AP Psychology Unit 3: Biological Bases of Behavior

**College Board Unit Overview:**

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. Approximately 8-10% of the multiple-choice section of the AP Psychology Exam will be from this unit.

**College Board Unit Objectives:**

1. 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.

1. Discuss the influence of drugs on neurotransmitters (e.g., reuptake mechanisms, agonists, antagonists).

3. Discuss the effect of the endocrine system on behavior.

4. 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.

5. Discuss the role of neuroplasticity in traumatic brain injury.

1. Recount historic and contemporary research strategies and technologies that support research (e.g., case studies, split-brain research, imaging techniques).

7. Discuss psychology’s abiding interest in how heredity, environment, and evolution work together to shape behavior.

8. Predict how traits and behavior can be selected for their adaptive value.

1. Identify key contributors (e.g., Paul Broca, Charles Darwin, Michael Gazzaniga, Roger Sperry, Carl Wernicke).

**Reading Assignments from Myers’ Psychology for AP:**

**UNIT 3: BIOLOGICAL BASES OF BEHAVIOR (pp. 75-149)**

**Module 9 – Biological Psychology and Neurotransmission (pp. 76-85)**

*College Board Objective:* 1, 2, 6

*Learning Objectives:*

1. Explain why psychologists are concerned with human biology, and describe the ill-fated phrenology theory.
2. Describe the parts of the neuron, and explain how its impulses are generated.
3. Describe how nerve cells communicate with other nerve cells.
4. Describe how neurotransmitters influence behavior, and explain how drugs and other chemicals affect neurotransmission.

*Terms:* phrenology, biological psychology, neurons, dendrite, axon, myelin sheath, action potential, refractory period, threshold, all-or-none response, synapse, neurotransmitter, reuptake, endorphins, agonist, antagonist

**Module 10 – The Nervous System and Endocrine Systems (pp.86-93)**

*College Board Objective*:1, 3, 4

*Learning Objectives:*

1. Describe the functions of the nervous system’s main divisions, and identify the three main types of neurons.
2. Describe the nature and functions of the endocrine system and its interaction with the nervous system.

*Terms*: nervous system, central nervous system (CNS), peripheral nervous system (PNS), nerves, somatic nervous system, autonomic nervous system, sympathetic nervous system, parasympathetic nervous system, reflex, sensory neurons, motor neurons, interneurons, endoctine system, hormones, pituitary gland, adrenal gland

**Module 11 – Studying the Brain, and Older Brain Structures (pp.94-103)**

*College Board Objectives*: 4, 6

*Learning Objectives*:

1. Describe several techniques for studying the brain’s connections to behavior and mind.
2. Describe the components of the brainstem, and summarize the functions of the brainstem, thalamus, and cerebellum.
3. Describe the limbic system’s structures and functions.

*Terms*: lesion, electroencephalogram, CT (computed tomography) scan, PET (positron emission tomography) scan, MRI (magnetic resonance imaging), fMRI (functional MRI), brainstem, medulla, thalamus, reticular formation, limbic system, amygdala, hypothalamus

**Module 12 – The Cerebral Cortex (pp. 104-113)**

*College Board Objectives*: 4, 5, 6, 9

*Learning Objectives*:

1. Identify the various regions of the cerebral cortex, and describe their functions.
2. Discuss the brain’s ability to reorganize itself, and define neurogenesis.

*Terms*: cerebral cortex, glial cells, frontal lobes, parietal lobes, occipital lobes, temporal lobes, motor cortex, somatosensory cortex, association areas, plasticity, neurogenesis, Paul Broca, Carl Wernicke

**Module 13 – Brain Hemisphere Organization and the Biology of Consciousness (pp.114-122)**

*College Board Objectives*: 4, 8, 9

*Learning Objectives*:

1. Explain how split-brain research helps us understand the functions of our two brain hemispheres.
2. Explain what is meant by “dual processing,” as revealed by today’s cognitive neuroscience.

*Terms*: corpus callosum, split brains, consciousness, cognitive neuroscience, dual processing, Roger Sperry, Michael Gazzaniga

**Module 14 – Behavior Genetics: Predicting Individual Differences (pp.123-134)**

*College Board Objectives*: 7, 8

*Learning Objectives*:

1. Define genes, and describe how behavior geneticists explain our individual differences.
2. Identify the potential uses of molecular genetics research.
3. Explain what is meant by heritability, and discuss how it relates to individuals and groups.
4. Discuss the interaction of heredity and environment.

*Terms*: behavior genetics, environment, chromosomes, DNA (deoxyribonucleic acid), genes, genome, identical twins (*monozygotic*), fraternal twins (*dizygotic*), molecular genetics, heritability, interaction, epigenetics

**Module 15 – Evolutionary Psychology: Understanding Human Nature (pp. 135-144)**

*College Board Objectives*: 7, 8, 9

*Learning Objectives*:

1. Describe evolutionary psychologists’ use of natural selection to explain behavior tendencies.
2. Discuss evolutionary explanations for gender differences in sexuality and mating preferences.
3. Summarize the key criticisms of evolutionary psychology, and describe how evolutionary psychologists respond.
4. Describe the biopsychosocial approach to individual development.

*Terms*: evolutionary psychologists, natural selection, mutation, Charles Darwin