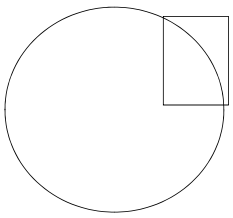
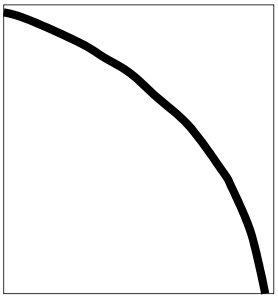
Retinal Input

- Depends on:
  - light source
  - surface reflectance
  - surface orientation
  - observer's viewing position

Segregating Features in the Input

- Contours





Segregating Features in the Input

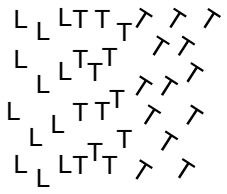
- Contours
- Ganzfeld
- POINT: We need contours. Contours are a basic part of *form* perception. Without contours, we would not see anything.

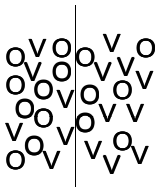
Texture Segregation

- Texture Segregation

Texture Segregation

- Texture Segregation
- NOT grouping by similarity.





Texture Segregation

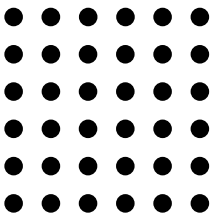
- Texture Segregation
- NOT grouping by similarity.
- POINT: The analysis of feature information *precedes* the combination of this “feature” information.

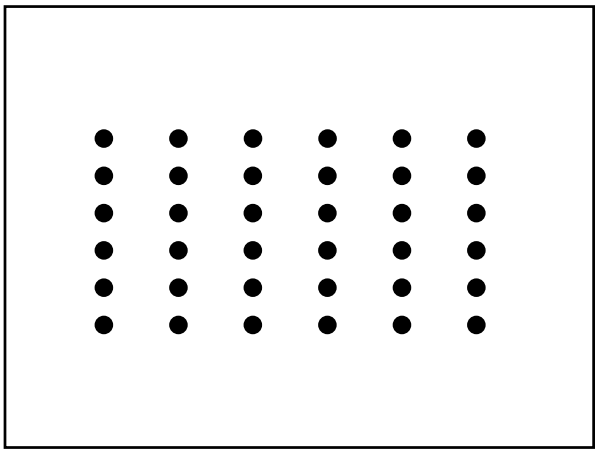
Figural Organization

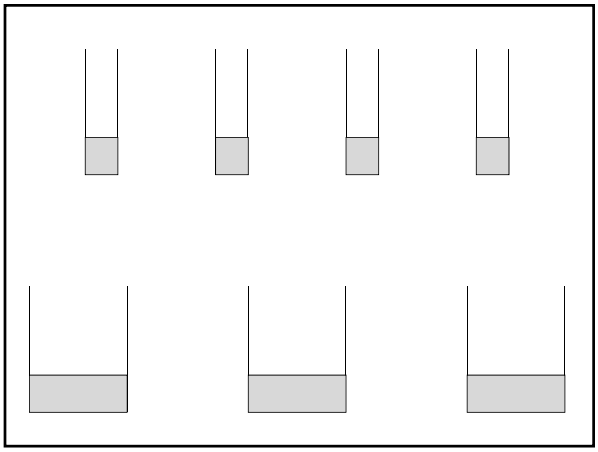
- Gestalt Psychology
- *Gestalt psychologists investigated three areas:*
  - laws of grouping
  - the “goodness” of figures
  - figure-ground relationships

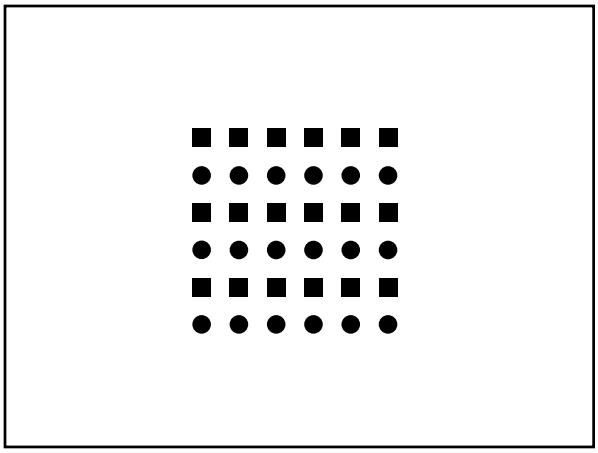
Laws (heuristics) of Grouping

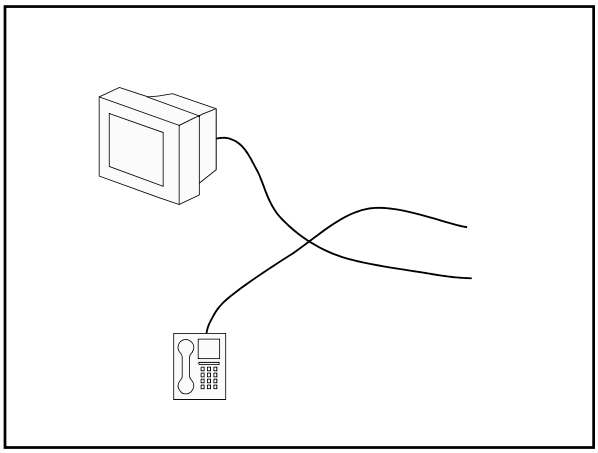
- Law of Proximity
- Law of Similarity
- Law of Good Continuation
- Law of Closure
- Law of Common Fate
- Law of Familiarity

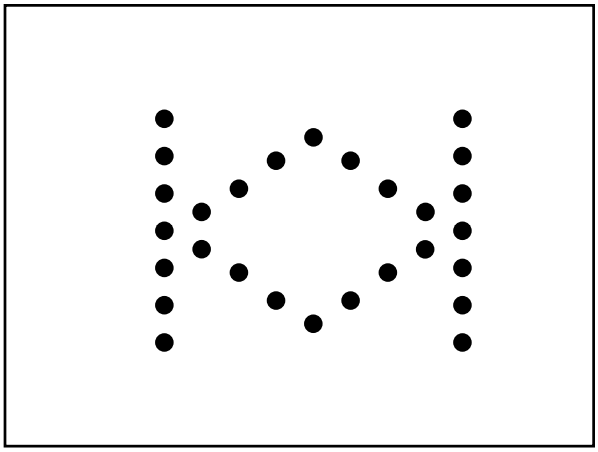


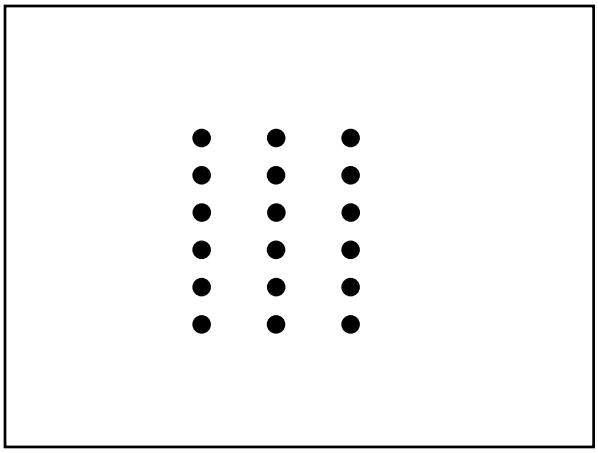






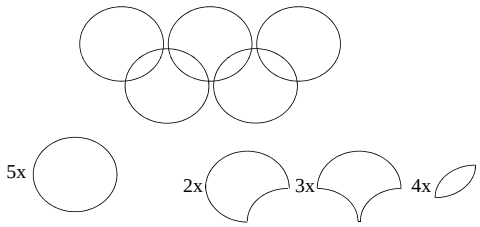






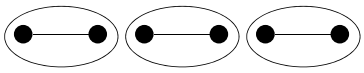
Law of Pragnanz

- Best, simplest, most stable shape.



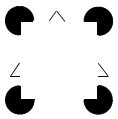
Other Principles of Grouping

- Common Region
- Element Connectedness
- Synchrony



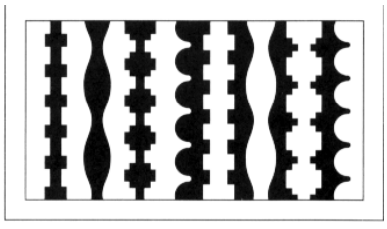
Repetition Discrimination Task

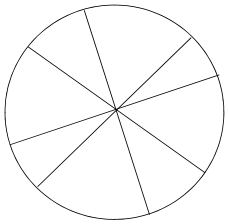
Illusory Contours

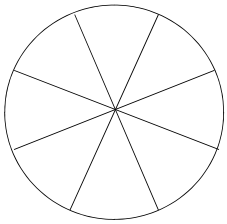


Separating Objects

- ***Properties related to figure perception:***
- symmetry
- smaller figure
- orientation
- meaning

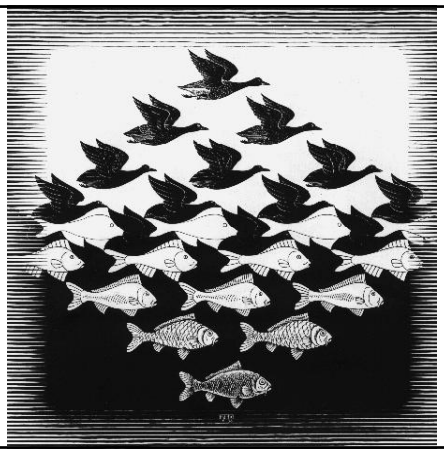






Separating Objects

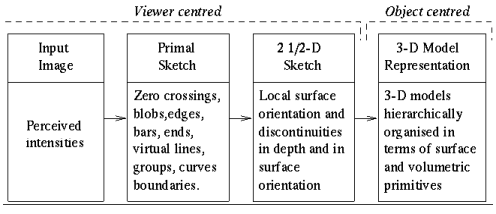
- ***Four properties of figure/ground are:***
- the *figure feels "thing-like"*
- the *figure feels like it's in front*
- the *contour seems to belong to the figure*
- the *background seems formless*



Pandemonium Model

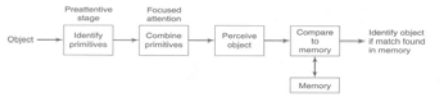
- data-driven
- Demons
  - Image > Feature > Cognitive > Decision
- limitations?

Marr



- Raw primal sketch—based on primitives
- 2½ D sketch – group primitives
- 3-D representation (perceive 3D object)

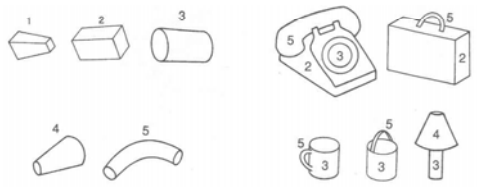
Feature Integration Theory (FIT)



- FIT
  - preattentive processes
  - active focal attention

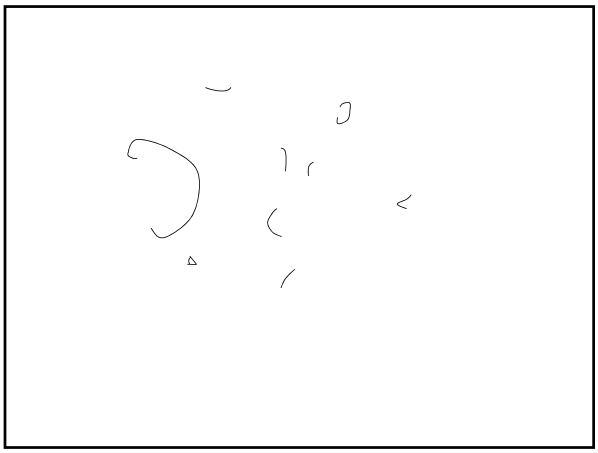
Biederman

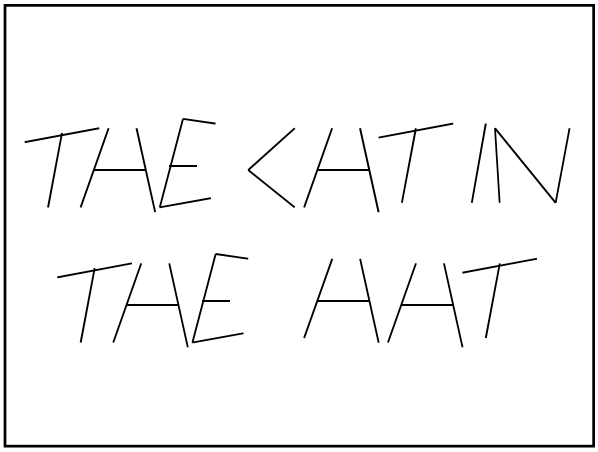
- volumetric primitives – geons (36)
- 3 principles



Object Recognition and Identification

- Data-Driven--bottom-up
- Conceptually-driven--top-down





Object Recognition and Identification

- Data-Driven--bottom-up
- Conceptually-driven--top-down
- We cannot recognize the parts without the context of the whole, and we cannot recognize the whole without information about the parts. **Perception has to proceed in both the bottom-up and top-down directions at the same time.**