

Visual Design

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Visual Design: The Problem

- Need to lay out elements
 - within a window
 - what's available?
 - where is it?
 - what do I do with it?
 - between windows
 - which interface does this window belong to?
 - Note: "Windows" can be on-screen simultaneously or serially (including dialog boxes)
- Still needs to make sense as windows are resized, rearranged, etc. That is, out layouts will be dynamic.
- Windows are similar because they work together. They are different because they offer different capabilities.

"Layout" includes position, size, color, window assignment, etc. of components.

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Objectives

- Highest level goals: Create desired relationships and avoid undesired relationships
- Create a presentation that
 - ◆ has an attractive look
 - ◆ is easy to understand “at a glance”
- has a distinctive look, across many windows and to avoid a presentation that...
 - ◆ is cluttered and hard to organize
 - ◆ is hard to perceive clearly
 - ◆ contains excessive idiosyncrasy
 - ◆ makes the user stop and think to avoid errors

How?

- Pay attention to cognitive conscious and unconscious capabilities of the human mind.
 - Keep things simple (limited conscious cognitive processing)
 - Make use of cognitive unconscious to establish relationships

Simplicity

- In anything at all, perfection is finally attained not when there is no longer anything to add, but when there is no longer anything to take away.

-- Antoine de Saint Exupery

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Simplicity


- Present the minimum amount of information to achieve maximum effect
- Simplicity leads to quickly recognized and understood functionality
 - Less information == less time to process
 - Can more quickly produce correct mental models
- Simplicity also aids recall
 - Less to remember

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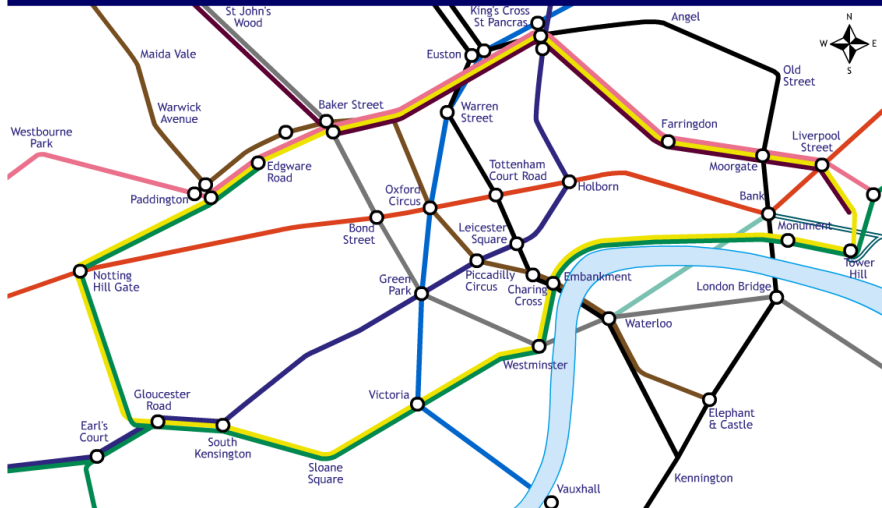
Simplicity



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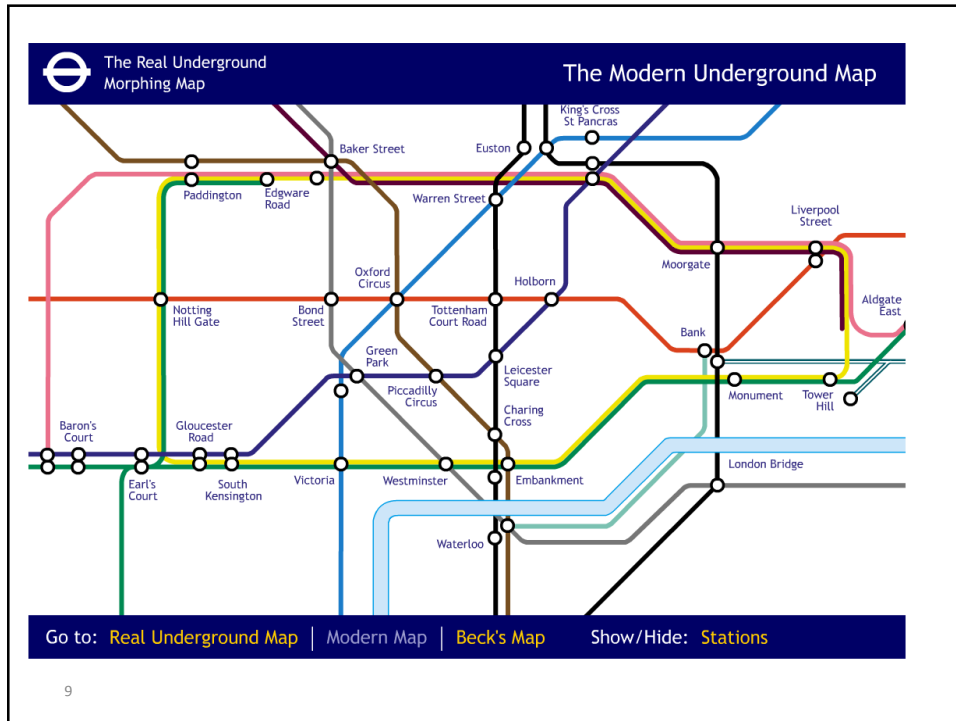
 The Real Underground Morphing Map

The Real Underground Map

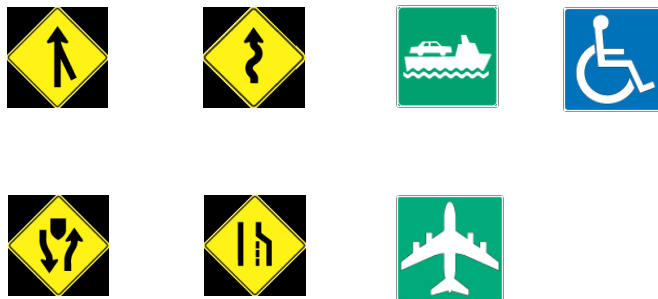


Go to: [Real Underground Map](#) | [Modern Map](#) | [Beck's Map](#) Show/Hide: [Stations](#) | [Streetmap](#)

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Only Absolute Essentials



How to achieve simplicity?

- Reduce, reduce, reduce
- Reduce some more
- Reduce until it hurts

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Organization and Structure

- Visual designs communicate with users through their structure and organization
 - Structure doesn't occur naturally, it must be created explicitly, designed
- People will find order and structure, even if none was intended
- Use Gestalt principles to create structure

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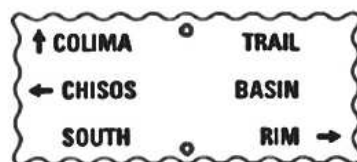
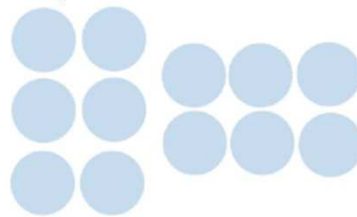
Gestalt Principles

- Theories of visual perception that describe how people tend to organize visual elements into groups or unified wholes, when certain principles are applied.
- Clues about how the brain groups raw visual input
- Proximity
- Similarity
- Smooth Continuity
- Closure
- Area
- Symmetry
- Uniform Connectedness

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Proximity

- Individual elements are associated more strongly with nearby elements than with those further away

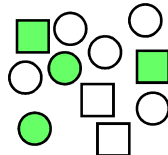
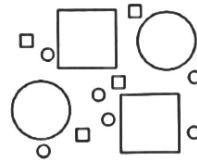


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Similarity

- Elements associated more strongly when they share basic visual characteristics, such as:

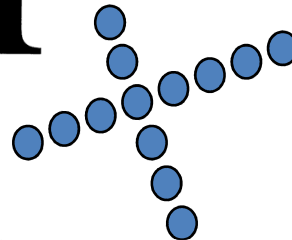
- Shape
- Size
- Color
- Texture
- Orientation



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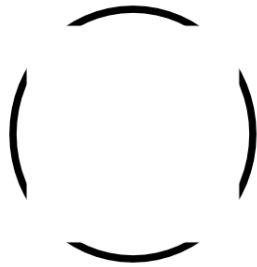
Smooth Continuity

- Elements arranged in a straight line or a smooth curve are perceived as being more related than elements not on the line or curve
- People will seek out the simplest possible explanation for abstract drawings



Closure

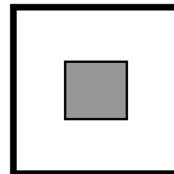
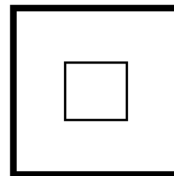
- The visual system will tend to perceive a set of individual elements as a single, recognizable pattern, rather than multiple individual elements.



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Area (figure-ground)

- Figure is the element that is interpreted as the object of interest
- Ground is area on which figure rests
- The principle of Area suggests that smaller of two overlapping figures seen as figure while larger is seen as ground



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Symmetry

- Symmetrical, unconnected elements are integrated into one coherent object
- The greater the symmetry, the more we ascribe meaning and relationships in a composition
- Separately, symmetry has long been associated with beauty

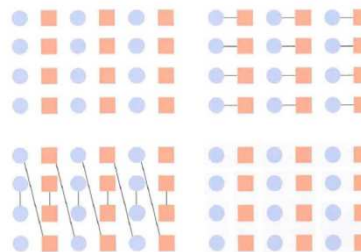


CSC Finland's logo

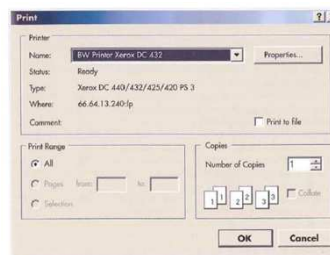
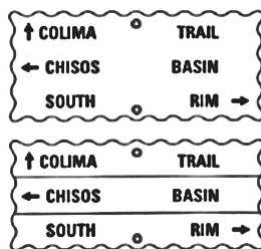
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Uniform Connectedness

- Elements connected to one another by uniform visual properties are perceived to be more related than elements that are not connected



- Two typical
 - connecting lines
 - connecting regions



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Achieving Organization, Structure

- Grouping
- Hierarchy
- Relationship
- Balance

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Grouping

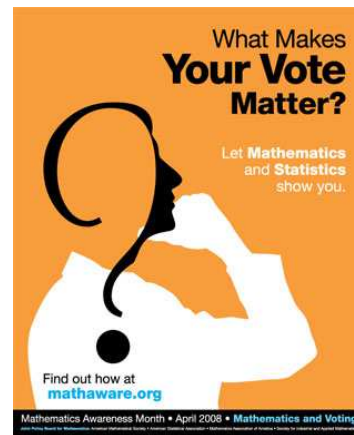
- Group elements into higher order units
 - e.g. Newspapers have paragraphs, columns, sections, pages
- Use the Gestalt principles to create group
- Reserve powerful techniques such as colour and uniform connectedness for explicitly telling the user something



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Hierarchy

- Create a visual hierarchy to guide the viewer, and to allow scanning of information.
- Create the hierarchy according to intended reading sequence.
- Useful techniques for creating hierarchy:
 - ◆ Size
 - ◆ Position
 - ◆ Spacing
 - ◆ White space
 - ◆ Colour



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Relationship

- Establish relationships between elements by using position, size, value (colour, shape, etc.)
- Use position, size, value (colour, shape, etc.)
- Alignment is very effective at creating relationships
- Similarity of form also effective



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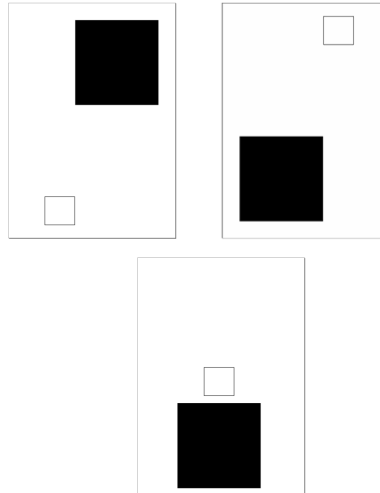
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Balance

- Try to create a stable composition by balancing elements (similar to physical balance)
- Stability achieved by manipulating properties such as:
 - Position
 - Size
 - Hue
 - Form
- Symmetric layouts naturally achieve balance



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Common Errors

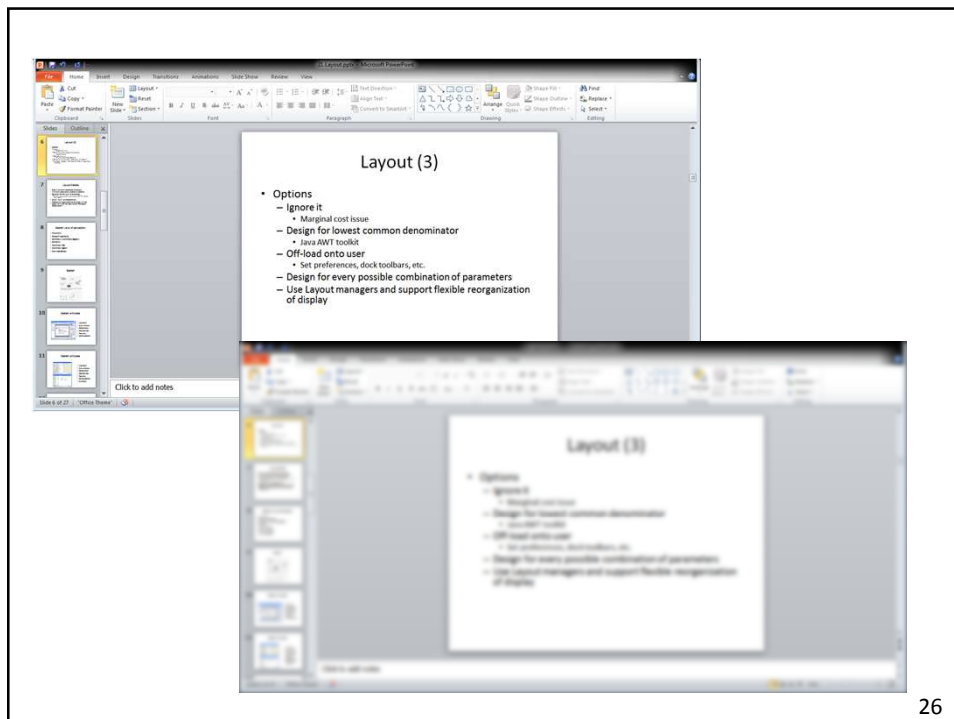
- Haphazard layout (no explicit design)
- Aligning labels, not controls
- Bounding boxes creating visual clutter and competing for attention (use white space instead)

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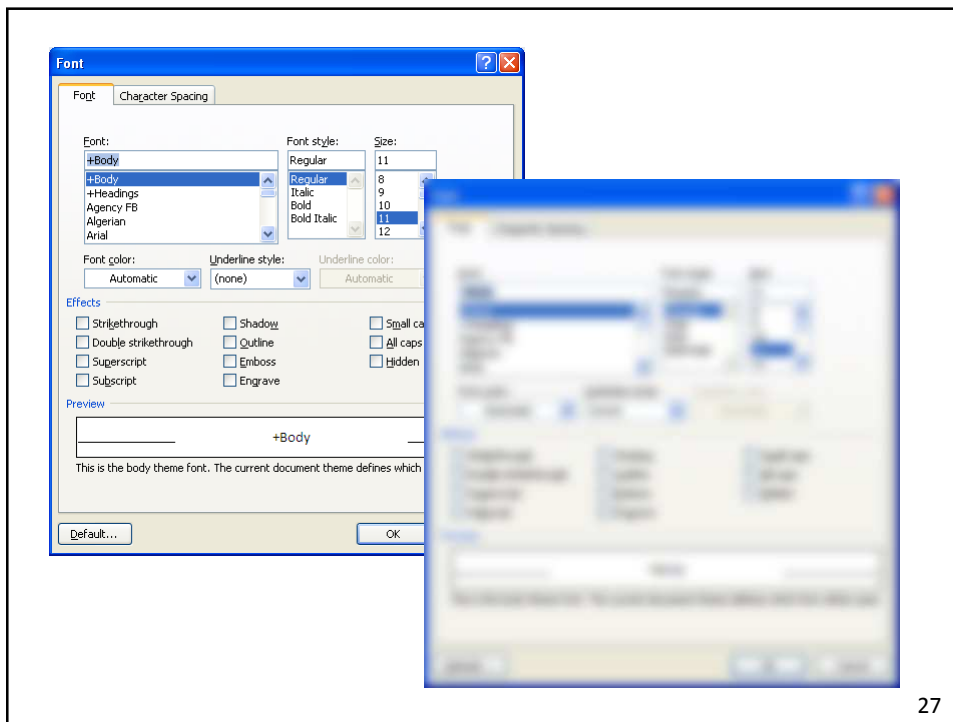
Testing it Out...

- Show it to someone else
 - Don't ask if they like it (why?)
 - Try to get first impressions
- Use the squint test...
 - Mimics early portion of visual recognition system

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Impact

- Good visual design can significantly reduce processing time by users
- Tullis redesigned screen for telephone line testing (1981)
 - 40% reduction in time to interpret display
 - 79 person years saved for every year of use
- Tullis redesigned lodging information screens (1984)
 - 5.5 vs. 3.2 sec avg search times

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Pennsylvania
Bedford Hotel/Hotel: Crinoline Courts
(814) 623-9511 S: $18 D: $20
Bedford Hotel/Hotel: Holiday Inn
(814) 623-9006 S: $29 D: $36
Bedford Hotel/Hotel: Midway
(814) 623-8107 S: $21 D: $26
Bedford Hotel/Hotel: Penn Manor
(814) 623-8177 S: $18 D: $25
Bedford Hotel/Hotel: Quality Inn
(814) 623-5188 S: $23 D: $28
Bedford Hotel/Hotel: Terrace
(814) 623-5111 S: $22 D: $24
Bradley Hotel/Hotel: De Soto
(814) 362-9567 S: $28 D: $24
Bradley Hotel/Hotel: Holiday House
(814) 362-4511 S: $22 D: $25
Bradley Hotel/Hotel: Holiday Inn
(814) 362-4501 S: $22 D: $24
Breezewood Hotel/Hotel: Best Western Plaza
(814) 735-4352 S: $28 D: $27
Breezewood Hotel/Hotel: Hotel 78
(814) 735-4385 S: $16 D: $18
    
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South Carolina		Area Code	Phone	Rates	
City	Hotel/Hotel			Single	Doub
Charleston	Best Western	803	747-0961	\$26	\$30
Charleston	Days Inn	803	881-1800	\$18	\$21
Charleston	Holiday Inn N	803	744-1621	\$36	\$40
Charleston	Holiday Inn SW	803	556-7100	\$33	\$37
Charleston	Howard Johnsons	803	524-4140	\$31	\$36
Charleston	Ranada Inn	803	774-8281	\$33	\$40
Charleston	Sheraton Inn	803	744-2401	\$34	\$42
Columbia	Best Western	803	796-9400	\$29	\$34
Columbia	Carolina Inn	803	799-8200	\$42	\$48
Columbia	Days Inn	803	736-0000	\$23	\$27
Columbia	Holiday Inn NW	803	794-9440	\$32	\$39
Columbia	Howard Johnsons	803	772-7200	\$25	\$27
Columbia	Quality Inn	803	772-0270	\$34	\$41
Columbia	Ranada Inn	803	796-2700	\$36	\$44
Columbia	Vagabond Inn	803	796-6240	\$27	\$33

Summary

- Strive for simplicity
- The Gestalt principles give us hints as to how the brain will react to visual stimulus
- Use them to structure a visual design by:
 - Grouping visual information into higher units
 - Creating a hierarchy to guide the user's viewing
 - Establishing relationships between elements
 - Creating a sense of balance