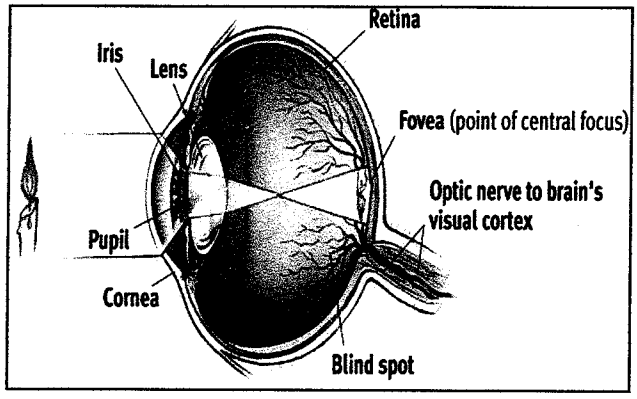
CHAPTER 4 ONE-PAGER

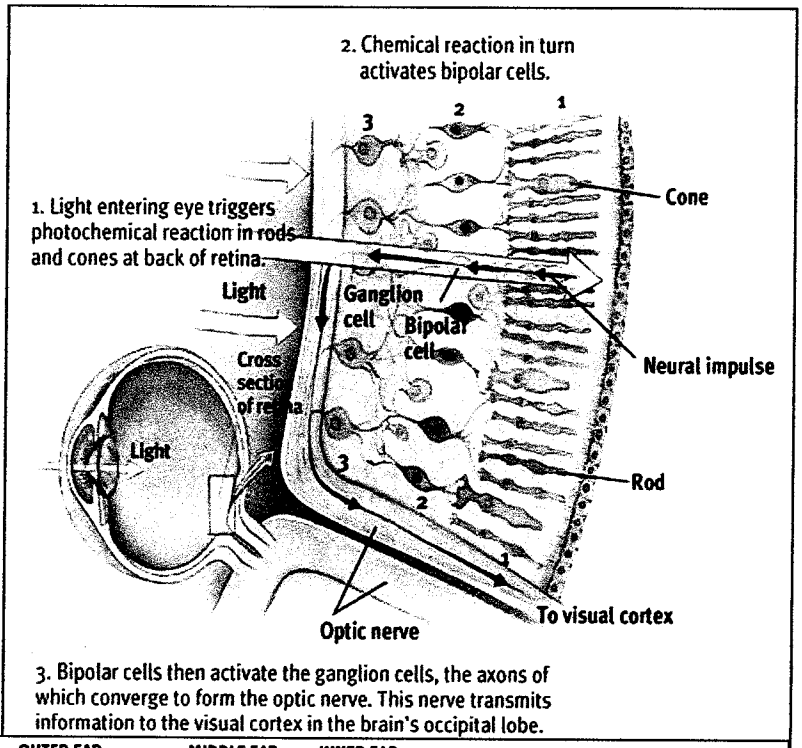
Stimulation → **Sensation** → **Perception**

Transduction is the process that turns external stimuli into nerve signals (sensation) that travel to our brain to be perceived.

Sensory Adaptation occurs when we get used to a stimulus after prolonged exposure (swimming pool)

Thresholds: Absolute (minimum needed to detect stimulus); **Difference** (smallest amount stimulus can be changed and the difference noticed – aka Just Noticeable Difference); **Weber's Law** (two stimuli must differ by a constant minimum percentage for a difference to be noticed); **Fechner's Law** (expresses the relationship between the actual magnitude of the stimulus and the perceived magnitude); **Subliminal** (stimulus is below absolute threshold)



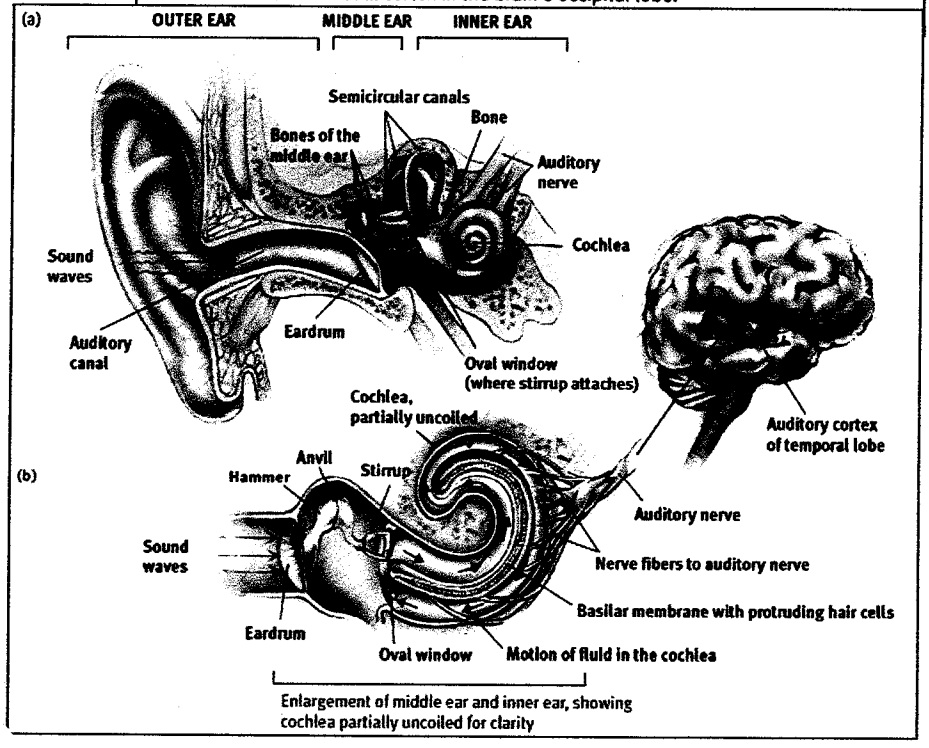


VISION

Wavelength = Color
Amplitude = Brightness
Trichromatic Theory = different cones for color
Opponent Proccess Theory = bipolar cells process color in complimentary pairs

HEARING

Wavelength = pitch
Amplitude = loudness
Place Theory = different places on tympanic membrane fire for different pitches (above 1000Hz)
Frequency Theory = different firing rates for different frequencies (below 5000Hz)



OTHER CHEMICAL AND BODILY SENSES

Olfaction	smell	Does not go through thalamus to get to olfactory bulb Receptors are **nose hairs with proteins**
Gustation	taste	Sweet, sour, bitter, salty, umami – dependent on smell **Taste buds** regenerate every 10 days
Touch and temperature	Skin senses	Touch lets us communicate comfort, love, support, & passion **Skin** protects us against injury
Kinesthetic	location of body in space	Keeps track of body parts relative to each other; movement **Muscles, joints, tendons** contain receptors
Vestibular	balance	**Semicircular canals** in inner ear orients us in respects to gravity (posture – lying, standing, leaning, etc.)
Pain	skin, eyes, ears, etc.	**Gate-control Theory** says we have a neural "gate" that allows or blocks pain signals from getting to the brain

PERCEPTION

Feature Detectors = cells in cortex that specialize in extracting features of a stimulus
Bottom-up Processing = *stimulus-driven processing* – percept is determined by stimulus
Top-down Processing = percept is determined by our goals, past experiences, knowledge, expectations, memory, motivation, cultural background
Perceptual Constancies = ability to recognize objects under different conditions (size, shape, color)
Illusions = "trick" the brain into an incorrect perception of a stimulus pattern
Ambiguous figures = stimulus patters that can be interpreted (top-down) in 2 or more ways

2 THEORIES ON PERCEPTION

***GESTALT THEORY (NATURE)*:** we have innate factors in our brain that help us perceive and shape perception

Figure-Ground: figure commands attention, ground is the background

Closure: we fill in gaps in figures to see wholes

Perceptual Grouping: our brain prefer to group stimulus elements together to form a percept
- **Similarity** - same
- **Proximity** - nearness
- **Continuity** - connectedness
- **Common Fate** – share common motion
- **Prägnanz** – simplest organization

Binocular Cues = convergence, retinal disparity

Monocular Cues = relative size, light & shadow, interposition, relative motion, atmospheric perspective

***LEARNING-BASED INFERENCE (NURTURE)*:** we use prior learning to interpret new sensory information (to perceive); perception is shaped by learning

Context and Expectations: identify a context to form expectations about what persons, objects, and events you will experience (perceive)

Perceptual Set: readiness to detect a particular stimulus in a given context (focused alertness for a particular stimuli)

Cultural Influence: perception can be shaped by your culture – for example, some cultures do not get "tricked" by illusions the same way that we do