Chapter 4: Sensation and Perception

Lecture Overview

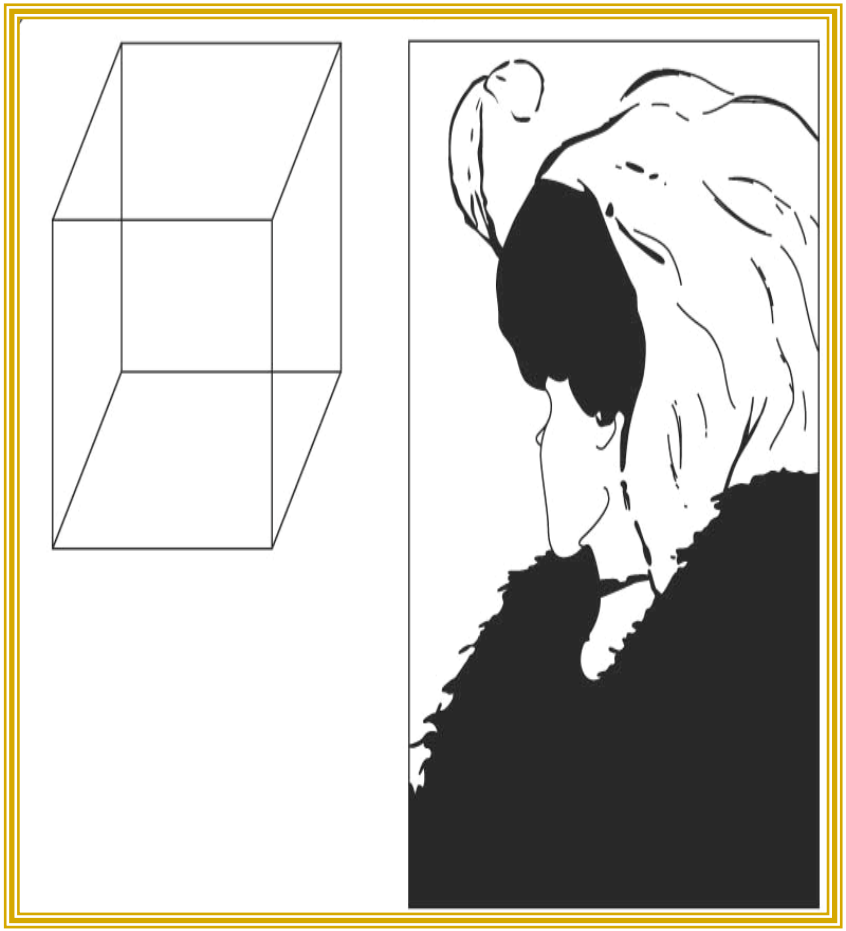
- Introduction to Sensation & Perception
- Understanding Sensation
- How We See and Hear
- Our Other Senses
- Understanding Perception

Introduction to Sensation and Perception

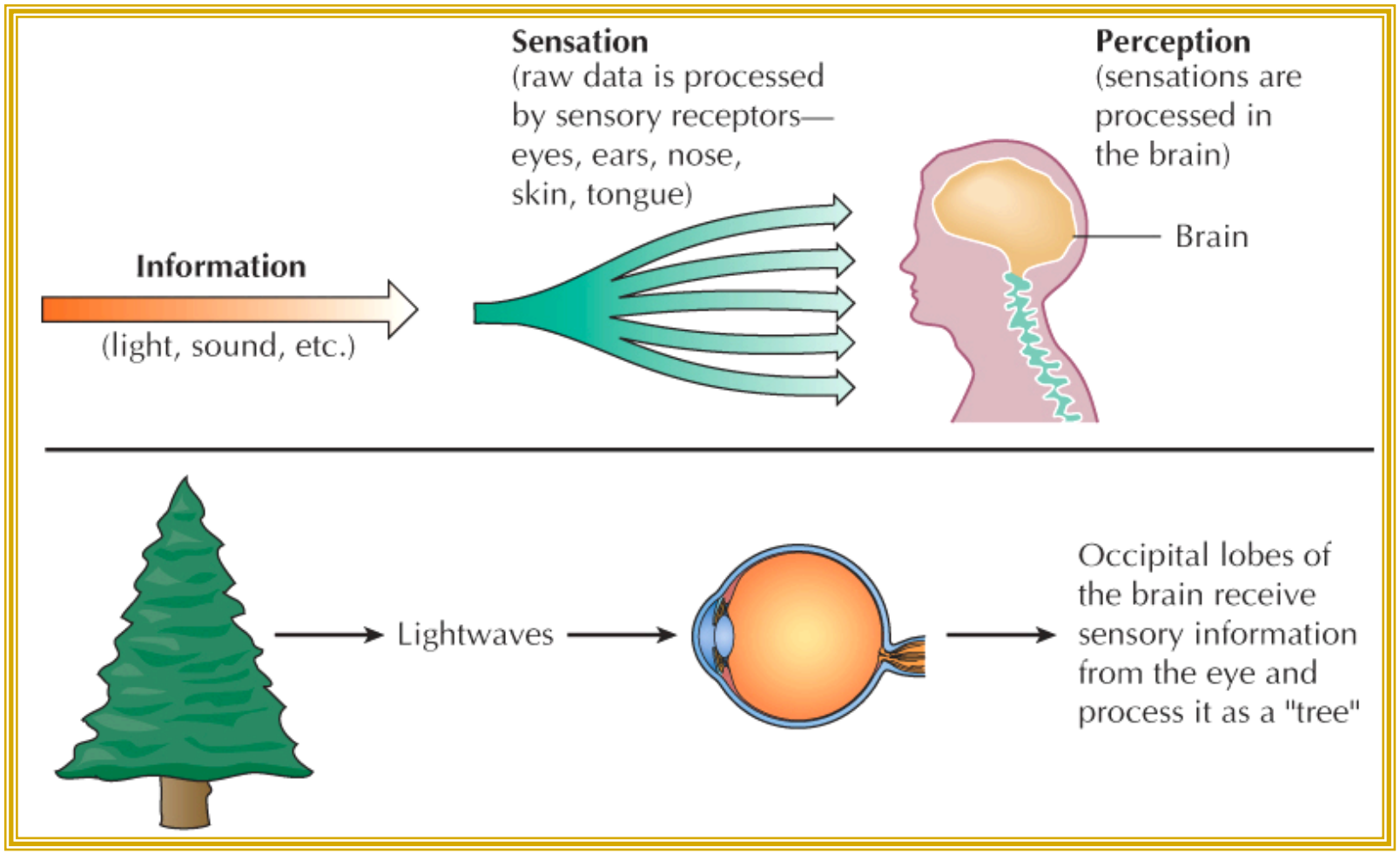
- **Sensation** *(*process of receiving, converting, and transmitting raw sensory information from the external and internal environments to the brain)
- **Perception** *(*process of selecting, organizing, and interpreting sensory information)

Sensation Versus Perception

- When you stare at the cube on the left, which area is the top, bottom, or back?
- In the figure on the right, is this a young woman looking to the right, or an older woman with her chin buried in her jacket?



Sensation Vs. Perception



Understanding Sensation: Processing

- **Processing** (sensory organs contain ***receptors*** that receive sensory information from the environment)

Understanding Sensation: Processing

Three Types of Processing:

1. **Transduction** converts the sensory stimuli into neural impulses that are sent on to the brain.
2. **Sensory reduction** filters and analyzes incoming sensations before sending on to the brain.
3. **Coding** converts particular sensory input into a specific sensation sent to parts of the brain.

Understanding Sensation: Thresholds

- **Psychophysics**: Testing limits and changes
  - Absolute Threshold: smallest amount of a stimulus we can detect
  - Difference Threshold: minimal difference needed to detect a a stimulus change; also called the *just noticeable difference* (JND)

Understanding Sensation: Thresholds

- **Sensory Adaptation:** decreased sensory response to continuous stimulation

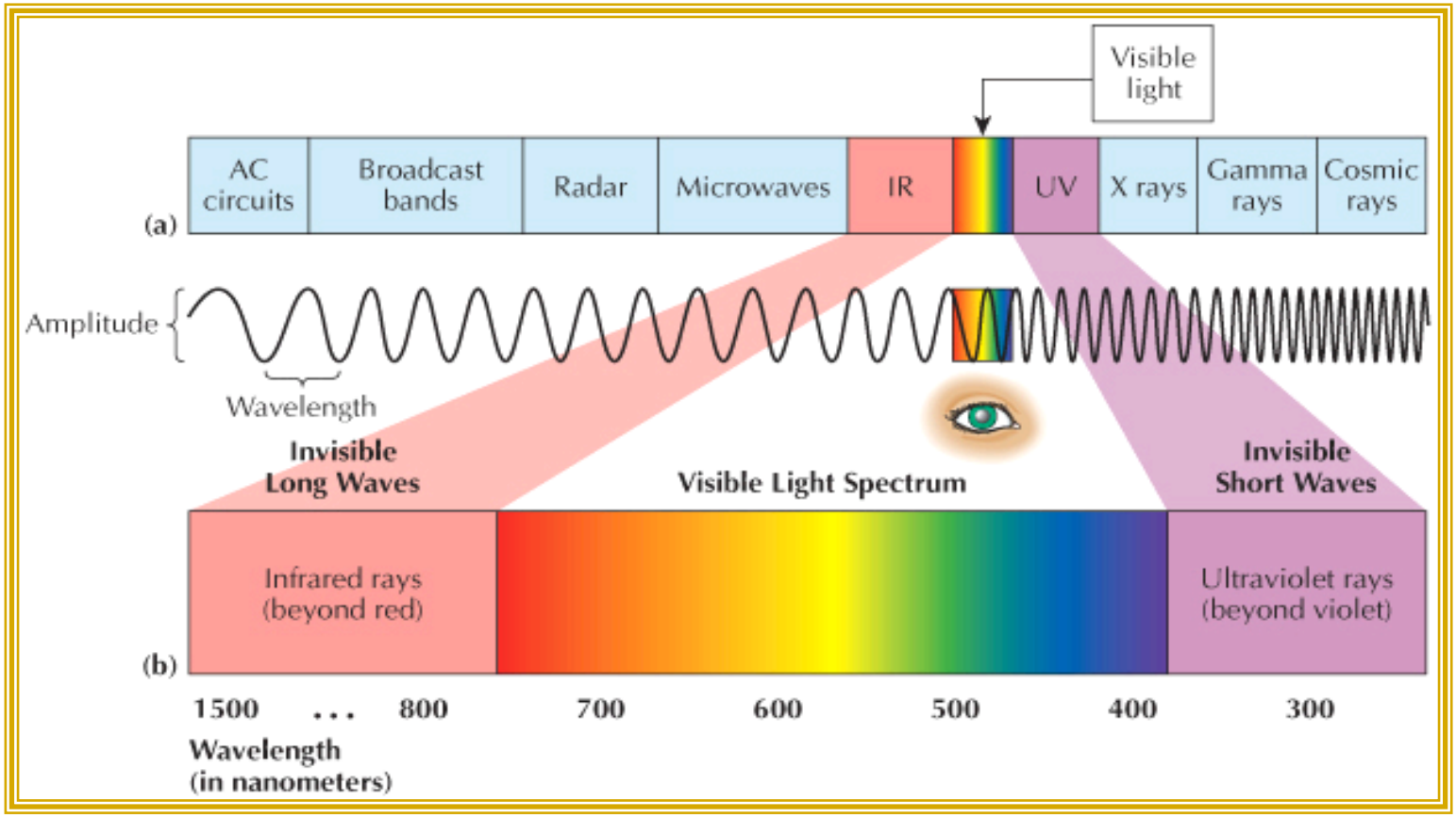
How We See

- **VISION-** How We See

- Light is a form of electromagnetic energy that moves in waves.

- Many types of electromagnetic waves form the electromagnetic spectrum.

How We See: Electromagnetic Spectrum



How We See: Light Waves

- **Light waves** vary in:

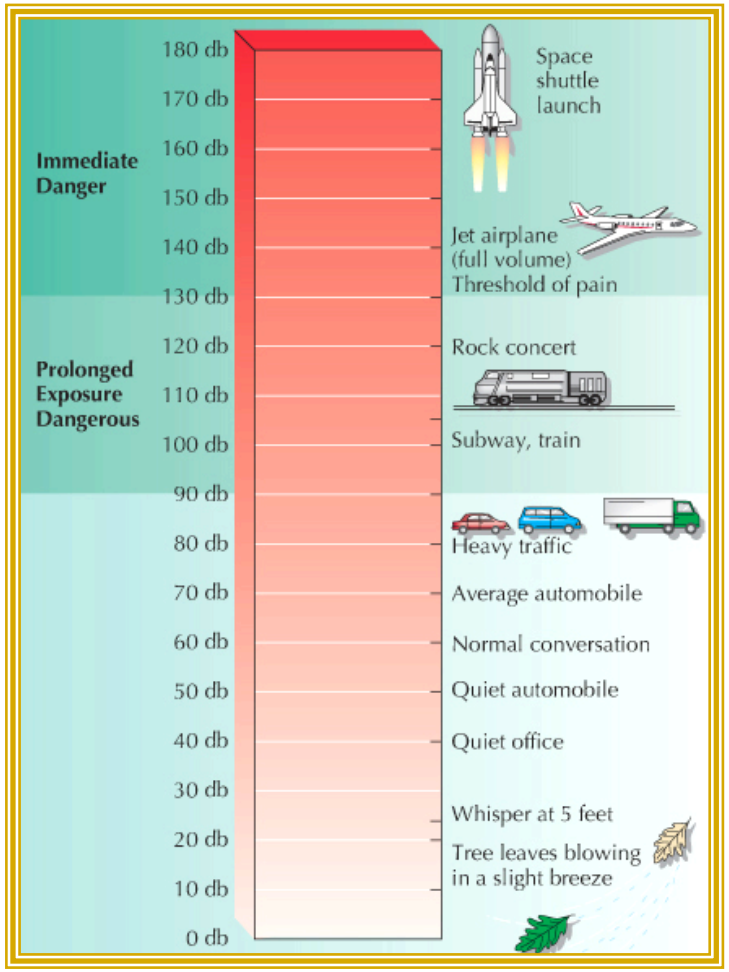
- **length** (wavelength), which determines frequency (hue or color).
- **height** (amplitude), which determines brightness or intensity.

How We Hear: Audition

- **Sound** results from movement of air molecules in a particular wave pattern.

- **Sound waves** vary in:
  - length (wavelength), which determines *pitch* (highness or lowness).
  - height (amplitude), which determines *loudness* (intensity of the sound).

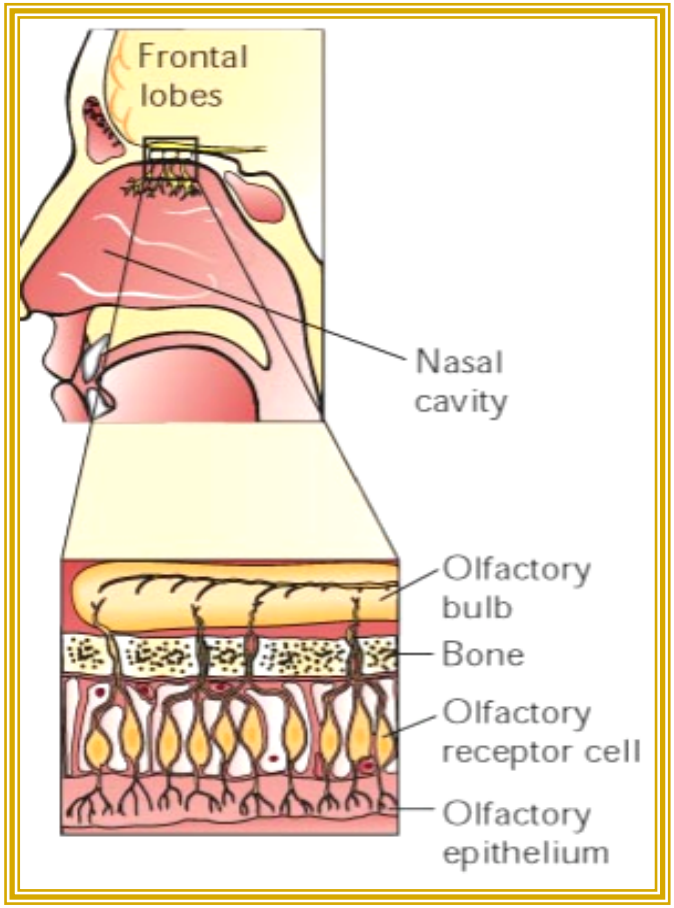
How We Hear: Audition



- The loudness of a sound is measured in *decibels*. Constant noise above 90 decibels can cause permanent nerve damage to the ear.

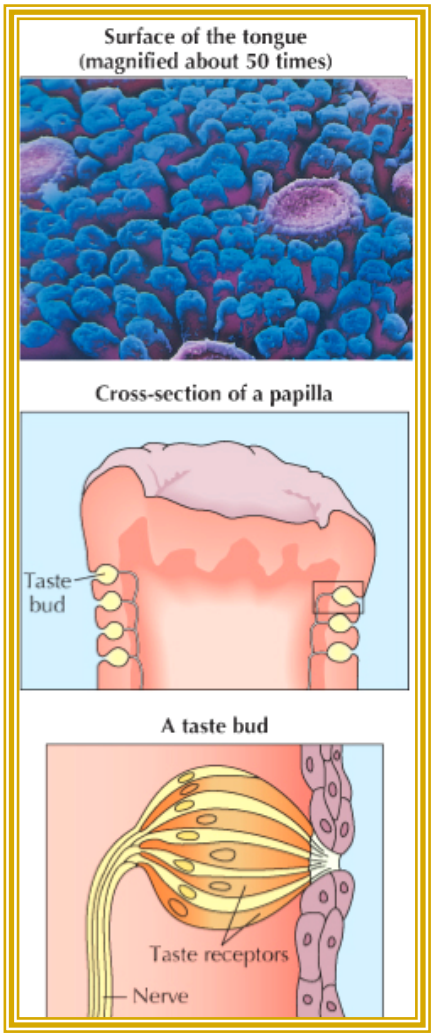
Our Other Senses

- Our sense of smell is called **olfaction**.
- Receptors for smell are embedded in a nasal membrane.



Our Other Senses: Gustation (Sense of Taste)

- Receptors for **gustation** are taste buds, located on the surface of the tongue.

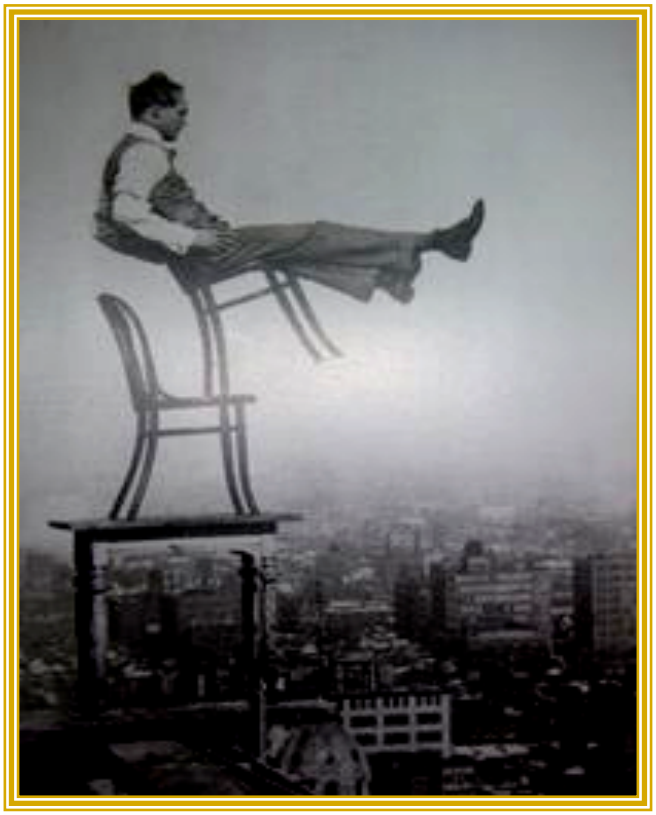


Our Other Senses: **Three** Body Senses

- **Skin senses** involve three basic skin sensations- touch (or pressure), temperature, and pain.
- Receptors for these sensations occur in various concentrations and depths in the skin.

Our Other Senses: **Three** Body Senses

- **Vestibular sense** (or sense of balance) located in the inner ear.

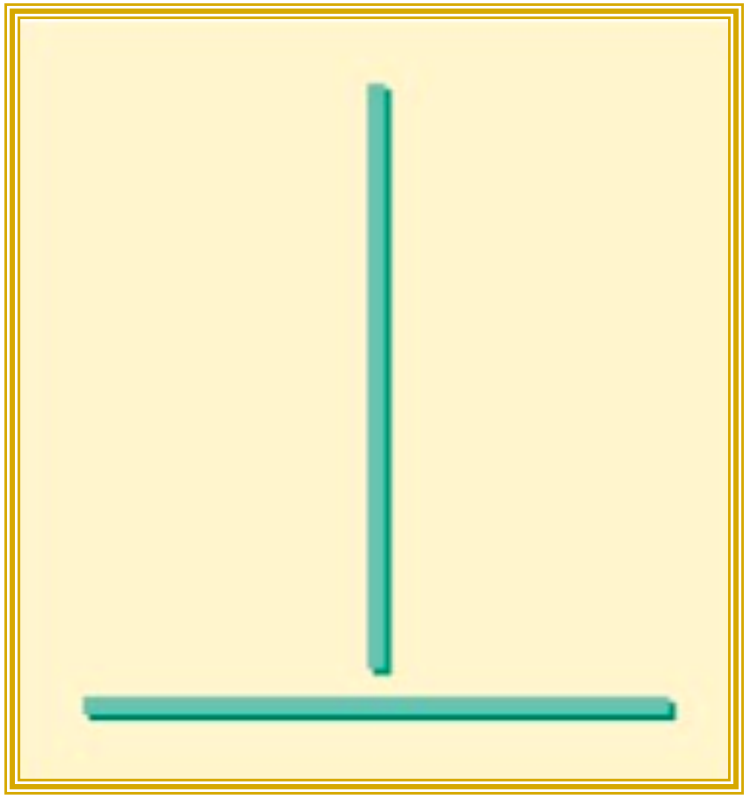


Three Body Senses (Continued)

- **Kinesthesia** provides the brain with information about bodily posture and bodily movement.
  - Kinesthetic receptors are found throughout the muscles, joints, and tendons of the body.

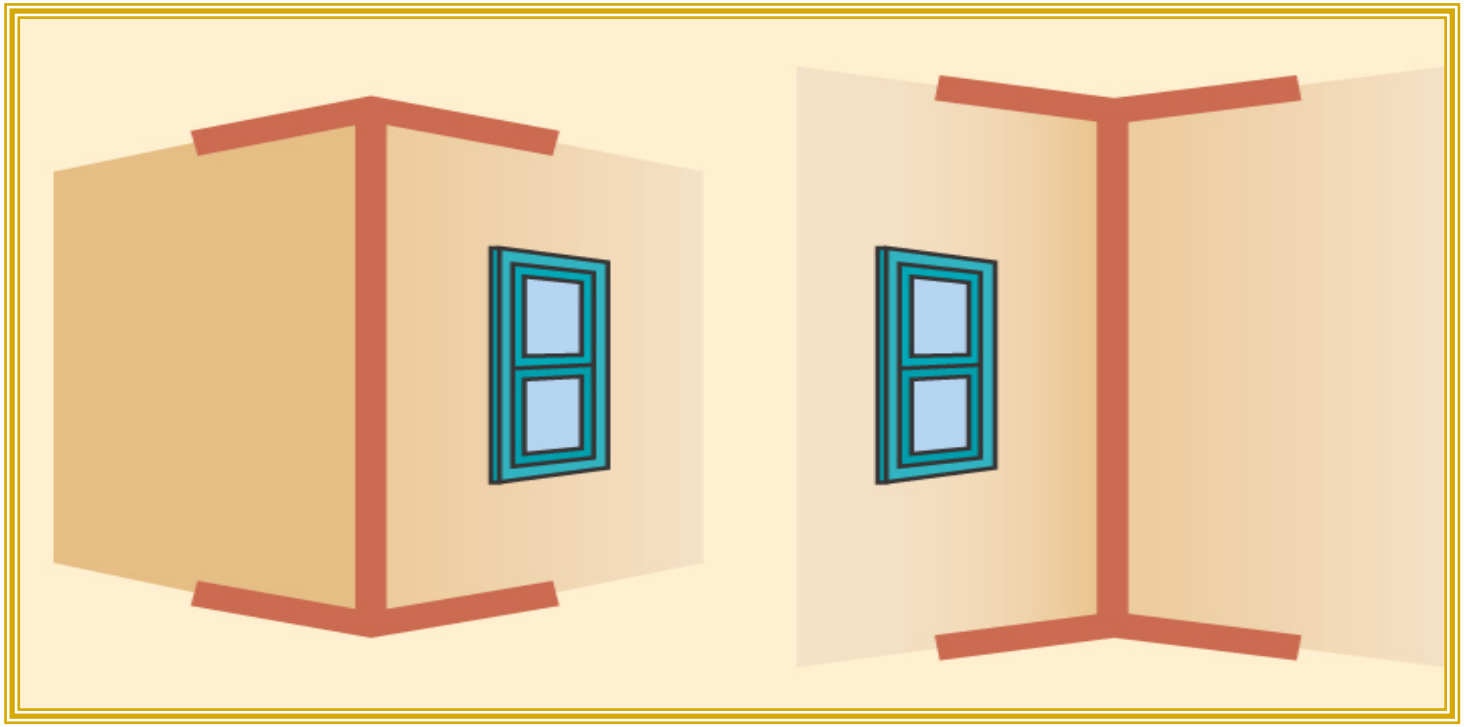
Understanding Perception

- **Illusions:**
  false or misleading perceptions help scientists study the processes of perception (e.g., the horizontal-vertical illusion)



Understanding Perception: The Muller-Lyer Illusion

Which vertical line is longer?



Understanding Perception

Do You See the Cow?

Understanding Perception

Now Can You See the Cow?

Understanding Perception (Continued)

- Perception's three basic processes:

1. **Selection**
2. **Organization**
3. **Interpretation**

Understanding Perception: Selection

- **Selection** (choosing where to direct attention) involves three factors:

  Selective Attention (filtering out and attending only to important sensory messages)

  Feature Detectors (specialized neurons respond only to certain sensory information)

  Habituation (brain's tendency to ignore environmental factors that remain constant)

Understanding Perception: Organization

- Organization: assembling of information into patterns that help us understand the world

- We organize sensory information in terms of:
  - Form
  - Constancy
  - Depth
  - Color

Understanding Perception: Organization

- **Form Perception**

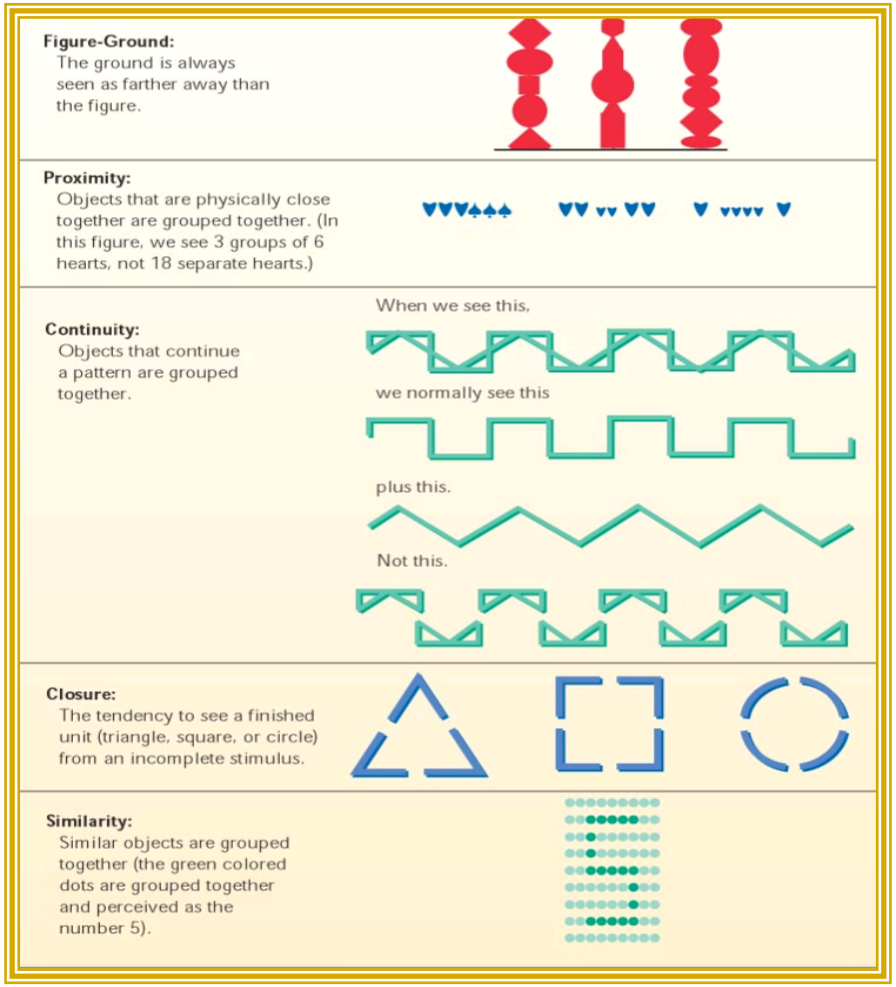
  Gestalt psychologists developed laws explaining how people perceive form according to:

  - Figure and ground
  - Proximity
  - Continuity
  - Closure
  - Similarity

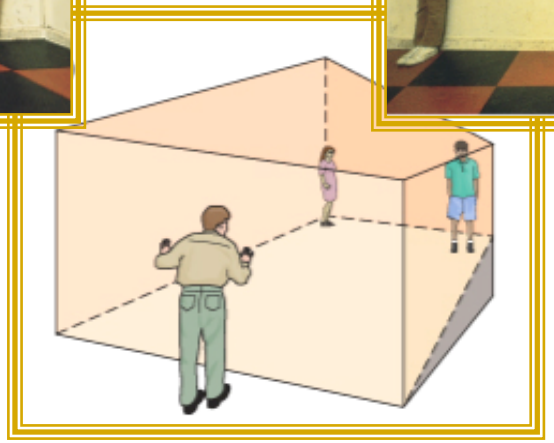
Understanding Perception: Organization

Form Perception-

Basic Gestalt Principles



Understanding Perception: Organization-- The Ames Room Illusion



Understanding Perception: Organization

- **Depth Perception:** ability to perceive three dimensional space and accurately judge distance

Problems with Believing in Subliminal Perception and ESP

- **Subliminal perception** may occur, but there is little or no evidence of *subliminal persuasion*.

Problems with Believing in Subliminal Perception and ESP

- **Extrasensory perception (ESP):** supposed ability to perceive things that go beyond the five normal senses

- ESP research is criticized due to lack of experimental control and replicability.