SUBJECT: The Human Body

BOE APPROVAL: August 2020

Cliffside Park Public Schools

GRADE: 11-12

The Human Body

New Jersey Student Learning Standards SCIENCE

Dual College enrollment course- Bio103

All standards are NJSLS-S

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Unit 1: Organ systems Overview

Unit 1: How do the structures of organisms enable life's functions?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 7 Instructional Days

Essential Question

How do the structures of organisms enable life's functions?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 1: Organ System: This unit will allow students to gain a familiarity with every organ system to set a base whereby they may understand the histological significance of cells associated with each system. The introduction additionally allows students to move forward gaining a greater depth of knowledge when each system is individually addressed.
HS-LS1-2

Unit Summary

The content in this unit will (in one week) cover what many science students master at the end of their entire academic careers, Thus, it is a bridge between being a high school student and being a college student taking a dual enrollment class.

Technical Terms

Circulatory, Respiratory, Integumentary, Skeletal, Nervous, Endocrine, Excretory, Digestive, Reproductive, Immune, Muscular

Disciplinary Core Ideas:	Crosscutting Concepts:	Science and Engineering Practices:
The human body is a collection of organ systems working together to meet the needs of the whole organism.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own

		investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What are the primary organs and functions of each organ system?	
Students who understand the concepts are able to: ● Associate an organ with an organ system and the organ system's purpose. ● Properly use terminology. ● Move forward at an accelerated rate studying detailed facts regarding each system.	
Part B: What do you mean they say that people are made of a system of systems?	
Students who understand the concepts are able to: Develop and use a model based on evidence to illustrate hierarchical organization of interacting systems that provide specific functions within multicellular organisms. ● Develop and use a model based on evidence to illustrate the interaction of functions at the organism system level.	
Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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	NA

citation. (HS-LS1-3) • WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

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Unit 2: Biochemistry		
Unit 2: How do chemical interactions in cells enable life's functions?		
Grade: 11-12 Content Area: Anatomy and Physiology Pacing: 10 Instructional Days		
Essential Question		
What chemicals and molecules create the foundations of cells?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 2: Biochemistry: Students will apply their knowledge from the prerequisite course of chemistry into an analysis of how dehydration synthesis and hydrolysis control the molecules that build cells. Students will be able to identify molecules based on presence or absence of functional groups and atomic structures.		
Unit Summary		
Each of the four basic macromolecules will be studied in terms of their jobs in a cell and in the maintenance of homeostasis, as well as studying how they are obtained in food and converted into new structures in the human body.		
Technical Terms		
Amino Acids, Proteins, Enzymes, Microtubules, Fats, Fatty Acids, Lipids, Glycerol, Sugars, Monosaccharides, Starches, Polysaccharides, Nucleotides, Nucleic Acids, RNA, DNA, Nitrogenous Bases, Phosphates, Ribose, Deoxyribose,		
Disciplinary Core Ideas: Cells are made of molecules, each molecule has its own distinct structure and arrangement. Bonds are made and broken in the catabolic and anabolic aspects of metabolism.	**Crosscutting Concepts:** Chemistry has direct applications in the study of biological sciences. 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	**Science and Engineering Practices:** Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own

		investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2) Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-ESS1-1)

Part A: Name the four main monomer, polymer groups?
Students who understand the concepts are able to: ● Explain which foods provide which molecules necessary for our metabolism. ● Properly use terminology. ● Move forward at an accelerated rate studying detailed facts regarding each system.
Part B: Which reactions permit polymerization and digestion?
Students who understand the concepts are able to: ● Locate functional groups in a molecular model where reactions will occur. ● Explain the process of polymerization in all four major molecular groups.

Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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	F-BF: A. Build a function that models a relationship between two quantities 1. Write a function that describes a relationship between two quantities.★ a. Determine an explicit expression, a recursive process, or steps for calculation from a context.

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. (HS-LS1-3) • WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

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Unit 3: Histology		
Unit 3: What structural facets of cells control their effective functioning? Which cells are associated with each organ system?		
Grade: 11-12		
Content Area: Anatomy and Physiology		
Pacing: 10 Days		
Essential Question		
Which organ systems are associated with each type of cell? How do epithelial cells differ from nerve cells, connective tissue cells and muscular cells? What types of cells are found in each category?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 3: Histology: Construct an explanation based on evidence for how the structure of DNA deterr the essential functions of life through systems of specialized cells. HS.LS.1.1		
Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. HS.LS.1.2		
Unit Summary		
Cells are the functional and structural units of every form of life. In humans, each organ system has a distinct cell type consistent with the organ systems functions. The histology unit will cover the anatomy of each cell type and the physiology associated with the cell meeting the needs of the organism as a whole.		
Technical Terms		
DNA,Organism, Homeostasis, Simple, Stratified, Squamous, Columnar, Cuboidal		
Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
Cells are the functional and structural units of all living things. Cells from each organ will be designed for specific functions according to the needs of each organ.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) Energy drives the cycling of matter within and between systems.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Use mathematical representations of phenomena or design solutions to support claims. (NJSLS-S-HS-LS2-4)

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	(NJSLS-S-HS-LS2-3) Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth). (HS-ESS1-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: How are different cells identified?

Students who understand the concepts are able to:

- Identify cells of the following organ systems: Circulatory, Respiratory, Integumentary, Nervous, Endocrine, Excretory, Digestive, Reproductive, Immune, Muscular; and they are able to explain how each cell's morphology permits it to perform necessary functions.

Part B: How are these cells studied?

Students who understand the concepts are able to:

- Properly use a light microscope from hands on learning and they are able to consider proper use of an SEM or TEM from discussions.

Part C: What are the levels of organization in a system?

- Students will discuss how cells become tissues, which become organs, etc.

Interdisciplinary Connections

NJSLS- ELA	NJSLS- Mathematics
• 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. RST.11-12.1 (HS-LS2-3) • Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. SL.11-12.5 (HS-LS1-5)	• Reason abstractly and quantitatively. MP.2 (HS-LS2-4) • Model with mathematics. MP.4 (HS-LS2-4) • Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. HSN-Q.A.1 (HS-LS2-4) • Define appropriate quantities for the purpose of descriptive modeling. HSN-Q.A.2 (HS-LS2-4)

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	• HSN-Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-LS2-4)
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11- 9.2.12.C.3, 9.2.12.C.6
Technology Standards	8.1.12.A.1, 8.1.12.A.2, 8.1.12.F.1 ,8.2.12.B.1

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding	Word walls	Teacher tutoring	Curriculum compacting
Word walls	Visual aides	Peer tutoring	Challenge assignments
Sentence/paragraph frames	Graphic organizers	Study guides	Enrichment activities
Bilingual dictionaries/translation	Multimedia	Graphic organizers	Tiered activities
Think alouds	Leveled readers	Extended time	Independent research/inquiry
Read alouds	Assistive technology	Parent communication	Collaborative teamwork
Highlight key vocabulary	Notes/summaries	Modified assignments	Higher level questioning
Annotation guides	Extended time	Counseling	Critical/Analytical thinking tasks
Think-pair- share	Answer masking		Self-directed activities
Visual aides	Answer eliminator		
Modeling	Highlighter		
Cognates	Color contrast		

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Unit 4: Skeletal System

Unit 4: What structural facets of bones control their effective functioning? What is the microscope structure of bones and how does that permit them to function effectively?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 7 Instructional Days

Essential Question

What are all of the functions of the skeletal system?
How are new blood cells formed?
What categories of bone exist?
What are the names of the 206 bones in the human body and what markers are found on each?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 4: Skeletal System: Cellular activity relating to mineral deposition via canaliculi and osteocyte activity will be the foundational content, leading to all functional activities of bones such as mineral storage, blood cell formation, protection of organs and systemic performance of movement in association with the muscular system shall be covered while students concomitantly learn all bones and structural markers such as the external auditory meatus, epicondyles, and each epiphysis, diaphysis, etc .
(Chapters: 6-9 in Martini / 5 in Marieb)
HS-LS1-2

Unit Summary

Each bone has a name and several distinct and important markers permitting articulation with adjacent bones and attachment points for muscles. Students will learn a significant portion of such names. Students will also understand the cellular functioning regarding calcium deposition and the microscopic structures of the bones.

Technical Terms

Articulation, Diaphysis, Epiphysis, Fossa, Condyle, Foramen, Foramina,

Disciplinary Core Ideas:	Crosscutting Concepts:	Science and Engineering Practices:
Human movement and blood cell production, protection of delicate internal organs and mineral storage are all accomplished by the skeletal system.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired	The cause and effect of muscles placing tension on bones leads to movement of the body. (NJSLS - HS-PS2) Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system.

	in the elementary grades lay the foundation for future academic and career success.	(NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: How do the cells and microscopic structures of this system permit functioning of bones?	
Students who understand the concepts are able to: ● Associate a bone with the bone's purpose. ● Properly use terminology. ● Move forward at an accelerated rate studying detailed facts regarding this system.	
Part B: Which bones are found in each area of the body and how do their shapes influence their functions?	
Students who understand the concepts are able to: ● Name all 206 bones, cite their locations, name their distinct surface markers and identify articulating bones.	
Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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;	NA

synthesize multiple sources on the subject, demonstrating an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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. (HS-LS1-3) ● WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) ● SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	

Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

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GRADE: 11-12

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Unit 5: Muscular System

Unit 5: How do the structures of organisms enable life's functions?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 20 Instructional Days

Essential Question

What are the components of a muscle cell?
How do different muscle types vary?
What are the names of the muscles on the body?
How do origin and insertion impact movement?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 5: Muscular system analysis: Beginning with the cellular level of function and intracellular components such as the sarcoplasmic reticulum and triad in relation to contraction of actin and myosin fibers leading to an understanding of macroscopic content such as insertions and origins of a majority of skeletal muscles. Cellular differences between smooth, skeletal and cardiac muscle will be studied in conjunction with histological studies of microscope slides.
(Chapters: 10,11 in Martini / 6 in Marieb)

Unit Summary

There are three types of muscles in the human body: Skeletal, Smooth and Cardiac.

Each type of muscle has its own unique microscopic structure.

There are specializations in the organelles of a muscle cell and proteins that permit proper function in conjunction with intracellular ions.

There are over 600 muscles attached to the human skeleton. Students will learn hundreds of their names.

Technical Terms

Origin, Insertion, Myosin, Actin, Troponin, Tropomyosin, Sarcoplasmic Reticulum, Neuromuscular Junction

Disciplinary Core Ideas:	Crosscutting Concepts:	Science and Engineering Practices:
The essence of the muscle's ability to function is based on the interacting proteins of the sarcomere.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) Algebraic thinking is used to examine scientific data and	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students'

	predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth). (HS-ESS1-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2) Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-ESS1-1)

Part A: How are muscles arranged at a microscopic level? What molecular interactions cause a contraction?	
Students who understand the concepts are able to: ● Explain the actin / myosin interactions and how calcium release following an action potential permits muscular contraction?	
Part B: How does each joint move and which muscles cause each type of movement?	
Students who understand the concepts are able to: ● Identify hundreds of the 600+ muscles in the body and name movements such as abduction, protraction, etc.	
Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an	NA

understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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. (HS-LS1-3) ● WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) ● SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

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GRADE: 11-12

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Unit 6: The Integumentary System

Unit 6: How do the structures of organisms enable life's functions?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 10 Instructional Days

Essential Question

What are the structural aspects of skin permitting it to act as a barrier to the environment?
What are the types of nerve receptors that allow skin to serve as a sensory organ?
How do glands secrete their contents?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 6: Integumentary System: Differences between epidermis, dermis and hypodermis will set a foundation leading to an understanding of the layers and cellular differences between the layers of the epidermis and a study of the rule of 9's in conjunction with learning the differences between first, second and third degree burns.
(Chapters: 5 in Martini / 4 in Marieb)
HS-LS1-2

Unit Summary

The skin is composed of three distinct layers: the epidermis, dermis and hypodermis.

Technical Terms

Epidermis, Dermis, Hypodermis, Merkel. Meissner, Ruffini, Pacinian, Sebaceous, Sudoriferous

Disciplinary Core Ideas:	Crosscutting Concepts:	Science and Engineering Practices:
The skin is both a barrier to the outside world, as well as a sensory organ embedded with a variety of glands.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3)

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

		Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: The skin is a barrier to the outside world?
Students who understand the concepts are able to: ● Identify the layers of the skin. ● Properly use terminology. ● Move forward at an accelerated rate studying detailed facts regarding each system. ● Extrapolate on the significance of different levels of burns.
Part B: The skin is a sensory organ?
Students who understand the concepts are able to: Develop and use a model based on evidence to illustrate hierarchical organization of interacting systems that provide specific functions within multicellular organisms. ● Develop and use a model based on evidence to illustrate the interaction of functions at the organism system level. ● Identify various touch receptors, identify them in a microscope slide and distinguish the stimulus to which each responds.

Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 Gather relevant information from multiple authoritative	NA

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. (HS-LS1-3) • WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

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GRADE: 11-12

BOE APPROVAL: August 2020

Unit 7: Special Senses		
Unit 7: What structures permit the receipt of stimuli from nature for the purposes of understanding our surroundings?		
Grade: 11-12 Content Area: Anatomy and Physiology Pacing: 10 Instructional Days		
Essential Question		
How is the body equipped to sense and understand the outside world?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 7: Special Senses: Touch will be revisited following our study of the Integumentary System, Vision, Hearing, Taste and Smell will serve as preludes to an understanding of the 12 cranial nerves. (Chapters: 17 in Martini / 8 in Marieb) HS-LS-1-2		
Unit Summary		
Each of the following organs and structures will be understood at an anatomical level, with associated application of the functional links: Ears, Eyes, Nose, Tongue, Skin.		
Technical Terms		
Malleus, Incus, Stapes, Papillae, Olfactory Nerve, Cribriform Plate, iris, lens, Retina, Cones, Rods, Cochlea		
Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
The human body interprets stimuli from the outside world using its five senses, each of which has its own organ and uniquely designed structures.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence

		obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What are the five senses?	
Students who understand the concepts are able to: ● Identify the five senses and the associated organ ● Interpet the importance of each underlying structure from the main organ.	
Part B: How is information transmitted to the Central Nervous system?	
Students who understand the concepts are able to: ● Express a pathway from the site of reception of a stimulus to the central nervous system.	
Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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. (HS-LS1-3) ● WHST.9-12.9 Draw evidence from informational texts to support	NA

analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 8: The Nervous System

Unit 8: How does the PNS react to impulses from the CNS and what are the parts of the CNS?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 20 Instructional Days

Essential Question

What pathways receive stimuli from the world and send impulses that cause responses?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 8: The Nervous System: Beginning with cellular specifics for neurons such as axons, dendrites, Nodes of Ranvier, etc. leading into an understanding of impulse transmission, there will be a clear understanding of how nerve cells function at a microscopic level. Macroscopic comprehension will include students mastering the ability to distinguish the various portions and structures of the brain including ventricles, brain stem structures and spinal nerves, as well as identifying the horns of the spinal cord will cover the nervous system at a macroscopic morphological level.
(Chapters: 12-16 in Martini / 7 in Marieb)
HS-LS1-1, HS-LS1-2, HS-LS1-3

Unit Summary

The nervous system is broken into the Central Nervous System and the Peripheral Nervous System. Nerves engage in action potentials due to the ability to transport ions across their cell membrane, thus the sodium potassium must be understood, as well as saltatory conduction. The CNS consists of numerous subsections which will be studied in terms of anatomy and functions.

Technical Terms

Axons, Dendrites, Nissl Bodies, Nodes of Ranvier, Schwann Cells, Temporal Lobe, Frontal Lobe, Parietal Lobe, Occipital Lobe, Thalamus, Hypothalamus, Infundibulum, Cerebellum, Meninges, etc.

Disciplinary Core Ideas:	Crosscutting Concepts:	Science and Engineering Practices:
The human body has a message transfer system. That system uses nerves which have a complex system of mechanisms to perpetuate an action potential. Within the nervous system, there are numerous subsections, each performing specific duties.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and

	the foundation for future academic and career success.	the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2) Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-PS4-2), (HS-PS4-3), (HS-PS4-4)

Part A: Explain the functional unit of the nervous system.

Students who understand the concepts are able to:

- Identify the parts of a nerve and be able to express how and why each structure is necessary to perpetuate an action potential.

Part B: How do the PNS and CNS break into subsections?

Students who understand the concepts are able to:

- Identify the structures of the CNS and the branches of the PNS. Particular attention is paid to the brain and its lobes.

Interdisciplinary Connections

NJSLS-ELA	NJSLS- Mathematics
• 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) • WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) • 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 an	NA

understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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. (HS-LS1-3) ● WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) ● SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 9: Cardiovascular system		
Unit 9: What are the components of the circulatory system and how does blood meet the body's needs?		
Grade: 11-12 Content Area: Anatomy and Physiology Pacing: 15 Instructional Days		
Essential Question		
What are the structures of the circulatory system and how do they function?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 9: Cardiovascular System: Blood, blood cells, and blood types will be studied both as a prelude to our study of the immune system and as a link to genetics in the context of studying the blood's functions in allowing life to exist for animals. Anatomical structures of the circulatory system will include having students name all blood vessels originating at the heart, all major blood vessels and all heart chambers and structures. (Chapters: 19-21 in Martini / 11 in Marieb) HS-LS1-2		
Unit Summary		
The circulatory system consists of the heart, the blood vessels and the blood. There is an expansive array of facts associated with mastery of each of those three components.		
Technical Terms		
Atria, Ventricles, Cuspids, Papillary muscles, Chordae Tendinae, SA node. AV node, Arteries and veins along with their individual names throughout the body. Cells and plasma make up the blood, over one dozen individual cells must be understood to discern how the immune function of the circulatory system operates.		
Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
Blood carries nutrients throughout the body and removes waste. It flows through a complex network of blood vessels and is pumped by the heart. Each of these components should be studied thoroughly to understand components and functions.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural

	academic and career success.	world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What are the primary organs and functions of the circulatory system?	
Students who understand the concepts are able to: ● Name and identify structures associated with theart as well as interpreting an EKG. ● Read the blood vessels of the body like a road map. ● Distinguish names, functions and appearances of Red, White blood cells and platelets.	
Part B: How are electrical signals transferred into muscular contractions of cardiac muscle?	
Students who understand the concepts are able to: ● Explain and EKG with references to the SA node and the AV node.	
Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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	NA

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. (HS-LS1-3) • WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 10: The Immune System		
Unit 10: How does the body fight infections? What is the role of each type of leukocyte?		
Grade: 11-12 Content Area: Anatomy and Physiology Pacing: 5 Instructional Days		
Essential Question		
How does the human body fight disease?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 10: The Immune System: Students will have the ability to identify all types of white blood cells and link the cells to their specific function in providing immunity, whether in the form of making antibodies or releasing cytotoxic proteins. (Chapters: 22 in Martini / 12 in Marieb) HS-LS1-2		
Unit Summary		
The human body defends itself using general defenses such as the skin, hydrochloric acid in the stomach, lysozyme in tears and mucus in the respiratory tract. There are also specific defenses such as antibodies produced by and stored by the memory B cells.		
Technical Terms		
Granular Leukocytes, neutrophils, basophils, eosinophils, Agranular Leukocytes, macrophages, monocytes, lymphocytes, etc. Antibodies consist of long and short chains, variable and constant regions.		
Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
Pathogens are a daily ubiquitous part of life. The body must maintain health by opposing germs that may have a harmful effect on the individual's homeostasis.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3)

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		Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What are the general defenses that protect the body?
Students who understand the concepts are able to: ● Explain the significance of mucus in the respiratory system or stomach acid in terms of killing bacteria found in food as well as many other defenses the body possesses.
Part B: What is a specific defense to disease?
Students who understand the concepts are able to: ● Differentiate between types of leukocytes, pair a white blood cell with an appropriate antigen and explain the antigen/antibody complex.

Interdisciplinary Connections

NJSLS-ELA	NJSLS- Mathematics
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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	NA

overreliance on any one source and following a standard format for citation. (HS-LS1-3) ● WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) ● SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
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SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 11: The Endocrine System		
Unit 11: Which glands produce hormones and how do those hormones influence cellular behaviors in various organs?		
Grade: 11-12 Content Area: Anatomy and Physiology Pacing: 10 Instructional Days		
Essential Question		
How do the structures of organisms enable life's functions?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 11: The Endocrine System: Organs, hormones, synergistic and antagonistic effects of hormones at target cells will be studied and linked to commonly known diseases. (Chapters: 18 in Martini / 9 in Marieb) HS-LS1-2 / HS-LS1-4		
Unit Summary		
Hormones are the chemical messengers of the human body and the second control system, joining the nervous system in eliciting responses toe stimuli. Understanding the system involves a study of the glands, the hormones and the target cells.		
Technical Terms		
Epinephrine, Testosterone, Estrogen, Progesteron, Thymosin, Triiodothryronine, Insulin, Glucagon, Calcitonin		
Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
Hormones are necessary chemical messengers, Endocrinologists are physicians who diagnose and treat defective endocrine responses to stimuli. Understanding their field requires an understanding of the entire system.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3)

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

		Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2) Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-PS4-2), (HS-PS4-3), (HS-PS4-4)

Part A: What are the glands that are part of the endocrine system?
Students who understand the concepts are able to: ● Identify the glands throughout the body from superior to inferior, beginning with the pineal and pituitary, leading down past the pancreas,
Part B: How do hormones cause a desired effect??
Students who understand the concepts are able to: ● Match a hormone with its target cell and the function it causes based on the stimulus present.

Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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	NA

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. (HS-LS1-3) • WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 12: Respiratory system		
Unit 12: How are gases exchanged with the atmosphere?		
Grade: 11-12 Content Area: Anatomy and Physiology Pacing: 15 Instructional Days		
Essential Question		
How do humans absorb oxygen and expel carbon dioxide?		
Student Learning Objectives (Performance Expectations NJSLS-S)		
Unit 12: Respiratory System: Students will understand how carbon dioxide content in the bloodstream influences blood pH, and how the gas exchanges occur with the atmosphere due to partial pressures. The physical structures of the system to be studied include the alveoli, bronchioles, bronchi, intercostal muscles, diaphragm, etc. Arteries and veins will be revisited which were previously learned in the study of the circulatory system. (Chapters: 23 in Martini / 13 in Marieb) HS-LS1-2 / HS-LS1-7		
Unit Summary		
An understanding of the respiratory system will be based on knowing structures, physiological responses and volume amounts for healthy individuals.		
Technical Terms		
Expiratory Reserve, Inspiratory Reserve, Tidal Volume, Vital Capacity, Trachea, Bronchi, Alveoli, Bicarbonate, Carbonic Acid, etc.		
Disciplinary Core Ideas: Absorbing oxygen and discharging carbon dioxide permits cellular respiration as discussed in biology class. The structures and processes that permit exchange of gases with the atmosphere are to be understood in context with understanding the air flow and the biochemistry of gas exchange.	**Crosscutting Concepts:** Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	**Science and Engineering Practices:** Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do

		so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3) Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2) Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-PS4-2), (HS-PS4-3), (HS-PS4-4)

Part A: What are the parts of the respiratory system?
Students who understand the concepts are able to: ● Identify the parts of the pharynx, branches of the trachea and the alveoli.

Part B: How is lung volume categorized?
Students who understand the concepts are able to: ● Part A: Calculate and categorize Tidal Volume, Total Lung Capacity, Vital Capacity, etc.
● Part B: In what ways is blood a mixture with a gas in solution?
Students who understand the concepts are able to: ● Trace the changes of atmospheric gases through blood via adherence to RBC's or as a solute in a liquid or as a neutralized acid due to bicarbonate ions.

Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**

• 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) • WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) • 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 an understanding of the subject under investigation. (HS-LS1-3) • WHST.11-12.8 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. (HS-LS1-3) • WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	NA

Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications			
English Language Learners	Special Education	At-Risk	Gifted and Talented

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 13: The Excretory system

Unit 13: How are waste products released into the circulatory system, then removed from the body?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 10 Instructional Days

Essential Question

How do the kidney's extract, then release waste from the bloodstream?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 13: Excretory System: The two parts of the excretory system will be studied with their link being understood as the necessity of filtering the blood if the wastes are to be released. The blood supply of the kidneys will be introduced first, with flow being completely understood, leading into a study of the extraction via filtration at the glomerulus of nitrogenous and other wastes.
(Chapters: 26 in Martini / 15 in Marieb)
HS-LS1-2 / HS-LS1-4

Unit Summary

The kidneys are a combination of a series of blood vessels leading to and away from the body's filtration unit, the nephron, as well as being a pathway of tubes exiting the body via the bladder.

Technical Terms

Arteries and veins named: Renal, Segmental, Intelobar, Arcuate, Cortical Radiate, etc, represent the blood flow. Ureters, bladder, Urethra, renal pyramids, collecting tubules, etc. Represent the pathway permitting flow of urine out of the body.

Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
Waste products collect in the body and the blood must be cleaned of nitrogenous waste. The excretory system filters the blood and releases the wastes.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3)

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

		Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What are the primary structures of the excretory system?
Students who understand the concepts are able to: ● Trace the flow of blood to and away from the kidneys. Follow the flow of urine out of the body.
Part B: How does the filtration system work at a microscopic level?
Students who understand the concepts are able to: ● Connect the circulatory system with the collecting tubules by understanding the nephron.

Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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. (HS-LS1-3)	NA

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

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• WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 14: The Digestive System

Unit 14: How does the body extract nutrients from the food we eat in order to make materials available to our own cells?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 10 Instructional Days

Essential Question

How do the structures of the digestive system break down food into the monomers of the four basic macromolecules of life?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 14: Digestive System: Enzymes and acids providing chemical digestion will be linked with a study of mechanical digestion as provided by peristalsis of the smooth muscles lining each portion of the digestive system from mouth to rectum. Associated organs such as the liver and pancreas will also be studied with an emphasis on their roles in digestion.
(Chapters: 24 in Martini / 14 in Marieb)
HS-LS1-2 / HS-LS1-4 / HS-LS1-5 / HS-LS1-7

Unit Summary

The alimentary canal is a tube made of distinct portions which travel through the body from mouth to anus being a continuous path through the body, yet distinct from the other organs, save what can travel through the bloodstream to share the absorbed nutrients.

Technical Terms

Enzyme / Substrate complex, pharynx, esophagus, stomach, intestines (duodenum, jejunum, ileum), large intestine, rectum, anus, lacteals, villi

Disciplinary Core Ideas:	Crosscutting Concepts:	Science and Engineering Practices:
The biochemistry involved in breaking down food requires a system permitting the body access to the food and enzymes and digestive juices capable of facilitating hydrolysis to cause chemical digestion following the mechanical breakdown of food by chewing and peristalsis.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3)

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

		Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What structures does food pass through as it winds its way down the alimentary canal?	
Students who understand the concepts are able to: ● Trace a bolus of food through a dozen structures sequentially during its passage from mouth to anus.	
Part B: How is food chemically digested?	
Students who understand the concepts are able to: ● Apply chemical concepts to the conversion of food from what we eat to what the body needs.	
Interdisciplinary Connections	
NJSLS-ELA	**NJSLS- Mathematics**
● 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) ● WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) ● 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 an understanding of the subject under investigation. (HS-LS1-3) ● WHST.11-12.8 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. (HS-LS1-3) ● WHST.9-12.9 Draw evidence from informational texts to support	NA

analysis, reflection, and research. (HS-LS1-1) • SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)	
Core Instructional Materials	Can include: Online resources, Textbooks Series, Lab Materials, etc.
Career ready Practices	CRP2, CRP4, CRP5, CRP 6, CRP8 ,CRP11 - 9.2.12.C.2
Technology Standards	8.1.12.A.1,8.1.2.B.1, 8.1.12.C.1, 8.1.12.E.1, 8.1.12.F.2

Modifications

English Language Learners	Special Education	At-Risk	Gifted and Talented
Scaffolding Word walls Sentence/paragraph frames Bilingual dictionaries/translation Think alouds Read alouds Highlight key vocabulary Annotation guides Think-pair- share Visual aides Modeling Cognates	Word walls Visual aides Graphic organizers Multimedia Leveled readers Assistive technology Notes/summaries Extended time Answer masking Answer eliminator Highlighter Color contrast	Teacher tutoring Peer tutoring Study guides Graphic-organizers Extended time Parent communication Modified assignments Counseling	Curriculum compacting Challenge assignments Enrichment activities Tiered activities Independent research/inquiry Collaborative teamwork Higher level questioning Critical/Analytical thinking tasks Self-directed activities

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

Unit 15: The Reproductive System

Unit 15: What permits the complementary nature of the males and female body to create life?

Grade: 11-12
Content Area: Anatomy and Physiology
Pacing: 10 Instructional Days

Essential Question

What processes precede and permit fertilization? How does a fertilized egg develop into a fully formed baby?

Student Learning Objectives (Performance Expectations NJSLS-S)

Unit 15: Reproductive System: Structures and functions of the male and female reproductive systems will include a study of meiotic division in each gonad, and how they differ, leading through students gaining an understanding of how fertilization is achieved and the ensuing development of the fertilized zygote into an infant.
(Chapters: 28, 29 in Martini / 16 in Marieb)
HS-LS1-2

Unit Summary

Reproduction is the culmination of the union of the products of two distinct systems producing two distinct gametes which fuse into a single zygote, leading to the development of a unique human being with DNA equally derived from two nuclei.

Technical Terms

Meiosis, Spermatogenesis, Oogenesis, Testes, Ovaries, Fallopian tubes, uterus, endometrium, Vas Deferens, Epididymis, etc.

Disciplinary Core Ideas:	**Crosscutting Concepts:**	**Science and Engineering Practices:**
The process of meiosis occurs differently in the two genders, leading to either four sperm, or one egg and polar bodies. After formation of the gametes, each system has complex pathways ensuring the meeting of the two gametes, that they may fuse into a fertilized egg, leading to the maturation which will define the gestation period.	Use of microscopes reinforces content knowledge associated with the study of optics in physics. (NJSLS-S-HS-LS1-7),(NJSLS-S-HS- LS2-4) 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	Use a model based on evidence to illustrate the relationships between systems or between components of a system. (NJSLS-S-HS-LS1-5), (NJSLS-S-HS-LS1-7) Develop a model based on evidence to illustrate the relationships between systems or components of a system. (NJSLS-S-HS-LS2-5) Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (NJSLS-S-HS-LS1-6),(NJSLS-S-HS-LS2-3)

SUBJECT: The Human Body

Cliffside Park Public Schools

GRADE: 11-12

BOE APPROVAL: August 2020

		Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-ESS1-2)

Part A: What structures define the male and female reproductive systems?

Students who understand the concepts are able to:

- Label both systems and formulate explanations as to how each part in both systems permits the eventual act of fertilization.

Part B: What happens at a cellular level leading to formation of gametes? What steps convert the unicellular zygote into a multicellular human being?

Students who understand the concepts are able to:

- Construct a linear timeline of events from the meiotic divisions during spermatogenesis and oogenesis to the mitotic divisions which lead to and beyond the development of the three primary germ layers and their differentiation into each of the unique organ systems.

Interdisciplinary Connections

NJSLS-ELA	NJSLS- Mathematics
• 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) • WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1) • 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 an understanding of the subject under investigation. (HS-LS1-3) • WHST.11-12.8 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	NA

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Modifications

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