Unit 2: Biological Bases of Behavior

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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

AP Psychology, Grades 11-12

Biological Bases of Behavior

Belleville Board of Education

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Unit Overview

In this unit, students will examine how the blending knowledge of physiological processes and psychology provide better explanations of behavior and mental processes.

Students will learn the following:

- The Interaction of Heredity and Environment
- The Endocrine System
- Overview of the Nervous System and the Neuron
- Neural Firing
- The Influence of Drugs on Neural Firing
- Brain Structure and Function
- Tools for Examining Brain Structure and Function
- The Adaptable Brain
- Sleep and Dreaming

Enduring Understanding

- The structures of human biological systems and their functions influence our behavior and mental processes.
- Some psychologists study behaviors & mental processes from a biological perspective, including examination of the influence that interaction between human biology & our environment has on behavior & mental processes.
- The Biological Perspective is a recurring topic throughout the course that will be used to explain many psychological phenomena.
- The biological perspective 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.

Essential Questions

- How can biology influence our behavior and mental processes?
- What happens when a particular neurotransmitter is absent from the body?
- How do biological and environmental factors interact to influence our behaviors and mental processes?

Exit Skills

By the end of Unit 2, the student should be able to:

- Analyze how biological and anatomical structures play an active role in an individual's mental and behavioral development.
- Demonstrate an understanding of the biological bases of psychology by describing the concept or applying it to a scenario.
- Describe the blended physiological & psychological knowledge and be able to apply it to behavior & mental processes in other fields of psychology (e.g., memory, learning, development & social psychology).
- Examine how psychological theories, schools of thought, and perspectives were developed.
- Build on the understanding of the appropriate use of research methods and designs from Unit 1.
- Define and/or apply the concepts related to the endocrine system, the nervous system, the neuron, neuron firing, the influence of drugs on neuron firing, the brain, the adaptable brain & sleeping & dreaming.
- Explain behavior in authentic context as it relates to the interaction of heredity and environment.
- Analyze and interpret quantitative data through the various tools for examing brain structure and function.

New Jersey Student Learning Standards (NJSLS-S)

SOC.9-12.1	Concept Understanding
SOC.9-12.1.A	Define and/or apply concepts.
SOC.9-12.1.B	Explain behavior in authentic context.
SOC.9-12.2	Data Analysis
SOC.9-12.2	Biological Bases of Behavior
SOC.9-12.2.1	Interaction of Heredity and Environment
SOC.9-12.2.A	Discuss psychology's abiding interest in how heredity, environment, and evolution work together to shape behavior.
SOC.9-12.2.B	Identify key research contributions of scientists in the area of heredity and environment.
SOC.9-12.2.C	Predict how traits and behavior can be selected for their adaptive value.
SOC.9-12.2.2	The Endocrine System
SOC.9-12.2.D	Discuss the effect of the endocrine system on behavior.
SOC.9-12.2.3	Overview of the Nervous System and the Neuron
SOC.9-12.2.E	Describe the nervous system and its subdivisions and functions.
SOC.9-12.2.F	Identify basic processes and systems in the biological bases of behavior, including parts of the neuron.
SOC.9-12.2.4	Neural Firing
SOC.9-12.2.G	Identify basic process of transmission of a signal between neurons.
SOC.9-12.2.5	Influence of Drugs on Neural Firing
SOC.9-12.2.H	Discuss the influence of drugs on neurotransmitters.
SOC.9-12.2.6	The Brain
SOC.9-12.2.I	Describe the nervous system and its subdivisions and functions in the brain.
SOC.9-12.2.J	Identify the contributions of key researchers to the study of the brain.
SOC.9-12.2.7	Tools for Examining Brain Structure and Function
SOC.9-12.2.K	Recount historic and contemporary research strategies and technologies that support research.
SOC.9-12.2.L	Identify the contributions of key researchers to the development of tools for examining the brain.
SOC.9-12.2.8	The Adaptable Brain

SOC.9-12.2.M	Discuss the role of neuroplasticity in traumatic brain injury.
SOC.9-12.2.N	Identify the contributions of key researchers to the study of neuroplasticity.
SOC.9-12.2.O	Describe various states of consciousness and their impact on behavior.
SOC.9-12.2.P	Identify the major psychoactive drug categories and classify specific drugs, including their psychological and physiological effects.
SOC.9-12.2.Q	Discuss drug dependence, addiction, tolerance, and withdrawal.
SOC.9-12.2.R	Identify the contributions of major figures in consciousness research.
SOC.9-12.2.9	Sleeping and Dreaming
SOC.9-12.2.S	Discuss aspects of sleep and dreaming.

Interdisciplinary Connections

LA.RH.11-12.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of primary and secondary sources, connecting insights gained from specific details to develop an understanding of the text as a whole.
LA.RH.11-12.4	Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
LA.RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.
LA.RH.11-12.10	By the end of grade 12, read and comprehend history/social studies texts in the grades 11-CCR text complexity band independently and proficiently.
LA.WHST.11-12.1	Write arguments focused on discipline-specific content.
LA.WHST.11-12.1.A	Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
LA.WHST.11-12.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
LA.WHST.11-12.2.A	Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.
LA.WHST.11-12.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
LA.WHST.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
LA.WHST.11-12.10	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

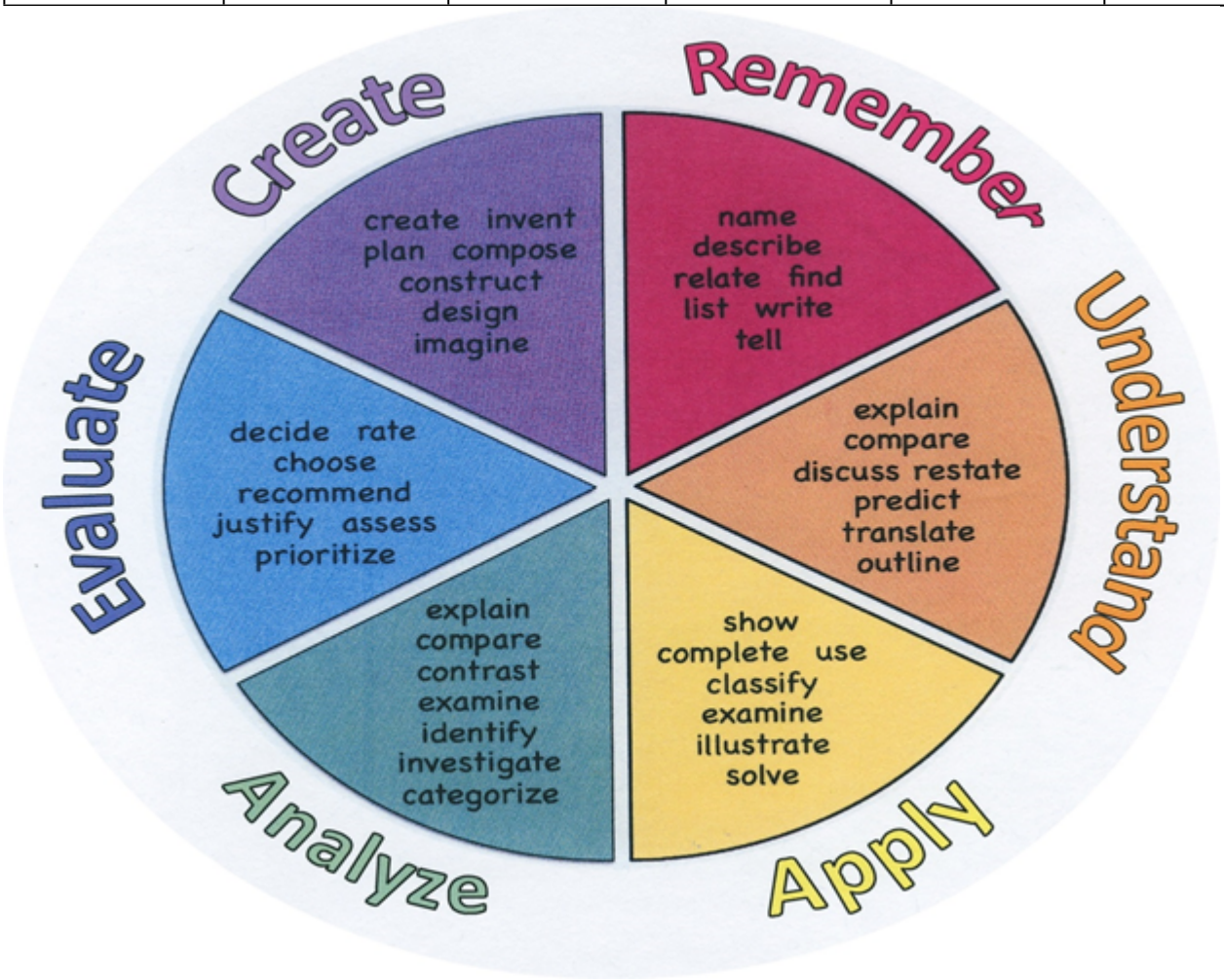
Learning Objectives

- Discuss psychology's abiding interest in how heredity, environment, and evolution work together to shape behavior.
- Identify key research contributions of scientists in the area of heredity and environment, including the contributions of Charles Darwin.
- Predict how traits and behavior can be selected for their adaptive value.
- Discuss the effect of the endocrine system on behavior.
- Describe the nervous system and its subdivisions and functions, such as the central and peripheral nervous systems.
- Identify basic processes and systems in the biological bases of behavior, including parts of the neuron.
- Identify basic process of transmission of a signal between neurons.
- Discuss the influence of drugs on neurotransmitters (Examples: Reuptake mechanisms, Agonists, Antagonists).
- Describe the nervous system and its subdivisions and functions in the brain, such as the major brain regions, lobes; cortical areas, and brain lateralization & hemispheric specialization.
- Identify the contributions of key researchers to the study of the brain, including the contributions of Paul Broca and Carl Wernicke.
- Recount historic & contemporary research strategies & technologies that support research (Examples of Research tools: case studies, split-brain research, imaging techniques, lesioning, autopsy).
- Identify the contributions of key researchers to the development of tools for examining the brain, including the contributions of Roger Sperry.
- Discuss the role of neuroplasticity in traumatic brain injury.
- Identify the contributions of key researchers to the study of neuroplasticity, including the contributions of Michael Gazzaniga.
- Describe various states of consciousness and their impact on behavior.
- Identify the major psychoactive drug categories and classify specific drugs, including their psychological & physiological effects (Examples: Depressants, Stimulants, Hallucinogens).
- Discuss drug dependence, addiction, tolerance, and withdrawal.
- Identify the contributions of major figures in consciousness research, including the contributions of William James and Sigmund Freud.
- Discuss aspects of sleep & dreaming such as the neural & behavioral characteristics of the stages of the sleep cycle, theories of sleep and dreaming & the symptoms & treatments of sleep disorders.

Action Verbs: Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make

Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise
Point	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Suggested Activities & Best Practices

- Construct an Argument: For example, have students read the article “Are You a Natural?” from the book 40 Studies that Changed AP Psychology. 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.
- Fishbowl: For example, 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.
- Manipulatives: For example, 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.
- Manipulatives: For example, 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.
- Think-Pair-Share: For example, 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.
- Read case studies and psychological experiments related to Unit 2 (For example: "My Father Forgets"; "The Brain of Phineas Gage") and respond to related writing tasks using a personal response journal.
- Conduct experiments related to Unit 2 (For example: "Building the Human Brain" Lab; "Do You Remember Your Dreams" Quick Lab) and analyze the results using a personal response journal.
- Create cartoons or other illustrations based on human behavior/psychology topics related to the brain.
- Student or teacher created rubrics for each project.
- Building a portfolio throughout the course; contains experiments and independent projects.
- Complete study guides for Assessment on "Biological Bases of Behavior".
- Use Commonlit.org to reinforce standardized tests strategies.
- Read the short story version of Flowers for Algernon by Daniel Keyes that features an adolescent as it's main character. As you read, connect the character to information learned in class about brain development and behavior, and the challenges of poor brain function. Write a profile of the character exploring these issues.
- Movie Options: "Concussion"- Brain parts, brain functions, brain damage effects. "Regarding Henry"- Brain Function, effects of Brain Damage, Therapy (physical, art, talk). "Brain on Fire"-Effects of Encephalititis, manifestation of various psychological disorders.
- Practice Quizzes (Multiple Choice Questions)
- Personal Progress Check 2 (Multiple-choice Questions; Free-response Questions)

Assessment Evidence - Checking for Understanding (CFU)

- Unit Test on Biological Bases of Behavior-summative assessement
- Experiment on the Building the Human Brain-alternate assessment
- Think Pair Share on "Why Do We Sleep"-formative assessment
- Personal Progress Check 2-self-assessment-alternate

- Admit Tickets
- Anticipation Guide

- Common Benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- DBQ's
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Learning Center Activities
- Multimedia Reports
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Surveys
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit review/Test prep
- Unit tests
- Web-Based Assessments
- Written Reports

Primary Resources & Materials

Pearson Psychology AP Edition (Fourth Edition) by Saundra K. Ciccarelli & J. Noland White:

- *Student Edition Textbook*
- *Teacher Edition & Resources (online)*
- *Ebook with interactive component (MyPsychLab)*

Ancillary Resources

- *HMH Psychology Text Set: Ebook and Textbook* (Readings: Case Study, Current Research in Psychology, Cultural Diversity in Psychology, Psychology in Today's World, Careers in Psychology; Statistically Speaking; Lab Experiments: Quick Labs, Labs, Experiments, Simulations)
- *Psychology Principles in Practice* Power Point Presentations
- *Psychology* Student Edition by Educational Impressions
- *Psychology* Teacher Supplement by Educational Impressions
- *Famous Psychology Experiments* (Social Studies School Service)
- *Great Thinkers in Psychology* (Social Studies School Service)

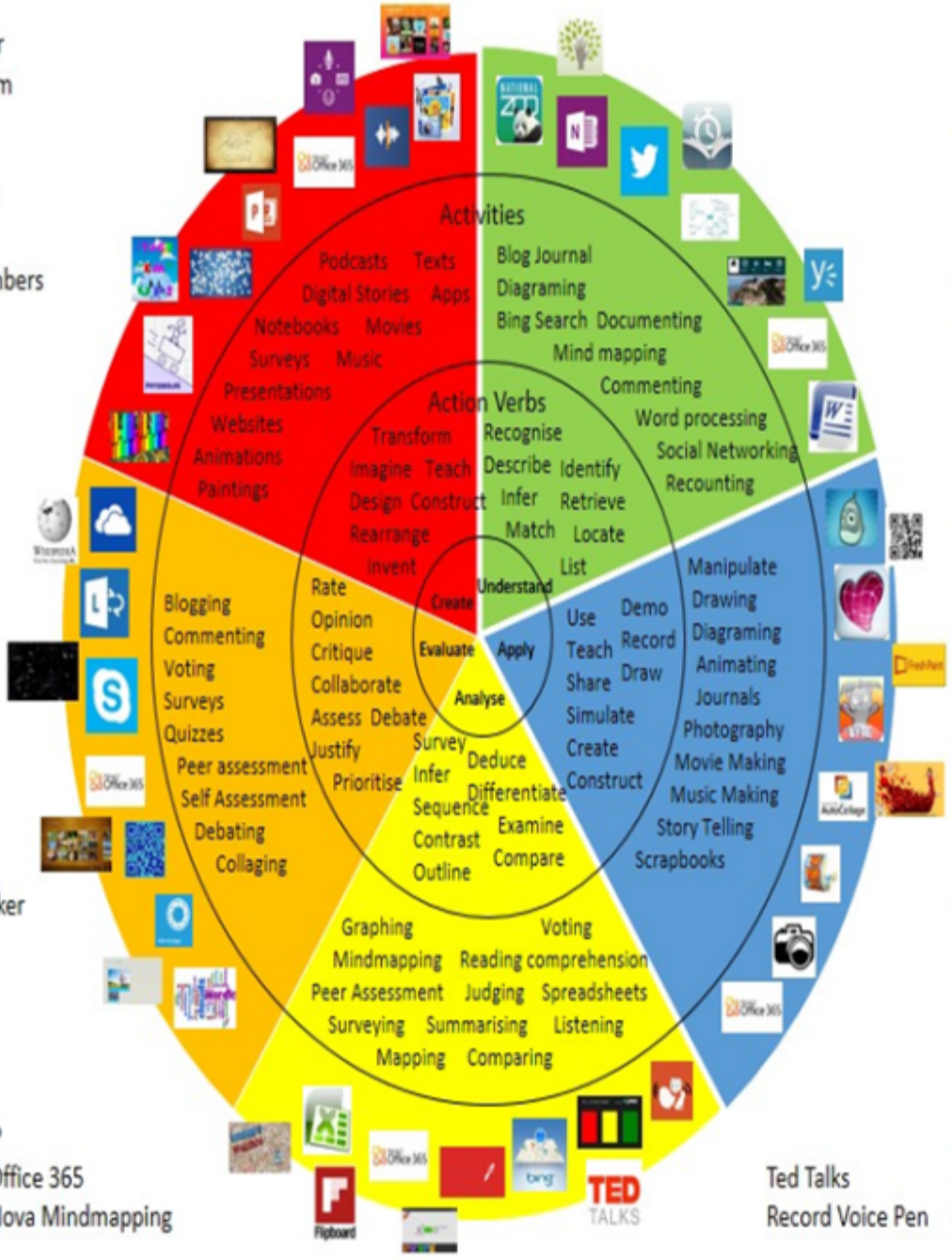
Technology Infusion

- *MyPsychLab/*HMH online/Youtube videos: "Brain Functions"; "In the Real World of Neurotransmitters"
- *MyPsychLab* Simulation "Do You Fly or Flight?"
- Use of Google Classroom/Slides for Presentation on Unit 2

Win 8.1 Apps/Tools Pedagogy Wheel

Podcasts
Photostory 3
Kid Story Builder
Music Maker Jam
Paint A Story
Office 365
MS PowerPoint
Stack 'Em Up
NqSquared Numbers
Physamajig
Xylophone 8

Wikipedia
Skydrive
Lync
SkyMap
Skype
Office 365
Puzzle Touch
Easy QR
Memorylage
Life Moments
Word Cloud Maker



Where's Waldo?
MS Excel Office 365
Flipboard Nova Mindmapping

Ted Talks
Record Voice Pen

Originally taken from http://www.coetail.com/vzimmer/files/2013/02/iPadagogy-Wheel.001.jpg
And adapted for Windows 8.1 devices by Charlotte Beckhurst @CharBeckhurst

Alignment to 21st Century Skills & Technology

CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CAEP.9.2.12.C.2	Modify Personalized Student Learning Plans to support declared career goals.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.

21st Century Skills/Interdisciplinary Themes

The **21st Century/Interdisciplinary Themes** that will be incorporated into this unit include:

- Communication and Collaboration
- Information Literacy
- Media Literacy
- ICT(Information, Communications and Technology) Literacy
- Life and Career Skills
- Creativity and Innovation
- Critical Thinking and Problem Solving

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- Life and Career Skills
- Media Literacy

21st Century Skills

The **21st Century Skills** that will be incorporated into this unit include:

- Global Awareness
- Civic Literacy

- Health Literacy

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

Differentiation

- Preview vocabulary for the textbook section "From the Bottom Up: The Structure of the Brain".
- Small group instruction for guided notes on "Biological Bases of Behavior".
- Small group assignment for "The Brain of Phineas Gage" case study reading.
- Study guides for "Biological Bases of Behavior" Assessments.
- Use manipulatives to create a model of the brain (students in pairs)

Differentiations:

- Small group instruction
- Small group assignments
- Extra time to complete assignments
- Pairing oral instruction with visuals
- Repeat directions
- Use manipulatives
- Center-based instruction
- Token economy
- Study guides
- Teacher reads assessments allowed
- Scheduled breaks
- Rephrase written directions
- Multisensory approaches
- Additional time
- Preview vocabulary
- Preview content & concepts
- Story guides
- Behavior management plan
- Highlight text
- Student(s) work with assigned partner
- Visual presentation
- Assistive technology
- Auditory presentations
- Large print edition
- Dictation to scribe

- Small group setting

Hi-Prep Differentiations:

- Alternative formative and summative assessments
- Choice boards
- Games and tournaments
- Group investigations
- Guided Reading
- Independent research and projects
- Interest groups
- Learning contracts
- Leveled rubrics
- Literature circles
- Multiple intelligence options
- Multiple texts
- Personal agendas
- Project-based learning
- Problem-based learning
- Stations/centers
- Think-Tac-Toes
- Tiered activities/assignments
- Tiered products
- Varying organizers for instructions

Lo-Prep Differentiations

- Choice of books or activities
- Cubing activities
- Exploration by interest
- Flexible grouping
- Goal setting with students
- Jigsaw
- Mini workshops to re-teach or extend skills
- Open-ended activities
- Think-Pair-Share
- Reading buddies
- Varied journal prompts
- Varied supplemental materials

Special Education Learning (IEP's & 504's)

- Provide a copy of teacher's notes for Unit 2.
- Decrease the number of slides for Unit 2 student presentation.
- Modify Experiments/Labs for Unit 2.

- Provide modifications as dictated in the student's IEP/504 plan.

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multi-sensory presentation
- multiple test sessions
- preferential seating
- preview of content, concepts, and vocabulary
- Provide modifications as dictated in the student's IEP/504 plan
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

English Language Learning (ELL)

- Provide a copy of teacher's notes for Unit 2.
- Decrease the number of slides for Unit 2 student presentation.
- Modify Experiments/Labs for Unit 2.

- teaching key aspects of a topic. Eliminate nonessential information

- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

At Risk

- Allow the use of notecards on the Unit Test on "Biological Bases of Behavior".
- Decrease the number of slides for the Unit 2 student presentation.
- Modify Labs/Experiments for Unit 2.

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests
- using videos, illustrations, pictures, and drawings to explain or clarify

Talented and Gifted Learning (T&G)

- Project-based learning for in-depth research on Unit 2 topics.
- Use research to construct an argument on nature and nirture.
- Used advanced problem solving skills to complete a "quick lab" on remembering dreams.

- Above grade level placement option for qualified students
- Advanced problem-solving
- Allow students to work at a faster pace
- Cluster grouping
- Complete activities aligned with above grade level text using Benchmark results
- Create a blog or social media page about their unit
- Create a plan to solve an issue presented in the class or in a text
- Debate issues with research to support arguments
- Flexible skill grouping within a class or across grade level for rigor
- Higher order, critical & creative thinking skills, and discovery
- Multi-disciplinary unit and/or project
- Teacher-selected instructional strategies that are focused to provide challenge, engagement, and growth opportunities
- Utilize exploratory connections to higher-grade concepts
- Utilize project-based learning for greater depth of knowledge

Sample Lesson