AP Psychology CHAPTER 2:Neuroscience and Behavior

LEARNING OBJECTIVES

Introduction: Neuroscience and Behavior

1. Define biological psychology and neuroscience, and explain why psychologists study the biological basis of behavior.

The Neuron: The Basic Unit of Communication

2. Describe the functions of neurons and glial cells, and distinguish among the three types of neurons.

3. Identify the basic characteristics of the neuron, describe the action potential, and explain the processes that take place within the neuron when it is activated.

4. Explain how information is communicated between neurons, and distinguish between excitatory and inhibitory messages.

5. Describe how neurotransmitters affect synaptic transmission, identify six important neurotransmitters, and explain their effects on behavior.

6. Explain what is meant by “runner’s high” and discuss the role of endorphins in this phenomenon.

7. Identify and explain several ways in which drugs can affect brain activity by interfering with synaptic transmission.

The Nervous System and the Endocrine System: Communication Throughout the Body

8. Describe the functions of the two major components of the central nervous system, and explain how spinal reflexes work.

9. Identify the divisions and subdivisions of the peripheral nervous system, and describe their functions.

10. Describe the general functions of the endocrine system, and explain how hormones influence human behavior.

11. Identify the functions of the major endocrine glands, and explain the relationship between the hypothalamus and the endocrine glands.

A Guided Tour of the Brain

12. Discuss how the pseudoscience called phrenology evolved, and how it ultimately helped advance the idea of cortical localization.

13. (Focus on Neuroscience) Describe the goals of the Human Connectome Project, the diffusion-spectrum imaging technique, and the challenges faced by the project.

14. Discuss the importance of neural pathways in the brain , distinguish between functional and structural plasticity, and explain neurogenesis.

15. (Focus on Neuroscience) Summarize the research involving juggling and brain plasticity, and explain how learning a new motor skill affects the adult brain.

16. Identify the structures of the brainstem, and describe their functions.

17. Identify the four lobes of the cerebral cortex and discuss the functions of each. Discuss the influence of the brain’s association areas on behavior.

18. Identify the structures that comprise the limbic system, discuss the specialized roles of each and their impact on behavior.

Specialization in the Cerebral Hemispheres

19. (Critical Thinking) Describe the differences in male and female brains, and explain what these differences do and do not mean.

20. State what cortical localization is, and explain how the findings of Broca and Wernicke provided early clinical evidence for lateralization of function, the development of different types of aphasia, and language specialization in the left hemisphere.

21. Describe the work of Roger Sperry, discuss the split-brain operation, and explain how it provided evidence for the differing abilities of left and right hemispheres.

22. (Science Versus Pseudoscience) Identify and discuss the myth about how much of our brain we use, explain left and right hemisphere functioning, and list the facts related to being left-handed or right-handed.

Psych for Your Life: Maximizing Your Brain’s Potential

23. Describe the research findings from studies on enriched versus impoverished environments using both nonhumans and humans, and list some of the practical implications of this research.