- 1 Myers' Psychology for AP*
- 2 🔲 Unit 4:

Sensation and Perception

- 3 🔲 Unit Overview
 - Sensing the World: Some Basic Principles
 - <u>Vision</u>
 - Hearing
 - <u>Other Senses</u>
 - Perceptual Organization
 - Perceptual Interpretation
 - Is there Extrasensory Perception?

4 Sensing the World: Some Basic Principles

- 5 🔲 Introduction
 - <u>Sensation</u>
 - <u>Perception</u>
 –Are one process

continuous

6 🔲 Introduction

- Bottom-up processing
- <u>Top-down processing</u>
- 7 Selective Attention
 - <u>Selective Attention</u>
 –Cocktail party effect
- 8 Selective Attention
 Selective Attention and Accidents
 Cell phone use and car accidents
 - Salaatiya Attention
- 9 Selective Attention

Selective Inattention Inattentional blindness **10** Selective Attention Selective Inattention Change blindness -Change deafness -Choice blindness -Choice-choice blindness • Pop-out 11 **Thresholds** Psychophysics 12 **Thresholds** Absolute Thresholds Absolute threshold -50 % of the time 13 Thresholds Signal Detection Signal-detection theory -Ratio of "hits" to "false alarms" 14 III Thresholds Subliminal Stimulation • Subliminal (below threshold) Priming -Masking stimulus Subliminal persuasion 15 Thresholds **Difference Thresholds** Difference threshold

- -Just noticeable difference (jnd)
- Weber's Law

- 16 Just noticeable difference
- 17 Just noticeable difference
- 18 Just noticeable difference
- 19 Just noticeable difference
- 20 Just noticeable difference
- 21 Just noticeable difference
- 22 Just noticeable difference
- 23 Just noticeable difference
- 24 Just noticeable difference
- 25 Just noticeable difference
- 26 Just noticeable difference
- 27 Just noticeable difference
- 28 Just noticeable difference
- 29 Sensory Adaptation
 - <u>Sensory Adaptation</u>
 - –Informative changes
 - -Reality versus usefulness
- 30 🔲 Vision
- 31 D The Stimulus Input: Light Energy
 - Transduction (transform)
 - Wavelength
 - <u>Hue</u> (color)
 –Wavelength
 - Intensity
 - -Wave amplitude

- 32 Electromagnetic Energy Spectrum
- 33 Electromagnetic Energy Spectrum
- 34 Electromagnetic Energy Spectrum
- 35 The Physical Property of Waves
- 36 The Physical Property of Waves
- 37 D The Physical Property of Waves
- 38 D The Physical Property of Waves
- 39 D The Physical Property of Waves
- 40 🔲 The Eye
 - Cornea
 - <u>Pupil</u>
 - <u>Iris</u>
 - <u>Lens</u>
 <u>accommodation</u>
 - <u>Retina</u>
- 41 D The Structure of the Eye
- 42 D The Structure of the Eye
- 43 D The Structure of the Eye
- 44 🔲 The Structure of the Eye
- 45 D The Structure of the Eye
- 46 D The Structure of the Eye
- 47 The Eye The Retina
 - Rods and Cones
- 48 Rods versus Cones

- 49 D The Retina's Reaction to Light
- 50 The Retina's Reaction to Light
- 51 D The Retina's Reaction to Light
- 52 D The Retina's Reaction to Light
- 53 D The Retina's Reaction to Light
- 54 D The Eye The Retina
 - Optic nerve
 - <u>Blind spot</u>
 - Fovea
- 55 D The Structure of the Eye
- 56 D The Structure of the Eye
- 57 D The Structure of the Eye
- 58 Visual Information Processing Visual Cortex
- 59 Dethways from the eyes to the visual cortex
- 60 Pathways from the eyes to the visual cortex
- 61 Pathways from the eyes to the visual cortex
- 62 Pathways from the eyes to the visual cortex
- 63 Visual Information Processing Feature Detection
 - Feature detectors
- 64 Visual Information Processing Parallel Processing
 - Parallel processing
 Diad circlet
 - -Blind sight

- 65 Disual information processing
- 66 Visual information processing
- 67 Disual information processing
- 68 Disual information processing
- 69 Disual information processing
- 70 Visual information processing
- 71 Color Vision
 - Young-Helmholtz trichromatic (three color) theory
 - -Red Green Blue
 - -Monochromatic
 - -Dichromatic
- vision vision

- 72 Color Vision
 - <u>Opponent-process theory</u>
 - -Three sets of colors
 - •Red-green
 - •Blue-yellow
 - •Black-white
 - –Afterimage
- 73 After image
- 74
- 75 🔲 Hearing
- 76 The Stimulus Input: Sound Waves
 - Audition
 - Amplitude
 - -loudness

- <u>Frequency</u> –<u>Pitch</u>
- 77 🔲 The Ear
 - Outer ear

 Auditory canal
 Ear drum
- 78 D The structure of the ear
- 79 D The structure of the ear
- 80 D The structure of the ear
- 81 D The structure of the ear
- 82 🔲 The Ear

 <u>Middle ear</u> –Hammer, anvil, stirrup

- 83 D The structure of the ear
- 84 🔲 The structure of the ear
- 85 D The structure of the ear
- 86 D The structure of the ear
- 87 D The structure of the ear
- 88 D The structure of the ear
- 89 🔲 The Ear
 - Inner ear
 - -Oval window
 - -Cochlea
 - Basilar membrane
 - -Auditory nerve

-Auditory cortex

- 90 D The structure of the ear
- 91 D The structure of the ear
- 92 D The structure of the ear
- 93 D The structure of the ear
- 94 D The structure of the ear
- 95 D The structure of the ear
- 96 D The structure of the ear
- 97 Neural impulse to the brain
- 98 D The Ear Perceiving Loudness
 - Basilar membrane's hair cells
 -Compressed sound
- 99 Cochlea and loud sounds
- 100 D The Ear Perceiving Pitch
 - Place theory
 High pitched sounds
 - Frequency theory

 Low pitched sounds
 - -Volley principle

101 🔲 The Ear

Locating Sounds

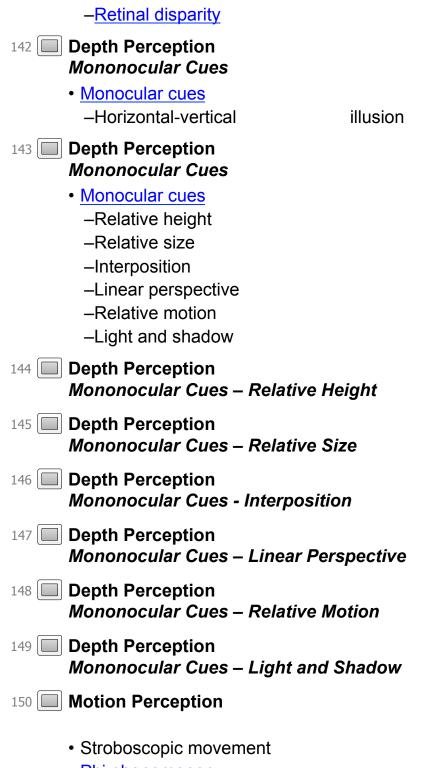
- Stereophonic hearing
- Localization of sounds –Intensity
 - -Speed of the sound
- 102 Hearing Loss and Deaf Culture

• Hearing loss -Conduction hearing loss -Sensorineural hearing loss -Cochlea implant Signing 103 Other Senses 104 Touch • Types of touch -Pressure -Warmth -Cold -Pain · Sensation of hot 105 Touch Rubber hand illusion 106 Touch Kinesthesis • Vestibular sense -Semicircular canals 107 🔲 Semicircular Canals 108 🔲 Pain **Understanding Pain** • Biological Influences -Noiceptors -Gate-control theory -Endorphins -Phantom limb sensations

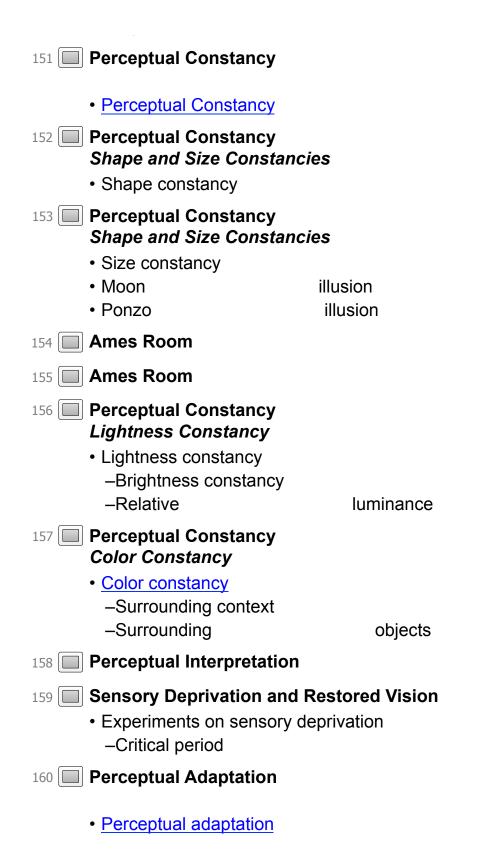


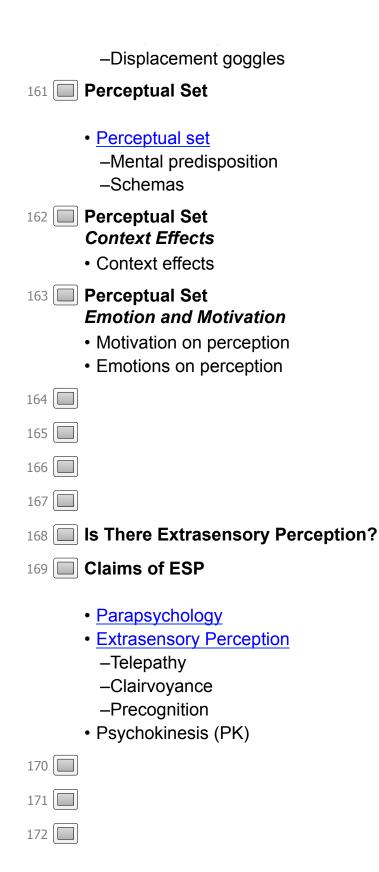
· Age and taste 122 Taste **Sensory Interaction** Sensory interaction Interaction of smell and taste -McGurk Effect Interaction of other senses 123 **Smell** Olfaction -Chemical sense -Odor molecules -Olfactory bulb -Olfactory nerve 124 Smell (olfaction) 125 Smell and age 126 Smell and age 127 Smell and age 128 Smell and age 129 Smell and age 130 Perceptual Organization 131 Introduction • Gestalt (form or whole) 132 **Form Perception** Figure and Ground • Figure-ground 133 **Form Perception** Grouping

 Grouping -Proximity -Similarity -Continuity -Connectedness -Closure 134 **Form Perception** Grouping Grouping -Proximity -Similarity -Continuity -Connectedness -Closure 135 Form Perception **Grouping - Proximity** 136 Form Perception Grouping - Similarity 137 **Form Perception Grouping - Continuity** 138 **Form Perception** Grouping - Connectedness 139 **Form Perception** Grouping - Closure 140 Depth Perception Depth perception -Visual-cliff 141 Depth Perception **Binocular Cues** • Binocular cues



<u>Phi phenomenon</u>





- 173
- 174
- 175
- 176 Premonitions or Pretensions?
 - Psychic predictions –Nostradamus

177 D Putting ESP to Experimental Test

- ESP Experiments
- 178 🔲 The End

179 **Teacher Information**

Types of Files

-This presentation has been saved as a "basic" Powerpoint file. While this file format placed a few limitations on the presentation, it insured the file would be compatible with the many versions of Powerpoint teachers use. To add functionality to the presentation, teachers may want to save the file for their specific version of Powerpoint.

Animation

-Once again, to insure compatibility with all versions of Powerpoint, none of the slides are animated. To increase student interest, it is suggested teachers animate the slides wherever possible.

- Adding slides to this presentation
 - -Teachers are encouraged to adapt this presentation to their personal teaching style. To help keep a sense of continuity, blank slides which can be copied and pasted to a specific location in the presentation follow this "Teacher Information" section.

180 **Teacher Information**

- Hyperlink Slides This presentation contain two types of hyperlinks. Hyperlinks can be identified by the text being underlined and a different color (usually purple).
 - -Unit subsections hyperlinks: Immediately after the unit title slide, a page (slide #3) can be found listing all of the unit's subsections. While in slide show mode, clicking on any of these hyperlinks will take the user directly to the beginning of that subsection. This allows teachers quick access to each subsection.
 - -Bold print term hyperlinks: Every bold print term from the unit is included in this presentation as a hyperlink. While in slide show mode, clicking on any of the hyperlinks will take the user to a slide containing the formal definition of the term. Clicking on the "arrow" in the bottom left corner of the definition slide will take the user back to the original point in the presentation.

These hyperlinks were included for teachers who want students to see or copy down the exact definition as stated in the text. Most teachers prefer the definitions not be included to prevent students from only "copying down what is on the screen" and not actively listening to the presentation.

For teachers who continually use the Bold Print Term Hyperlinks option, please contact the author using the email address on the next slide to learn a technique to expedite the returning to the original point in the presentation.

181 **Teacher Information**

- · Continuity slides
 - -Throughout this presentation there are slides, usually of graphics or tables, that build on one another. These are included for three purposes.
 - •By presenting information in small chunks, students will find it easier to process and remember the concepts.

 By continually changing slides, students will stay interested in the presentation. To facilitate class discussion and critical thinking. Students should be encouraged to think about "what might come next" in the series of slides. Please feel free to contact me at kkorek@germantown.k12.wi.us with any questions, concerns, suggestions, etc. regarding these presentations. Kent Korek Germantown High School Germantown, WI 53022 262-253-3400 kkorek@germantown.k12.wi.us
182 Division title (green print) subdivision title (<i>blue print</i>)
• xxx -xxx -xxx 183 Division title (green print) subdivision title (<i>blue print</i>)
 184 Definition Slide = add definition here
185 Definition Slides
 Sensation = the process by which our sensory receptors and nervous system receive and represent stimulus energies from our environment.
 Perception = the process of organizing and interpreting sensory information, enabling us to recognize meaningful objects and events.

188 Bottom-up processing	
= analysis that begins with the sensory receptors and works up to the brain's integration of sensory information.	
189 🔲 Top-down processing	
 information processing guided by higher-level mental processes, as when we construct perceptions drawing on our experience and expectations. 	
190 Selective attention	
= the focusing of conscious awareness on a particular stimulus.	
191 🔲 Inattentional blindness	
= failing to see visible objects when our attention is directed elsewhere.	
192 🔲 Change blindness	
= failing to notice changes in the environment	
193 Psychophysics	
= the study of relationships between the physical characteristics of stimuli, such as their intensity, and our psychological experience of them.	
194 🔲 Absolute threshold	
= the minimum stimulation necessary to detect a particular stimulus 50% of the time.	
195 🔲 Signal detection theory	
= a theory predicting how and when we detect the presence a faint stimulus (signal) amid background stimulation (nois Assumes there is no absolute threshold and that detection depends partly on a person's experience, expectations, motivation, and altertness.	e).
196 🔲 Subliminal	

= below one's absolute threshold for conscious awareness.

197 Priming
 the activation, often unconsciously, of certain associations, thus predisposing one's perception, memory, or response.
198 Difference threshold
 the minimum difference between two stimuli required for detection. We experience the difference threshold as a just noticeable difference (jnd).
199 🔲 Weber's law
 the principle that, to be perceived as different, two stimuli must differ by a constant percentage (rather than a constant amount).
200 Sensory adaptation
 diminished sensitivity as a consequence of constant stimulation.
201 Transduction
 conversion of one form of energy into another. In sensation, the transforming of stimulus energies, such as sights, sounds, and smells into neural impulses our brains can interpret.
202 🔲 Wavelength
= the distance from the peak of one light or sound wave to the peak of the next. Electromagnetic wavelengths vary from the short blips of comic rays to the long pulses of radio transmission.
203 🔲 Hue
= the dimension of color that is determined by the wavelength of light; what we know as the color names <i>blue</i> , <i>green</i> , and so forth.
204 Intensity
= the amount of energy in a light or sound wave, which we perceive as brightness or loudness, as determined by the

wave's amplitude. 205 🔲 Pupil = the adjustable opening in the center of the eye through which lights enters. 206 🔲 Iris = a ring of muscle tissue that forms the colored portion of the eye around the pupil and controls the size of the pupil opening. 207 🔲 Lens = the transparent structure behind the pupil that changes shape to help focus the images on the retina. 208 🔲 Retina = the light-sensitive inner surface of the eye, containing the receptor rods and cones plus layers of neurons that begin the processing of visual information. 209 Accommodation = the process by which the eye's lens changes shape to focus near or far objects on the retina. 210 **Rods** = retinal receptors that detect black, white, and gray; necessary for peripheral and twilight vision, when cones don't respond. 211 Cones = retinal receptor cells that are concentrated near the center of the retina and that function in daylight or in well-lit conditions. The cones detect fine detail and give rise to color sensations. 212 Optic Nerve = the nerve that carries neural impulses from the eye to the brain. 213 Blind Spot

 the point at which the optic nerve leaves the eye, creating a "blind" spot because no receptor cells are located there.
= the central focal point in the retina, around which the eye's cones cluster.
215 E Feature detectors
 nerve cells in the brain that respond to specific features of the stimulus, such as shape, angle, or movement.
216 Parallel processing
 the processing of many aspects of a problem simultaneously; the brain's natural mode of information processing for many functions, including vision. Contrasts with the step-by-step (serial) processing of most computers and of conscious problem solving.
217 🔲 Young-Helmholtz trichromatic (three-color) theory
 the theory that the retina contains three different color receptors – one most sensitive to red, one to green, one to blue – which, when stimulated in combination can produce the perception of any color.
218 Opponent-process theory
 the theory that opposing retinal processes (red-green, yellow-blue, white-black) enable color vision. For example, some cells are stimulated by green and inhibited by red; others are stimulated by red and inhibited by green.
219 Audition
= the sense or act of hearing.
- -
 Frequency = the number of complete wavelengths that pass a point in a given time (i.e. per second).
221 Ditch
= a tone's experienced highness or lowness; depends on

frequency.

222 Middle Ear

= the chamber between the eardrum and cochlea containing three tiny bones (hammer, anvil, and stirrup) that concentrate the vibrations of the eardrum on the cochlea's oval window.

223 Cochlea

- = a coiled, bony, fluid-filled tube in the inner ear through which sound waves trigger nerve impulses.
- 224 🔲 Inner ear
 - = the innermost part of the ear, containing the cochlea, semicircular canals, and vestibular sacs.

225 Place theory

= in hearing, the theory that links the pitch we hear with the place where the cochlea's membrane is stimulated.

226 Frequency theory

= in hearing, the theory that the rate of nerve impulses traveling up the auditory nerve matches the frequency of a tone, thus enabling us to sense its pitch.

227 Conduction hearing loss

- = hearing loss caused by damage to the mechanical system that conducts sound waves to the cochlea.
- Problems with the eardrum or three bones of the middle ear.

228 Sensorineural hearing loss

= hearing loss caused by damage to the cochlea's receptor cells or to the auditory nerves; also called nerve deafness.

229 Cochlea implant

= a device for converting sounds into electrical signals and stimulating the auditory nerve through electrodes threaded into the cochlea.

230 Kinethesis

= the system for sensing the position and movement of individual body parts.
231 🔲 Vestibular sense
= the sense of body movement and position, including the sense of balance.
232 Gate-control theory
= the theory that the spinal cord contains a neurological "gate" that blocks pain signals or allows them to pass on to the brain. The "gate" is opened by the activity of pain signals traveling up small nerve fibers and is closed by activity in larger fibers or by information coming from the brain.
233 Sensory interaction
= the principle that one sense may influence another, as when the smell of food influences its taste.
234 Gestalt
 an organized whole. Gestalt psychologists emphasized our tendency to integrate pieces of information into meaningful wholes.
235 🔲 Figure-ground
= the organization of the visual field into objects (the figures) that stand out from their surroundings (the ground).
236 🔲 Grouping
= the perceptual tendency to organize stimuli into coherent groups.
237 Depth perception
 the ability to see objects in three dimensions although the images that strike the retina are two-dimensional; allows us to judge distance.
238 🔲 Visual cliff
 a laboratory device for testing depth perception in infants and young animals.

239 Binocular cues
= depth cues, such as retinal disparity, that depend on the use of two eyes.
240 Retinal disparity
 a binocular cue for perceiving depth. By comparing images from the retinas in the two eyes, the brain computes distance – the greater the disparity (difference) between the two images, the closer the object.
241 Monocular cues
= depth cues, such as interposition and linear perspective, available to either eye alone.
242 Dhi phenomenon
= an illusion of movement created when two or more adjacent lights blink on and off in quick succession.
243 Derceptual constancy
 perceiving objects as unchanging (having consistent shapes, size, lightness, and color) even as illumination and retinal images change.
244 D Color constancy
= perceiving familiar objects as having consistent color, even if changing illumination alters the wavelengths reflected by the object.
245 Derceptual adaptation
= in vision, the ability to adjust to an artificially displaced or even inverted visual field.
246 Perceptual set
= a mental disposition to perceive one thing and not another.
247 Extrasensory perception (ESP)
 the controversial claim that perception can occur apart from sensory input; includes telepathy, clairvoyance, and precognition.



248 Parapsychology

= the study of paranormal phenomena, including ESP and psychokinesis.