

Unit Reading Guide
Unit Three: Biological Bases of Behavior
Unit Four: Sensation and Perception

Unit Three: Biological Bases of Behavior

Key Terms:

For key terms, be able to explain the meaning of the term (like with any vocabulary), but also be able to explain what is significant about the term in the context of the unit (i.e., what the book says) and in the larger context of the study of psychology. Your textbook is the first place to start. Online sources, such as Quizlet, are helpful for study and review but should not be your only source of information. Bolded terms correlate to what is shown in the AP Psychology Course Requirements.

Concepts			
Biological Psychology	Neuron	Dendrites	Axon
Myelin Sheath	Action Potential	Refractory Period	Threshold
All-or-None Response	Synapse	Neurotransmitters	Reuptake
Endorphins	Agonist	Nervous System	Central Nervous System
Peripheral Nervous System	Nerves	Sensory/Afferent Neurons	Motor/Efferent Neurons
Interneurons	Somatic Nervous System	Autonomic Nervous System	Sympathetic Nervous System
Parasympathetic Nervous System	Reflex	Endocrine System	Hormones
Adrenal Glands	Pituitary Gland	Lesion	Electroencephalogram
Computed Tomography Scan	Positron Emission Tomography Scan	Magnetic Resonance Img	Functional MRI (fMRI)
Brainstem	Medulla	Thalamus	Reticular Formation
Cerebellum	Limbic System	Amygdala	Hypothalamus
Cerebral Cortex	Glial Cells	Frontal Lobes	Parietal Lobes
Occipital Lobes	Temporal Lobes	Motor Cortex	Somatosensory Cortex
Association Areas	Plasticity	Neurogenesis	Corpus Callosum
Split Brain	Consciousness	Cognitive Neuroscience	Dual Processing
Behavior Genetics	Environment	Chromosomes	DNA
Genes	Genome	Identical Twins	Fraternal Twins
Molecular Genetics	Heritability	Interaction	Epigenetics
Evolutionary Psychology	Natural Selection	Mutation	
People:			
Paul Broca	Roger Sperry	Charles Darwin	Carl Wernicke
Michael Gazzaniga			

Unit Three Essential Questions

These do not represent the entirety of what students must understand. They do, however, point people in the correct direction. Use these questions to see where the concepts above “fit.” Also, use the questions listed as a guide in your reading.

1. What are the basic parts, mechanisms, and processes that make up the nervous system?
2. How do the endocrine system and the nervous system interact?
3. What are the techniques used to study the brain and endocrine systems, and how do they work?
4. What are the psychological subfields devoted to studying the interaction of biology and environment, and what sort of “things” would they encounter?
5. How does the brain use reorganization and neurogenesis to adapt to change?
6. What are the processes and the findings of split-brain research?
7. How does the brain utilize dual processing?
8. What are the mechanisms and processes of behavior genetics?
9. In what ways do the principles of behavioral/molecular genetics explain the interaction of heredity and environment?
10. What is heritability, and how does it relate to explanations of individual and group differences?
11. What are the principles of evolution as they relate to behavior tendencies and gender differences—and how would you evaluate these principles?
12. What are the key points in the debate about the usefulness of evolutionary psychology?
13. What is the biopsychosocial approach to development?

Unit Four: Sensation and Perception

Key Terms:

For key terms, be able to explain the meaning of the term (like with any vocabulary), but also be able to explain what is significant about the term in the context of the unit (i.e., what the book says) and in the larger context of the study of psychology. Your textbook is the first place to start. Online sources, such as Quizlet, are helpful for study and review but should not be your only source of information. Bolded terms correlate to what is shown in the AP Psychology Course Requirements.

Concepts			
Sensation	Perception	Bottom-Up Processing	Top-Down Processing
Selective Attention	Inattentional Blindness	Change Blindness	Transduction
Psychophysics	Absolute Threshold	Signal Detection Theory	Subliminal
Priming	Difference Threshold	Weber's Law	Sensory Adaptation
Perceptual Set	Extrasensory Perception	Parapsychology	Wavelength
Hue	Intensity	Pupil	Iris
Lens	Retina	Accommodation	Rods
Cones	Optic Nerve	Blind Spot	Fovea
Feature Detectors	Parallel Processing	Young-Helmholtz Theory	<=aka. Trichromatic Theory
Opponent-Process Theory	Gestalt	Figure-Ground	Grouping
Depth Perception	Visual Cliff	Binocular Clues	Retinal Density
Monocular Clues	Phi Phenomenon	Perceptual Constancy	Color Constancy
Perceptual Adaptation	Audition	Frequency	Pitch
Middle Ear	Cochlea	Inner Ear	Sensorineural Hearing Loss
Conduction Hearing Loss	Cochlear Implant	Place Theory	Frequency Theory
Gate-Control Theory	Kinesthesia	Vestibular Sense	Sensory Interaction
Embodied Cognition			
People			
Gustav Fechner	Ernst Weber	David Hubel	Torsten Wiesel

Unit Four Essential Questions

These do not represent the entirety of what students must understand. They do, however, point people in the correct direction. Use these questions to see where the concepts above "fit." Also, use the questions listed as a guide in your reading.

1. What are the differences between sensation and perception (but know that these processes are interrelated)?
2. How much information can be processed at any given point of time?
3. What are the basic sensory concepts of thresholds and adaptation?
4. In what way can expectations, contexts, emotions, and motivation influence perceptions?
5. What are the claims of ESP, and what conclusions can be drawn from research on those claims?
6. How do the eyes receive, process, and transform light signals?
7. What are the various theories that explain our sensation and perception of color?
8. What are "gestalt perceptual principles," particularly figure—ground and grouping principles?
9. What are the differences among the binocular and monocular depth cues that help us perceive 3D and motion? (How do they help us perceive 3D and motion?)
10. How do perceptual constancies help us create meaning from sensory signals?
11. What does research say about restored vision, sensory restriction, and perceptual adaptation? How does that research contribute to our understanding of perception?
12. How do the ears process sound waves and contribute to our perception of pitch and sound location?
13. How do the senses of touch, pain, taste, smell, and body position/movement work?
14. In what ways do the senses interact?

Advanced Placement Psychology Unit Outlines

Unit Three: Biological Bases of Behavior (8-10% of the AP Exam)—AP Topic Outline

An effective introduction to the relationship between physiological processes and behavior — including the influence of neural function, the nervous system and the brain, and genetic contributions to behavior — is an important element in the AP course.

AP students in psychology should be able to do the following:

- Identify basic processes and systems in the biological bases of behavior, including parts of the neuron and the process of transmission of a signal between neurons.
- Discuss the influence of drugs on neurotransmitters (e.g., reuptake mechanisms, agonists, antagonists).
- Discuss the effect of the endocrine system on behavior.
- Describe the nervous system and its subdivisions and functions:
 - central and peripheral nervous systems;
 - major brain regions, lobes, and cortical areas;
 - brain lateralization and hemispheric specialization.
- Discuss the role of neuroplasticity in traumatic brain injury.
- Recount historic and contemporary research strategies and technologies that support research (e.g., case studies, split-brain research, imaging techniques).
- Discuss psychology's abiding interest in how heredity, environment, and evolution work together to shape behavior.
- Predict how traits and behavior can be selected for their adaptive value.
- Identify key contributors (e.g., Paul Broca, Charles Darwin, Michael Gazzaniga, Roger Sperry, Carl Wernicke).

Unit Four: Sensation and Perception (6-8% of the AP Exam)—AP Topic Outline

Everything that organisms know about the world is first encountered when stimuli in the environment activate sensory organs, initiating awareness of the external world. Perception involves the interpretation of the sensory inputs as a cognitive process.

AP students in psychology should be able to do the following:

- Discuss basic principles of sensory transduction, including absolute threshold, difference threshold, signal detection, and sensory adaptation.
- Describe sensory processes (e.g., hearing, vision, touch, taste, smell, vestibular, kinesthesia, pain), including the specific nature of energy transduction, relevant anatomical structures, and specialized pathways in the brain for each of the senses.
- Explain common sensory disorders (e.g., visual and hearing impairments).
- Describe general principles of organizing and integrating sensation to promote stable awareness of the external world (e.g., Gestalt principles, depth perception).
- Discuss how experience and culture can influence perceptual processes (e.g., perceptual set, context effects).
- Explain the role of top-down processing in producing vulnerability to illusion.
- Discuss the role of attention in behavior.
- Challenge common beliefs in parapsychological phenomena.
- Identify the major historical figures in sensation and perception (e.g., Gustav Fechner, David Hubel, Ernst Weber, Torsten Wiesel).