

The following instructional plan is part of a GaDOE collection of Unit Frameworks, Performance Tasks, examples of Student Work, and Teacher Commentary for the Psychology Social Studies Course.

Psychology/9 - 12 - Unit Four - Biological Foundations of Psychology	
Elaborated Unit Focus	In this unit, students will study and be able to explain their understanding of the biological basis of psychology with an emphasis on the brain and nervous system. The theme of Beliefs and Ideals will help students understand neurons, the nervous system, the anatomy of the brain, as well as Theories of sensation and perception. The theme of Human Environmental Interaction will help students understand the sleep cycle, stress, and the mechanics of the five senses. The theme of Technological Innovation will help students gain an understanding of the diagnostic technology (i.e. MRI, PET, fMRI, EEG, and CT), which is used to analyze human anatomy for the purpose of research, diagnosis, and treatment of physiological disorders. Individuals, Groups and Institutions illustrate genetics in psychology and the role of substance use/abuse in the physical and psychological reactions of the body.
Connection to Connecting Theme/Enduing Understandings	<ul style="list-style-type: none"> • Beliefs and Ideals: The student will understand that the beliefs and ideals of a society influence the social, political, and economic decisions of that society. • Individuals, Groups, and Institutions: The student will understand that the actions of individuals, groups and/or institutions affect society through intended and unintended consequences. • Technological Innovation: The student will understand that technological innovations have consequences, both intended and unintended, for a society. • Human Environmental Interaction: The student will understand that humans, their society, and the environment affect each other.
GSE for Social Studies (standards and elements)	<p>SSPBF1 Explain the development, structure, and function of biological systems and their role in behavior, cognition, and emotion.</p> <ul style="list-style-type: none"> a. Discuss the major divisions and sub-divisions of the nervous system and their role in behavior, include: central (brain and spinal cord) and peripheral [autonomic (sympathetic and parasympathetic) and somatic]. b. Identify the components and function of a neuron. c. Explain the process of neurotransmission, include: action potentials and synaptic transmission. d. Identify the major structures and functions of the brain. e. Describe the methods used to analyze neural form and function: include the MRI, fMRI, PET, CAT, and EEG. f. Examine the role of genetics in the development of behaviors. <p>SSPBF2 Compare different states of consciousness.</p> <ul style="list-style-type: none"> a. Identify altered states of consciousness, include: sleeping, dreaming, hypnosis, meditation, biofeedback, and mind-altering substances. b. Describe the sleep cycle and circadian rhythm. c. Explain theories of sleeping and dreaming. d. Investigate the validity of hypnosis. e. Analyze the physical and psychological issues associated with addiction. f. Explain how the major drug classes (stimulants, depressants, and hallucinogens) affect neurotransmission and behaviors.

	<p>SSPBF3 Discuss the components of stress.</p> <ul style="list-style-type: none"> a. Categorize and explain the different physiological and psychological reactions to stress. b. Identify strategies to deal with stress that promote health, include: coping strategies and behavioral modification. <p>SSPBF4 Describe how the physical world is translated into a psychological experience.</p> <ul style="list-style-type: none"> a. Describe the basic structures of the eye and ear, the associated neural pathways, and the process of sensory transduction. b. Recognize causes which can lead to hearing and vision deficits: include environmental causes, aging, genetics, diet, disease, and trauma. c. Describe the major theories associated with visual and auditory sensation and perception: include threshold theory, opponent process theory, trichromatic theory of vision, frequency theory, volley theory and place theory of hearing. d. Identify additional senses, include: smell, taste and touch. e. Analyze different perceptual illusions and describe why illusions are important for our understanding of perception. f. Compare top-down and bottom-up processing. <p>SSPBF5 Identify major theories and concepts related to motivation and emotion.</p> <ul style="list-style-type: none"> a. Compare and contrast the biological, cognitive/learning, and humanistic perspectives of motivation. b. Compare and contrast theories of emotion, include: James-Lange, Cannon-Bard, and Singer-Schachter’s Two Factor.
<p>Connection to Literacy Standards for Social Studies (reading and/or writing)</p>	<p>L9-10RHSS1: Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.</p> <p>L9-10RHSS2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.</p> <p>L9-10RHSS3: Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.</p> <p>L9-10RHSS4: Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.</p> <p>L9-10RHSS10: By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.</p> <p>L9-10WHST2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</p> <p>L9-10WHST4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>L9-10WHST7: 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.</p> <p>L9-10WHST8: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</p> <p>L9-10WHST9: Draw evidence from informational texts to support analysis, reflection, and research.</p>

	<p>L9-10WHST10: 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.</p> <p>L11-12RHSS1: Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.</p> <p>L11-12RHSS2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.</p> <p>L11-12RHSS3: Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.</p> <p>L11-12RHSS4: 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).</p> <p>L11-12RHSS10: By the end of grade 12, read and comprehend history/social studies texts in the grades 11–12 text complexity band independently and proficiently.</p> <p>L11-12WHST2: Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</p> <p>L11-12WHST4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>L11-12WHST7: 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.</p> <p>L11-12WHST8: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>L11-12WHST9: Draw evidence from informational texts to support analysis, reflection, and research.</p> <p>L11-12WHST10: 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.</p>
<p>Connection to Social Studies Matrices (information processing and/or map and globe skills)</p>	<p>Information Processing Skills:</p> <ol style="list-style-type: none"> 1. compare similarities and differences 3. identify issues and/or problems and alternative solutions 4. distinguish between fact and opinion 5. identify main idea, detail, sequence of events, and cause and effect in a social studies context 6. identify and use primary and secondary sources 7. interpret timelines, charts, and tables 8. identify social studies reference resources to use for a specific purpose 9. construct charts and tables

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| | <ul style="list-style-type: none">11. draw conclusions and make generalizations12. analyze graphs and diagrams14. formulate appropriate research questions15. determine adequacy and/or relevancy of information16. check for consistency of information |
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Essential Questions and Related Supporting/Guiding Questions	
<p>Enduring Understanding 1</p>	<p>Beliefs and Ideals: The student will understand that the beliefs and ideals of a society influence the social, political, and economic decisions of that society.</p> <ul style="list-style-type: none"> • Essential Question: How do the beliefs of society influence psychological theories? <ul style="list-style-type: none"> ○ What psychological theories have a physiological basis? ○ How does understanding the brains structure and processes change our understanding of psychological responses? ○ How could an understanding of psychology influence society?
<p>Enduring Understanding 2</p>	<p>Individuals, Groups, and Institutions: The student will understand that the actions of individuals, groups and/or institutions affect society through intended and unintended consequences.</p> <ul style="list-style-type: none"> • Essential Question: How have the actions of individuals, groups and/or institutions affected society in relation to the body and it processes? <ul style="list-style-type: none"> ○ How does stress impact society? ○ How have developments in genetics changed psychology? ○ How have drugs changed psychology?
<p>Enduring Understanding 3</p>	<p>Technological Innovation: The student will understand that technological innovations have consequences, both intended and unintended, for a society.</p> <ul style="list-style-type: none"> • Essential Question: How has technology impacted our understanding of the body and its implications for psychology? <ul style="list-style-type: none"> ○ What are the basic mechanisms and useful applications of the technological innovations of EEG, MRI, fMRI, CAT or CT, and PET scanners? ○ How are these aforementioned technologies utilized to study the biological/neurological processes of humans? ○ How could future technologies change our understanding of the human body?
<p>Enduring Understanding 4</p>	<p>Human Environmental Interaction: The student will understand that humans, their society, and the environment affect each other.</p> <ul style="list-style-type: none"> • Essential Question: How does the environment effect our psychological responses? <ul style="list-style-type: none"> ○ How are stress and sleep related? ○ How can changes in our senses effect our psychological responses? ○ How does the body regulate our behaviors?

Sample Instructional Activities/Assessments

Aesthesiometer Testing

As an introduction to the topic of the nervous system, the teacher may want to purchase an aesthesiometer, an inexpensive plastic instrument with two points that can be moved further or closer apart. The distance between the two points is measured on the aesthesiometer. For a free substitute to the aesthesiometer, teachers can use two pointy objects (ex. the ends of paperclips) and a ruler to measure the distance between the two points. Have a student volunteer come up to the front of the class. Either blindfold the student or ask them to close their eyes. Set the aesthesiometer to the smallest setting. Have another volunteer come to the front and have them push the two points of the aesthesiometer against the blindfolded student's skin (medium pressure). The aesthesiometer points should be gradually moved further apart until the blindfolded student reports that they distinctively feel two points instead of one.

Recommendations:

- 1) Preselect appropriate body parts (i.e. finger, forearm, cheek, bottom of the foot, back of neck, etc.).
- 2) Make sure that some of these body parts are noticeable more sensitive than others.
- 3) Have a student write the measurements for each body part on the board.
- 4) Ask if any of the students in the class have had an injury, like a broken arm, and then compare their aesthesiometer measurements to the original/control student.
- 5) To conclude this lesson the teacher should lead a discussion focusing on the density of sensory neuron receptors throughout the body which leads to areas being more sensitive than others. For example, the fingertip is more sensitive than the forearm, so it can be concluded that more sensory receptors are available at the fingertip. The teacher could challenge the class to number the chosen body parts in order from most sensitive to least sensitive and then compare with the number of sensory receptors reported in these areas.

Objective:

The students should understand that we feel touch sensations through sensory neural receptors and that these receptors are unevenly distributed in the body to maximize sensitivity in certain areas. Teachers can continue this conversation to include the disbursement of motor neurons.

<p>GSE Standards and Elements</p>	<p>SSPBF1 Explain the development, structure, and function of biological systems and their role in behavior, cognition, and emotion.</p> <p>a. Discuss the major divisions and sub-divisions of the nervous system and their role in behavior, include: central (brain and spinal cord) and peripheral [autonomic (sympathetic and parasympathetic) and somatic].</p> <p>c. Explain the process of neurotransmission, include: action potentials and synaptic transmission.</p>
<p>Literacy Standards Social Studies Matrices Enduring Understanding(s)</p>	<p>Literacy Standards: No Social Studies literacy standards are addressed during this task.</p> <p>Social Studies Matrices:</p> <p>Information Processing Skills:</p> <p>1. compare similarities and differences</p> <p>9. construct charts and tables</p> <p>11. draw conclusions and make generalizations</p> <p>Enduring Understanding(s):</p> <p>Beliefs and Ideals: The student will understand that the beliefs and ideals of a society influence the social, political, and economic decisions of that society.</p> <ul style="list-style-type: none"> • Essential Question: How do the beliefs of society influence psychological theories?

- How does understanding the brains structure and processes change our understanding of psychological responses?

Human Environmental Interaction: The student will understand that humans, their society, and the environment affect each other.

- **Essential Question:** How does the environment effect our psychological responses?
 - How can changes in our senses effect our psychological responses?
 - How does the body regulate our behaviors?

[Drugs and Consciousness WebQuest](#)

In this WebQuest students will explore addiction and the effect of drugs upon the body. See [Drugs and Consciousness WebQuest](#) for the student work sheet.

Students will need to have access to a computer with internet access.

Note: some of the activities on the website work better with Internet Explorer or Firefox.

GSE Standards and Elements	<p>SSPBF1 Explain the development, structure, and function of biological systems and their role in behavior, cognition, and emotion.</p> <ul style="list-style-type: none"> d. Identify the major structures and functions of the brain. f. Examine the role of genetics in the development of behaviors. <p>SSPBF2 Compare different states of consciousness.</p> <ul style="list-style-type: none"> e. Analyze the physical and psychological issues associated with addiction. f. Explain how the major drug classes (stimulants, depressants, and hallucinogens) affect neurotransmission and behaviors. <p>SSPBF4 Describe how the physical world is translated into a psychological experience.</p> <ul style="list-style-type: none"> b. Recognize causes which can lead to hearing and vision deficits: include environmental causes, aging, genetics, diet, disease, and trauma.
Literacy Standards Social Studies Matrices Enduring Understanding(s)	<p>Literacy Standards:</p> <p>L9-10RHSS2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.</p> <p>L9-10RHSS4: Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.</p> <p>L9-10RHSS10: By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.</p> <p>L9-10WHST4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>L9-10WHST7: 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.</p> <p>L9-10WHST9: Draw evidence from informational texts to support analysis, reflection, and research.</p> <p>L9-10WHST10: 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.</p> <p>L11-12RHSS2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.</p> <p>L11-12RHSS4: 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).</p> <p>L11-12RHSS10: By the end of grade 12, read and comprehend history/social studies texts in the grades 11–12 text complexity band independently and proficiently.</p> <p>L11-12WHST4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>

L11-12WHST7: 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.

L11-12WHST9: Draw evidence from informational texts to support analysis, reflection, and research.

L11-12WHST10: 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.

Social Studies Matrices:

Information Processing Skills:

1. compare similarities and differences
5. identify main idea, detail, sequence of events, and cause and effect in a social studies context
7. interpret timelines, charts, and tables
11. draw conclusions and make generalizations
12. analyze graphs and diagrams

Enduring Understanding(s):

Beliefs and Ideals: The student will understand that the beliefs and ideals of a society influence the social, political, and economic decisions of that society.

- **Essential Question:** How do the beliefs of society influence psychological theories?
 - How does understanding the brain's structure and processes change our understanding of psychological responses?

Individuals, Groups, and Institutions: The student will understand that the actions of individuals, groups and/or institutions affect society through intended and unintended consequences.

- **Essential Question:** How have the actions of individuals, groups and/or institutions affected society in relation to the body and its processes?
 - How have developments in genetics changed psychology?
 - How have drugs changed psychology?

Human Environmental Interaction: The student will understand that humans, their society, and the environment affect each other.

- **Essential Question:** How does the environment affect our psychological responses?
 - How does the body regulate our behaviors?

Compare and Contrast Table

In this activity students will complete a chart like a semantic features analysis. On the left-hand side of the chart there will be listed three theories of emotions and across the top features of those theories. In each of the columns students will note what each theorist says about the different features. In the final two columns on the right students will record their response to the theory and in the last column a summary of the theory.

This chart will enable them to make a quick comparison of all three theories.

A [student copy of the chart](#) is available at the end of this document. Students could complete these charts individually or in groups.

	Stimulus	Physiological Response	Cognitive Response	Criticism	My Response	Summary
James-Lange						
Cannon-Bard						
Singer-Schachter's Two Factor						

Below are three articles that describe the three theories:

- Cherry, Kendra, and Steven Gans. "What Is the James-Lange Theory of Emotion?" Verywell Mind. Verywellmind, n.d. Web. 20 May 2018. <<https://www.verywellmind.com/what-is-the-james-lange-theory-of-emotion-2795305>>.
- Cherry, Kendra. "How the Cannon-Bard Theory Explains Emotion." Verywell Mind. Verywellmind, n.d. Web. 20 May 2018. <<https://www.verywellmind.com/what-is-the-cannon-bard-theory-2794965>>.
- Cherry, Kendra. "What Exactly Makes Up Our Emotions? The Two-Factor Theory." Verywell Mind. Verywellmind, n.d. Web. 20 May 2018. <<https://www.verywellmind.com/the-two-factor-theory-of-emotion-2795718>>.

GSE Standards and Elements	<p>SSPBF5 Identify major theories and concepts related to motivation and emotion.</p> <p>b. Compare and contrast theories of emotion, include: James-Lange, Cannon-Bard, and Singer-Schachter's Two Factor.</p>
Literacy Standards Social Studies Matrices Enduring Understanding(s)	<p>Literacy Standards:</p> <p>L9-10RHSS1: Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.</p> <p>L9-10RHSS2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.</p> <p>L9-10RHSS10: By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.</p> <p>L9-10WHST7: 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.</p> <p>L9-10WHST9: Draw evidence from informational texts to support analysis, reflection, and research.</p> <p>L9-10WHST10: 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.</p>

<p>L11-12RHSS1: Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole.</p> <p>L11-12RHSS2: Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.</p> <p>L11-12RHSS10: By the end of grade 12, read and comprehend history/social studies texts in the grades 11–12 text complexity band independently and proficiently.</p> <p>L11-12WHST7: 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.</p> <p>L11-12WHST9: Draw evidence from informational texts to support analysis, reflection, and research.</p> <p>L11-12WHST10: 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.</p> <p>Social Studies Matrices:</p> <p>Information Processing Skills:</p> <ol style="list-style-type: none">1. compare similarities and differences11. draw conclusions and make generalizations <p>Enduring Understanding(s):</p> <p>Beliefs and Ideals: The student will understand that the beliefs and ideals of a society influence the social, political, and economic decisions of that society.</p> <ul style="list-style-type: none">• Essential Question: How do the beliefs of society influence psychological theories?<ul style="list-style-type: none">○ What psychological theories have a physiological basis?

Culminating Unit Performance Task

Patient Form

Students will fill in a Patient Form that describes the symptoms of a fictional patient who suffers from a neurological disorder.

Students should be assigned or allowed to choose one of the following neurological disorders: Alzheimer’s Disease, Huntington’s Disease, Parkinson’s Disease, Epilepsy, Schizophrenia, Lou Gehrig’s Disease, or a localized brain tumor. More neurological disorders can be added if desired.

Students can either work individually, in pairs, or small groups on this culminating project. The students will need to complete the Neuroscience Patient Form, which includes patient information, symptoms, and genetic predispositions for the specific neurological disorder.

Students will also include the effects the neurological disorder will have on neurons, neural transmission, the nervous system, and the brain. Students will then add a short description of a diagnostic test that they would use as the patient’s medical professional (EEG, MRI, fMRI, PET, CT scan, etc.).

The students will have to describe the purpose of using the chosen diagnostic test and the expected outcomes of the test. Finally, the Patient Form will include a works cited page.

[See the [Performance Task](#) and [Product Rubrics](#), [Performance Task Directions](#), [Neuroscience Patient Form](#), and [Neuroscience Patient Form \(Example\)](#) for further clarification of the standards and requirements for this project.]

GSE Standards and Elements	<p>SSPBF1 Explain the development, structure, and function of biological systems and their role in behavior, cognition, and emotion.</p> <ul style="list-style-type: none"> a. Discuss the major divisions and sub-divisions of the nervous system and their role in behavior, include: central (brain and spinal cord) and peripheral [autonomic (sympathetic and parasympathetic) and somatic]. b. Identify the components and function of a neuron. c. Explain the process of neurotransmission, include: action potentials and synaptic transmission. d. Identify the major structures and functions of the brain. e. Describe the methods used to analyze neural form and function: include the MRI, fMRI, PET, CAT, and EEG. f. Examine the role of genetics in the development of behaviors.
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L9-10WHST8: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

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Additional Information, Rubrics for the Performance Task

Rubric for Performance Task

Scale Criteria	1 Below Standard	2 Needs Improvement	3 Meets Standard	4 Exceeds Standard
Identifies and describes the patient’s fictional personal information (name, race, age, gender), reason for visit, and symptoms	Incorrectly identifies symptoms, genetic predispositions, and appropriate treatments for the neurological disorder.	Correctly identifies basic symptoms, genetic predispositions, and appropriate treatments for the neurological disorder.	Correctly identifies and effectively incorporates symptoms, genetic predispositions, and treatments for the neurological disorder into the details of the fictitious patient.	In addition to everything in 3 (meets standard): The symptoms identified are appropriate for patient at the early stages of the disorder, fitting of the diagnosis stage.
Identifies and describes the diagnostic tests that a doctor would order to confirm the assigned neurological disorder, the purpose of the diagnostic test, and test results common to the disorder.	Incorrectly identifies the appropriate diagnostic tests typically used by a medical professional when attempting to confirm a diagnosis of the assigned neurological disorder.	Correctly identifies the appropriate diagnostic tests used by a medical professional when attempting to confirm a diagnosis of the assigned neurological disorder but fails to identify the purpose and/or expected outcome of the diagnostic tests.	Correctly identifies the appropriate diagnostic tests used by a medical professional when attempting to confirm a diagnosis of the assigned neurological disorder. Correctly identifies the purpose and expected outcome of the diagnostic tests.	In addition to everything in 3 (meets standard): Identifies the particular body parts, using anatomical terms, of the patient that will be tested. (i.e. the temporal lobe, or the somatic nervous system in the legs, etc.)
Identifies and describes the diagnosis and any genetic predispositions the patient may have for the disorder.	Incorrectly identifies the diagnosis and general genetic predispositions of the specific neurological disorder.	Correctly identifies the diagnosis and general genetic predispositions of the specific neurological disorder but fails to associate the genetic predispositions with the specific patient using the age, gender, race, and fictional familial history of the disorder.	Correctly identifies the diagnosis and general genetic predispositions of the specific neurological disorder. The student can associate the genetic predispositions with their specific patient using their age, gender, race, and fictional familial history of the disorder.	In addition to everything in 3 (meets standard): Student provides statistics that identify the patient’s genetic predisposition for this disorder.
Identifies the neurological disorder’s effects on the patient’s neurons, neurotransmission, and nervous system.	Incorrectly identifies neurological disorder’s effects on the patient’s neurons, neurotransmission, and nervous system.	Identifies, with a rudimentary level of comprehension, the neurological disorder’s effects on the patient’s neurons, neurotransmission, and nervous system.	Correctly identifies, with a high level of accuracy, the neurological disorder’s effects on the patient’s neurons, neurotransmission, and nervous system.	In addition to everything in 3 (meets standard): Student is able to infer the long-term effects the disorder will have on neurons, neurotransmission, and the nervous system.
Identifies the neurological disorder’s effects on the patient’s physiological brain and its processes and functions.	Incorrectly identifies physiological and functional changes in the patient’s brain due to the neurological disorder.	Correctly identifies, with a rudimentary level of accuracy, the physiological and functional changes in the patient’s brain due to the neurological disorder.	Correctly identifies, with a high level of accuracy and the use of neuroanatomy terminology, the physiological and functional changes in the patient’s brain due to the neurological disorder.	In addition to everything in 3 (meets standard): Student is able to infer the long term effects the disorder will have on the physiology of the patient’s brain.
Identifies and describes the treatment that a doctor may prescribe to a patient with this disorder, the expected outcomes of the treatment, and the overall prognosis of the patient.	Incorrectly identifies typical treatments, expected outcomes of said treatments, and overall prognosis of a patient with the assigned neurological disorder.	Correctly identifies typical treatments, expected outcomes of said treatments, and overall prognosis of a patient with the assigned neurological disorder. The treatment, outcomes, and prognosis only focus on the present time and near future.	Correctly identifies typical treatments, expected outcomes of said treatments, and overall prognosis of a patient with the assigned neurological disorder. The treatment, outcomes, and prognosis focus on the immediate and long term.	In addition to everything in 3 (meets standard): Student identifies treatments that will promote the overall well-being of their patient, focusing on both physiological health, psychological health, and his or ability to complete everyday tasks.

Product Rubric for Performance Task


Scale Criteria	1 Below Standard	2 Needs Improvement	3 Meets Standard	4 Exceeds Standard
Organization, Grammar, and Spelling	The Patient Form contains numerous grammar and spelling errors. If handwritten, student writing is illegible.	The Patient Form contains sporadic grammar and spelling errors. If handwritten, student writing is legible.	The Patient Form contains rare grammar and spelling errors. If handwritten, student writing is legible and neat	In addition to everything in 3 (meets standard): The patient form is grammatically clean and free of spelling errors.
Perspective	The student fails to take the perspective of a medical professional; they recite facts about the disorder, but do not connect those facts to their fictional patient.	The student attempts to take the perspective of a medical professional; the facts they share about their disorder are sometimes, but no always connected to their fictional patient.	The student takes the perspective of a medical professional; the facts they share about their disorder are all connected to their fictional patient.	In addition to everything in 3 (meets standard): The student uses medical jargon associated with the neurological disorder correctly and clearly shows a grasp of each word's meaning.
Works Cited Page	Not all the information on the Patient Form is cited. The bibliography does not follow an accepted format.	All the information on the Patient Form is cited. The bibliography does not follow an accepted format.	All the information on the patient form is cited. The bibliography does follow an accepted format.	In addition to everything in 3 (meets standard): Student uses medical resources and resources focused on the specific neurological disorder. (i.e. http://www.als.org is focused on ALS/Lou Gherig's disease.)

Performance Task Directions

- Students will either choose or be assigned a neurological disorder (i.e. Alzheimer’s Disease, Huntington’s Disease, Parkinson’s Disease, Epilepsy, Schizophrenia, Lou Gehrig’s Disease, localized tumor, etc. The teacher can add more disorders if desired).
- Students will take the perspective of a neurosurgeon, a specialist in the diagnosis and treatment of neurological disorders.
- Students will assign a name, gender, race, and age for their fictional patient. Students will also select a picture for their fictional patient.
- Students will then use internet and/or media center resources to research the following aspects of his or her assigned neurological disorder:
 - 1) Symptoms their Patient is likely to Exhibit with this Diagnosis
 - 2) Possible Genetic Predispositions their Patient is likely to have with this Diagnosis
 - 3) Diagnostic Tests a Medical Professional would Typically Order for this Disorder
 - 4) Diagnostic Test Results Typical of their Patient with this Disorder
 - 5) The Effects this Disorder would have on their Patient’s Neurons
 - 6) The Effects this Disorder would have on their Patient’s Neurotransmission
 - 7) The Effects this Disorder would have on their Patient’s Nervous System
 - 8) The Effects this Disorder would have on their Patient’s Brain Anatomy
 - 9) Treatment Suggested for their Patient with this Disorder
 - 10) Prognosis for the Patient with this Disorder
- Students will record the data on the “Neuroscience Patient Form.” Students can either type on this form or write on it.
- Finally, students will provide a Works Cited page, or Bibliography of the resources they used for their research.
- See the Performance Task and Product Rubrics for assessment standards.
- See the “Neuroscience Patient Form (Example)” for an example of this project.

Student Name: _____

Neuroscience Patient Form

Last Name	First Name	MI	
Gender	Age	Race	
Reason for visit			
Symptoms			
Diagnostic Tests Ordered and Purpose of Test			
Diagnostic Test Results			
Diagnosis			
Genetic Predispositions			
Effects on Neurons			

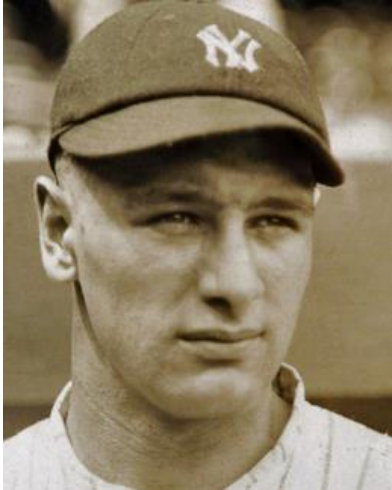
Psychology Frameworks for the Georgia Standards of Excellence in Social Studies

Effects on Neurotransmission
Effects on Nervous System
Effects on Brain Regions
Suggested Treatment(s), Purpose of Treatment, and any Known Side Effects
Prognosis

Works Cited:

Student Name: _____

Neuroscience Patient Form (example)

Last Name <i>Mous</i>	First Name <i>Anon</i>	MI <i>Y.</i>	
Gender <i>Male</i>	Age <i>49</i>	Race <i>Caucasian</i>	
Reason for visit <ul style="list-style-type: none"> • <i>Anon reports feeling weak and not himself lately.</i> • <i>He has not been able to work out or run in months- an activity he used to enjoy daily.</i> • <i>Anon sometimes has a hard time getting up in the morning.</i> • <i>He reports that sometimes his legs "fall asleep" and feel "numb."</i> 			
Symptoms <ul style="list-style-type: none"> • <i>Anon has been experiencing shakes and temporary loss of muscle control in his legs.</i> • <i>Mr. Mous has been tripping more frequently than usual. He trips even while he is focused on walking.</i> • <i>Anon has also recently noticed atrophy, loss of muscle mass, in his legs.</i> • <i>I noticed that sometimes Mr. Mous has a hard time speaking. When I asked him about it, he replied that he knows exactly what he wants to say, but has a hard time getting the words out.</i> 			
Diagnostic Tests Ordered and Purpose of Test <ul style="list-style-type: none"> • <i>Electromyography (EMG)- The purpose of this test is to see whether electrical activity is still reaching Mr. Mous' leg muscles.</i> • <i>Magnetic Resonance Imaging (MRI)- The purpose of this test is to look for scarring/sclerosis along the spine, deterioration of the brain stem and motor cortexes, and atrophy and loss of muscle mass in the legs.</i> 			
Diagnostic Test Results <ul style="list-style-type: none"> • <i>The EMG showed a below average level of neural activity, electrical activity, in Mr. Mous' legs.</i> • <i>The MRI scans showed deterioration of the brain stem and motor cortex- two areas of the brain associated with voluntary muscle movements.</i> • <i>The MRI also showed a below average level of muscle mass in Mr. Mous' leg muscles.</i> 			
Diagnosis <ul style="list-style-type: none"> • <i>Sporadic Lou Gehrig's Disease [a.k.a. Amyotrophic lateral sclerosis (ALS)]- No genetic component</i> 			
Genetic Predispositions <ul style="list-style-type: none"> • <i>According to the ASL Association, 60 % of those in the national ASL database are male, and 93% are Caucasian.</i> • <i>Most individuals who develop ASL are above the age of 55, but it is known to occur in adults as young as forty.</i> • <i>Anon Y. Mous is male, a Caucasian, and above the age of 40. No one in Anon Y. Mous' family has been diagnosed with ASL; therefore, it is not inherited- it is sporadic.</i> 			
Effects on Neurons <p><i>Lou Gehrig's Disease leads to the weakening and eventual death of motor neurons. Where there are clusters of motor neurons along the spine, hardening of the nerves can occur after extensive neural degeneration, causing scarring, also known as Sclerosis.</i></p>			

<p>Effects on Neurotransmission</p> <ul style="list-style-type: none"> • Since ALS leads to the unnatural death and degeneration of motor neurons, this disrupts neurotransmission between the CNS (brain and spinal cord) and the muscles throughout the body. • Neurotransmission issues often begin in the extremities- fingers, toes, arms, and legs. As the disease progresses, neurotransmission disruption will spread to the face and throat areas, making breathing, swallowing, and talking difficult.
<p>Effects on Nervous System</p> <ul style="list-style-type: none"> • The spinal cord in the Central Nervous System (CNS) experiences scarring, sclerosis where connected to degenerated motor neurons. The somatic nervous system, which controls voluntary muscle movements, is the most affected by ALS and the autonomic nervous continues to function properly. • In the final stages of the disease, patients with ALS will experience total paralysis of the body.
<p>Effects on Brain Regions</p> <ul style="list-style-type: none"> • ALS affects the brain stem and motor cortexes. When these areas of the brain can no longer communicate with the motor neurons and muscles, then they begin to degenerate. The brain stem and motor cortexes will lack brain activity and eventually scar and shrink.
<p>Suggested Treatment(s), Purpose of Treatment, and any Known Side Effects</p> <ul style="list-style-type: none"> • Prescribe FDA approved drug- Riluzole. Riluzole will, in most cases, slow the progression of motor neuron degeneration and sclerosis along the spinal nerve. Riluzole also decreases the release of the neurotransmitter glutamate. Riluzole side effects include dizziness and overall weakness. In addition to drug therapy, Mr. Mous should be referred to a physical therapist (PT) in order to promote motor neuron activity and muscle use. Mr. Mous should also be referred to an occupational therapist (OT), who can help him learn how to complete daily tasks (i.e. button his shirt) as he slowly loses muscle control and movement. Finally, Mr. Mous should be referred to a speech therapist and speech pathologist to help him maintain speech, swallowing, and breathing skills. If Mr. Mous fails to maintain a regular PT, OT, and speech therapy regiment, his symptoms will most likely progress more quickly, be more severe, and will lead to a quicker death. • Since patients with ALS frequently develop depression and related psychological issues, we should also suggest seeking a counselor, psychiatrist, or psychologist.
<p>Prognosis</p> <ul style="list-style-type: none"> • ALS is a terminal illness. • Since Mr. Mous is being diagnosed in the early stages of ALS, he most likely has three to five years left to live. • As his ALS symptoms progress, he will most likely need the assistance of technology (i.e. wheelchair) to aid in mobility and everyday motor tasks.

Works Cited:

The ALS Association (2006) "What is ALS?" retrieved from

<http://www.alsa.org/als/what.cfm?CFID=3132274&CFTOKEN=77bb6fd3bfe2ec-ED179086188B2E6280BDBBD17B0E0875>.

Kids Health from Neumors (2009) "EMG (Electromyography)" retrieved from

<http://kidshealth.org/parent/general/sick/emg.html>.

Neurology Channel (2009) "Amyotrophic Lateral Sclerosis (ALS)/Lou Gehrig's Disease: Treatment and Prognosis" retrieved from <http://www.neurologychannel.com/als/treatment.shtml>.

Image of Lou Gehrig:

By Wide World Photos (Legendary Auctions) [Public domain],

https://upload.wikimedia.org/wikipedia/commons/f/fb/1923_Lou_Gehrig.png

Drugs and Consciousness WebQuest

<http://learn.genetics.utah.edu/content/addiction/drugs/index.html>


1. Read "Drug Use Changes the Brain Over Time". How do drugs influence the synapse?
2. Read "Genes and Addiction". How can genes influence peoples drug use?
3. Check out the section called "Drug Delivery Methods". How does the form of the drug change its addiction levels?
4. Watch "The Reward Pathway" and then read the section "Beyond the Reward Pathway". How do drugs take advantage of the brains pathways to influence behavior?
5. Click on "DRUGS OF ABUSE" and complete this chart.

Name of Drug	How Taken	Nick Names	Facts Classification, Effects on Body, Effects on Brain, Withdrawal Symptoms, Addictive Properties
Alcohol			
Anabolic Steroids			

Name of Drug	How Taken	Nick Names	Facts Classification, Effects on Body, Effects on Brain, Withdrawal Symptoms, Addictive Properties
Cocaine			
Dissociative Drugs			
GHB & Rohypnol			
Hallucinogens			
Heroin			

Name of Drug	How Taken	Nick Names	Facts Classification, Effects on Body, Effects on Brain, Withdrawal Symptoms, Addictive Properties
Inhalants			
Marijuana			
MDMA			
Methamphetamine			
Nicotine			

6. Click on “[HOW DRUGS CAN KILL](#)”. Complete the following chart explaining how each drug can kill.

<p>Polydrug Cocktails: Opiates and Alcohol</p>	
<p>Nicotine</p>	<p>Cocaine and Other Stimulants</p>

7. Scroll to the top and click on “[EXPLORE: MOUSE PARTY](#)”. Mouse party is designed to provide a small glimpse into the chemical interactions at the synaptic level that cause the drug user to feel “high”. Navigate through the mouse party and answer the questions.

Eddie the Ecstasy Mouse



- 1) When the transporter takes in the ecstasy, what does it do with the excess serotonin?
- 2) How does ecstasy cause “the high”? In other words, how does it over stimulate the receptors?

3) What are the serotonin pathways responsible for that ecstasy effects?

Annie the Alcohol Mouse



- 1) GABA Neurotransmitters are responsible for what?
- 2) What two things happen when Alcohol enters the brain?

3) Why is memory affected when people drink too much?

Carter the Cocaine Mouse



1) What happens when cocaine blocks the dopamine transporters?

2) Why are cocaine users so fidgety?

Miley the Marijuana Mouse



1) Cannabinoid receptors turn off the release of what?

2) What does THC do? How are THC and anandamide similar? How are they different?

3) Name 2 parts of the brain marijuana affects.



Lucy the LSD Mouse

1) Why does LSD have complex sensory effects?

2) What is the LC and what does it do?



Max the Meth Mouse

1) How does Meth get into your body's cells?

2) What does the excess dopamine end up doing?

3) Why is Meth so addictive?



Henry the Heroin Mouse

1) How does Heroin mimic our body's natural processes?

2) What is the effect of this mimicry?

Student Name: _____

Student Chart: Theories of Emotions

	Stimulus	Physiological Response	Cognitive Response	Criticism	My Response	Summary
James-Lange						
Cannon-Bard						
Singer-Schachter's Two Factor						