UNIT 2

Biological Bases of Behavior

AP EXAM WEIGHTING

8–10%

CLASS PERIODS

~11–12
Remember to go to AP Classroom to assign students the online Personal Progress Check for this unit.

Whether assigned as homework or completed in class, the Personal Progress Check provides each student with immediate feedback related to this unit’s topics and skills.

**Personal Progress Check 2**

**Multiple-choice: ~25 questions**

**Free-response: 2 questions**

- Concept Application (partial)
- Concept Application (partial)
Biological Bases of Behavior

Developing Understanding

The structures of human biological systems and their functions influence our behavior and mental processes. Some psychologists study behaviors and mental processes from a biological perspective. This includes an examination of the influence that the interaction between human biology and our environment has on behavior and mental processes. This is a recurring topic throughout the course that will be used to explain many psychological phenomena. The biological perspective also provides insight into the causes of and treatments for psychological disorders. There is a complex interaction between a person’s biology and their behavior and mental processes. Heredity and environment play a role, as do variations in a person’s consciousness.

Building Course Skills

Unit 2 focuses on blending knowledge about physiological processes and psychology to provide better explanations of behavior and mental processes. This course teaches students how biological and anatomical structures play an active role in an individual’s mental and behavioral development. To demonstrate an understanding of these biological bases of psychology, students should describe the concept or apply it to a scenario.

As students learn to describe this blended physiological and psychological knowledge, they should be able to apply it to behavior and mental processes in other fields of psychology (e.g., memory, learning, development, and social psychology). This approach will help students understand how psychological theories, schools of thought, and perspectives were developed. Students will also continue to build on their understanding of the appropriate use of research methods and designs from Unit 1.

Preparing for the AP Exam

Students often struggle with knowing which neurotransmitters function with which biological processes and how those functions relate to behavior and mental processes. Teachers can give students opportunities to map the neurotransmitter pathways and describe outcomes in both successful and disrupted transmission. Students will also benefit from many opportunities to connect psychological processes to an individual’s physiology. They often struggle to make accurate and complete connections between anatomy and physiology as it relates to behavior and mental processes. If a question asks students to give an explanation, they would need to provide an answer in terms of evidence and/or reasoning.
## UNIT AT A GLANCE

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<tr>
<th>Topic</th>
<th>Suggested Skill</th>
<th>Class Periods</th>
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</thead>
<tbody>
<tr>
<td>2.1 Interaction of Heredity and Environment</td>
<td>1.B Explain behavior in authentic context.</td>
<td>~11–12 CLASS PERIODS</td>
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<tr>
<td>2.2 The Endocrine System</td>
<td>1.A Define and/or apply concepts.</td>
<td></td>
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<tr>
<td>2.3 Overview of the Nervous System and the Neuron</td>
<td>1.A Define and/or apply concepts.</td>
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<tr>
<td>2.4 Neural Firing</td>
<td>1.A Define and/or apply concepts.</td>
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<tr>
<td>2.5 Influence of Drugs on Neural Firing</td>
<td>1.A Define and/or apply concepts.</td>
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<tr>
<td>2.6 The Brain</td>
<td>1.A Define and/or apply concepts.</td>
<td></td>
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<tr>
<td>2.7 Tools for Examining Brain Structure and Function</td>
<td>2 Analyze and interpret quantitative data.</td>
<td></td>
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<tr>
<td>2.8 The Adaptable Brain</td>
<td>1.A Define and/or apply concepts.</td>
<td></td>
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<tr>
<td>2.9 Sleep and Dreaming</td>
<td>1.A Define and/or apply concepts.</td>
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</table>

Go to **AP Classroom** to assign the **Personal Progress Check** for Unit 2. Review the results in class to identify and address any student misunderstandings.
SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 151 for more examples of activities and strategies.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Topic</th>
<th>Sample Activity</th>
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<tbody>
<tr>
<td>1</td>
<td>2.1</td>
<td><strong>Construct an Argument</strong>&lt;br&gt;Have students read the article “Are You a Natural?” from the book <em>40 Studies that Changed AP Psychology</em>. Then have them write an abstract of the article that includes the research question, methodology, and conclusions. Lead the class in a discussion about the interaction of nature and nurture.</td>
</tr>
<tr>
<td>2</td>
<td>2.2</td>
<td><strong>Fishbowl</strong>&lt;br&gt;Provide students with various scenarios of physiological changes in the body related to the endocrine system. Students should read the scenario, identify the hormone, and explain why the change is occurring. At the end of the unit, or after Topic 2.3, have students compare and contrast neurotransmitters and hormones.</td>
</tr>
<tr>
<td>3</td>
<td>2.3</td>
<td><strong>Manipulatives</strong>&lt;br&gt;Give students sheets of butcher paper. Have them draw two neurons and label their parts. Then have them model an action potential traveling through the two neurons using everyday materials such as tennis balls or ping pong balls. Add variety by having students model what happens in response to different neurons.</td>
</tr>
<tr>
<td>4</td>
<td>2.6</td>
<td><strong>Manipulatives</strong>&lt;br&gt;Have student pairs create a model of the brain by tracing each other’s heads on a piece of paper. On each drawing, they should draw and color in the parts of the brain. Then have them define each part and explain its function.</td>
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<tr>
<td>5</td>
<td>2.9</td>
<td><strong>Think-Pair-Share</strong>&lt;br&gt;Begin by having students watch the TED talk “Why Do We Sleep?” Have students maintain a written or electronic sleep log for one to two weeks. Afterward, have them calculate their data and discuss any dreams they recorded. Follow up by giving them dream scenarios with an explanation from each dream theory. Students can then write a letter to the school administration about why school start times should be later for teens.</td>
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**Unit Planning Notes**

Use the space below to plan your approach to the unit.
TOPIC 2.1
Interaction of Heredity and Environment

LEARNING TARGET

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

2.B Identify key research contributions of scientists in the area of heredity and environment.

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

EXAMPLES

2.B.1 Contributions of Charles Darwin, a key scientist in the area of heredity and environment

Topic Planning Notes

Use the space below to plan your approach to the topic.
TOPIC 2.2
The Endocrine System

LEARNING TARGET

2.D
Discuss the effect of the endocrine system on behavior.

SUGGESTED SKILL

Concept Understanding

1.A
Define and/or apply concepts.

Topic Planning Notes

Use the space below to plan your approach to the topic.
TOPIC 2.3
Overview of the Nervous System and the Neuron

LEARNING TARGET

2.E
Describe the nervous system and its subdivisions and functions.

2.F
Identify basic processes and systems in the biological bases of behavior, including parts of the neuron.

EXAMPLES

2.E.1
Central and peripheral nervous systems

Topic Planning Notes

Use the space below to plan your approach to the topic.
TOPIC 2.4
Neural Firing

LEARNING TARGET
2.0
Identify basic process of transmission of a signal between neurons.

SUGGESTED SKILL
Concept Understanding
1.A
Define and/or apply concepts.

AVAILABLE RESOURCE
Classroom Resource > The Brain, the Nervous System, and Behavior

Topic Planning Notes
Use the space below to plan your approach to the topic.
TOPIC 2.5
Influence of Drugs on Neural Firing

LEARNING TARGET

2.H
Discuss the influence of drugs on neurotransmitters.

EXAMPLES

2.H.1
Reuptake mechanisms

2.H.2
Agonists

2.H.3
Antagonists

Topic Planning Notes

Use the space below to plan your approach to the topic.
TOPIC 2.6
The Brain

LEARNING TARGET
2.1 Describe the nervous system and its subdivisions and functions in the brain.

EXAMPLES
2.1.1 Major brain regions
2.1.2 Lobes
2.1.3 Cortical areas
2.1.4 Brain lateralization and hemispheric specialization

2.2 Identify the contributions of key researchers to the study of the brain.

EXAMPLES
2.2.1 Contributions of Paul Broca
2.2.2 Contributions of Carl Wernicke

Topic Planning Notes
Use the space below to plan your approach to the topic.
TOPIC 2.7
Tools for Examining Brain Structure and Function

LEARNING TARGET

2.K
Recount historic and contemporary research strategies and technologies that support research.

2.L
Identify the contributions of key researchers to the development of tools for examining the brain.

EXAMPLES

2.K.1
Research tool: case studies

2.K.2
Research tool: split-brain research

2.K.3
Research tool: imaging techniques

2.K.4
Research tool: lesioning

2.K.5
Research tool: autopsy

2.L.1
Contributions of Roger Sperry

Topic Planning Notes

Use the space below to plan your approach to the topic.
TOPIC 2.8
The Adaptable Brain

LEARNING TARGET

2.M
Discuss the role of neuroplasticity in traumatic brain injury.

2.N
Identify the contributions of key researchers to the study of neuroplasticity.

2.O
Describe various states of consciousness and their impact on behavior.

2.P
Identify the major psychoactive drug categories and classify specific drugs, including their psychological and physiological effects.

2.Q
Discuss drug dependence, addiction, tolerance, and withdrawal.

2.R
Identify the contributions of major figures in consciousness research.

EXAMPLES

2.N.1
Contributions of Michael Gazzaniga

2.P.1
Depressants

2.P.2
Stimulants

2.P.3
Hallucinogens

2.R.1
Contributions of William James, major figure in consciousness research

2.R.2
Contributions of Sigmund Freud, major figure in consciousness research

AVAILABLE RESOURCE

Classroom Resource > The Brain, the Nervous System, and Behavior
TOPIC 2.9
Sleeping and Dreaming

LEARNING TARGET
2.S
Discuss aspects of sleep and dreaming.

EXAMPLES
2.S.1
Neural and behavioral characteristics of the stages of the sleep cycle
2.S.2
Theories of sleep and dreaming
2.S.4
Symptoms and treatments of sleep disorders

Topic Planning Notes
Use the space below to plan your approach to the topic.