



Map Design II



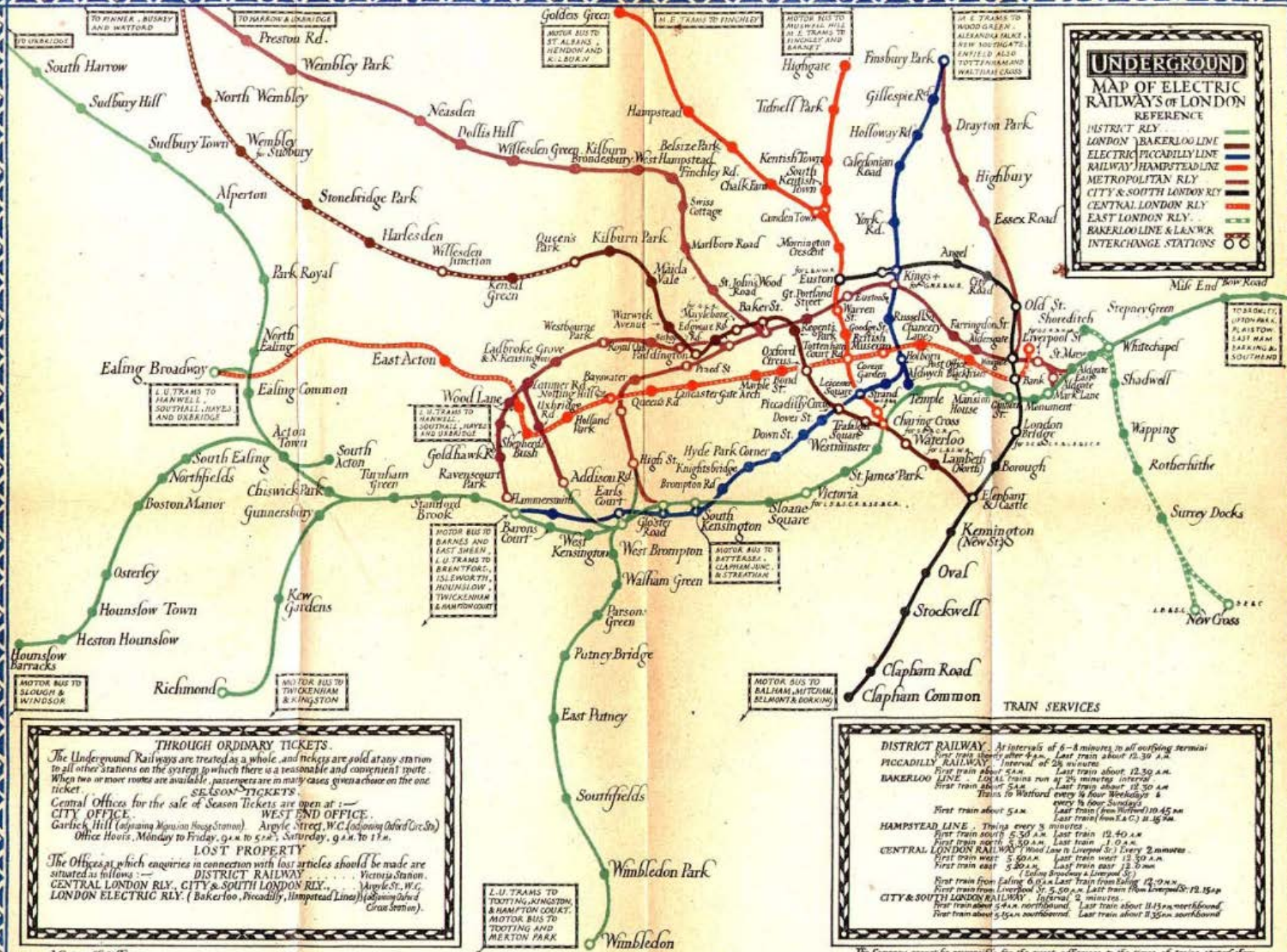
GEOG380 FA2018

Outline

- ▶ Design evaluation
- ▶ Gestalt principles in map design
- ▶ Map Composition







UNDERGROUND

MAP OF ELECTRIC RAILWAYS OF LONDON

REFERENCE

- DISTRICT RLY.
- LONDON & BAKERLOO LINE
- ELECTRIC PICCADILLY LINE
- RAILWAY/HAMPSTEAD LINE
- METROPOLITAN RLY.
- CITY & SOUTH LONDON RLY.
- CENTRAL LONDON RLY.
- EAST LONDON RLY.
- BAKERLOO LINE & L&NWR
- INTERCHANGE STATIONS

THROUGH ORDINARY TICKETS.
 The Underground Railways are treated as a whole, and tickets are sold at any station to all other stations on the system to which there is a reasonable and convenient route. When two or more routes are available, passengers are in many cases given a choice on the one ticket.

SEASON TICKETS.
 Central Offices for the sale of Season Tickets are open at:—
CITY OFFICE. Garlick Hill (adj. main station).
WEST END OFFICE. Argyle Street, W.C. (adj. main station).
 Office hours, Monday to Friday, 9 a.m. to 5 p.m.; Saturday, 9 a.m. to 1 p.m.

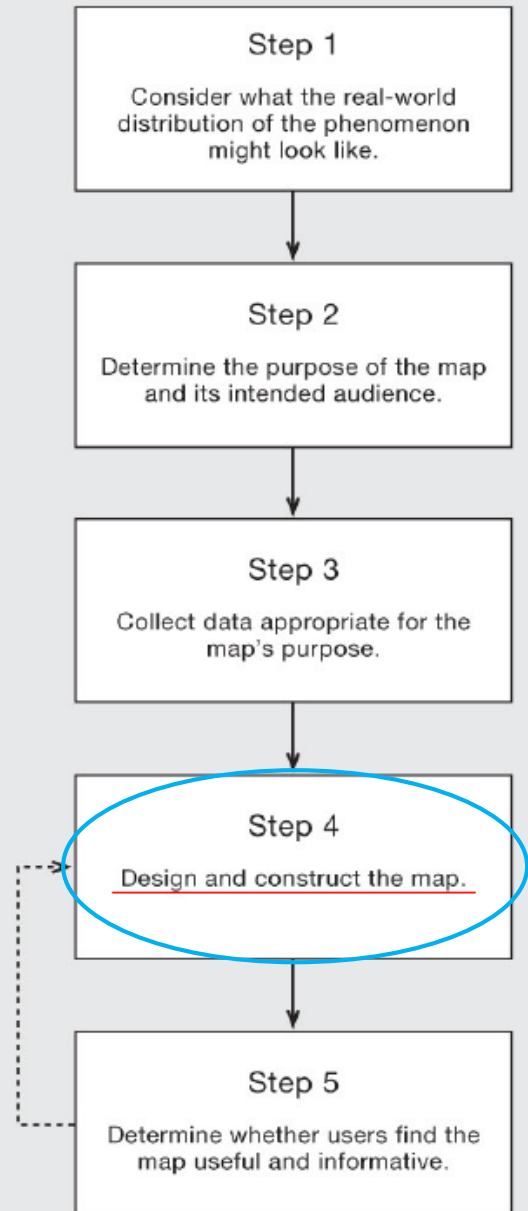
LOST PROPERTY.
 The Offices at which enquiries in connection with lost articles should be made are situated as follows:—
DISTRICT RAILWAY. Victoria Station.
CENTRAL LONDON RLY., CITY & SOUTH LONDON RLY. Argyle St., W.C.
LONDON ELECTRIC RLY. (Bakerloo, Piccadilly, Hampstead Lines) (adj. main station).
 Circular 3000.

DISTRICT RAILWAY. At intervals of 6-8 minutes in all working termini.
PICCADILLY RAILWAY. Interval of 25 minutes.
BAKERLOO LINE. Local trains run at 25 minutes intervals.
HAMPSTEAD LINE. Trains to Watford every 15 minutes Weekdays & every 10 minutes Saturdays.
CENTRAL LONDON RAILWAY. Interval of 2 minutes.
CITY & SOUTH LONDON RAILWAY. Interval of 2 minutes.
EAST LONDON RAILWAY. Interval of 2 minutes.

Cartographic Design

- ▶ Using designated **graphic symbols** to visualize **the meaning** of spatial information
- ▶ The map communication model revisited

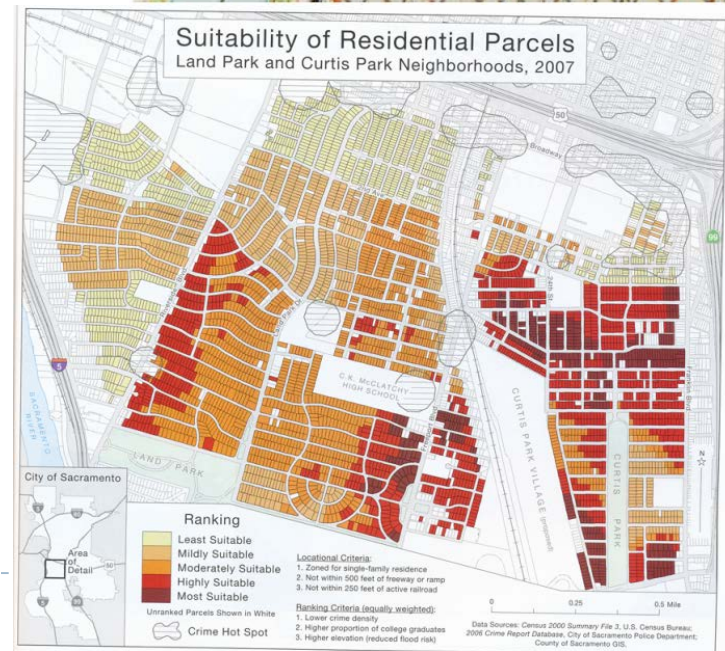
Map Communication Model



Objectives of Map Design

- ▶ General reference map
 - ▶ All symbols should be equally important
- ▶ Thematic map
 - ▶ Overall, the form of a given geographical distribution must be portrayed

Q. What kind of information do you see from the two maps?



COLOR PLATE 12.3 The final real estate site suitability map, resulting from the case study in section 12.2.

Map Aesthetics

- ▶ cA R T o g r a p h y

- ▶ “Maps should have *harmony* within themselves. An ugly map, with *crude colors, careless line work, and disagreeable, poorly arranged lettering* may be intrinsically as accurate as a beautiful map, but it is less likely to inspire *confidence*.”

John K. Wright

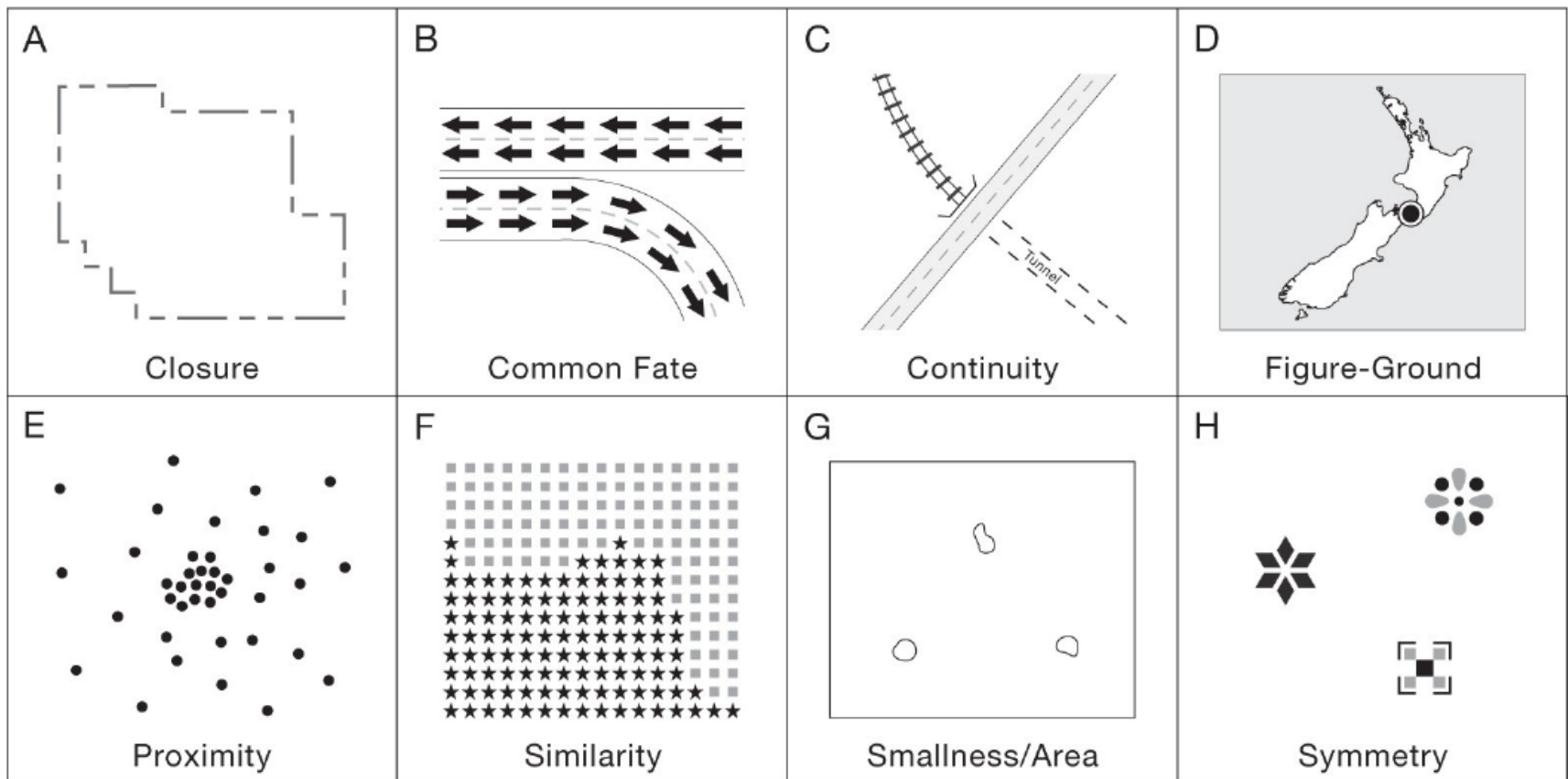
- ▶ Bad maps vs. Incorrect maps

- ▶ Good design = *Harmony* + *Composition* + *Clarity*



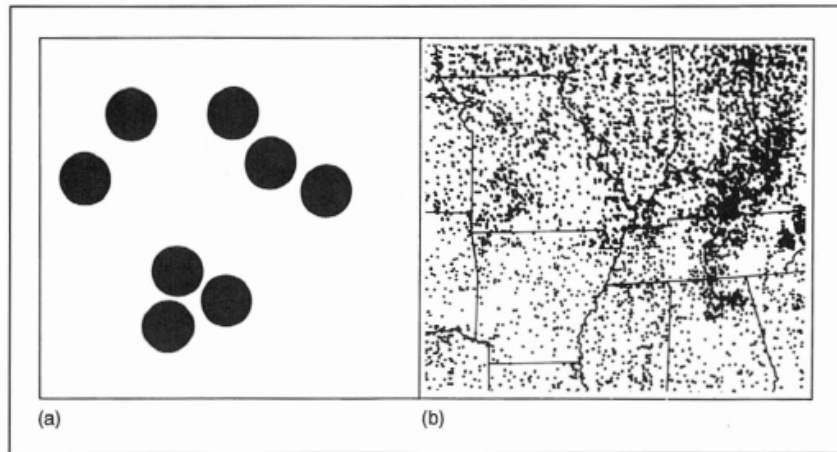
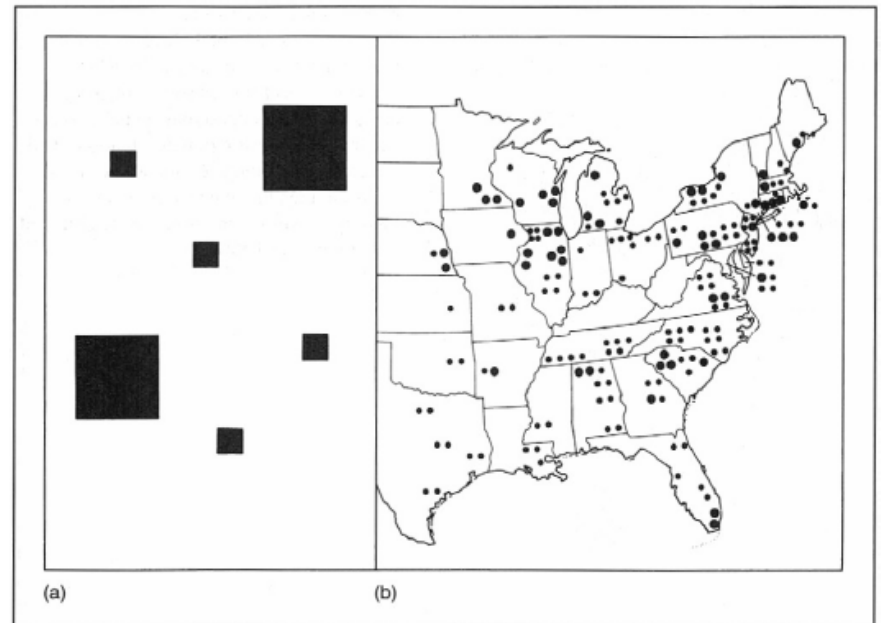
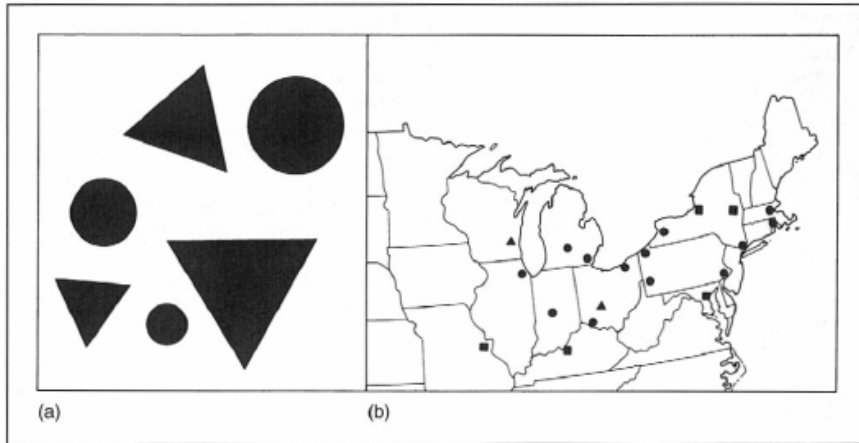
Gestalt Principles for visual perception

- ▶ The meaning of graphic symbols as “unified whole”, or a visual group



▶ Example of Common Fate: <http://vogons.zetafleet.com/files/mac-lemmings.gif>

Gestalt Principles – similarity, proximity



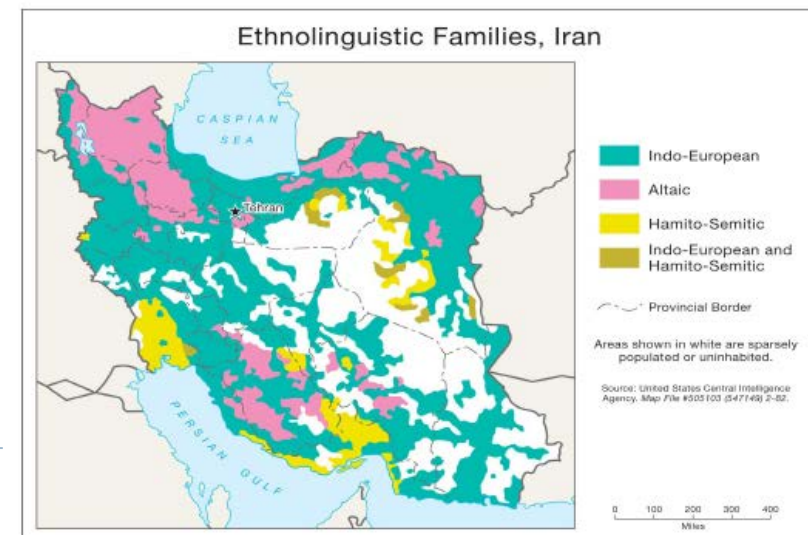
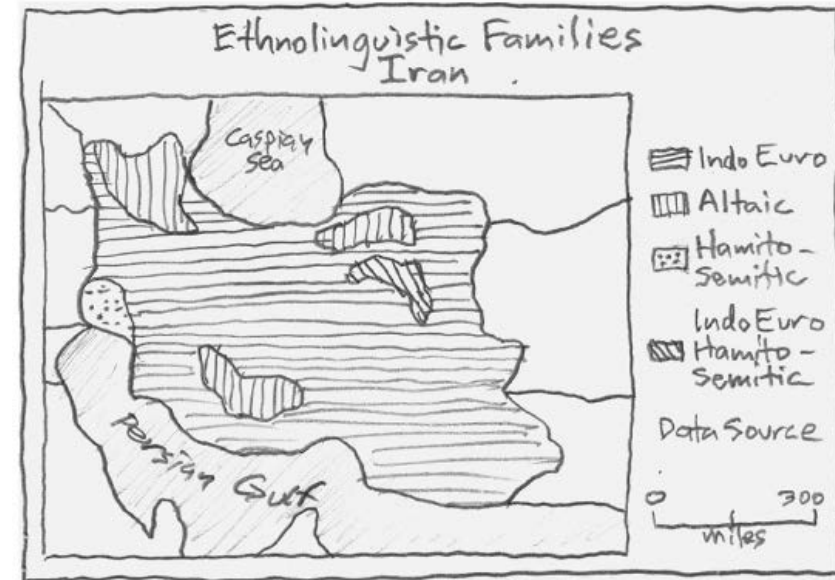
Group Activity

- ▶ Make a group of 3-4 people around you.
- ▶ Your group will be assigned one of the 8 types of Gestalt Principles in cartography.
- ▶ Find an example of your group's type.
 - ▶ Try to search the textbook or internet!
- ▶ Share your group's finding with other groups.



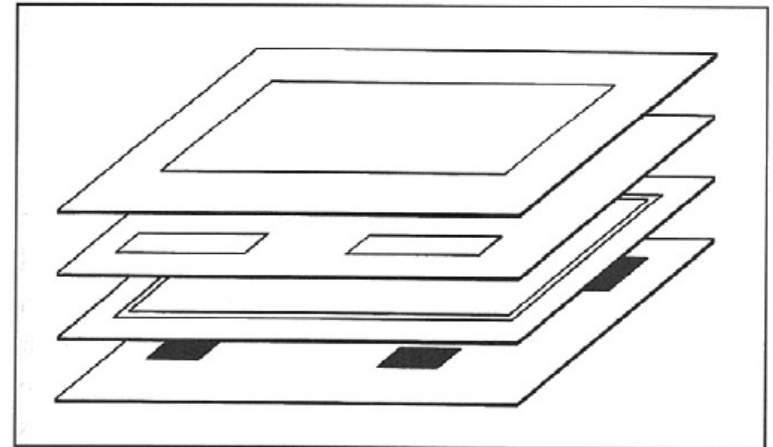
Main Steps of Cartographic Design revisited

- ▶ Know how the map will be reproduced (media)
- ▶ Select a scale and projection
- ▶ Determine data processing method and symbolization
- ▶ Choose map elements
- ▶ Establish an intellectual hierarchy
- ▶ Create sketch maps
- ▶ Construct the map



Map Composition

- ▶ A thematic map can be considered to be a composition of **levels** (hierarchy between layers)
 - ▶ Each level contains one or more design elements
- ▶ The arrangement of elements at each level is called **planar organization** ↔
- ▶ The arrangement between levels is called **hierarchical organization**, or **visual hierarchy** (in the order of importance) ↔



Visual Hierarchy

- ▶ **The intellectual plan** for the map and eventually a graphic solution that satisfies the plan
- ▶ **A guideline** to organize map elements in the hierarchy

Usual Intellectual Level*	Object	Visual Level
1	Thematic symbols	I
1	Title, legend material, symbols and labeling	I
2	Base map—land areas, including political boundaries, significant physical features	II
3–4	Important explanatory materials—map sources and credits	II–III
4	Base map—water features, such as oceans, lakes, bays, rivers	III
5	Other base-map elements—labels, grids, scales	IV

Activity: Visual Hierarchy

What is the better map? Why do you think so?

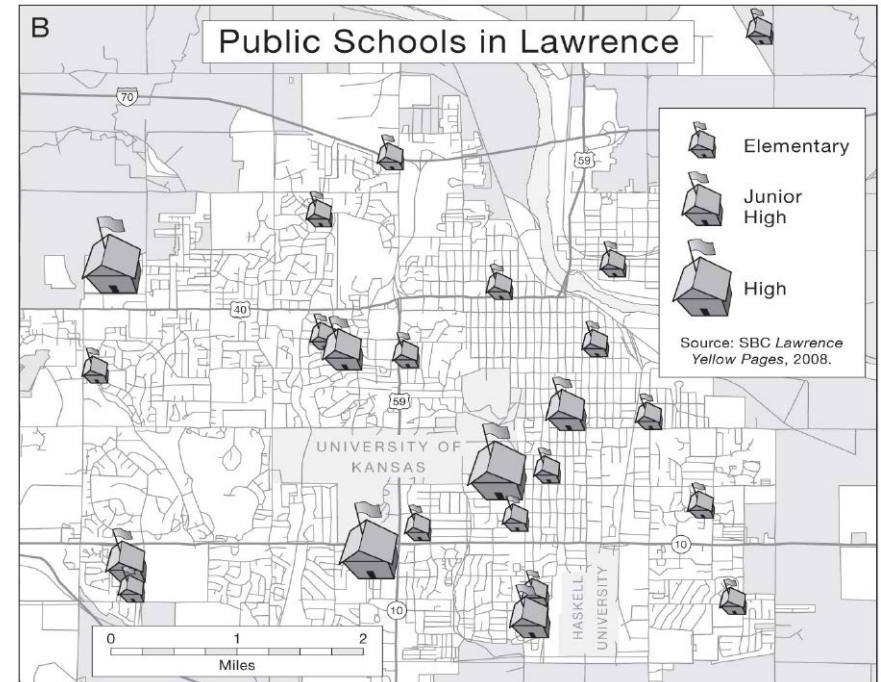
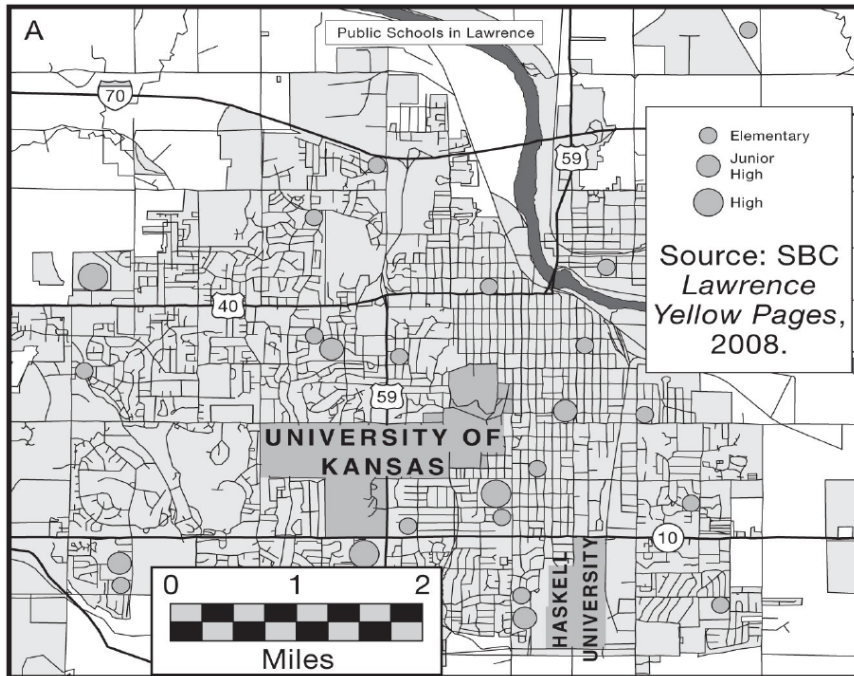


Figure-Ground Organization

- ▶ A way of organizing perception into a **hierarchy** of figures and grounds
- ▶ **Figures**: things that are more important and dominating
- ▶ **Ground**: things that are less important

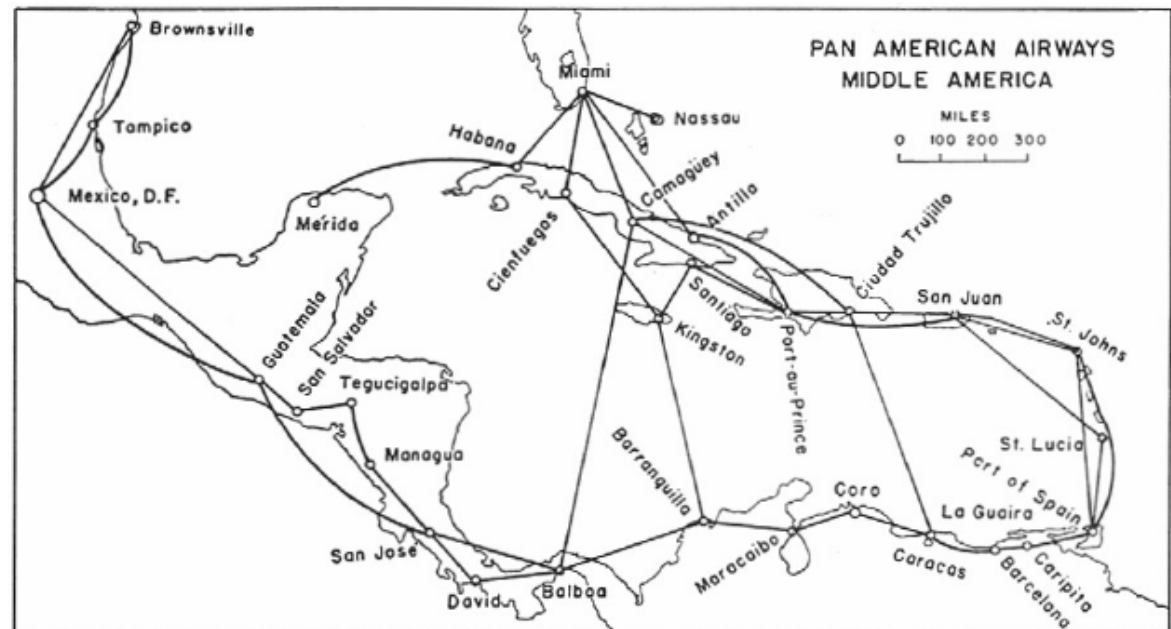
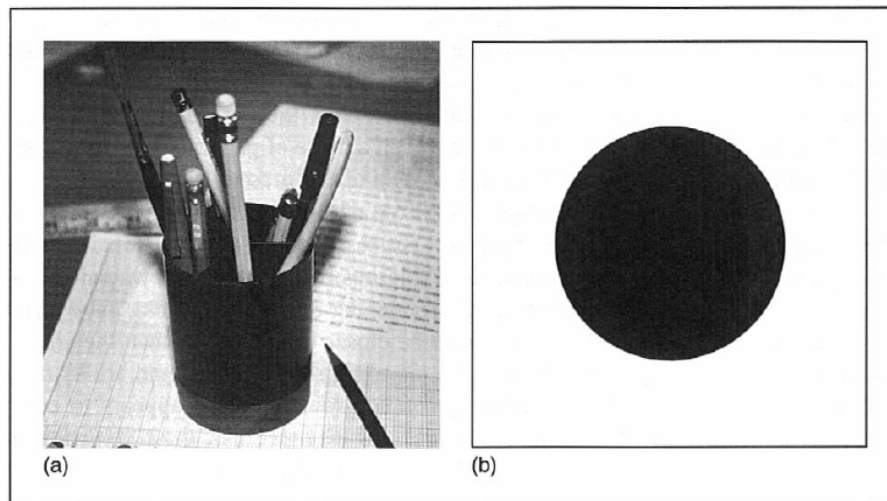


Figure Formation

- ▶ Figures are seen separately from the remainder of the visual field
 - ▶ With form and shape
 - ▶ Appears to be closer to the viewer
- ▶ The ground may appear to continue unbroken behind the figure



Contrast

- ▶ Fundamental in developing figure and ground
- ▶ Can be achieved using
 - ▶ Line
 - ▶ Texture
 - ▶ Value
 - ▶ Detail
 - ▶ Color
 - ▶ ...in the followings

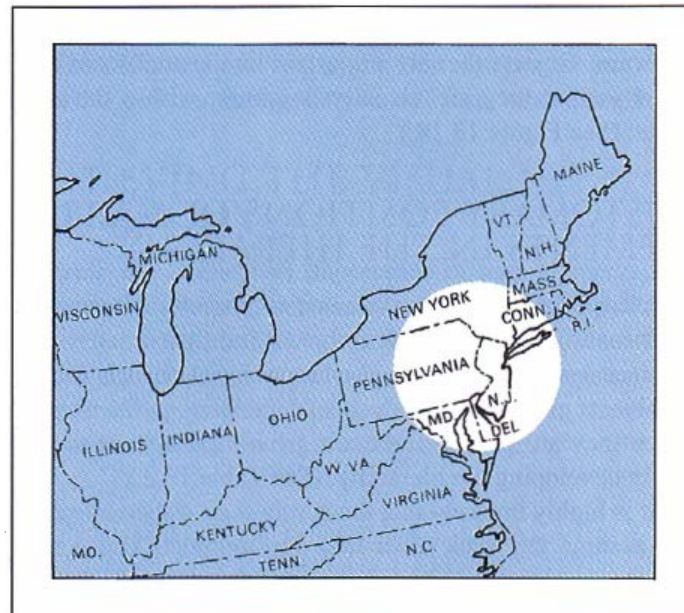
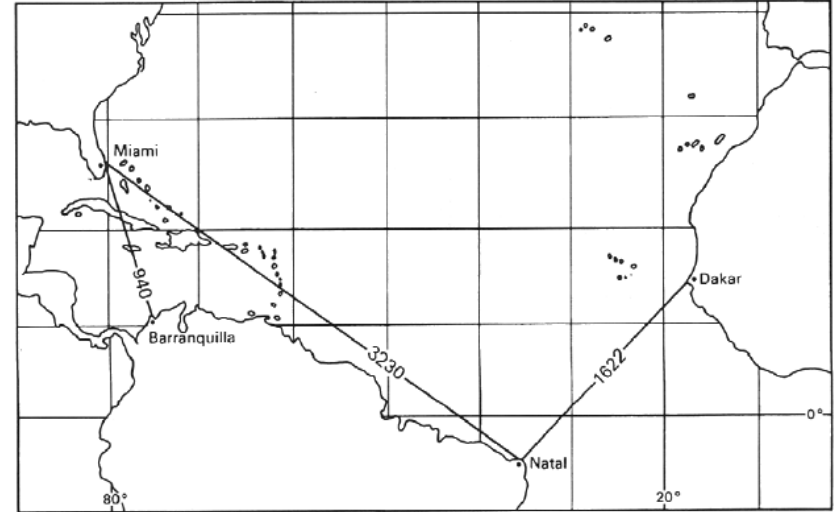
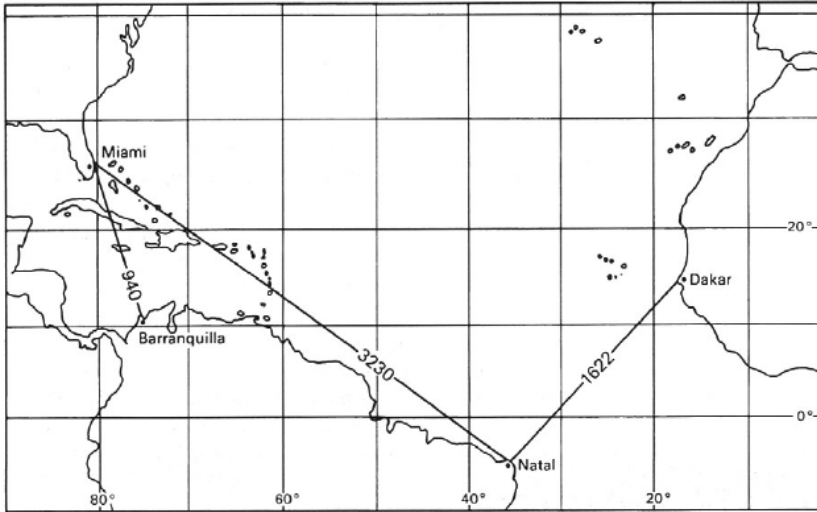


Line Contrast

- ▶ **Line character**
 - ▶ Line segments, value, or color
 - ▶ No clear relationship to intellectual hierarchy
- ▶ **Line weight: thickness**
 - ▶ Broader lines may carry more intellectual importance

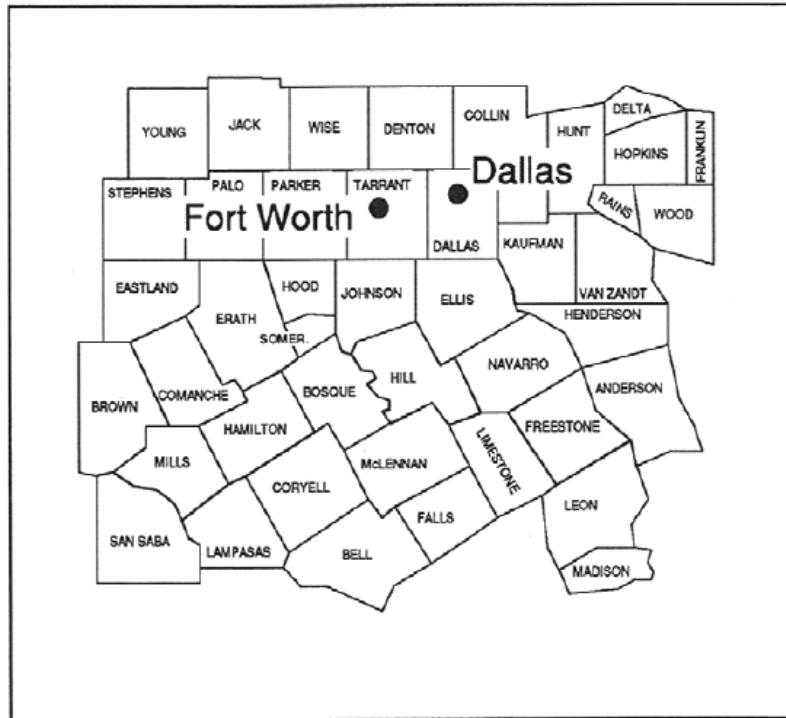


Texture and Value Contrast

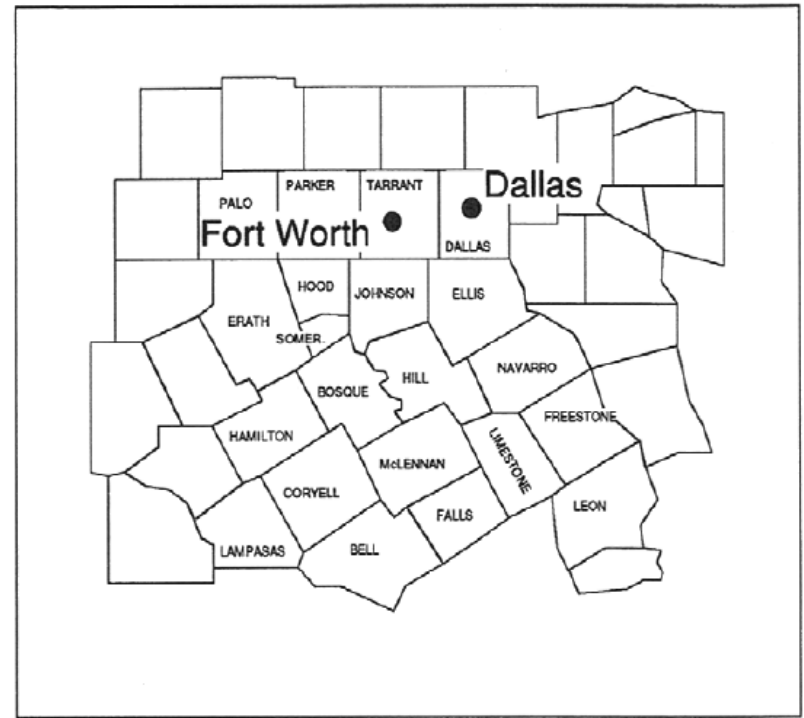


Contrast in detail

- ▶ The reader's eye will be attracted to areas of the map with the most details
- ▶ Need to avoid unnecessary, distracting details



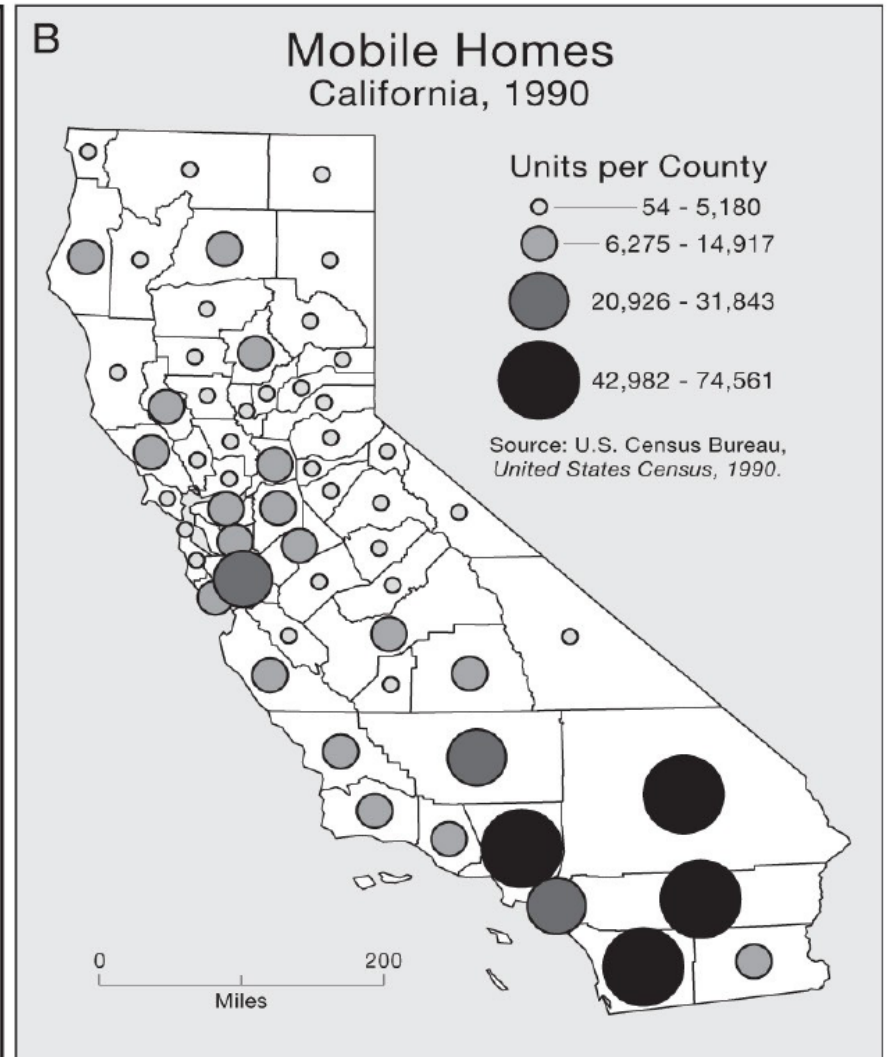
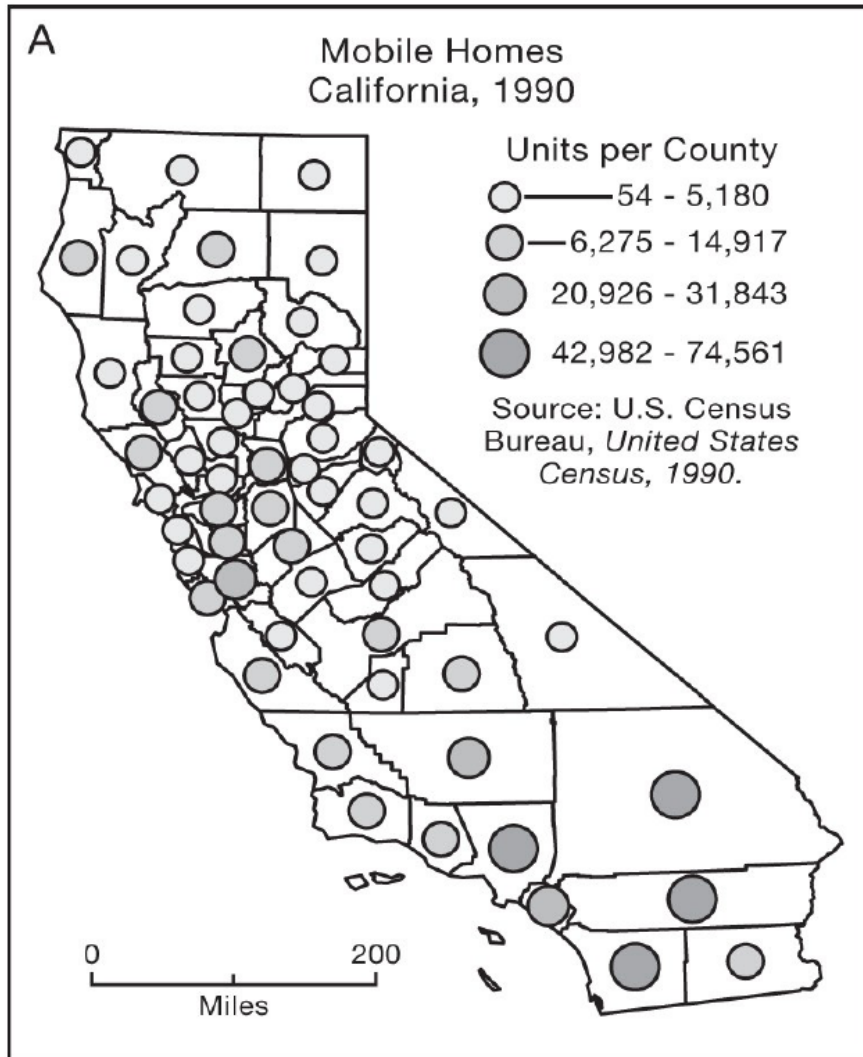
(a)



(b)

Activity: Got Contrast?

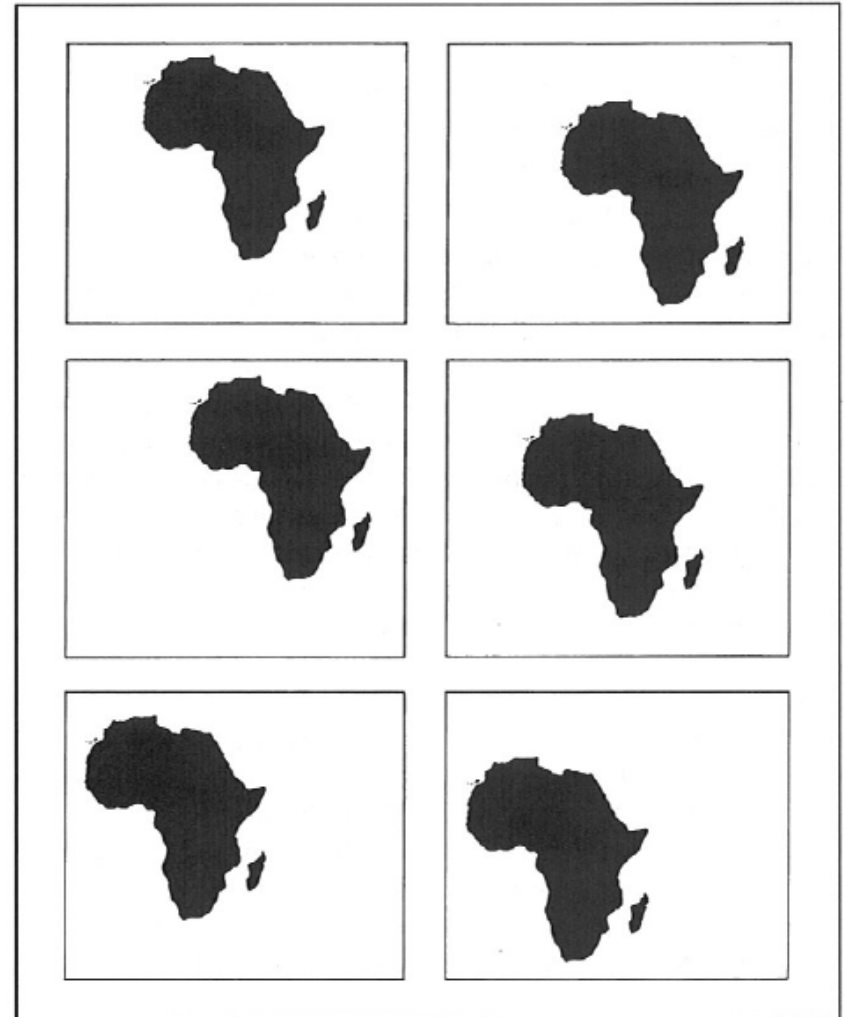
What is the better map? Why do you think so?



Planar Organization

: Visual Balance within a level

- ▶ Balance is achieved when everything appears to have come to **a standstill**
- ▶ Factors include
 - ▶ Location of features
 - ▶ Size
 - ▶ Color, interest, and isolation
 - ▶ Shape



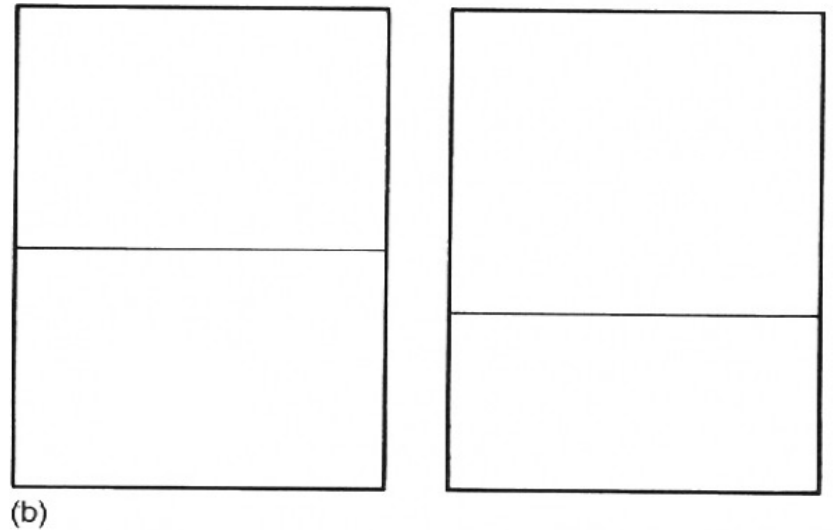
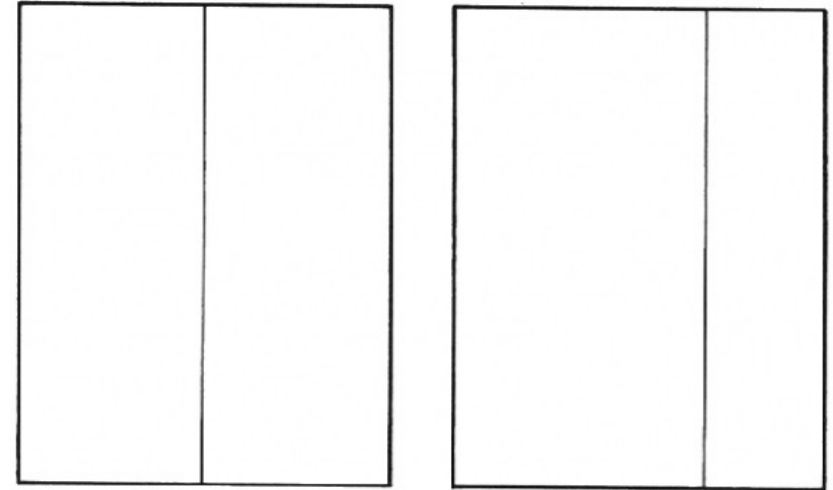
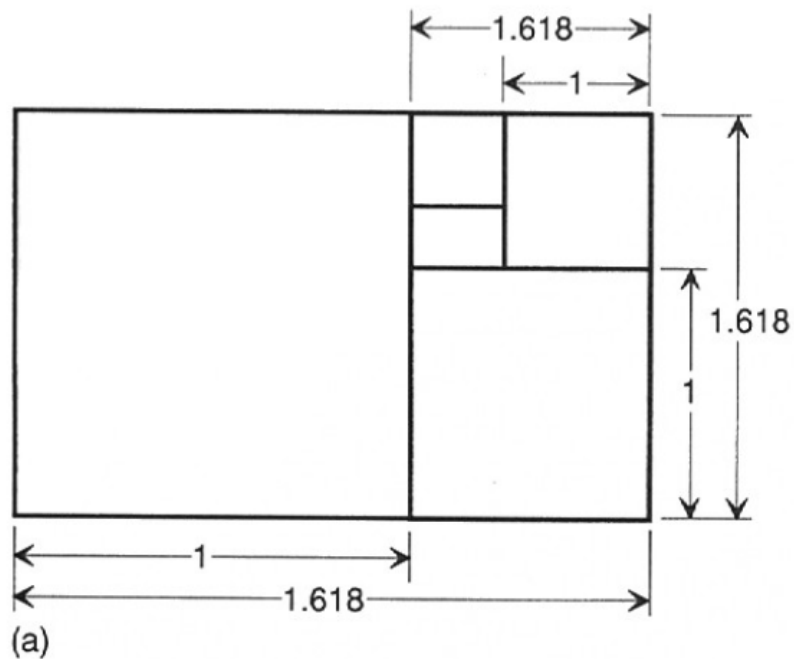
Achieving Visual Balance

- ▶ Equal divisions of space are the least interesting
 - ▶ **Inequality** makes layout visually alive
- ▶ Small spaces struggling against large spaces
- ▶ **Variety** creates interest
 - ▶ Complex design may be more exciting than simple ones



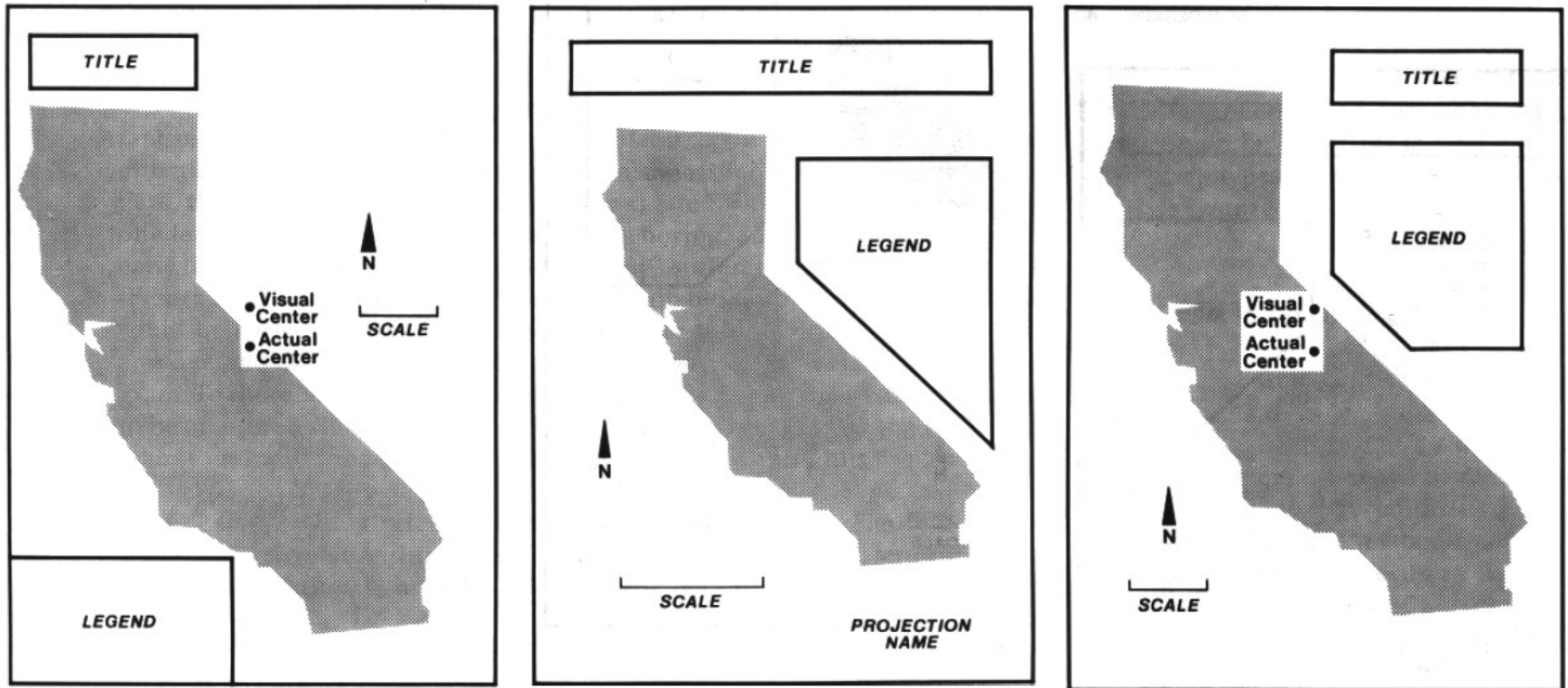
Golden Section May Help

- ▶ When you really need help, this might be a good choice...



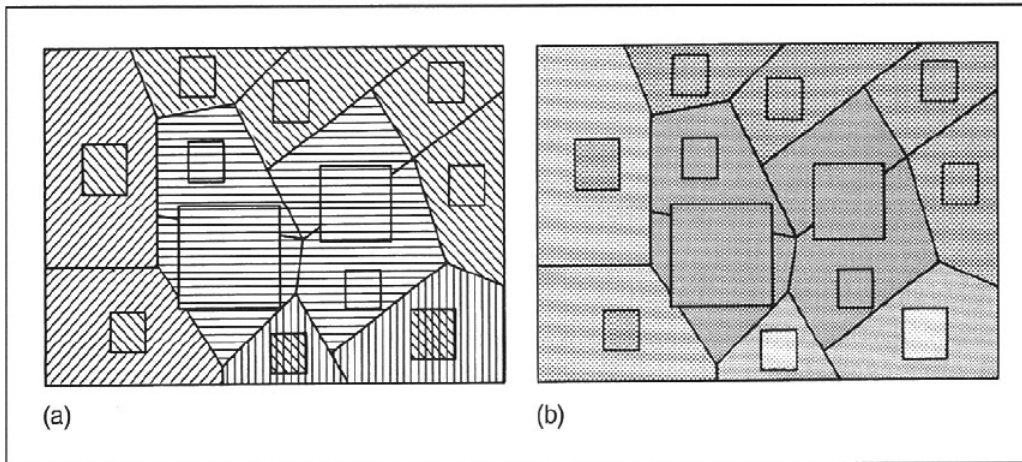
Design Choices?

- ▶ Which one is the most suitable?

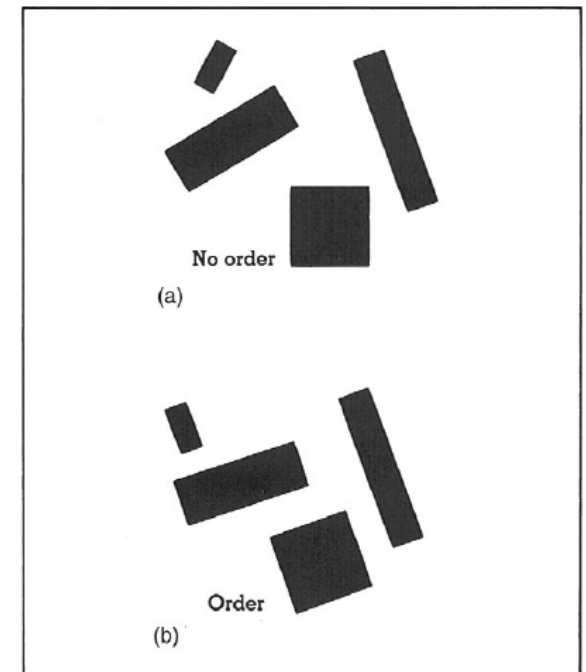


Internal Organization

- ▶ Internal order implies an **underlying structure** that binds the parts of the whole together
- ▶ **Intra-parallelism** is achieved when the elements are aligned with each other

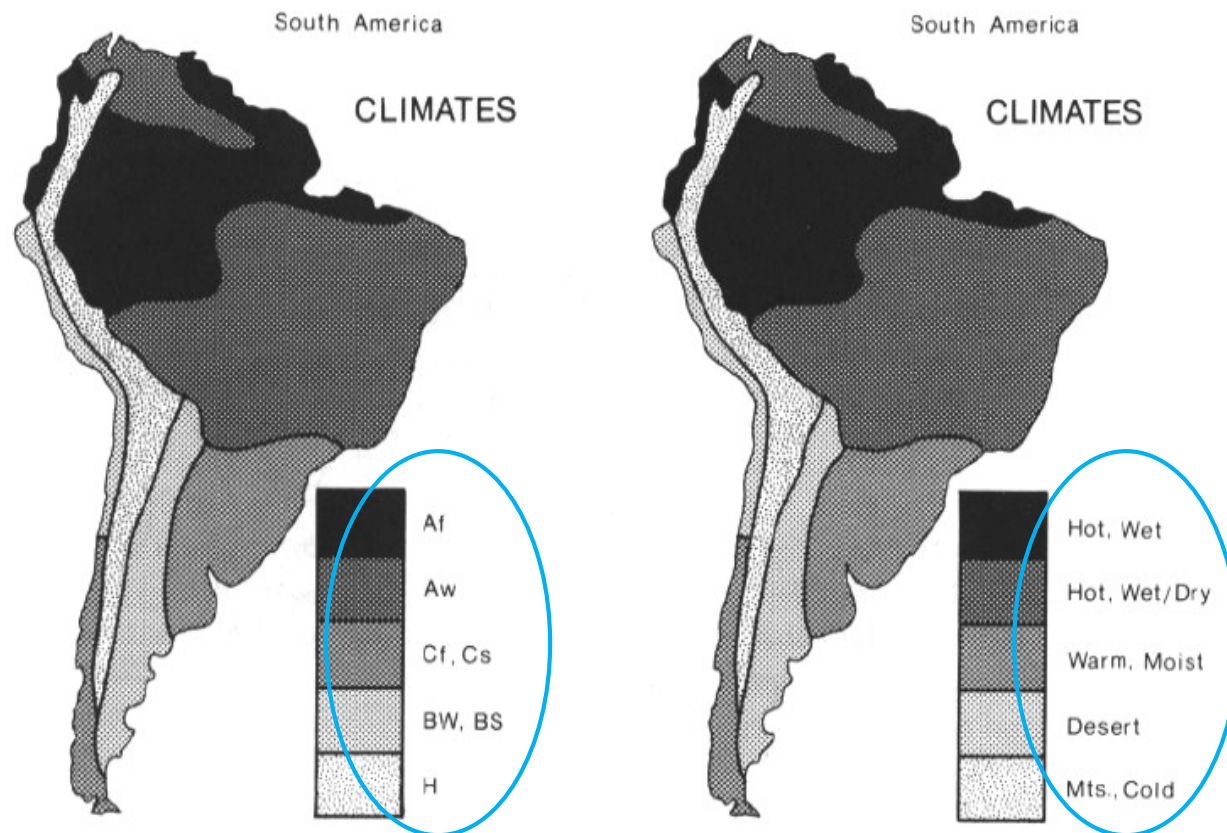


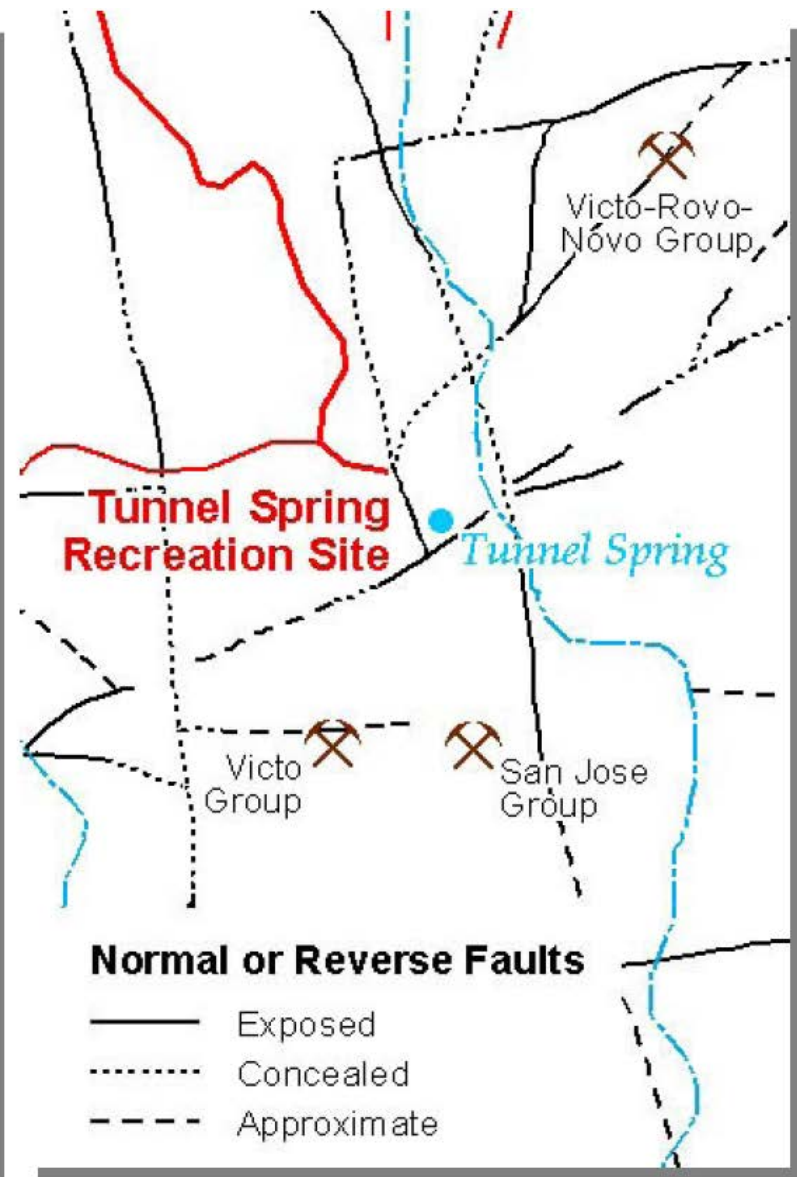
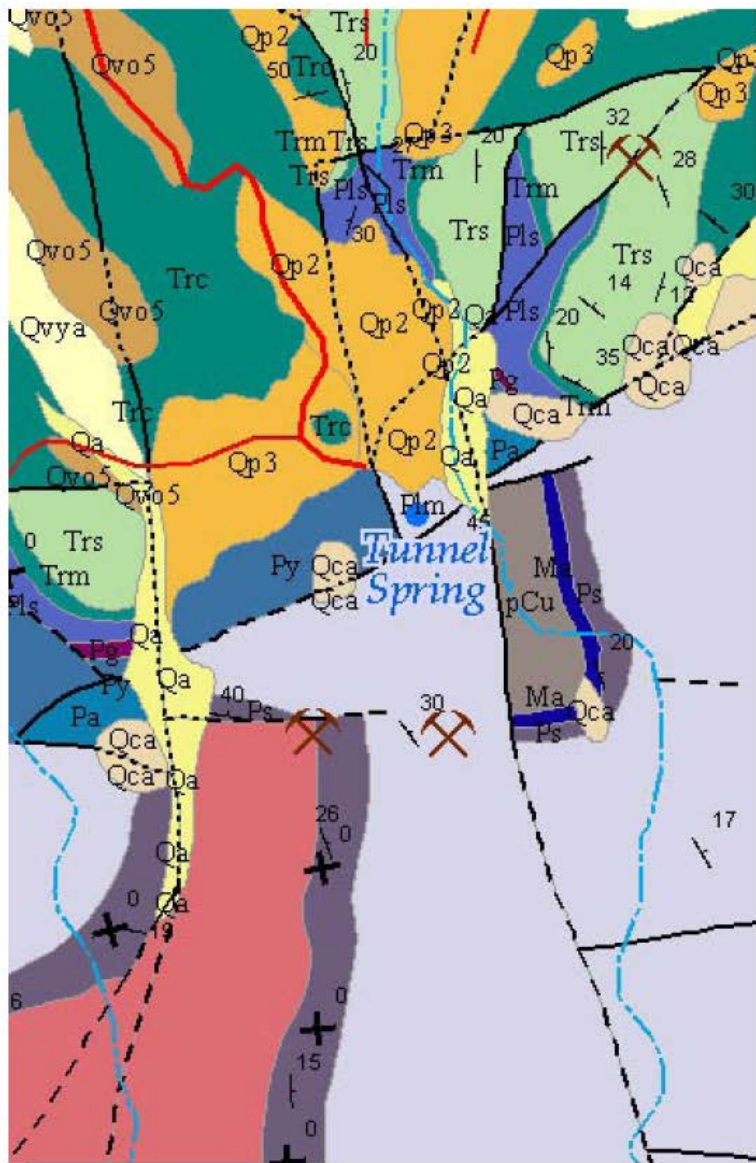
(A) No order because square symbols have different structures. (B) Order because both square and polygon symbols have structures as the dots used appear to be "parallel" (they point to one direction).



Design for an Intended Audience

- ▶ “*Confusion and clutter are failures of design, not attributes of information*” (Tufte, 1990)





Design evaluation

- ▶ A map should be suited to **the needs** of its users
- ▶ A map should be **easy** to use
- ▶ Maps should be **accurate**, presenting information without error, distortions, or misrepresentation
- ▶ The **language** of the map should relate to the elements or qualities represented
- ▶ A map should be **clear, legible, and attractive**
- ▶ Many maps would ideally permit **interaction** with the user, allowing changes, updates, or personalization



Summary

- ▶ Importance of cartographic design
- ▶ Design process and evaluation
- ▶ Design principles
 - ▶ Gestalt principles
 - ▶ Map composition
 - ▶ Planar organization
 - ▶ Visual hierarchy



For next time...

- ▶ Readings

- ▶ Ch. 10 & 18

