 18

Presentation tips

Time is extremely short

- Use your slides as cues, but **don't talk at them**
- Make sure you **know what you will say**
- Share the work, **don't try to talk and demo at same time**
- **Stand up**, talk to the people at the back of the room
- Don't try to fit everything into your talk. Make sure the important points are there, and that you cover them thoroughly

Technology tips

- **Technology: Test your setup on a projector!**
- Don't assume the projector can handle your default resolution.
- Don't assume anyone else has the dongle you need.
- Don't assume Powerpoint slides, videos, demos etc. will appear on the right screen. Your computer will probably default to two-screen mode, and you need to send everything to the projector screen.
- Have at least **one backup computer** ready to go.
- There is no time for you to figure this out during your presentation.
- Projectors will be available **in GSI office hours** this Thursday.

Answering Questions

1. Every question is **good**, even if it doesn't make sense – always be polite to the questioner

2. Act like you **enjoy** answering questions, it suggests that you know your stuff, and your product is good

3. Questions are an opportunity to **persuade** interactively

4. Make a **best effort** answer at every question – if you can't answer exactly, give some information that's relevant

5. If you think you know what's coming you can prepare **extra slides**

6. Give plenty of detail, but stop to allow more questions

Topics
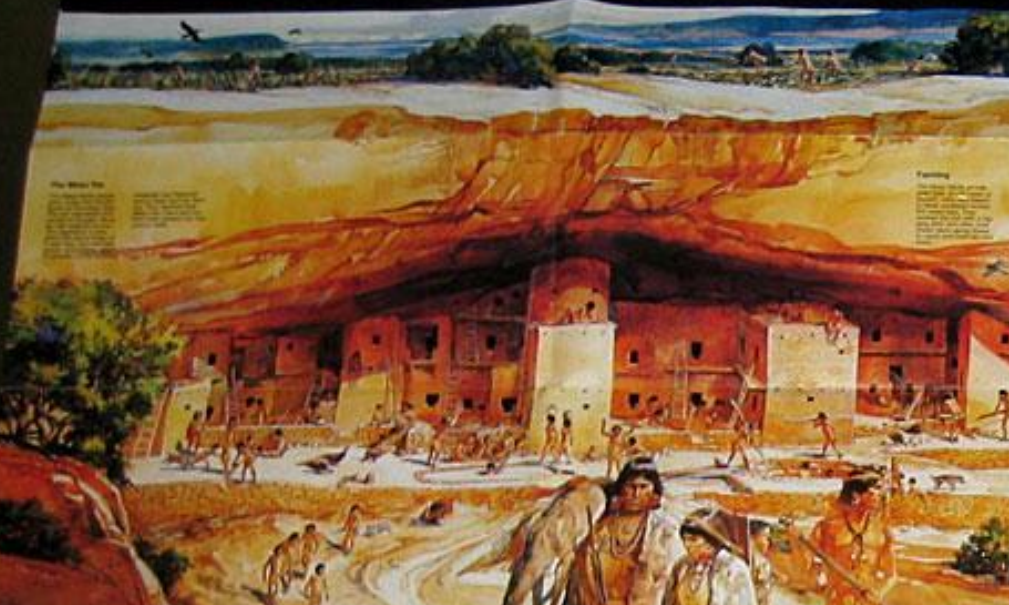
1. Brief History of Graphic & Product Design
2. Simplicity and Elegance
3. Color
4. Gestalt Principles
5. Typography
6. Composition

Graphic Design is about Communication

Graphic Design is also about Interpretation
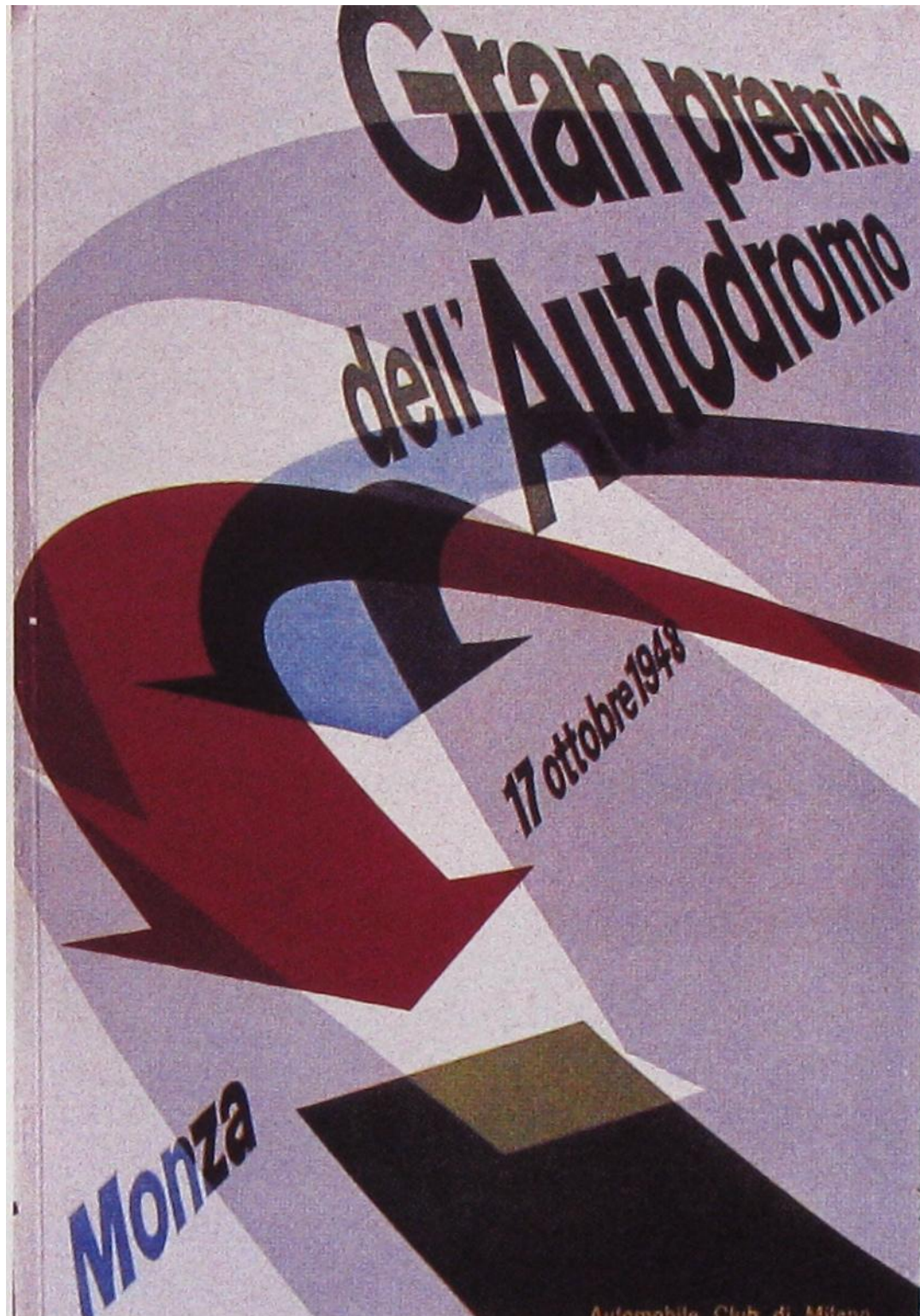
Max Huber, Poster, 1948

Wes Wilson, Poster, 1966

Great Design is about Emotion and Desire

Modern Design: Bauhaus

Bauhaus

Joost Schmidt, Exhibition Poster, 1923

Herbert Bayer, Exhibition Poster, 1926

Jan Tschichold

Before: Tschichold, Leipzig Trade Fair, 1922

After: Tschichold, Elemental Typography, 1925

Grid-Based Design

Josef Müller-Brockmann
Exhibition Poster, 1980

Design Systems: Corporate Identity
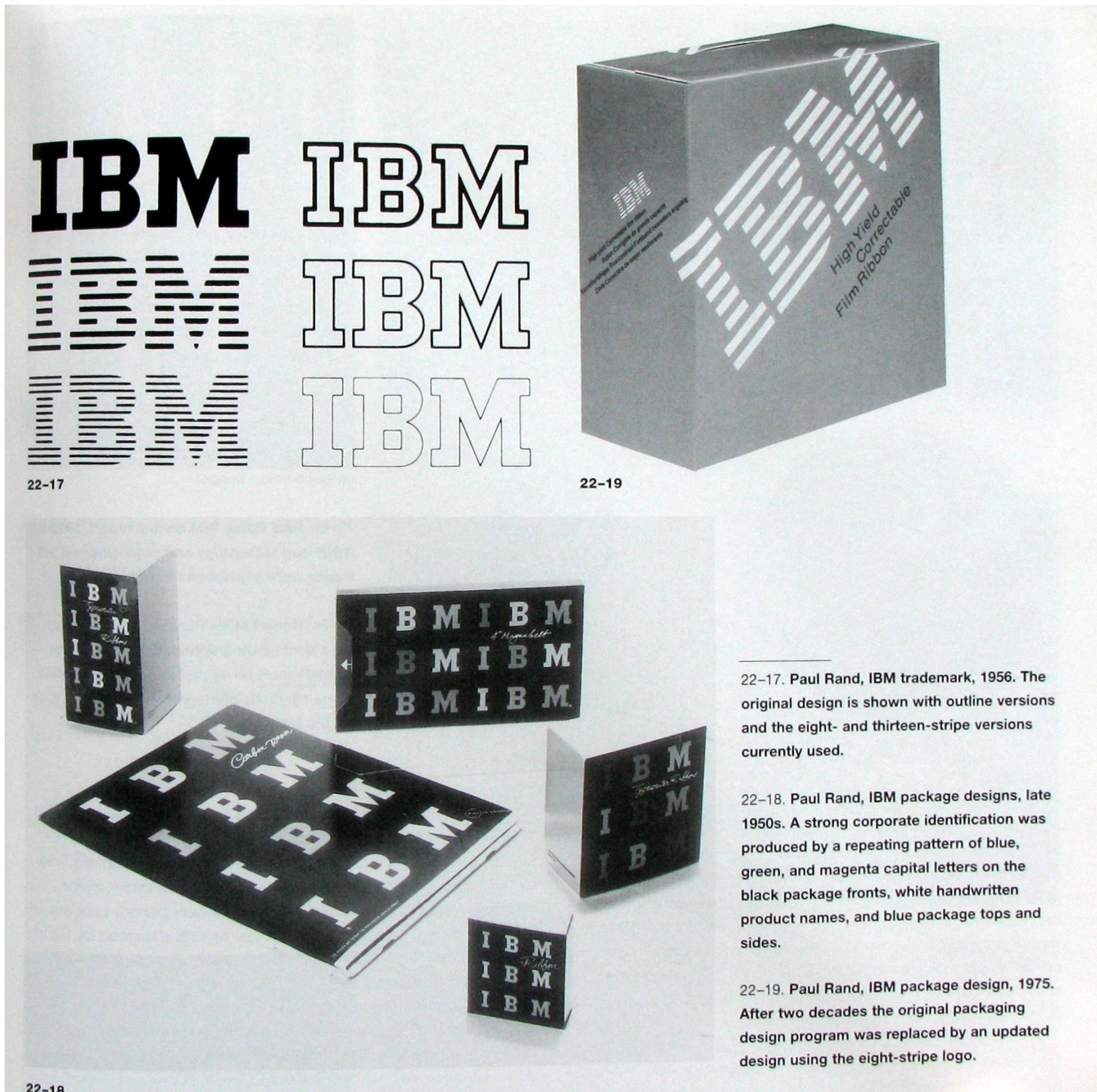
22–17

22–19

22–18

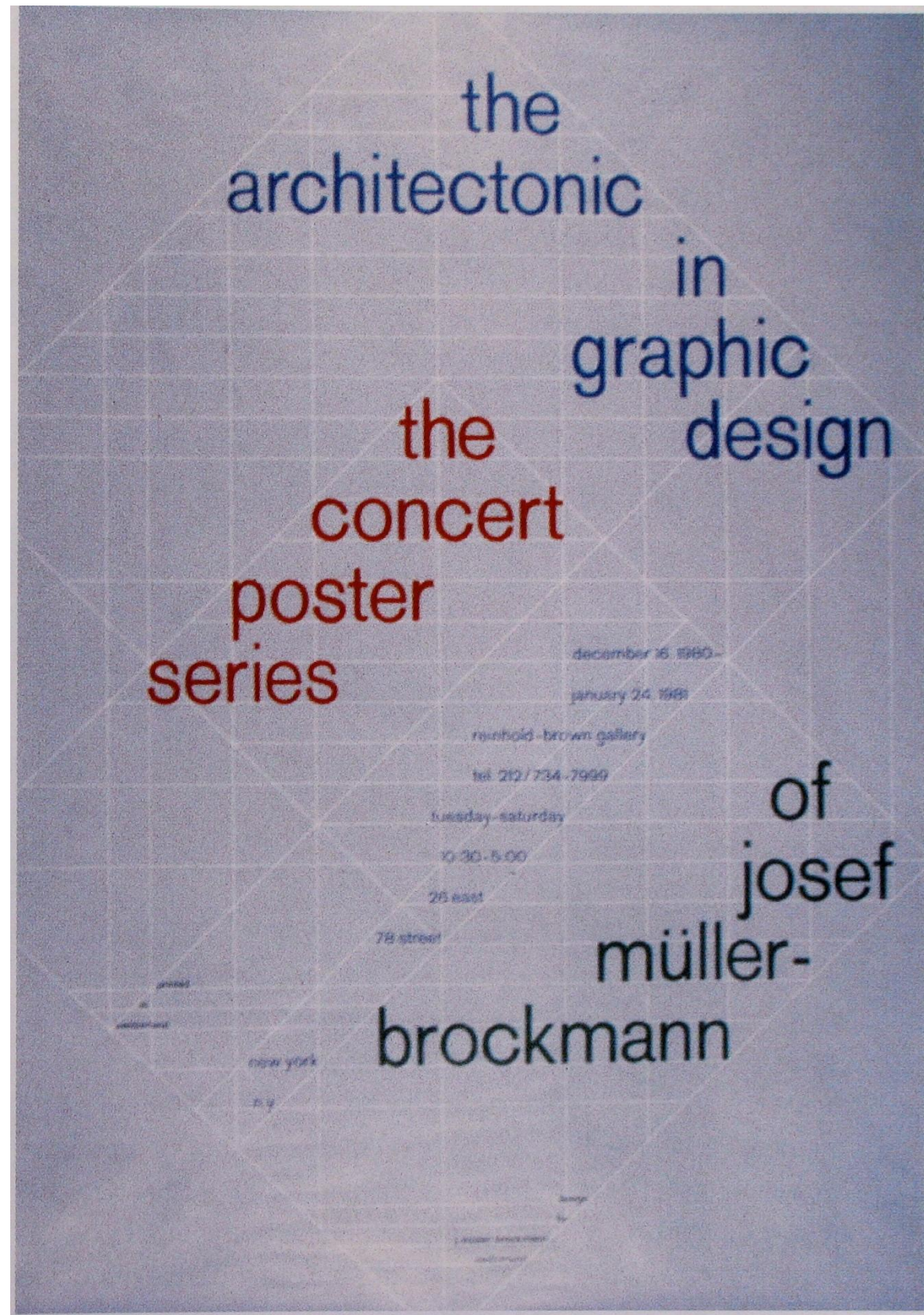22–17. **Paul Rand, IBM trademark, 1956.** The original design is shown with outline versions and the eight- and thirteen-stripe versions currently used.

22–18. **Paul Rand, IBM package designs, late 1950s.** A strong corporate identification was produced by a repeating pattern of blue, green, and magenta capital letters on the black package fronts, white handwritten product names, and blue package tops and sides.

22–19. **Paul Rand, IBM package design, 1975.** After two decades the original packaging design program was replaced by an updated design using the eight-stripe logo.

BBC

Search

Monday 29 March 2010

+ Add more to this page ?

Reset homepage

TOP NEWS STORY

Moscow vows to avenge bomb blasts

Russia's leaders pledge to "destroy" those behind rush-hour suicide attacks on the Moscow Metro in which 38 people died.

» **More from BBC News**

▼ More Top Stories   Edit ×

US Treasury plans Citi share sale

S Korea ship 'may have hit mine'

Arrest over US consulate shooting

- Gaddafi wants more Nigeria splits
- EU row sours Merkel's Turkey trip
- US 'Christian militants' charged
- Falklands oil search disappoints
- Four Rio Tinto executives jailed

» MORE TOP STORIES   + −

- Gaddafi wants more Nigeria splits
- EU row sours Merkel's Turkey trip
- US 'Christian militants' charged

» **More from BBC News**

▼ World Service   Edit ×

NEWS IN 32 LANGUAGES

العربية   فارسی   اردو
中文   हिन्दी   **Somali**

▼ Sport   Edit ×

Man City 3-0 Wigan

Zola vows to stay as Hammers boss

Pakistan batsman Yousuf retires

- Newcastle 2-0 Nottm Forest
- Rooney & Ferdinand boost Man Utd
- Lyon v Bordeaux
- Gascoigne on drink-drive charge
- Els hangs on for Bay Hill victory

▼ Travel   Edit ×

from lonely planet

▼ Spotlight   ×

» CLICK

Click: The BBC's flagship technology programme

Your guide to the latest gadgets, websites, games and computer industry news.

- First look gadget reviews
- Webscape: The best of the web
- ClickBits: The week in tech in 3 minutes

▼ Business & Money   Edit ×

» MARKET DATA MON, 29 MARCH 2010 22:44:31 BST

Dow Jones	10895.86	▲	45.5
Nasdaq	2404.36	▲	9.23
FTSE 100	5710.66	▲	7.64

DRUDGE REPORT

CAIN TOPS PERRY -- *IN TEXAS*...

Says race isn't fueling surge...

'This many white people can't pretend they like me'...

TRANSPARENT: White House seeks to hide documents...

LIBERATE: Al Qaeda flag flies over Libya...

Palestinians win full membership on UN cultural agency...

US: Counterproductive...

Cuts funding...

DOW shaves 200...

Frustrated Sheriff Warns Citizens to Carry Concealed Weapons...

'Don't get mace. Get a firearm'...

'GPS shoes' would track Alzheimer's patients...

Homeless sex offenders rounded up for Halloween...

SPREAD THE WEALTH: CA Assemblywoman charged with felony grand theft...

Obama Campaigning 'Like It's 1936'...

UPDATE: White House scrubs fundraiser with ex-Enron trader...

CURL: 'THE VERY ANGRY FIRST LADY'...

REPORT: Chinese scientists make blood from rice...

100+ Halloween Revelers In Costume Brawl On Hollywood Street...

Woman hit in head by shopping cart pushed from rooftop; two 12 year olds arrested...

FBI video, documents on Russian spy ring

FCC Cracks Down on Religious Broadcasters...

Second Energy Department-backed company goes bankrupt...

Corzine's MF GLOBAL files Chapter 11...

Likely Among the 10 Biggest Bankruptcies Ever...

Angry librarians stand up to 'Godfather'...

Home prices heading for triple-dip...

Gas lines after snow storm...

Product Design is about Form and Function

Philippe Starck, Juicer for Alessi

Oxo Angled Measuring Cup

Bauhaus Again

Le Corbusier
Grand Confort, 1928

Marcel Breuer
Wassily Chair, 1925

Form Follows Function

Centre Georges Pompidou, Paris
All infrastructure (ducts, vents, stairs) on outside of building

Form Follows Function

It is the pervading law of all things organic and inorganic,
Of all things physical and metaphysical,
Of all things human and all things super-human,
Of all true manifestations of the head,
Of the heart, of the soul,
That the life is recognizable in its expression,
That form ever follows function. This is the law.

- Louis Sullivan

Steal Good Design Ideas

- "Good artists borrow (from other artists), but great artists steal !"   - Pablo Picasso

- Compelling visual design takes practice and experience – a natural part of which is study and critique of other's work
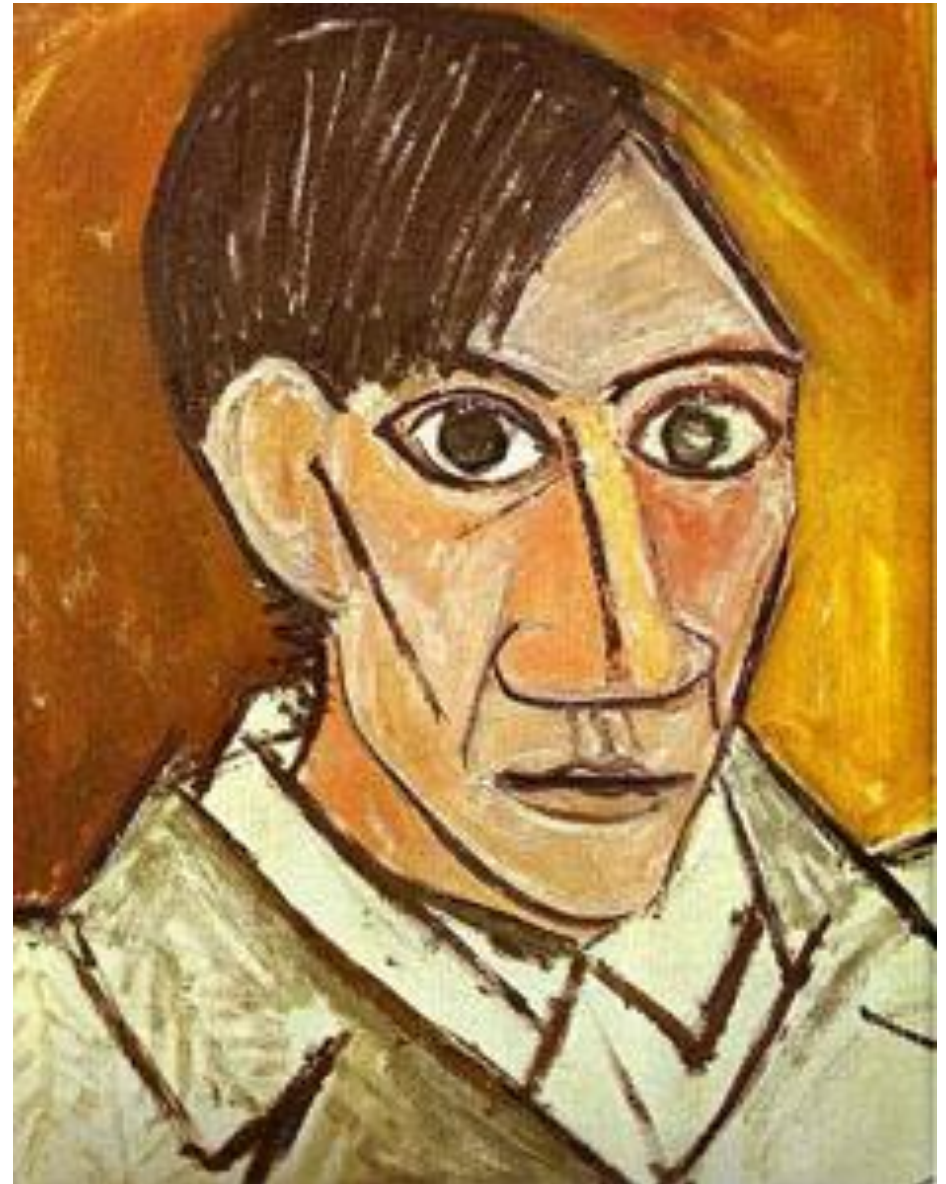
Simplicity and Elegance

Simplicity

- Simple, minimalist, designs are often most effective

Elegance

- Reduction: Only include essential elements
- Regularization: Use one set of shapes, colors, forms etc.
- Leverage: Use elements in multiple roles
  - scrollbar allows scrolling and indicates position in document

job was in jeopardy because of the task force.

Speaking Sunday morning on the CBS program "Face the Nation," President Obama stressed that he intended to maintain an American auto industry.

"But it's got to be one that's realistically designed to weather this storm, and to emerge at the other end much more lean, mean and competitive than it currently is," he said. "And that's going to mean a set of sacrifices from all parties involved — management, labor, shareholders, creditors, suppliers, dealers. Everybody is going to have to come to the table and say it's important for us to take serious restructuring steps now, in order to preserve a brighter future down the road."

The findings of the president's task force on the auto industry, expected on Monday, are expected to back increasing short-term aid to the two weakest of the Big Three automakers, General Motors and Chrysler, in return for concessions that would help the

Done

Benefit: Approachability

- Visual elements rapidly understood - invite further exploration

Benefit: Recognizability

- Less visual clutter makes it easier to recognize what is there

Benefit: Immediacy
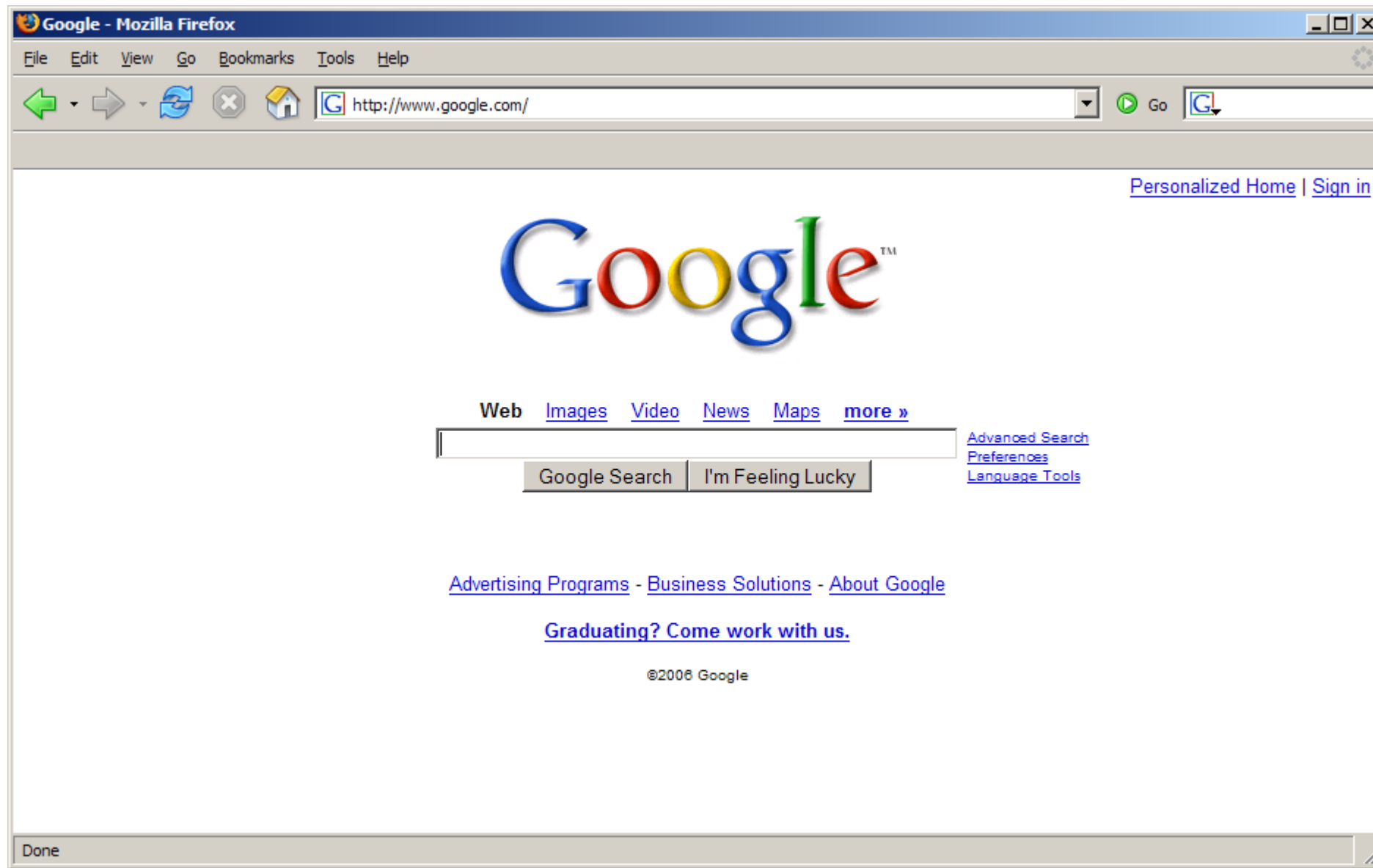
Eye is immediately drawn to important visual elements
– Details that remain are more prominent

Unity

- One path to simplicity & elegance is through unifying themes:
  - Forms, colors, components with like qualities

Refinement
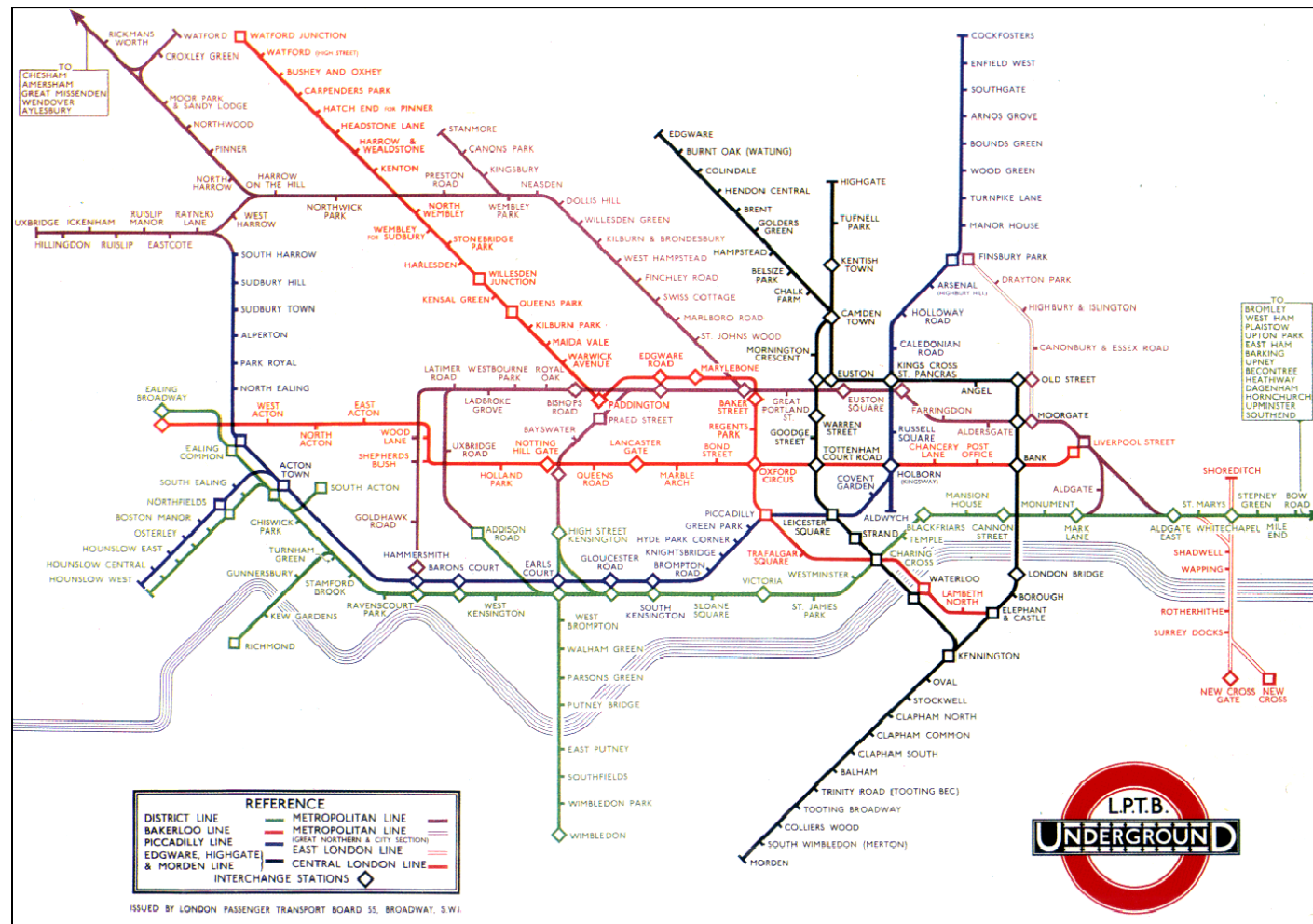
London Underground [Beck 33]
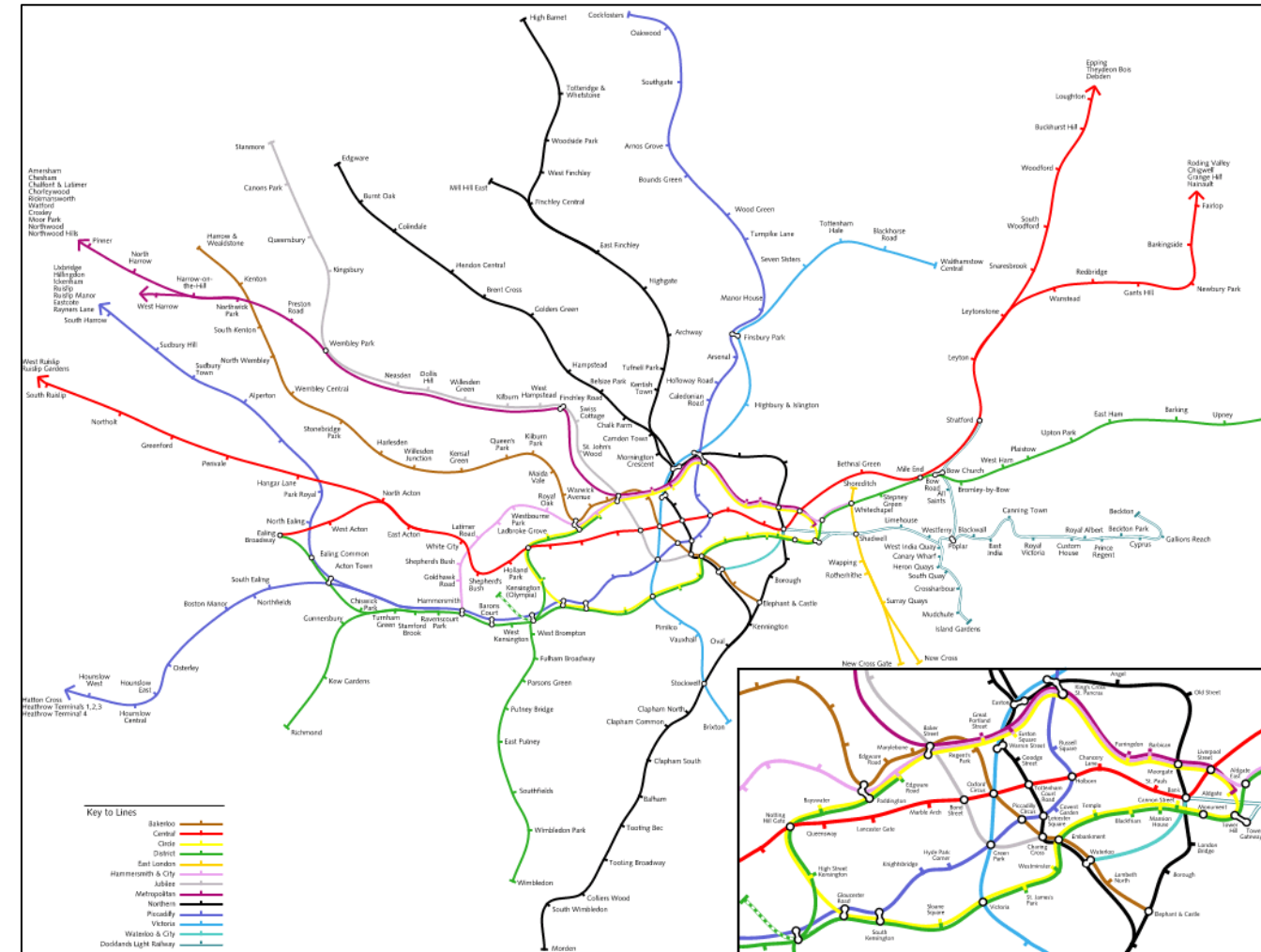
Geographic version of map

- Draw viewers' attention to essential information
  – Straighten subway lines to emphasize sequence of stops

From Literal to Abstract
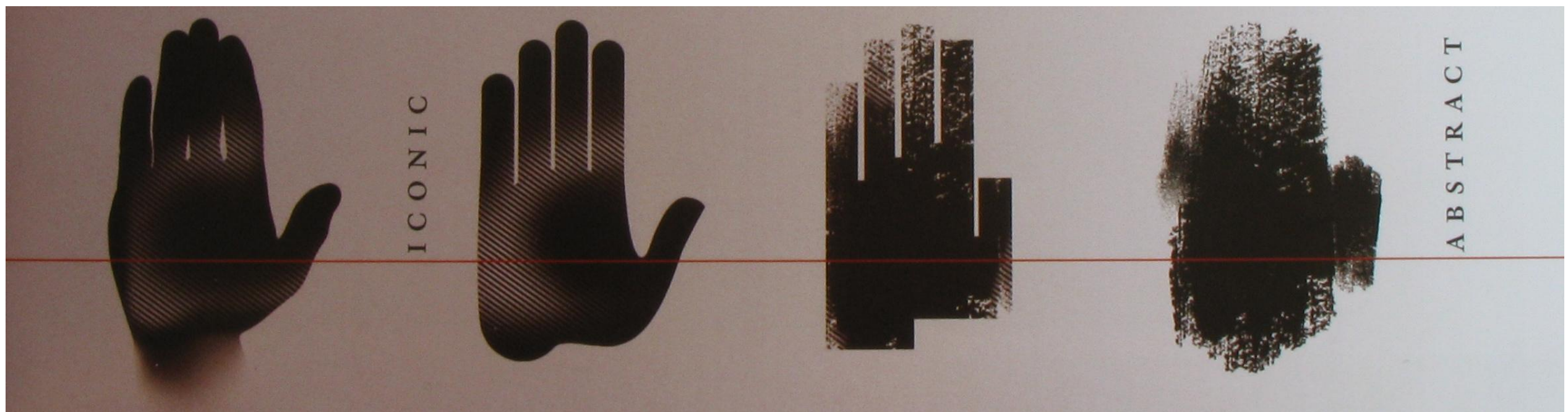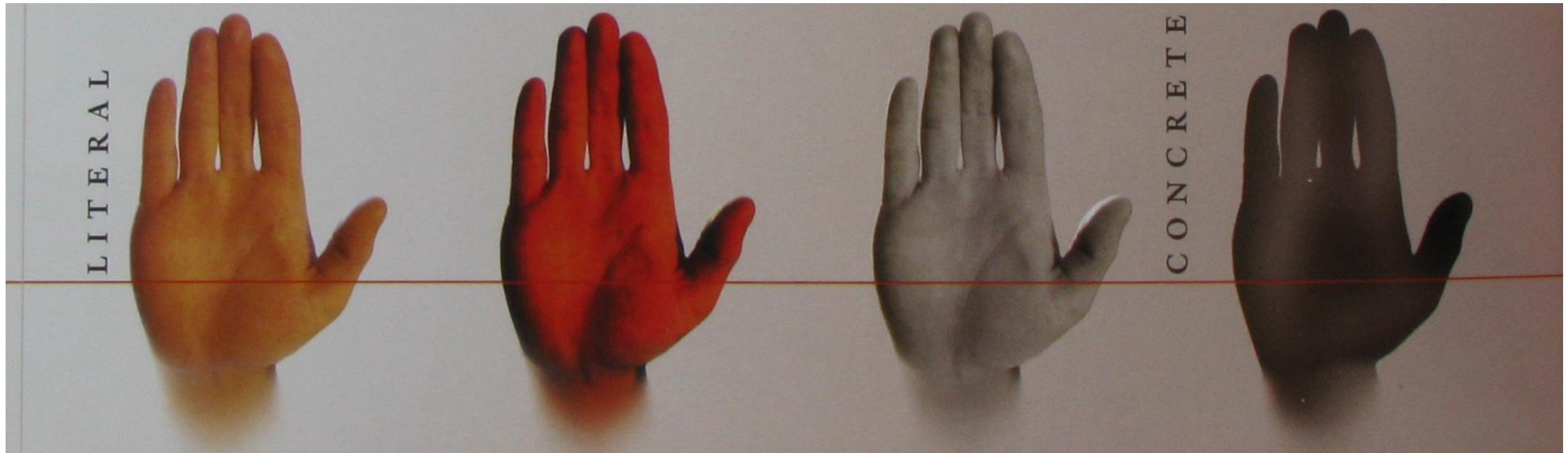
Fitness

- Match design to capabilities of technology and user

The Quick Brown Fox Jumps Over The Lazy Dog. g

abcdefghijklmnopqrstuvwxyz0123456789 [ ] ( ) { } / \ < > ?
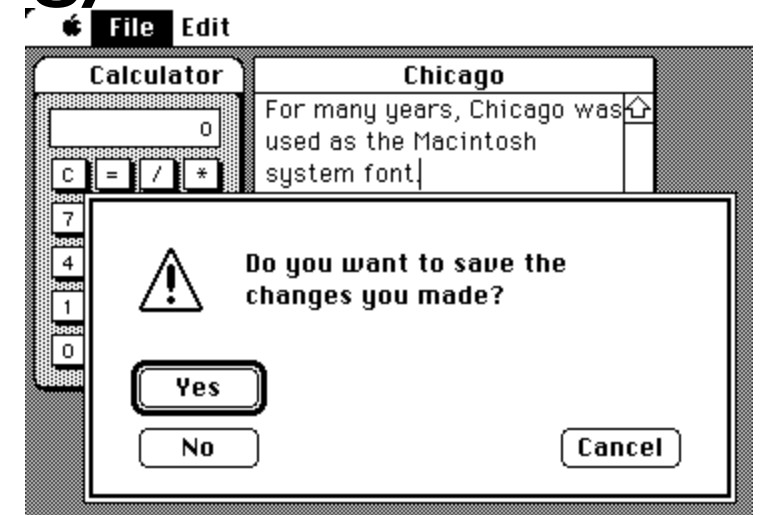
- Chicago screen font designed for early low-res Macintosh display
  - Thick verticals ensure visibility after applying 50% gray pattern
  - Used as default font 1984-1997

Mistakes: Clutter & Noise
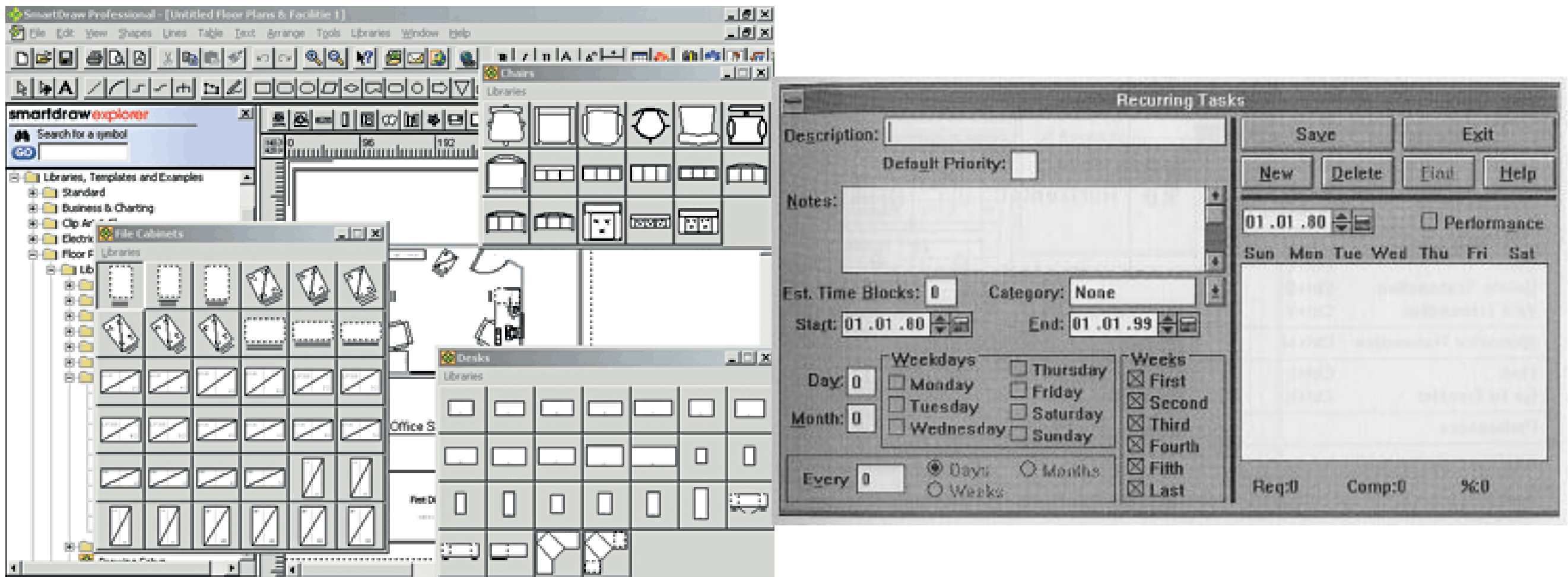
Mistakes: Interference
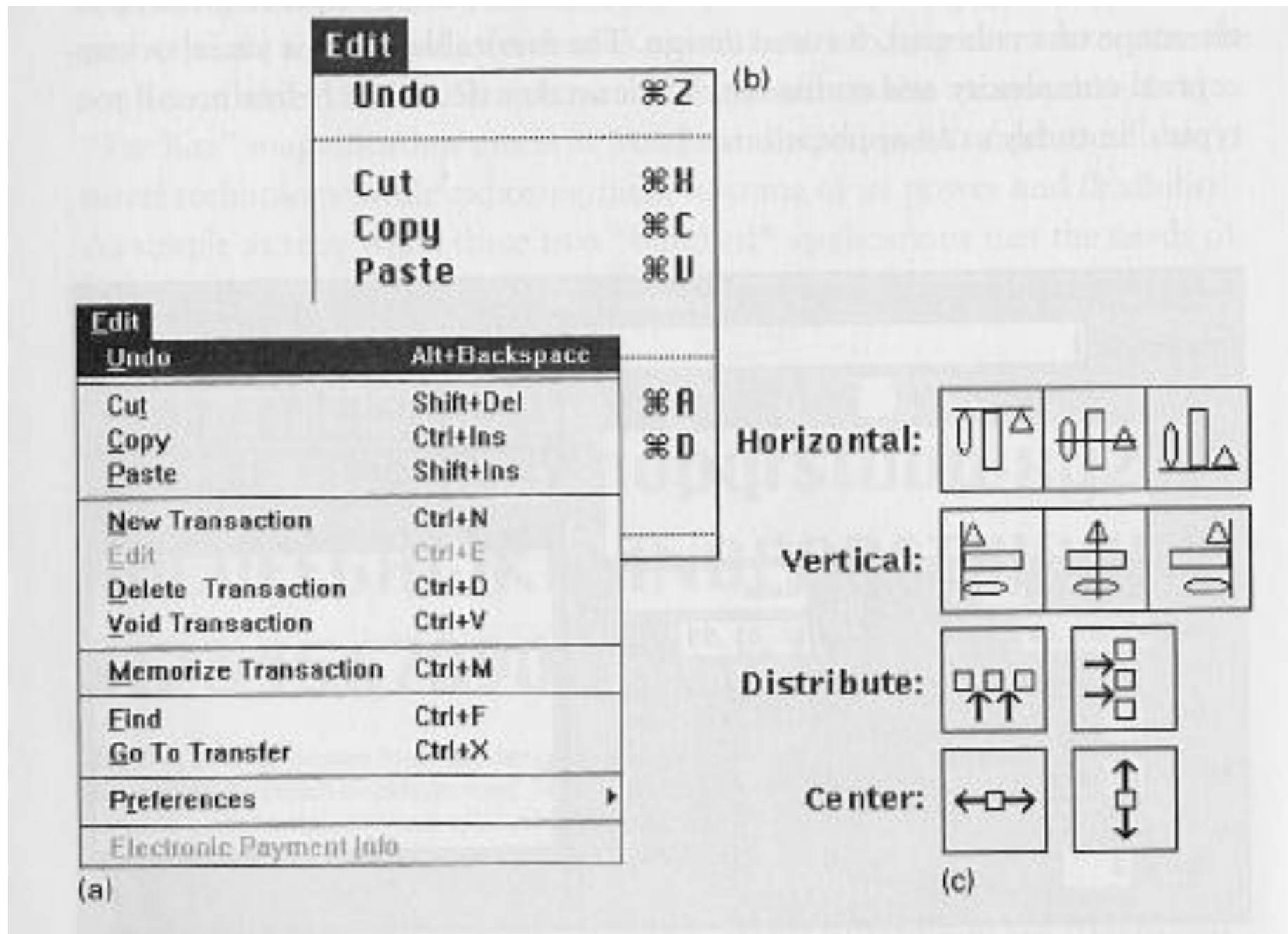
Shortcuts interfere with menu labels in (a) not in (b).
Different shapes cause confusion in alignment tools

Mistakes: Too Much Structure
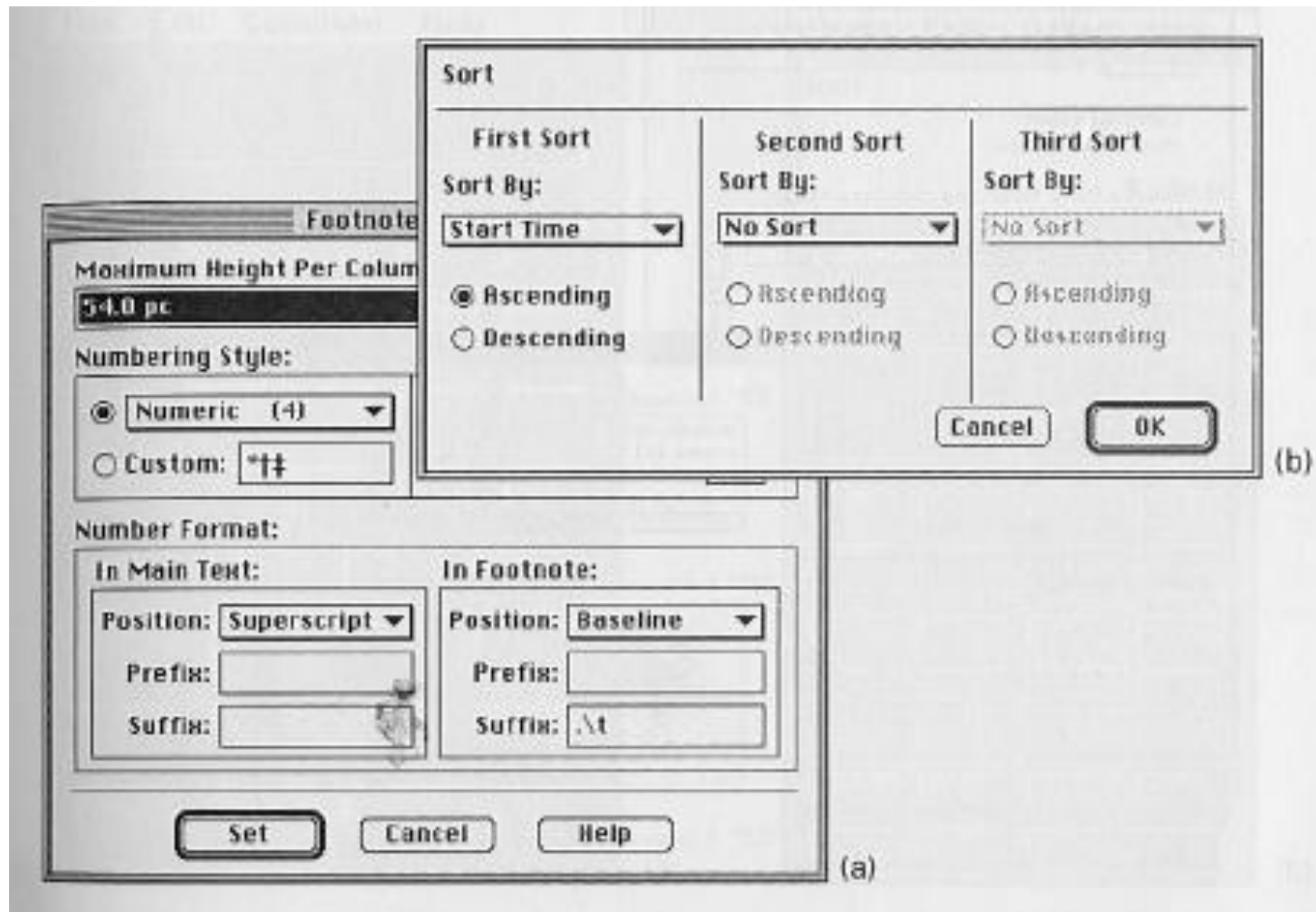
Bounding boxes in (a) adds unnecessary structural information
Simpler structure in (b) using space rather than lines is better

Mistakes: Belaboring the Obvious

Mistakes: Gratuitous use of 3D
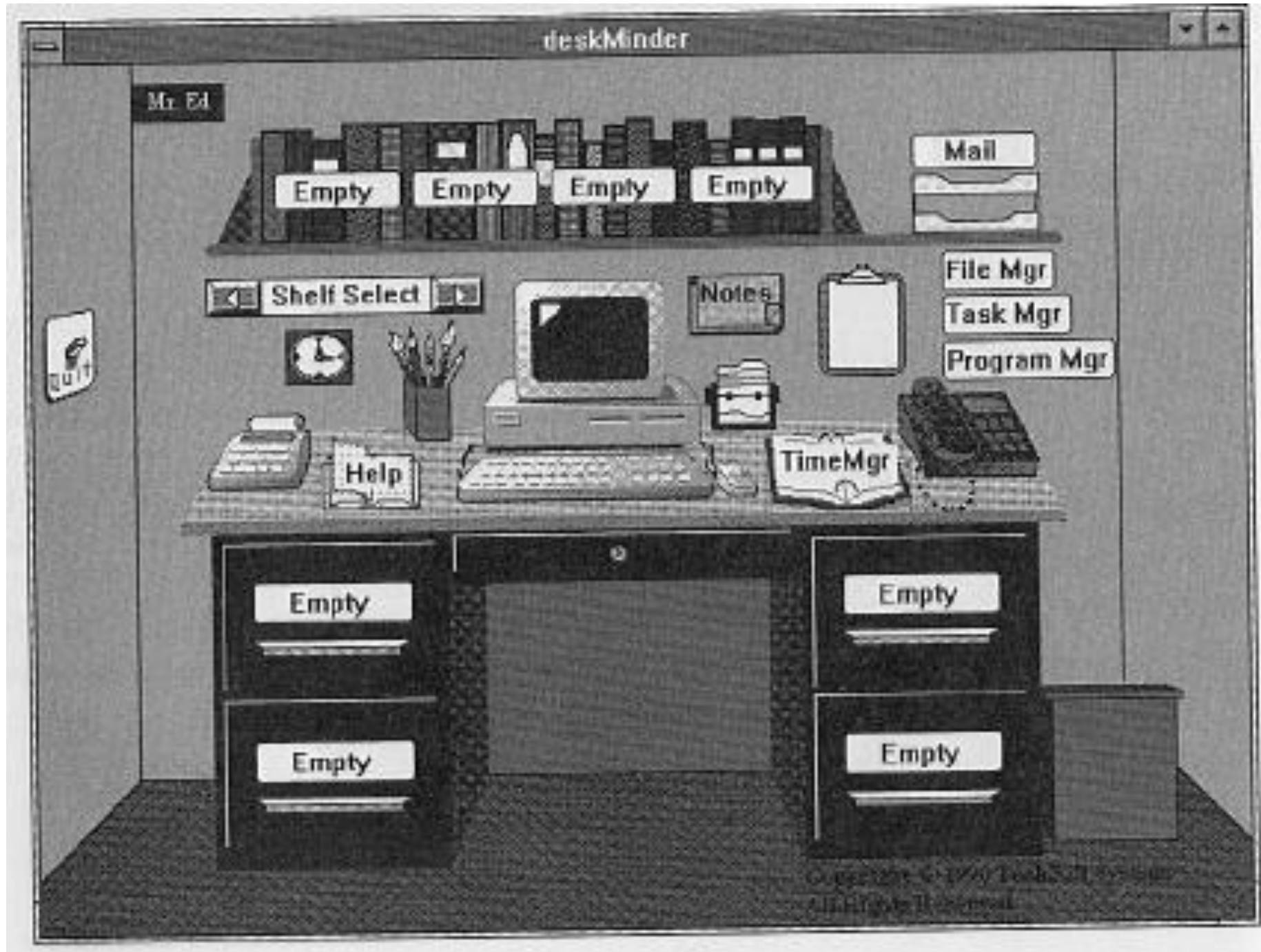
Mistakes: Excessive Embellishment
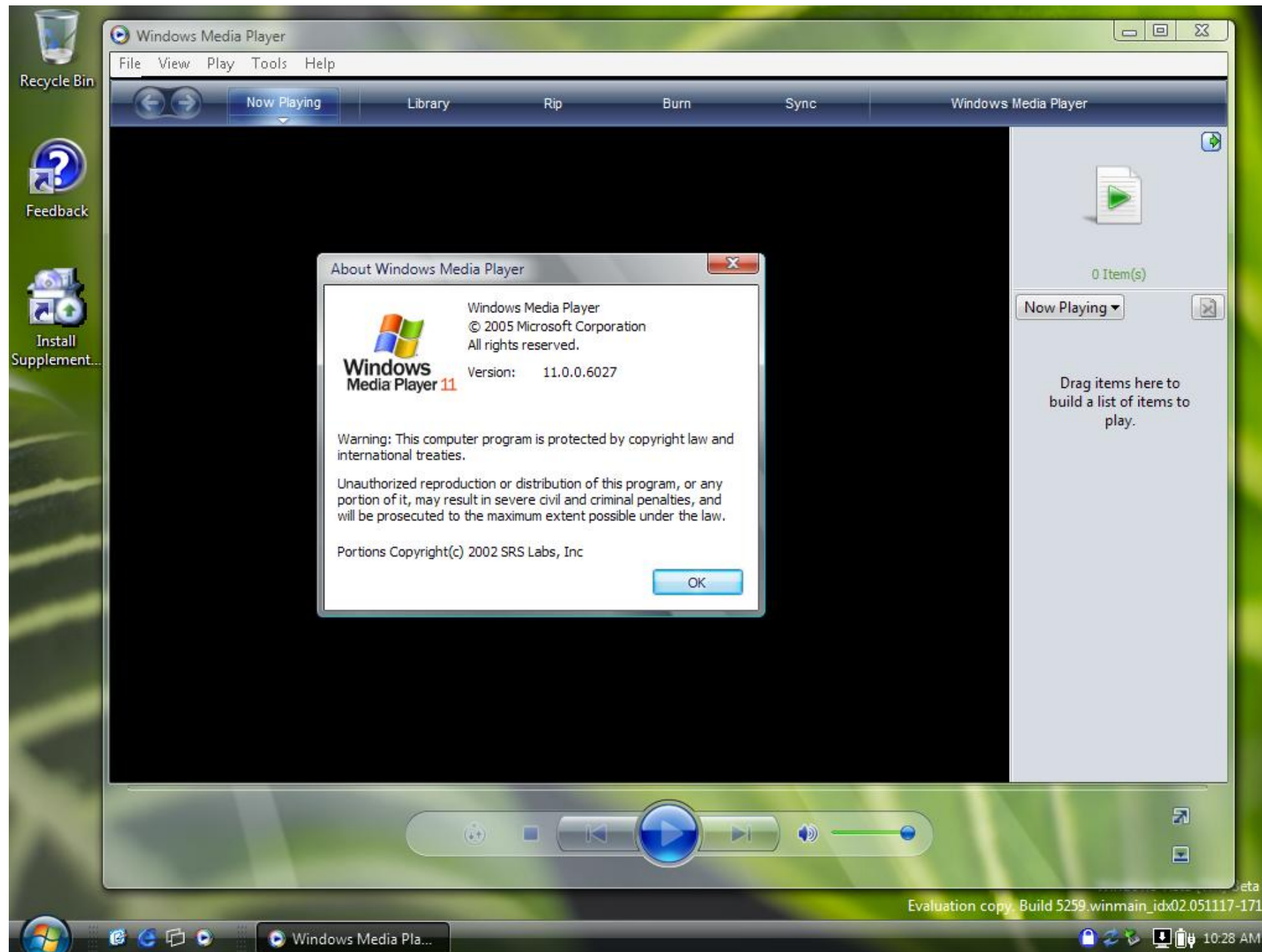
Minimalists hate it, but sometimes users like embellishment

Color

Seeing color
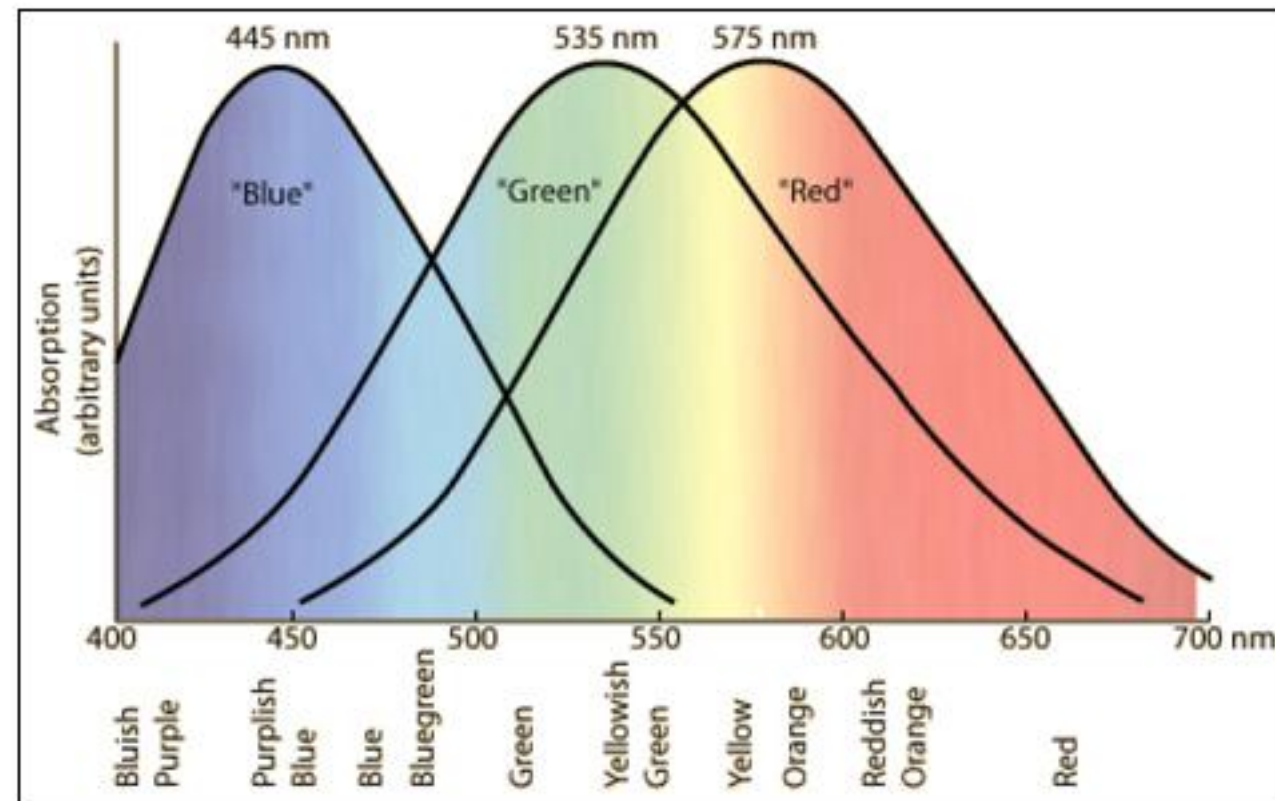
The eye has rod and cone cells – only the cones respond to color.

There are three types of cone, as shown above, and because of this, perceived color can be *roughly* modeled with 3 components.

Color Gamut
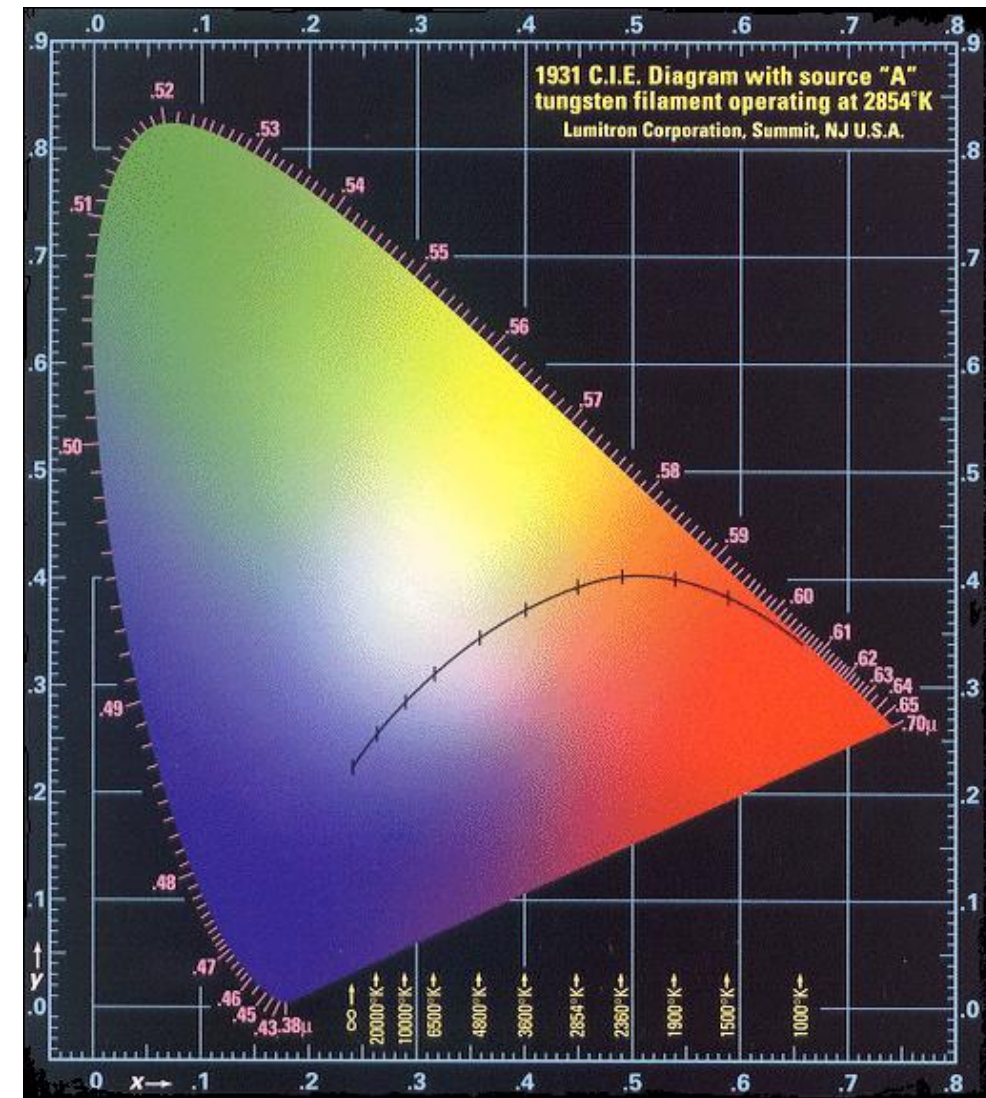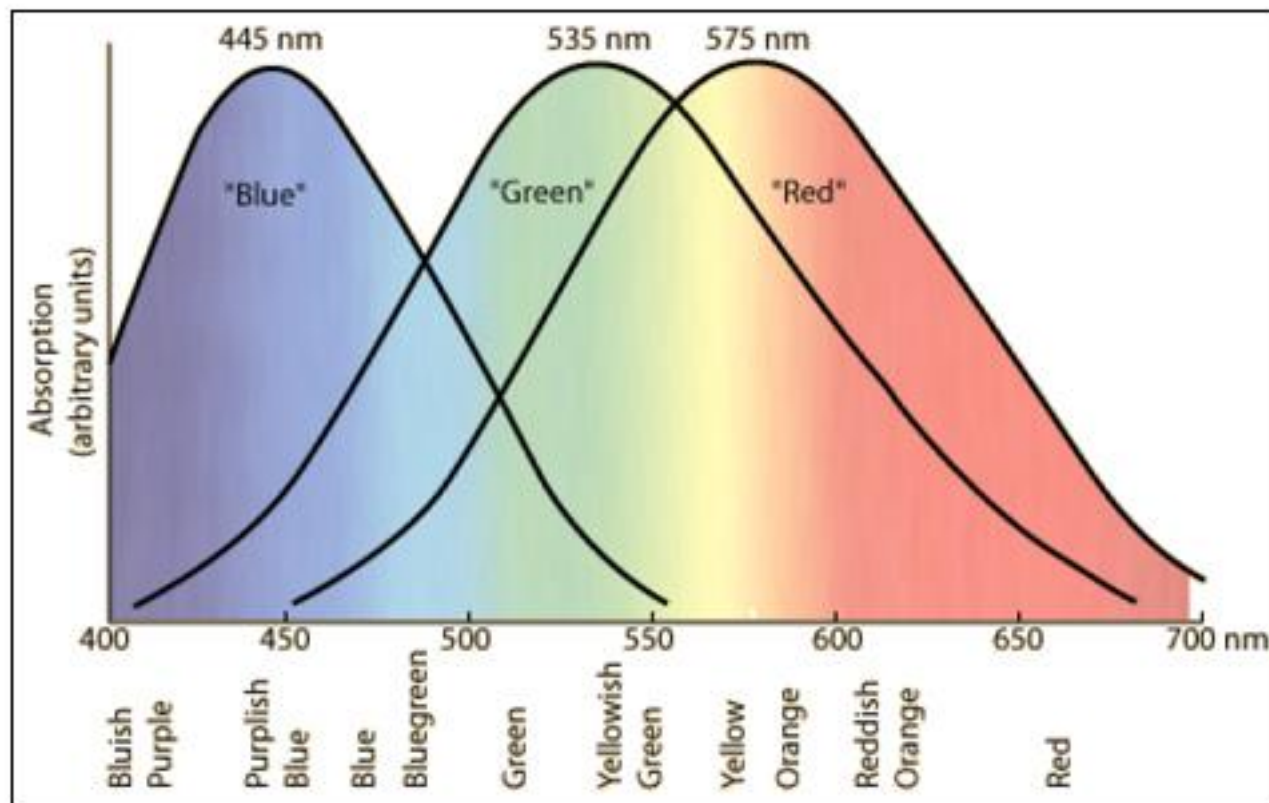
Since the responses curves for cones overlap, not all non-negative combinations of responses are possible (e.g. R>0, B>0 ➜ G>0).

That means we cant synthesize most pure colors with 3 colored emitters – real displays lack vividness for these colors.

Color sensitivity
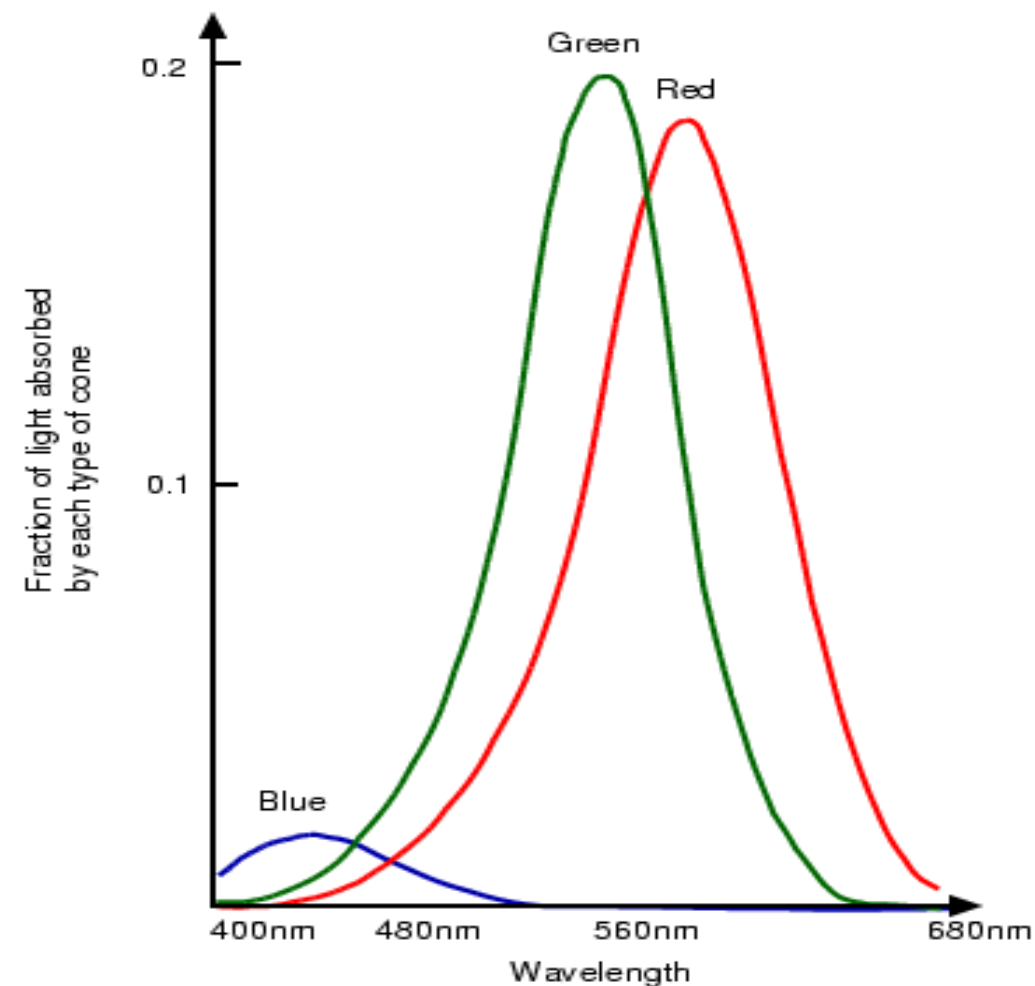
The absolute sensitivities of cones are quite different.

In fact we have a hard time seeing blue, and perceiving blue contrast.

Yves Klein + IKB (#002FA7)
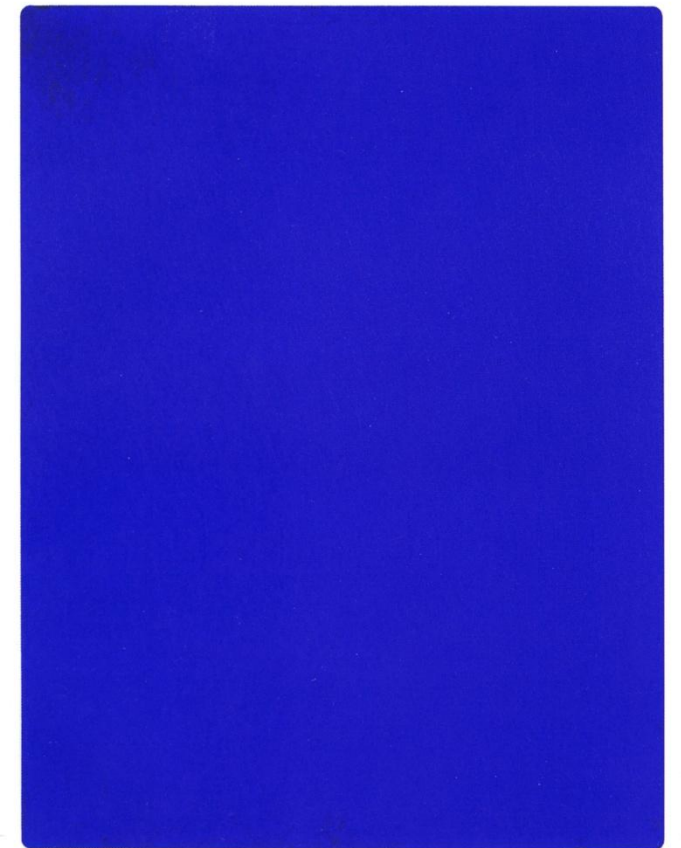
Color Spaces
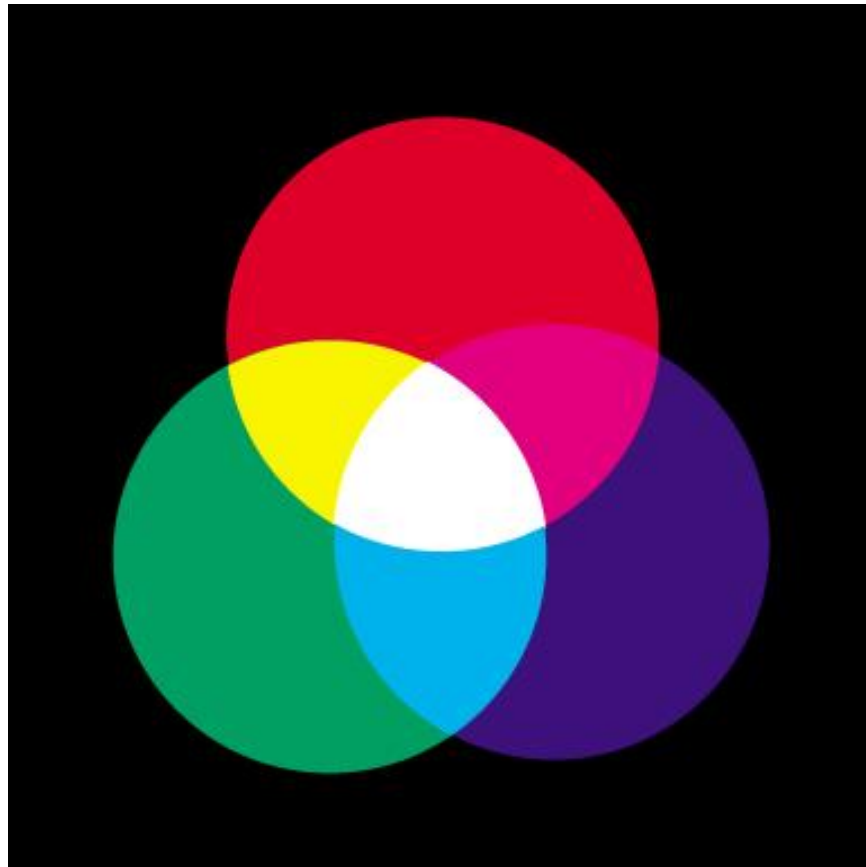
RGB

Additive

Electronic Media
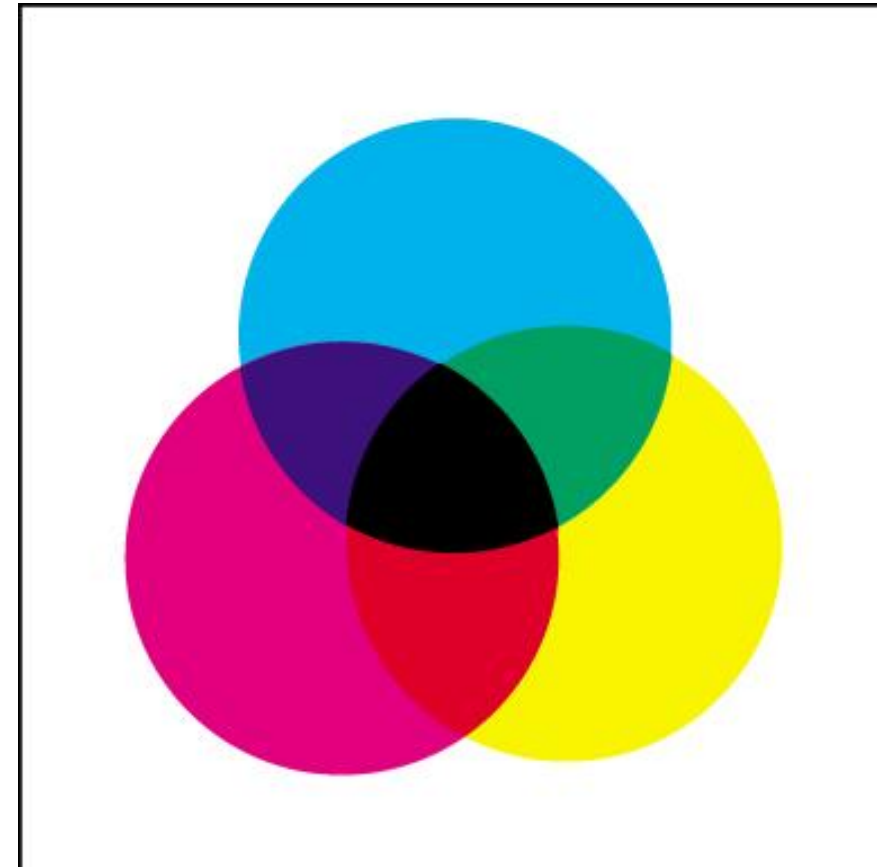
CMY

Subtractive

Printed Media

Parameters of color space driven by technology

Technology-Centered Colors

- Nice RGB Hex codes, "evenly" distributed
- But, lime green and hot pink?
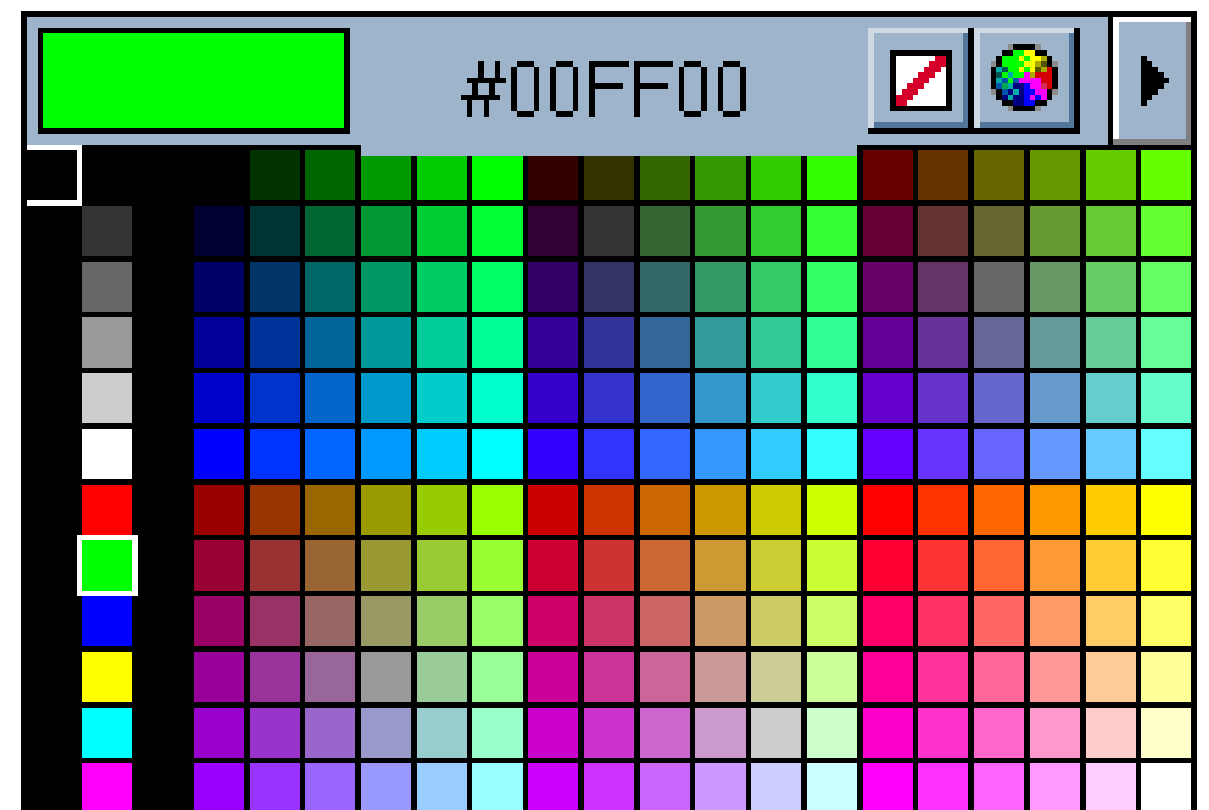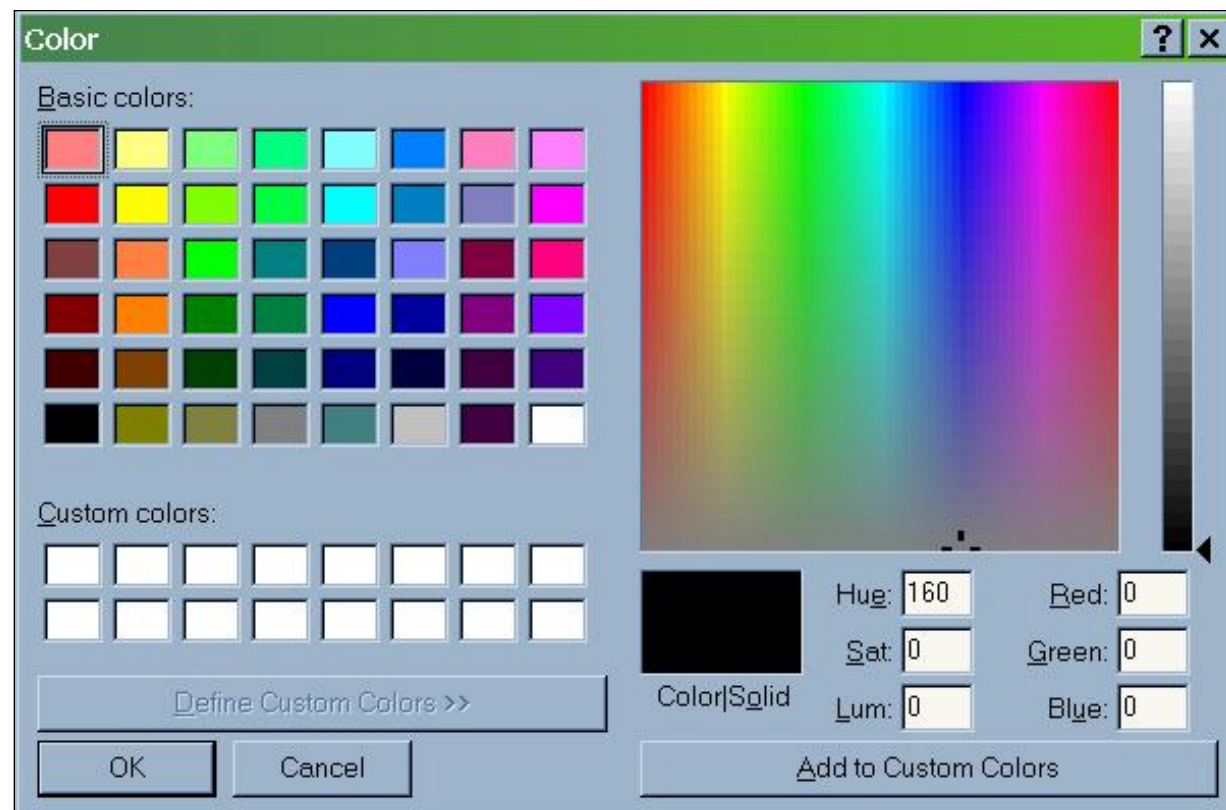
Perceptual Organization

Lightness

Saturation

Hue
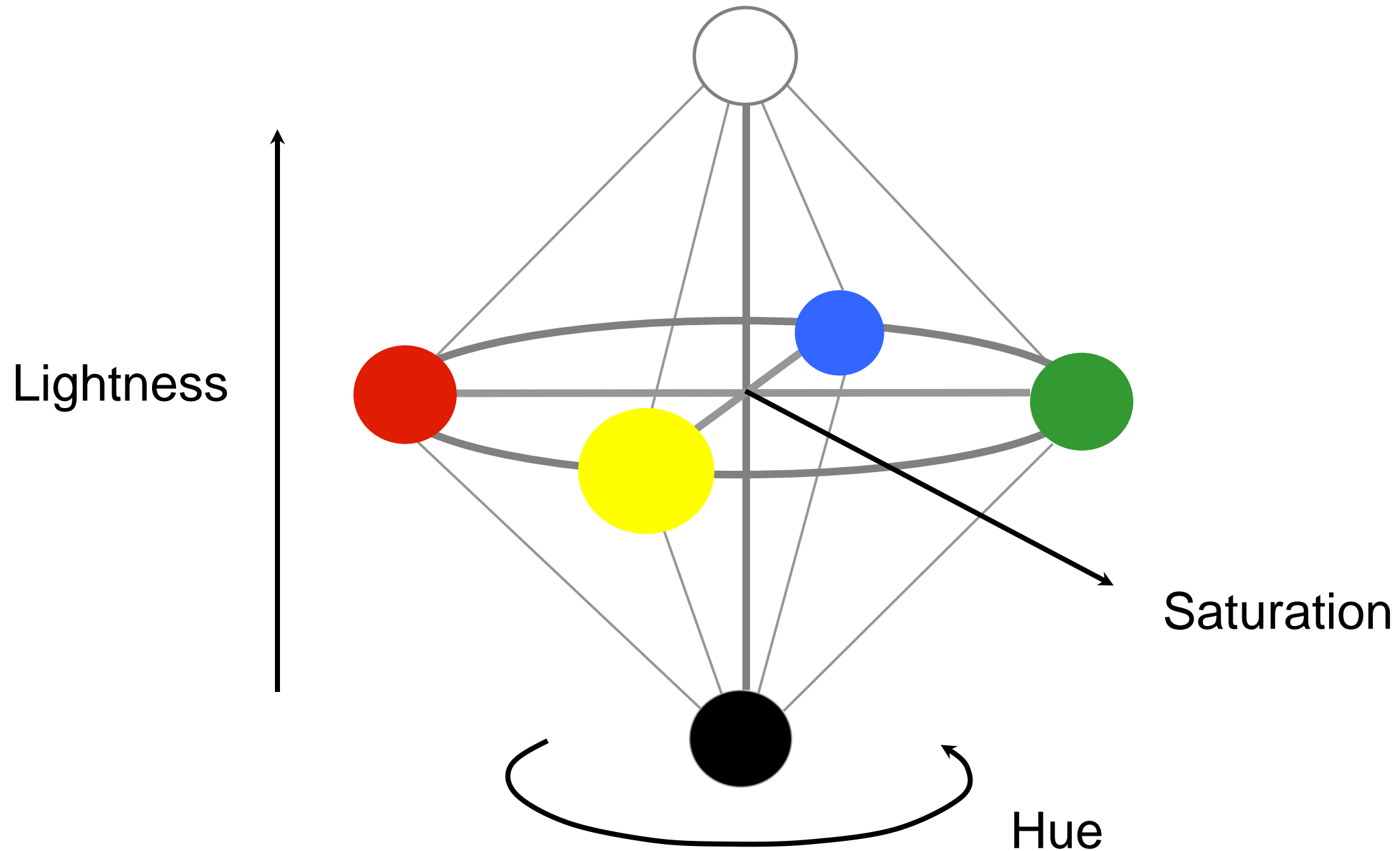
Parameters of color space driven by perception

Munsell Color Space

Perceptually uniform book of painted chips
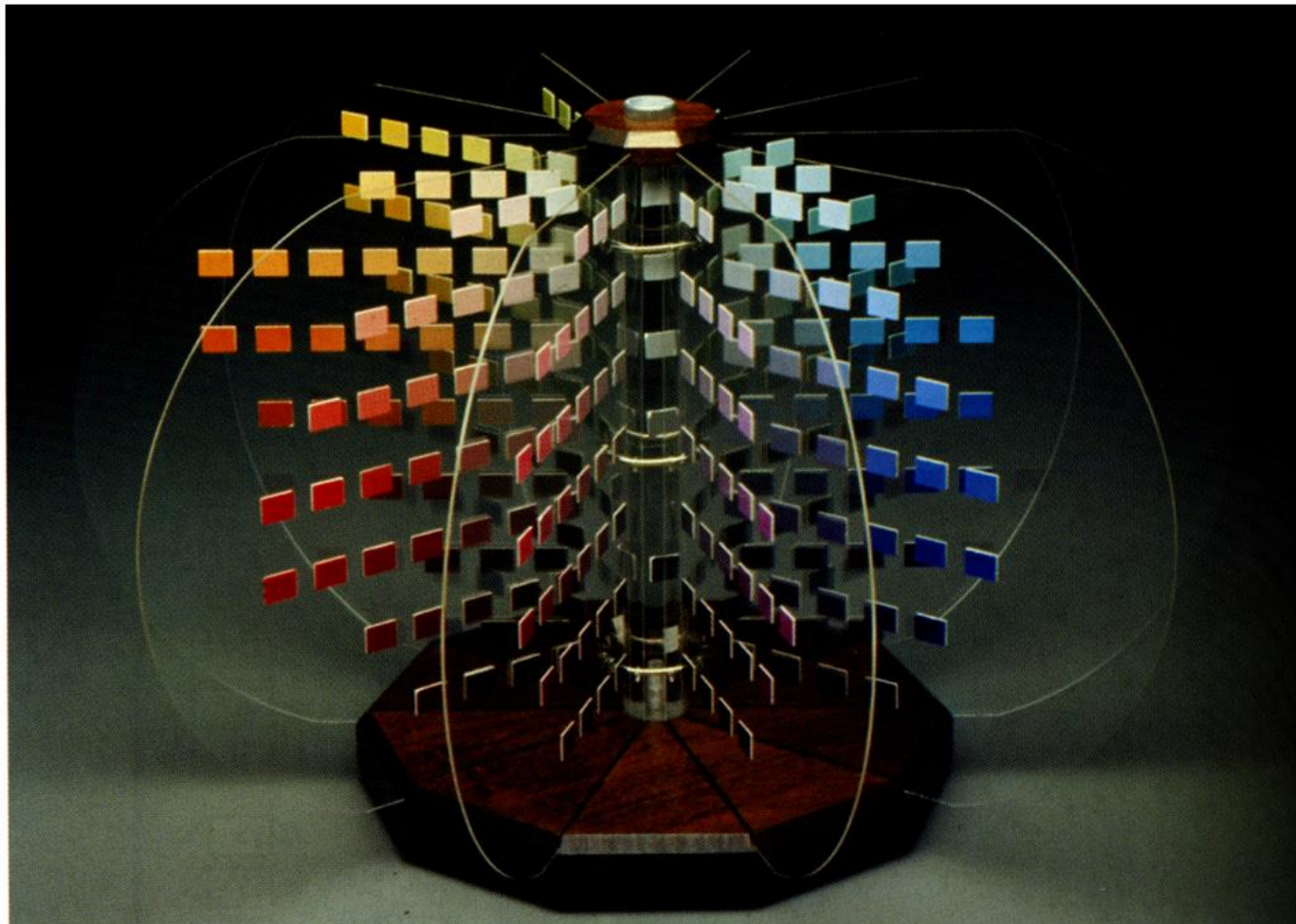
Hue
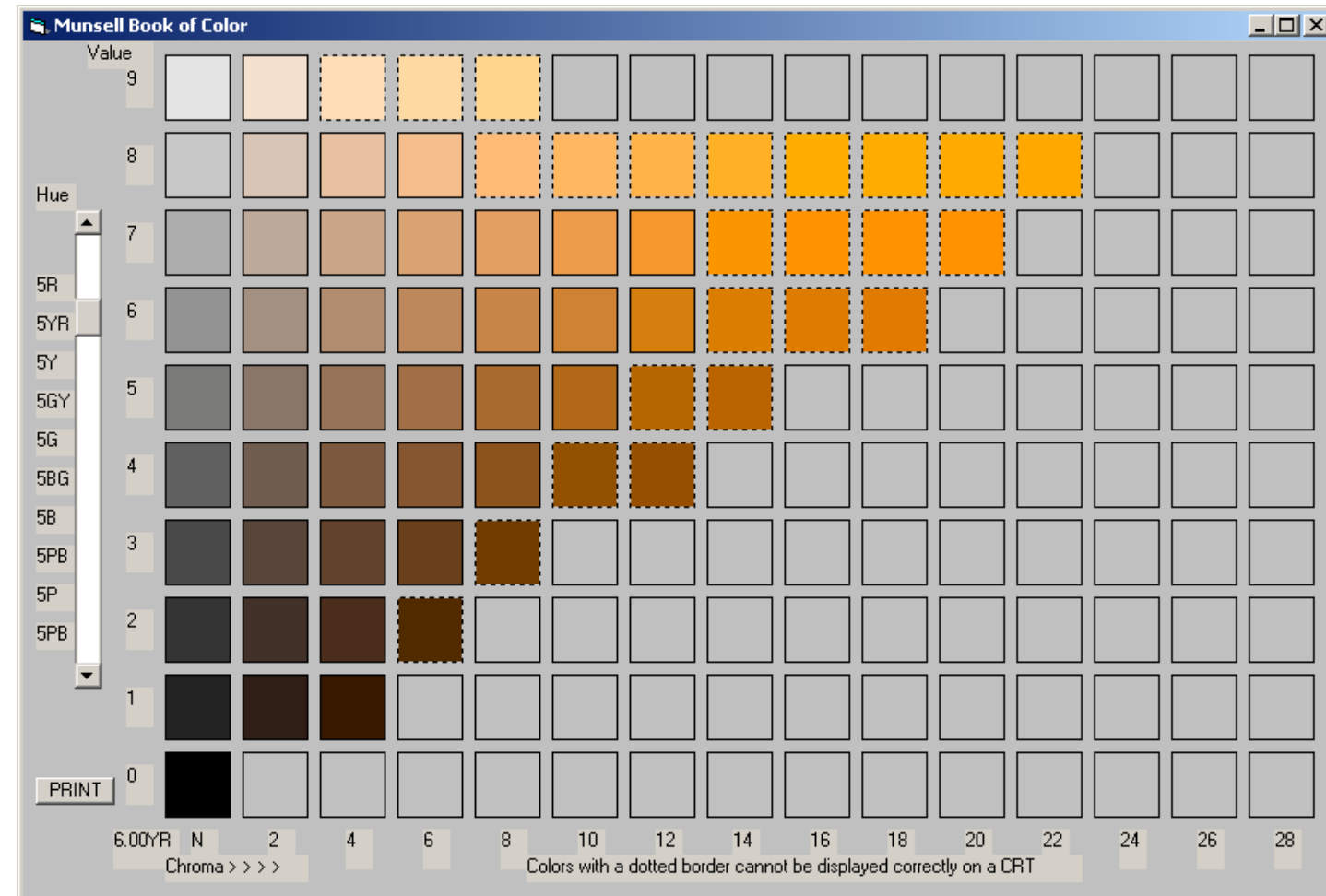
Chroma vs. Value

Munsell Color Utility: www.wallkillcolor.com

Conflicts

Some Red Text Here

Some Blue Text Here

Some Yellow Text Here

Some Red Text Here

Use intensity contrast for text!!

Tips for Picking Colors

We perceive color holistically when they are not directly related to the content – which is usually the case for interfaces.

Colors are often designed together into a "theme" – they work together to create the mood you want.

Themes

Themes

Pantone 1235 C 116 U	Pantone 1405 C	Pantone 165 C	Pantone 168 C	Pantone Red 032 (Maryland Red)
Pantone 201 C 1935 U	Pantone 202 C	Pantone 269 C	Pantone 272 C	Pantone 2725 C
Pantone 2955 C	Pantone 3155 C	Pantone 3727 C	Pantone 330 C	Pantone 349 C
Pantone 377 C 390 U	Pantone 448 C	Pantone 464 C	Pantone 5275 C 5265 U	Pantone 541 C
Pantone 568 C	Pantone 5767 C	Pantone 632 C	Pantone 658 C	Pantone 696 C
Pantone Cool Gray 5	Pantone Cool Gray 9	Pantone Warm Gray 5	Pantone Warm Gray 9	

Themes

nano-chromatic
The new iPod nano. Now in 8GB and 16GB.

Saturation

Saturation

Tempered Saturation

NEUTRAL

	C	M	Y	K
A	15	25	10	25
B	10	15	10	20
C	5	10	10	10
D	7	15	10	20
E	5	10	15	15
F	3	5	15	10
G	5	15	40	15
H	3	10	35	10
I	2	5	25	5
J	15	10	35	20
K	10	5	30	15
L	7	5	20	10
M	20	10	10	20
N	15	5	5	15
O	10	3	3	10
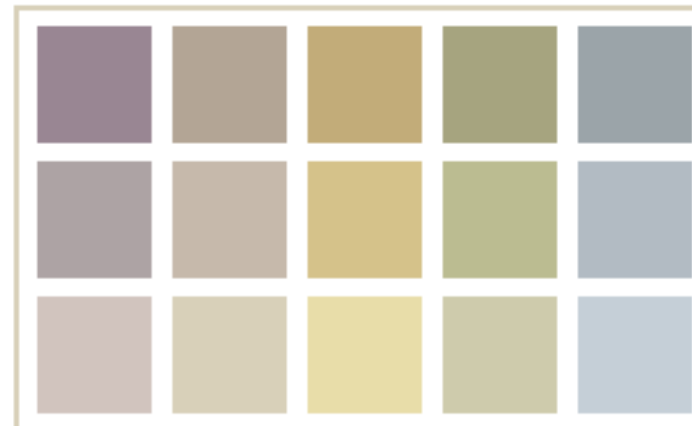
NEUTRAL-O	NEUTRAL-I	NEUTRAL-A
NEUTRAL-I	NEUTRAL-A	NEUTRAL-J
NEUTRAL-O	NEUTRAL-A	NEUTRAL-G
NEUTRAL-I	NEUTRAL-A	NEUTRAL-J
NEUTRAL-C	NEUTRAL-A	NEUTRAL-M

Let Someone Else Pick For You

Let Someone Else Pick For You

Contrast Sensitivity

Chiaroscuro

Gestalt Principles

Principles

- figure/ground
- proximity
- similarity
- symmetry
- connectedness
- continuity
- closure
- common fate
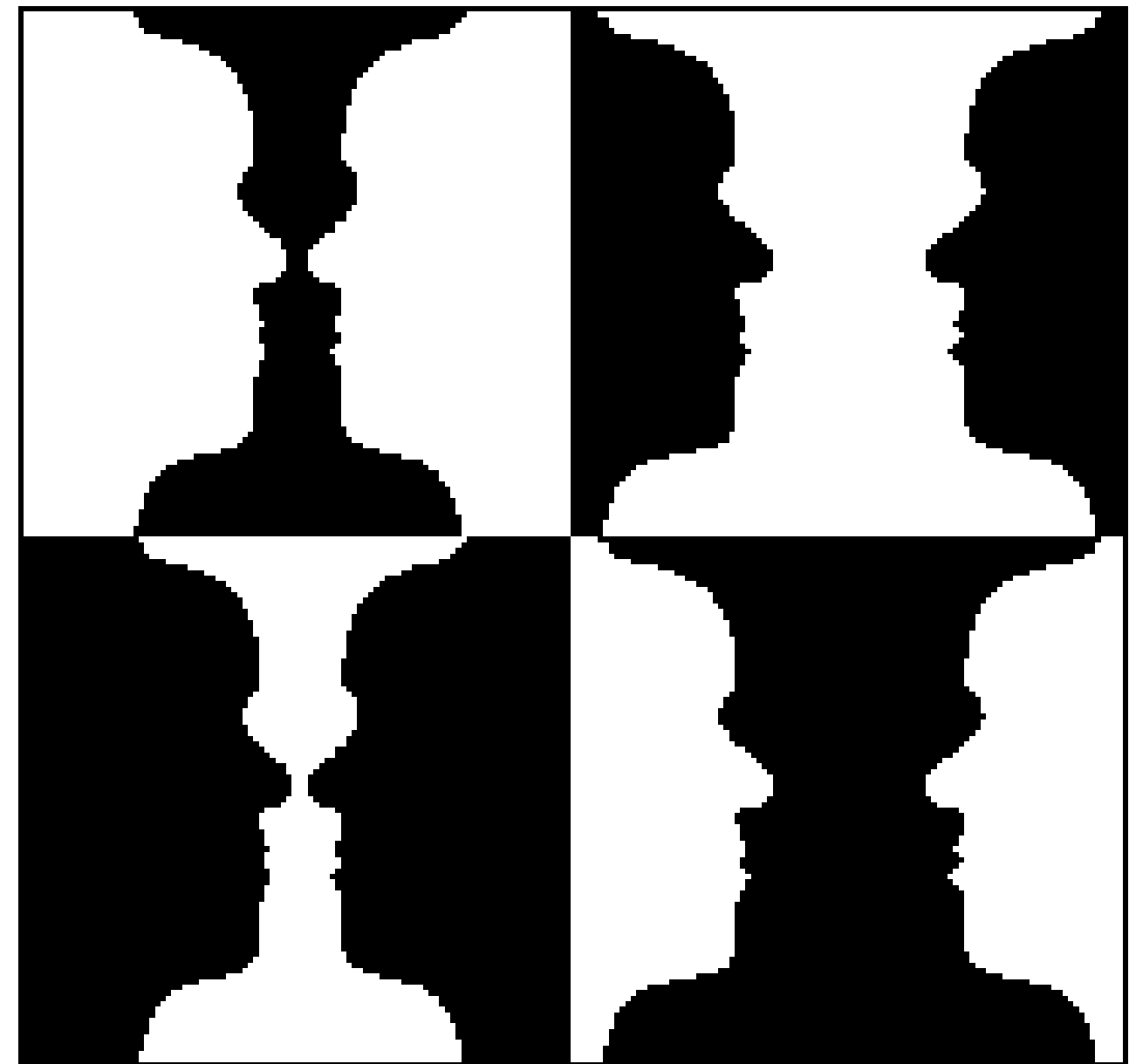- transparency

Figure/Ground

Ambiguous
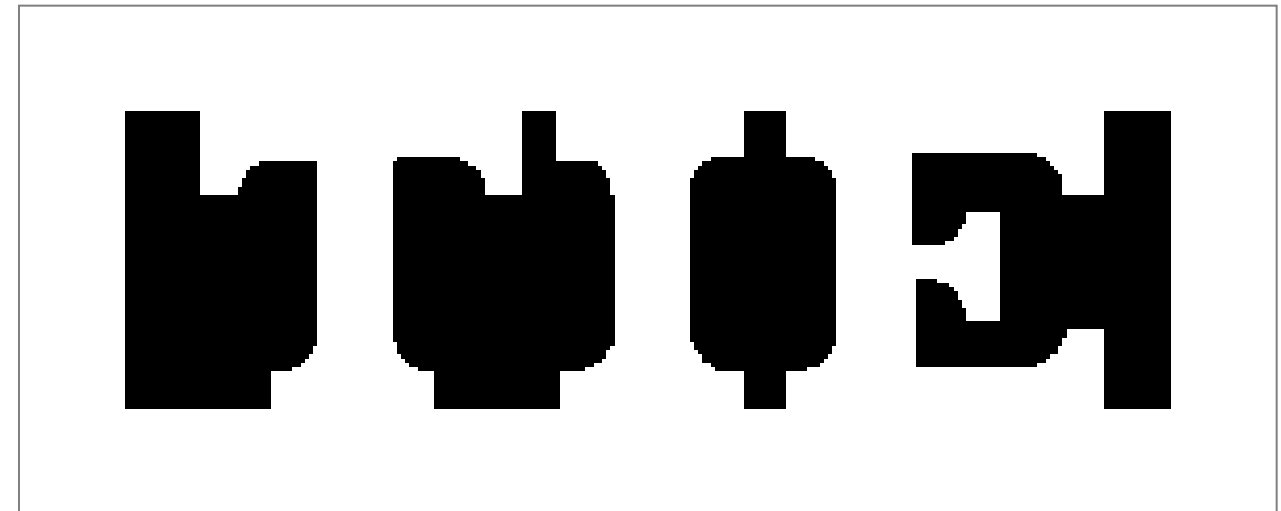
Principle of surroundedness
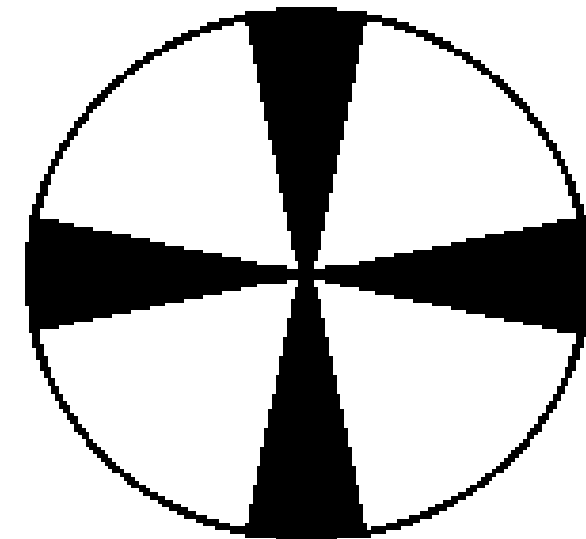
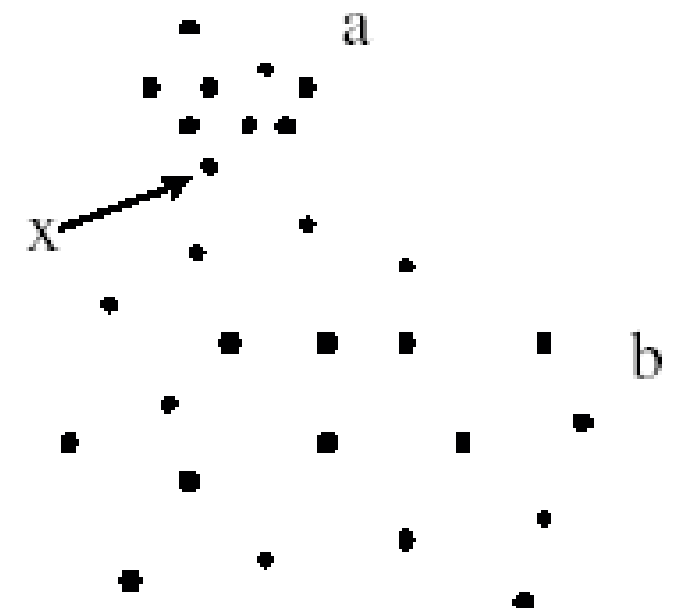
Principle of relative size

Figure/Ground

Ambiguous

Unambiguous

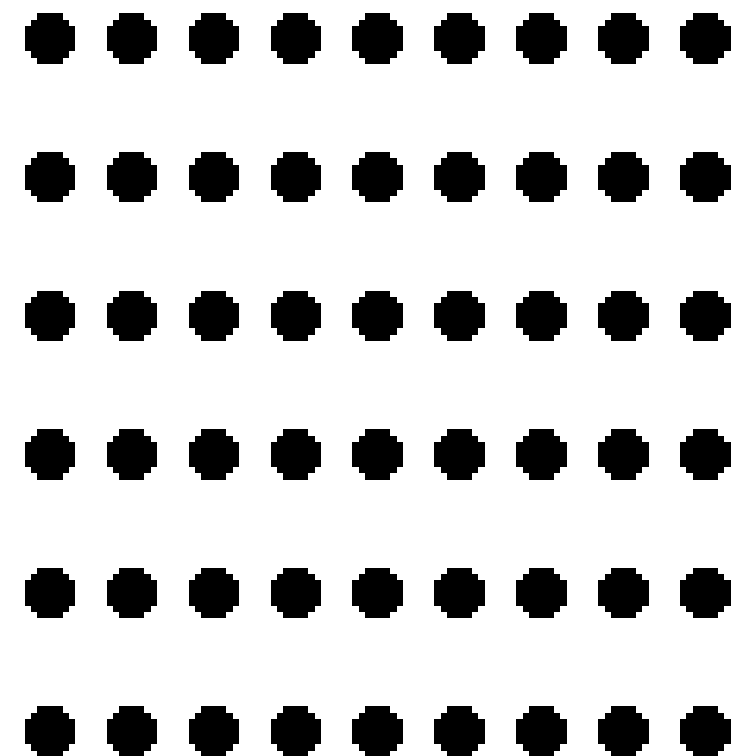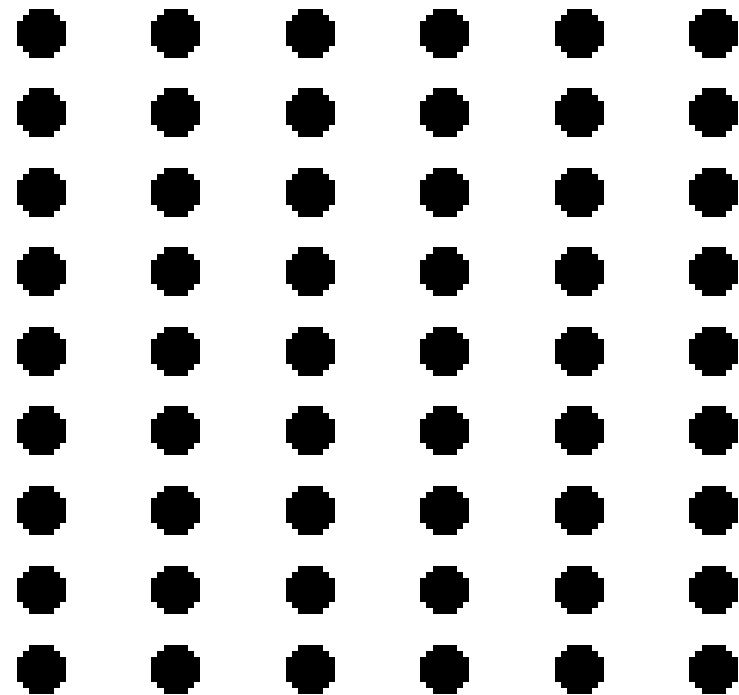http://www.aber.ac.uk/media/Modules/MC10220/visper06.html
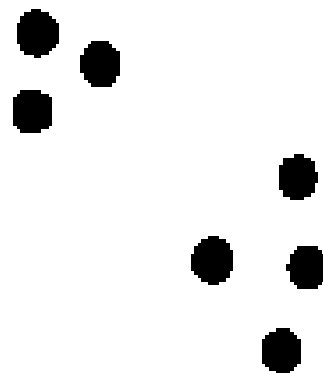
Proximity

Dots that are near one another are grouped
Dots that are concentrated are grouped

Proximity

Tuesday, November 4
Election Day
An American Menu $75
Caesar salad with anchovies, egg, and
Parmesan cheese
Clam chowder with Maine lobster and
pancetta
Grilled chicken with house-made
barbeque sauce with potato purée and
greens
Apple and raspberry pecan crisp with
vanilla ice cream

Proximity

Tuesday, November 4 —Election Day

An American Menu

$75

Caesar salad with anchovies, egg, and Parmesan cheese

Clam chowder with Maine lobster and pancetta

Grilled chicken with house-made barbeque sauce with potato purée and greens

Apple and raspberry pecan crisp with vanilla ice cream

Similarity

TUESDAY, NOVEMBER 4 — ELECTION DAY

AN AMERICAN MENU $75

Caesar salad
with anchovies, egg, and Parmesan cheese

Clam chowder
with Maine lobster and pancetta

Grilled chicken
with house-made barbeque sauce with
potato purée and greens

Apple and raspberry pecan crisp
with vanilla ice cream

Symmetry
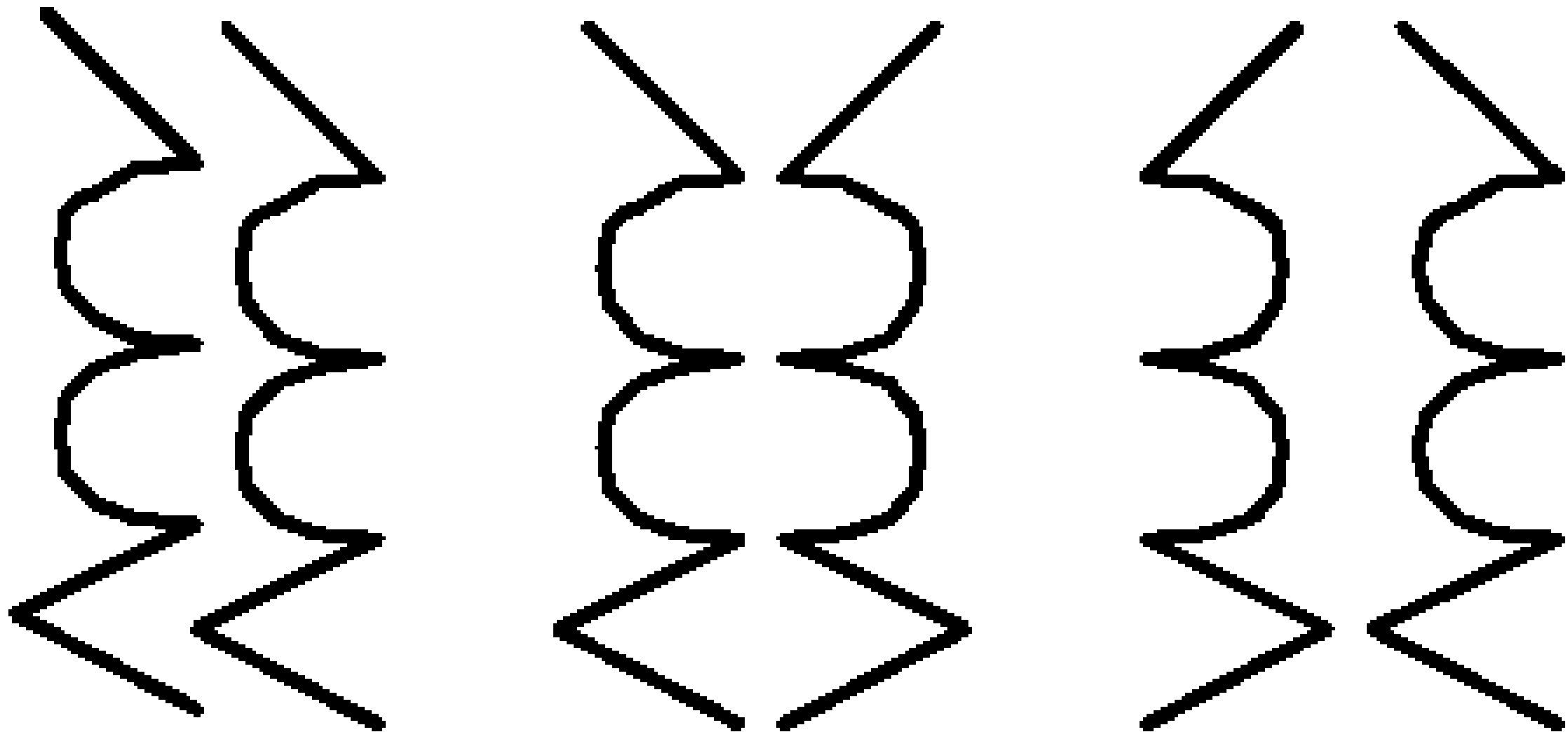
Bilateral symmetry gives strong sense of figure [from Ware 04]

Connectedness
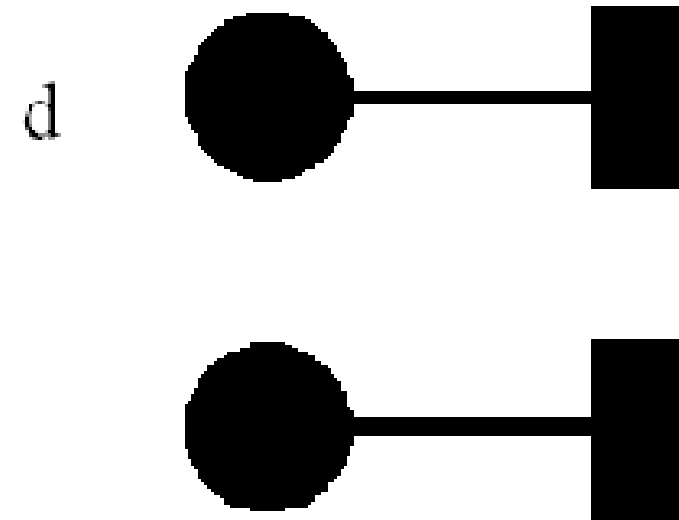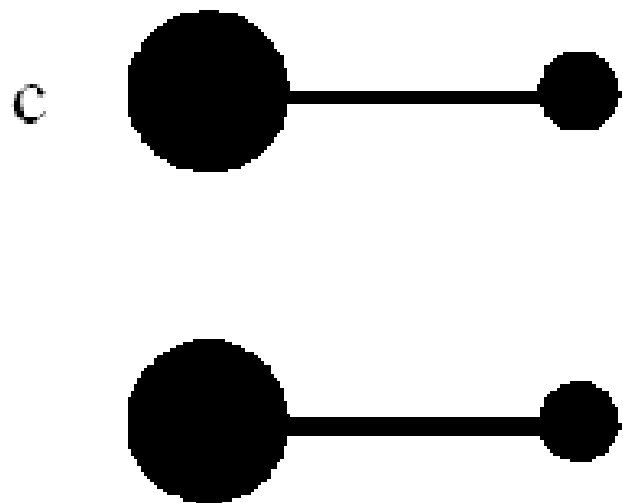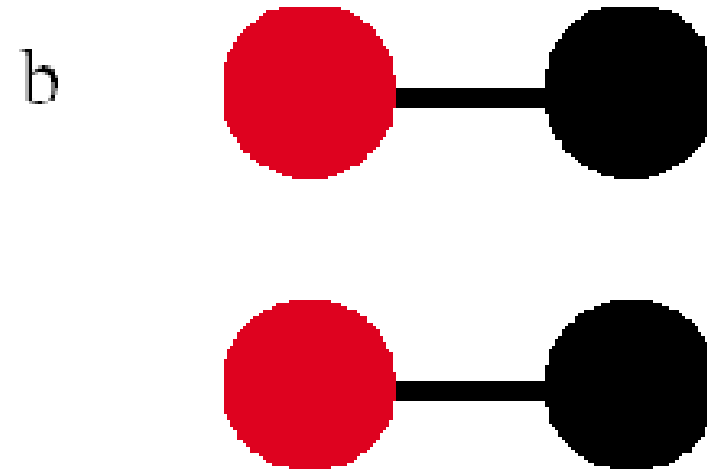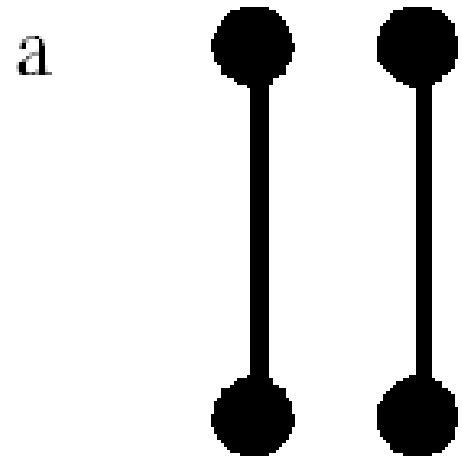
Connectedness overrules proximity, size, color shape [from Ware 04]

Grid Systems
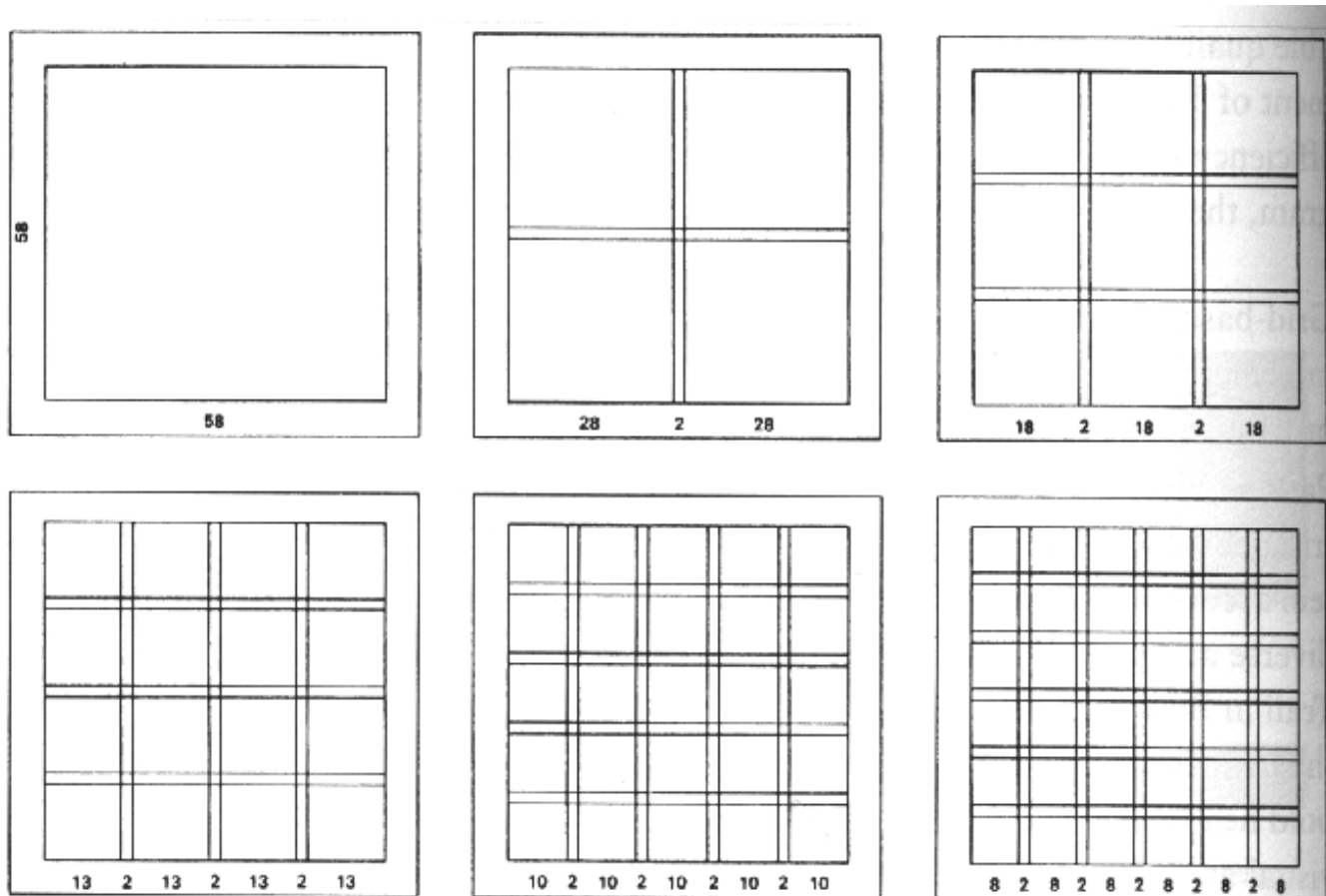
142: These typographic grids for book design subdivide the page uniformly into one to six columns. Grids for GUI design have important differences, but the goal of providing systematic structure is the same. From *Basic Typography: Design with Letters*, by Ruedi Rüegg, ABC-Verlag, Zurich, 1987.
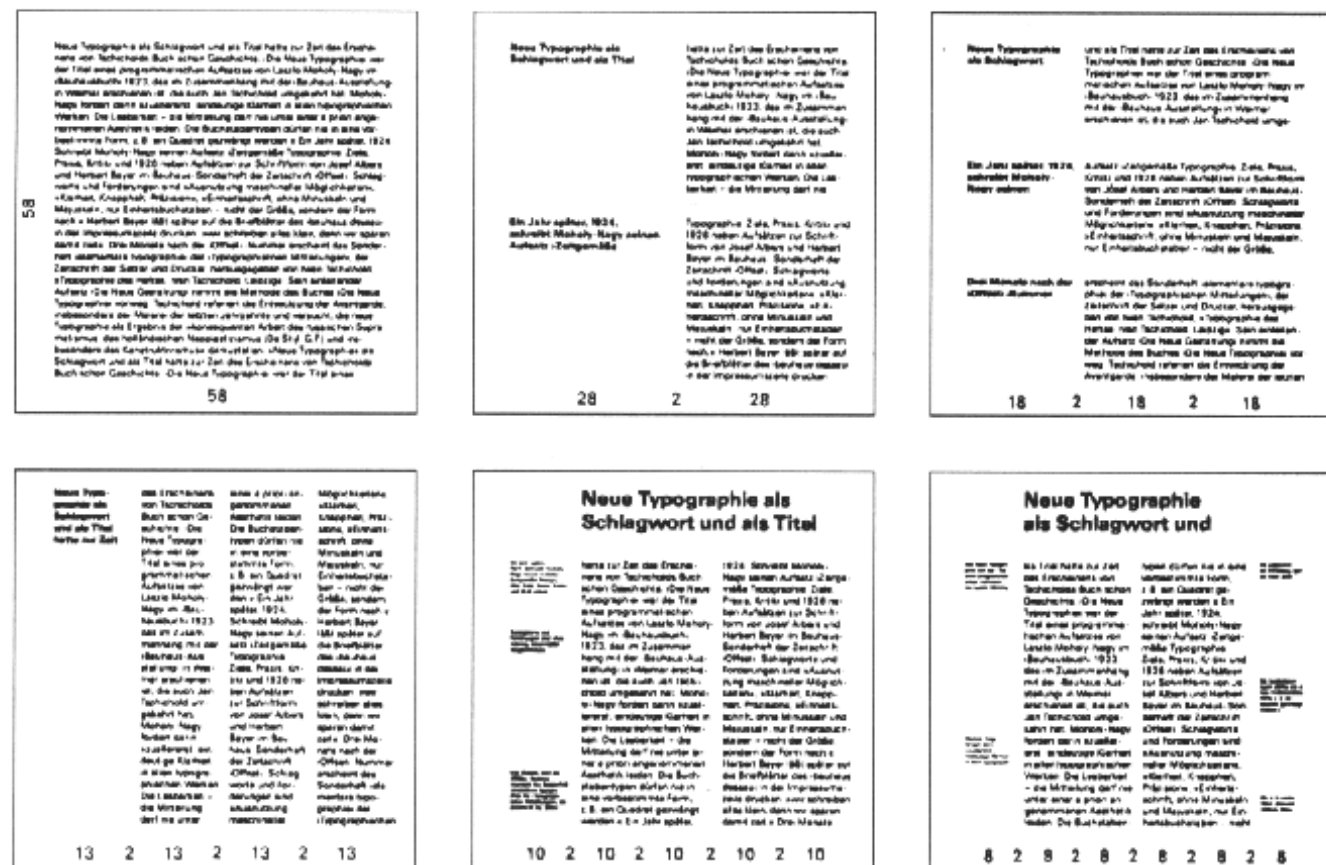
143: Each of the grids in Figure 142 leaves a distinct imprint on the resulting layout. When the *same* grid is used throughout a book – or GUI application – this imprint becomes a unifying element for the entire work. From *Basic Typography: Design with Letters*, by Ruedi Rüegg, ABC-Verlag, Zurich, 1987.

Web Page Layout

Grids can shape layout without over constraining it
- – Grid is not always obvious from page layout
- – Produces good repetition of size and shape

Alignment

- Every item on a screen has a relationship to the other items. Elements that are almost collinear should be aligned.

- Left, right and both-justified alignments create strong boundaries around a piece of text.

- Its best to stick with one kind of justification within a page.

Alignment

Alignment

Techniques

Canonical Grid

- – Six-column grid with column separators and label templates
- – Covers most common grid-based layouts
- – Can be implemented with HTML tables

176: This *canonical grid* supports two-, three-, four-, and six-column layouts in any graphical user interface (the 1/6 and 5/6 divisions are implicit). The gray bars reflect the widths of components spanning (from top to bottom) 6, 3, 1.5, and 1 column-units, respectively, on the basic 6-column grid. The grid can be used with any vertical module, depending on the widget set and type size.

Summary

- Design is about communication, form and function
  - Simplicity and elegance are keys to good design
  - Minimalism constrains you and reduces chances of bad design
- Use a small palette of colors
  - Let others pick them for you (colorbrewer.org)
- Human vision is organized by Gestalt Principles
  - Be aware of these principles as you design the visual look
- Avoid common layout mistakes by using grid-based design