

CURRICULUM NAME Unit Integration and Coordination

The systems contained in this unit are tasked with coordinating the entire human body. This unit also illustrates how these system are constantly making adjustments so the body can efficiently operate in different environments.

Overarching Essential Questions	Overarching Enduring Understandings	
<ul style="list-style-type: none"> • How is the nervous system organized to maintain homeostasis for the body and control the workings of the body? <ul style="list-style-type: none"> • How do the sense organs work with the nervous system to provide information about the environment? • How does the endocrine system maintain homeostasis for the body on a chemical level? 	<ul style="list-style-type: none"> • The nervous system maintains body homeostasis with electrical signals, provides for sensation, higher mental functioning, emotional responses and activates muscles and glands. • The sense organs respond to stimuli involved in vision, hearing, balance, smell and taste. • The endocrine system releases chemical and controls the processes of the body? 	
Student Learning Objectives		
<i>What students should be able to do after instruction.</i>		<i>Evidence Statements</i>
Given a diagram of identify the structures of the nervous system compare and contrast the central and peripheral nervous system to demonstrate how these two are interrelated in the human body.		HS-LS-1-2 HS-LS-1-3
Diagram the structures of the eye and the accessory structures and discuss the function of each to build understanding of how the eye gives us information and how the brain interprets this information into something we know as the image.		HS-LS-1-2 HS-LS-1-3
Organize the components of the endocrine system to show the control each of the structures have on the homeostasis and therefore the coordination of the systems of the body.		HS-LS-1-2 HS-LS-1-3

The Student Learning Objectives above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<ul style="list-style-type: none"> Examine a nervous tissue under the microscope. Dissect the sheep brain Drexel Cadaver Lab- Neurology presentation Reflex testing lab Cow eye dissection Visual testing lab Microscopic examination of the structure of the thyroid gland. End of the course cat dissection. 	<ul style="list-style-type: none"> LS1.A: Structure and Function All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1) Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2) In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions 	<ul style="list-style-type: none"> Cause and Effect - Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8) Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-4),(MSLS1-5) Scale, Proportion, and Quantity Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)

Embedded English Language Arts/Literacy and Mathematics

English Language Arts/Literacy –

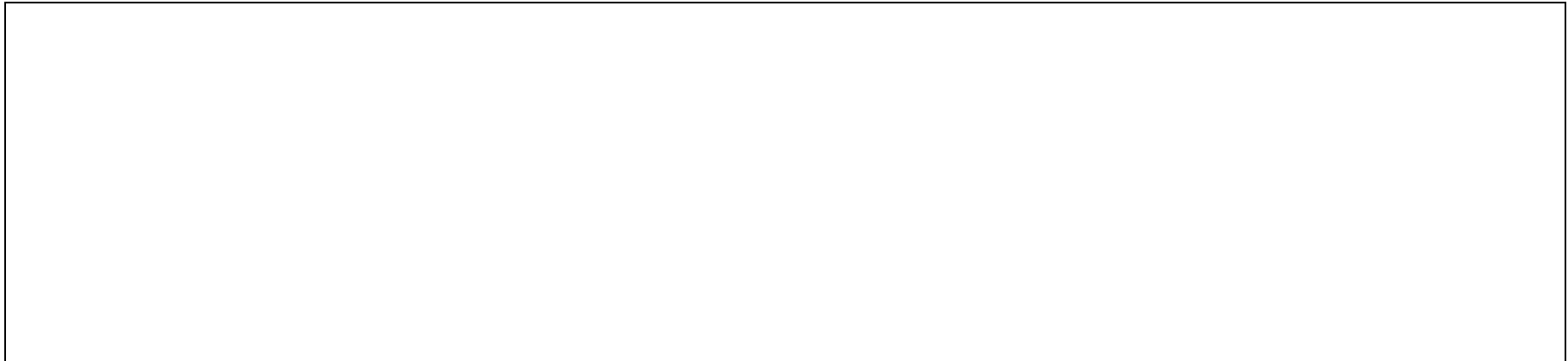
RST.11-12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS1-1),(HS-LS1-6)

WHST.9-12.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (HS-LS1-6) WHST.9-12.7 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. (HSL1-3)

Mathematics –

MP.4 Model with mathematics. (HS LS1-4)

HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (HS LS1-4)



Three-Dimensional Teaching and Learning

This unit deals with the multiple systems that work together to coordinate the complex activities going on inside the body and allow the body to interact successfully with other bodies and its environment.

The DCI's and CC's SEP's allow us to intensify our investigation of these systems by studying them using different tools and from different perspectives. We are investigating the coordination of the body on a microscopic level all the way to the workings of the entire organism.

Prior Learning

- Biochemistry
- Cytology
- Microscope technique
- Previous units taught in this course

• Part A:

Concepts	Formative Assessment
<ul style="list-style-type: none">• How is the nervous system organized to maintain homeostasis for the body and control the workings of the body?• How do the sense organs work with the nervous system to provide information about the environment?	<p><i>Students who understand the concepts are able to:</i></p> <p>Compare and contrast the areas of a neuron differentiating the jobs they do.</p>

<ul style="list-style-type: none"> How does the endocrine system maintain homeostasis for the body on a chemical level? 	<p>Reconstruct depolarization of a neuron and the movement of a nerve impulse down the length of the neuron.</p> <p>How does a nerve impulse travel biochemically between neurons.</p> <p>Compare and contrast the central and peripheral nervous systems and how they work together to</p> <p><i>Illustrate</i> the regions of the brain to showing how different regions compare and contrast both structurally and functionally and identify these areas and regions on a sheep brain.</p>
<ul style="list-style-type: none"> 	

Part B:	
Concepts	Formative Assessment
<ul style="list-style-type: none"> How do the sense organs work with the nervous system to provide information about the environment? 	<p><i>Students who understand the concepts are able to:</i></p> <ul style="list-style-type: none"> Compare and contrast the structures of the eye in order to build understanding of the interrelatedness of these structures in seeing an image correctly. Eye practical following dissection using a cow eye Measure and compare the visual acuity and compare it with lab partners.

Part C:	
Concepts	Formative Assessment
<ul style="list-style-type: none"> How does the endocrine system maintain homeostasis for the body on a chemical level? 	<p><i>Students who understand the concepts are able to:</i></p> <p>Compare and contrast the cells of different endocrine glands using microscope slides to build understanding of the different jobs these glands do.</p> <p>Compare and contrast the different organs of the endocrine system to build an understanding of the interrelatedness of these structures to the homeostatic balance of the body.</p>

	Trace hyper or hypoactivity of a gland and the affects that will have on the entire endocrine system
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Modifications: *Teachers identify the modifications that they will use in the unit. The unneeded modifications can then be deleted from the list.(See NGSS Appendix D)*

- *Reinforcement packet*
- *One on one conferencing*
- *504s and IEPs will be consulted and followed.*
- *Case managers will be brought in to maximize learning.*
- Videos for reinforcement to maximize learning for ELL students
- Concept Maps and quizzes evaluate topics as the unit progresses

Leveraging English Language Arts/Literacy and Mathematics

English Language Arts/Literacy
 Precis of articles will be done by students.
 Text and additional writings will be assigned to students.
 Read and comprehend complex laboratory instructions.
 Write formal lab reports

Mathematics
 Collect individual data
 Collect Class data
 Calculate % error
 Graph individual and class data

Samples of Open Education Resources for this unit:

Bozeman Videos
 Quia testing
 Google Classroom

Online flashcards of structures.

Anatomy lab simulator <http://kobiljak.msu.edu/CAI/ANT551/index.html>

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Appendix

Differentiation	
Enrichment	<ul style="list-style-type: none">● Utilize collaborative media tools● Provide differentiated feedback● Opportunities for reflection● Encourage student voice and input● Model close reading● Distinguish long term and short term goals
Intervention & Modification	<ul style="list-style-type: none">● Utilize “skeleton notes” where some required information is already filled in for the student● Provide access to a variety of tools for responses● Provide opportunities to build familiarity and to practice with multiple media tools● Leveled text and activities that adapt as students build skills● Provide multiple means of action and expression● Consider learning styles and interests● Provide differentiated mentors● Graphic organizers

ELLs	<ul style="list-style-type: none">● Pre-teach new vocabulary and meaning of symbols● Embed glossaries or definitions● Provide translations● Connect new vocabulary to background knowledge● Provide flash cards● Incorporate as many learning senses as possible● Portray structure, relationships, and associations through concept webs● Graphic organizers
21st Century Skills	
<ul style="list-style-type: none">● Creativity● Innovation● Critical Thinking● Problem Solving● Communication● Collaboration	
Integrating Technology	
<ul style="list-style-type: none">● Chromebooks● Internet research● Online programs● Virtual collaboration and projects● Presentations using presentation hardware and software	