

BENWAY SCHOOL

Anatomy and Physiology

Grades: 11-12

Credits: 5



Benway School	
Unit 1	
Content Area: Anatomy and Physiology	
Unit Title: Introduction to the Body	
Grade Level: 11-12	
Unit Overview: At the end of this unit, students will have an understanding of the organization and terms of the body, the needs the body requires for survival, and how the body controls homeostasis.	
Recommended Pacing: 10 Days	
Student Learning Objectives/Performance Expectations	NJSLS
The students will be able to explain the organization of the body.	HS-LS1-2
The students will be able to analyze various needs and requirements of the body	HS-LS1-2
The students will be able to identify control mechanisms in the body as positive or negative. Plan and conduct an investigation to provide evidence that feedback mechanism maintain homeostasis.	HS-LS1-3
The students will refer to the parts of the body by using proper anatomical terms	HS-LS1-2
New Jersey Student Learning Standards/Disciplinary Core Ideas	
LS1.A: Structure and Function	
Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)	
Science and Engineering Practices	Crosscutting Concepts

<p>Constructing Explanations and Designing Solutions</p> <ul style="list-style-type: none"> Construct 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. (HS-LS1-1) <p>Developing and Using Models</p> <ul style="list-style-type: none"> Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-LS1-2) <p>Planning and Carrying Out Investigations</p> <ul style="list-style-type: none"> Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly. (HS-LS1-3) 	<p>Systems and System Models</p> <ul style="list-style-type: none"> Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS1-2) <p>Stability and Change</p> <ul style="list-style-type: none"> Feedback (negative or positive) can stabilize or destabilize a system. (HS-LS1-3)
Interdisciplinary Connections	
<p style="text-align: center;">English Language Arts</p> <p>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-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.7 (HS-LS2-6)</p> <p>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. RST.11-12.8 (HS-LS2-6)</p> <p>Write informative/explanatory texts, including the narration of historical events, scientific</p>	<p style="text-align: center;">Mathematics</p> <p>Reason abstractly and quantitatively. MP.2 (HS-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Model with mathematics. MP.4 (HS-LS2-1),(HS-LS2-2)</p> <p>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-LS2-1),(HS-LS2-2)</p> <p>Define appropriate quantities for the purpose of descriptive modeling. HSN.Q.A.2 (HS-LS2-1),(HS-LS2-2)</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. HSN.Q.A.3 (HS-LS2-1),(HS-LS2-2)</p>

procedures/ experiments, or technical processes. WHST.9-12.2 (HS-LS2-1),(HS-LS2-2)	Represent data with plots on the real number line. HSS-ID.A.1 (HS-LS2-6) Understand statistics as a process for making inferences about population parameters based on a random sample from that population. HSS-IC.A.1 (HS-LS2-6)
New Jersey Student Learning Standards	
Technology	
<i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.	8.1.12.D.1
Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.	8.1.12.D.2
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards	
21st Century Life and Career Skills	
<i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Career Ready Practices	
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5

Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
Anatomy, embryology, developmental biology, histology, surface anatomy, gross anatomy, systemic anatomy, regional anatomy, radiographic anatomy, pathological anatomy, physiology, neurophysiology, endocrinology, cardiovascular physiology, immunology, respiratory physiology, renal physiology, exercise physiology, pathophysiology, structural organization of the human body (chemical to organismic), integumentary system, muscular system, endocrine system, lymphatic and immune system, skeletal system, nervous system, cardiovascular system, respiratory system, digestive system, urinary system, reproductive system, dorsal body cavity, ventral body cavity, major organs (identify and label), frontal plane, transverse plane, parasagittal plane, midsagittal plane, oblique plane	
Evidence of Learning	
Suggested Assessments:	
<ul style="list-style-type: none"> ● Chapter 1 Reading ● Outline/Notes ● Vocabulary Assessments/ Application of Vocabulary ● Test: Introduction to Anatomy ● Notebook Check 	
Learning Activities:	
<ul style="list-style-type: none"> ● Differentiated Instructional Groups and Activities ● Small group/ large group discussion ● Investigation of key concepts ● Anchor Activities ● Vocabulary/ Concept-based Projects 	
Work individually and collaboratively to explore key concepts:	
How is the body organized?	
<ul style="list-style-type: none"> ● Define anatomy and physiology ● Sequence the levels of structural organization from the molecular level through the organismic level. ● Articulate how function is dependent on structure. ● Identify all of the major systems of the body and their organs and briefly describe the functions of each. ● Identify and label the body cavities and major organs in each. 	
What does the body do to maintain homeostasis?	

- All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.
- Feedback mechanisms maintain a living system's internal conditions within certain limits, and they mediate behaviors, allowing the system to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
- Feedback (negative or positive) can stabilize or destabilize a system.

What terms are essential to understanding the anatomy of the human body?

- Apply correct terminology to reference body regions.
- Apply correct terminology to reference anatomical orientation and direction.
- Apply correct terminology to reference body planes and sections.
- Demonstrate and verbally describe the anatomical position.

What medical imaging is best suited for different medical diagnoses?

- Identify the function of medical imaging devices.

Instructional Materials:

Primary Text: Principles of Anatomy and Physiology

- Edmodo
- Notebooks
- Laptops
- Index Cards
- Lab Supplies
- Smartboards
- Internet

Secondary Texts:

- Supplemental Readings/ Articles based on student interest/discussion
- <http://www.the-scientist.com/?articles.list/categoryNo/2625/category/The-Scientist/tagNo/3326.6/tags/human-anatomy,disease-medicine/>
- <http://www.scoop.it/t/anatomy-physiology-articles>

Teacher Resources:

- Organ systems Concept Map Body Regions- https://www.biologycorner.com/anatomy/intro/organ_systems.html
- Body Regions- https://www.biologycorner.com/anatomy/intro/bodyregions_describe.html
- Body Cavities- http://www.anatomycorner.com/intro/body_cavities.html
- Medical Terminology- https://www.biologycorner.com/anatomy/intro/medical_and_applied.html
- Relative Body Position On-line Activity- <https://www.wisc-online.com/learn/natural-science/life-science/ap15305/anatomical-terminology-relative-position>

- Body Organization and Terminology- file:///C:/Users/Val/Downloads/Microsoft_Word_-_Body_Organization_Activity_redone.pdf
- Homeostasis Lab- file:///C:/Users/Val/Downloads/Microsoft_Word_-_Homeostasis_lab.pdf
- Feedback Loops- file:///C:/Users/Val/Downloads/Microsoft_Word_-_Homeostasis_lab.pdf

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

<p align="center"><u>Gifted and Talented</u> <i>(content, process, product, and learning environment)</i></p>	<p align="center"><u>English Language Learners</u></p>
<p>Extension Activities:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities 	<p>Modifications:</p> <ul style="list-style-type: none"> ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers

<ul style="list-style-type: none"> ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking 	
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily ● Student requires use of other assistive technology device <p>Modifications for Homework and Assignments:</p> <ul style="list-style-type: none"> ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. 	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide a copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments

<ul style="list-style-type: none"> ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication <p>Modifications for Assessments:</p> <ul style="list-style-type: none"> ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments 	<ul style="list-style-type: none"> ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily <p>Modifications for Homework and Assignments:</p> <ul style="list-style-type: none"> ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication <p>Modifications for Assessments:</p> <ul style="list-style-type: none"> ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments
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Unit Title: Chemistry & Cells Overview (Biology Review)	
Grade Level: 11-12	
Unit Overview: At the end of the unit students will be able to analyze the connections between the cell cycle and cancer, identify the role of enzymes and organic molecules in the human body. Describe the basic molecular structures and primary functions of the four major categories of organic molecules (carbohydrates, lipids, proteins, nucleic acids). Students investigate explanations for the structure and functions of cells as the basic unit of life, of hierarchical organization of interacting organ systems, and of the role of specialized cells for maintenance and growth. The crosscutting concepts of structure and function, matter and energy, and systems and system models are called out as organizing concepts for the disciplinary core ideas.	
Recommended Pacing: 15 days	
Student Learning Objectives/Performance Expectations	NJSLS
The students will be able to describe the structure and function of carbohydrates, proteins, lipids and nucleic acids	HS-LS1-6
The students will be able to explain the relationship between mitosis and cancer. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	HS-LS1-4
The students will be able to explain the role of enzymes in biological reactions and they will be able to explain the effects of pH and temperature on the rate of these reactions.	HS-LS1-1
The student will be able to identify each organelle of the cell and explain its function. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	HS-LS1-2
Construct models that explain the movement of molecules across membranes with membrane structure and function.	LS1.A
New Jersey Student Learning Standards/Disciplinary Core Ideas	
LS1.A: Structure and Function	
<ul style="list-style-type: none"> • Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2) • Regions of DNA called genes determine the structure of proteins, which carry out the essential functions of life through systems of specialized cells. The sequence of genes contains instructions that code for proteins. (LS1.A) • Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1) • Groups of specialized cells (tissues) use proteins to carry out functions that are essential to the organism. (LS1.A) 	
Science and Engineering Practices	Crosscutting Concepts
Constructing Explanations and Designing Solutions Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own	Systems and System Models <ul style="list-style-type: none"> • Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy,

<p>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. (HS-LS1-1)</p> <p style="text-align: center;">Developing and Using Models</p> <p>Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-LS1-2)</p> <p>Planning and Carrying Out Investigations</p> <p>Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly. (HS-LS1-3)</p>	<p>matter, and information flows—within and between systems at different scales. (HS-LS1-2)</p>
Interdisciplinary Connections	
<p>English Language Arts/Literacy</p> <ul style="list-style-type: none"> Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. <p>Mathematics</p> <ul style="list-style-type: none"> Evaluate the validity of evidence and reasoning that support claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem, verifying the data when possible and corroborating or challenging conclusions with other sources of information. 	
English Language Arts	Mathematics
<p>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-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Integrate and evaluate multiple sources of information presented in diverse formats and</p>	<p>Reason abstractly and quantitatively. MP.2 (HS-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Model with mathematics. MP.4 (HS-LS2-1),(HS-LS2-2)</p> <p>Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas;</p>

<p>media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.7 (HS-LS2-6)</p> <p>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. RST.11-12.8 (HS-LS2-6)</p> <p>Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.9-12.2 (HS-LS2-1),(HS-LS2-2)</p>	<p>choose and interpret the scale and the origin in graphs and data displays. HSN.Q.A.1 (HS-LS2-1),(HS-LS2-2)</p> <p>Define appropriate quantities for the purpose of descriptive modeling. HSN.Q.A.2 (HS-LS2-1),(HS-LS2-2)</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. HSN.Q.A.3 (HS-LS2-1),(HS-LS2-2)</p> <p>Represent data with plots on the real number line. HSS-ID.A.1 (HS-LS2-6)</p> <p>Understand statistics as a process for making inferences about population parameters based on a random sample from that population. HSS-IC.A.1 (HS-LS2-6)</p>
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New Jersey Student Learning Standards Technology <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	Indicator
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.	8.1.12.D.1
Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.	8.1.12.D.2
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards 21st Century Life and Career Skills <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	Indicator
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4

Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	Indicator
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
Macromolecules, enzymes, catalyst, biochemical reactions, pH, carbohydrate, lipid, nucleic acid, covalent bond, dehydration synthesis, hydrolysis, organelle, permeability, cells, cell division, mutation, cancer	
Evidence of Learning	
<p>Suggested Assessments:</p> <ul style="list-style-type: none"> ● Outline/Notes ● Vocabulary Assessments/ Application of Vocabulary ● Worksheet ● Lab ● Cell Analogy Project ● Quiz ● Writing Assessment ● Notebook Check 	
<p>Learning Activities:</p> <ul style="list-style-type: none"> ● Differentiated Instructional Groups and Activities ● Small group/ large group discussion ● Investigation of key concepts & principles ● Anchor Activities ● Labs ● Culminating Projects <p>Work individually and collaboratively to explore key concepts:</p>	

How are chemical reactions controlled in the human body?

- Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.
- Effects of pH and temperature on enzyme activity

What are the basic molecules that make up the human body? How do they work?

- Describe the basic molecular structures and primary functions of the four major categories of biological molecules: Carbohydrate, protein, lipid, nucleic acid (structure and function)
- Identify and describe a covalent bond.
- Describe how dehydration synthesis and hydrolysis are necessary for constructing and digesting macromolecules.

How does each organelle contribute to cell functioning?

- Be able to identify and describe the function of each organelle.
- List the major types of cellular transport.
- Define selective permeability.

Why is cancer a disease that can affect any living organism? Why is it so difficult to cure?

- Explain the relationship between mutation, cell cycle and uncontrolled cell growth potentially resulting in cancer.
- Cells, Cell division & Cancer
- Mutations—cell cycle—cancer

- [Membrane Channels Simulation](#): Students begin by asking questions that arise from demonstrations with aromatic sprays and they will articulate the movement of particles from areas of high concentrations to lower concentrations. The students will then ask questions that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information. Students will develop, revise, and /or use a model based on evidence to illustrate and/or predict the relationship between systems or between components of a system using a computer simulation. Students will then communicate scientific and/or technical information or ideas in multiple formats (including orally, graphically, and textually).
- [Membrane Diffusion](#): Collaboratively, students will analyze data using tools, technologies, and/or models in order to make valid and reliable scientific claims or determine an optimal design solution. Students can then work either collaboratively or independently to use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Instructional Materials:

Textbook

- Notebooks
- Laptops
- Index Cards
- Lab Supplies
- Smartboards
- Internet

Secondary Texts:

- Supplemental Readings/ Articles based on student interest/discussion
- <http://www.the-scientist.com/?articles.list/categoryNo/2625/category/The-Scientist/tagNo/3326.6/tags/human-anatomy,disease-medicine/>
- <http://www.scoop.it/t/anatomy-physiology-articles>

Teacher Resources:

- Chemistry Webquest- <http://www.glencoe.com/sec/science/webquest/content/fireworks.shtml>
- Cell Organelles coloring - <https://www.biologycorner.com/worksheets/cellcolor.html>
- Cell Model- <https://www.biologycorner.com/worksheets/cellmodel.html>
- Cell Cycle- https://www.biologycorner.com/worksheets/cellcycle_labelme.html
- Cell Cycle- file:///C:/Users/Val/Downloads/15_The_Cell_Cycle-S.pdf
- Osmosis Lab- https://www.biologycorner.com/worksheets/observing_osmosis.html
- Macromolecules- http://www.ngsslifescience.com/biology_lesson_plans_macromolecules.html
- Macromolecules webquest- <http://tstephenssci.weebly.com/>
- Cell Organization- <http://www.cellsalive.com/>
- Enzyme Lab- https://www.biologycorner.com/worksheets/enzymelab_web.html

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

<p align="center"><u>Gifted and Talented</u> <i>(content, process, product, and learning environment)</i></p>	<p align="center"><u>English Language Learners</u></p>
<p>Extension Activities:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. 	<p>Modifications:</p> <ul style="list-style-type: none"> ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers

<ul style="list-style-type: none"> ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking 	
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP team)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily 	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Structure lessons around questions that are authentic, relate to students' interests,

- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

social/family background and knowledge of their community.

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide a copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily

Modifications for Homework and Assignments:

- Extended time to complete assignments
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- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed

	<ul style="list-style-type: none"> ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments
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Benway School	
Unit 3	
Content Area: Anatomy and Physiology	
Unit Title: Body Tissues	
Grade Level: 11-12	
Unit Overview: At the end of the unit students will be able to identify the 4 major types of tissues and evaluate their function based on structure. They will evaluate and describe the functions of each tissue. This knowledge will be obtained through differentiated strategies and rigorous course study.	
Recommended Pacing: 25 days	
Student Learning Objectives/Performance Expectations	NJSLs
The students will be able to identify the four major types of tissues based on structure and function	HS-LS1-2
The students will be able to describe the functions of each of the four major types of tissues.	HS-LS1-2
The students will be able to evaluate the structure of each tissue and how it relates to its function.	HS-LS1-2
New Jersey Student Learning Standards/Disciplinary Core Ideas	
LS1.A: Structure and Function	
<ul style="list-style-type: none"> ● Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2) ● Regions of DNA called genes determine the structure of proteins, which carry out the essential functions of life through systems of specialized cells. The sequence of genes contains instructions that code for proteins. (LS1.A) ● Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1) ● Groups of specialized cells (tissues) use proteins to carry out functions that are essential to the organism. (LS1.A) 	
Science and Engineering Practices	Crosscutting Concepts
Using Mathematics and Computational Thinking	Systems and System Models <ul style="list-style-type: none"> ● Models (e.g., physical, mathematical, computer models) can be used to simulate

<ul style="list-style-type: none"> • Use mathematical and/or computational representations of phenomena or design solutions to support explanations. (HS-LS2-1) • Use mathematical representations of phenomena or design solutions to support and revise explanations. (HS-LS2-2) <p>Engaging in Argument from Evidence Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments. (HS-LS2-6)</p>	<p>systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS1-2)</p>
Interdisciplinary Connections	
<p>English Language Arts/Literacy</p> <ul style="list-style-type: none"> • Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. <p>Mathematics</p> <ul style="list-style-type: none"> • Evaluate the validity of evidence and reasoning that support claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem, verifying the data when possible and corroborating or challenging conclusions with other sources of information. 	
English Language Arts	Mathematics
<p>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-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.7 (HS-LS2-6)</p> <p>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. RST.11-12.8 (HS-LS2-6)</p>	<p>Reason abstractly and quantitatively. MP.2 (HS-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Model with mathematics. MP.4 (HS-LS2-1),(HS-LS2-2)</p> <p>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-LS2-1),(HS-LS2-2)</p> <p>Define appropriate quantities for the purpose of descriptive modeling. HSN.Q.A.2 (HS-LS2-1),(HS-LS2-2)</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. HSN.Q.A.3 (HS-LS2-1),(HS-LS2-2)</p>

<p>Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.9-12.2 (HS-LS2-1),(HS-LS2-2)</p>	<p>Represent data with plots on the real number line. HSS-ID.A.1 (HS-LS2-6)</p> <p>Understand statistics as a process for making inferences about population parameters based on a random sample from that population. HSS-IC.A.1 (HS-LS2-6)</p>
<p align="center">New Jersey Student Learning Standards Technology <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i></p>	
<p>Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.</p>	<p align="center">8.1.12.A.3</p>
<p>Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.</p>	<p align="center">8.1.12.C.1</p>
<p>Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.</p>	<p align="center">8.1.12.D.1</p>
<p>Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.</p>	<p align="center">8.1.12.D.2</p>
<p>Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.</p>	<p align="center">8.1.12.F.1</p>
<p>Demonstrate how reusing a product affects the local and global environment.</p>	<p align="center">8.2.2.B.2</p>
<p>Identify products or systems that are designed to meet human needs.</p>	<p align="center">8.2.2.B.3</p>
<p>Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.</p>	<p align="center">8.2.12.B.2</p>
<p align="center">New Jersey Student Learning Standards 21st Century Life and Career Skills <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i></p>	
<p>Identify transferable career skills and design alternate career plans.</p>	<p align="center">9.2.12.C.3</p>
<p>Analyze how economic conditions and societal changes influence employment trends and future education.</p>	<p align="center">9.2.12.C.4</p>
<p>Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.</p>	<p align="center">9.2.12.C.5</p>
<p>Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.</p>	<p align="center">9.2.12.C.6</p>
<p>Identify transferable career skills and design alternate career plans.</p>	<p align="center">9.2.12.C.3</p>
<p align="center">Career Ready Practices</p>	
<p>Act as a responsible and contributing citizen and employee.</p>	<p align="center">CRP1</p>
<p>Apply appropriate academic and technical skills.</p>	<p align="center">CRP2</p>
<p>Attend to personal health and financial well-being.</p>	<p align="center">CRP3</p>

Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12

Key Vocabulary Words

tissues, epithelial tissue, connective tissue, muscle tissue, nervous tissue, histology, basement membrane, endocrine, exocrine, structure, function

Evidence of Learning

Suggested Assessments:

- Test
- Outline/Notes
- Vocabulary Assessments/ Application of Vocabulary
- Class discussion
- Participation
- Notebook Check

Learning Activities:

- Differentiated Instructional Groups and Activities
- Small group/ large group discussion
- Investigation of key concepts & principles
- Anchor Activities
- Labs
- Culminating Projects

Work individually and collaboratively to explore key concepts:

How are structure and function related for each of the types of body tissues?

- Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue.
- Define the terms endocrine and exocrine

Instructional Materials:

Primary Text: Principles of Anatomy and Physiology

- Smartboards
- Internet
- Lab Supplies
- Notebooks
- Index Cards

Secondary Texts:

- Supplemental Readings/ Articles based on student interest/discussion

- <http://www.the-scientist.com/?articles.list/categoryNo/2625/category/The-Scientist/tagNo/3326,6/tags/human-anatomy,disease-medicine/>
- <http://www.scoop.it/t/anatomy-physiology-articles>

Teacher Resources:

- Body Tissue Concept Map- https://www.biologycorner.com/anatomy/tissues/tissue_concept.html
- Types of body tissues- https://www.biologycorner.com/anatomy/tissues/tissue_chart.html
- Connective Tissue Matrix- https://www.biologycorner.com/anatomy/tissues/connective_tissue_coloring.html
- Histology Lab- <https://www.biologycorner.com/anatomy/histology/index.html>
- Histology Webquest- http://www.murrieta.k12.ca.us/cms/lib5/CA01000508/Centricity/Domain/1775/Histology_Web_Quest.pdf

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

<p align="center"><u>Gifted and Talented</u> <i>(content, process, product, and learning environment)</i></p>	<p align="center"><u>English Language Learners</u></p>
<p>Extension Activities:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. 	<p>Modifications:</p> <ul style="list-style-type: none"> ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers

<ul style="list-style-type: none"> ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking 	
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP team)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time 	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities.

- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and practice
- Model skills/techniques to be mastered
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	<ul style="list-style-type: none"> ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments
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Benway School	
Unit 4	
Content Area: Anatomy and Physiology	
Unit Title: Integumentary System	
Grade Level: 11-12	
Unit Overview: At the end of the unit students will be able to identify the structure and functions of various parts of the integumentary system. This knowledge will be obtained through differentiated strategies and rigorous course study.	
Recommended Pacing: 10 days	
Student Learning Objectives/Performance Expectations	NJSLs
The students will be able to describe the structure and function of the body membranes.	HS-LS1-2
The students will be able to describe the structure of the integumentary system.	HS-LS1-2
The students will be able to analyze the importance of the functions of the integumentary system.	HS-LS1-2
The students will be able to explain the accessory structures of the integumentary system.	HS-LS1-2
New Jersey Student Learning Standards/Disciplinary Core Ideas	
LS1.A: Structure and Function	
<ul style="list-style-type: none"> ● Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2) ● Regions of DNA called genes determine the structure of proteins, which carry out the essential functions of life through systems of specialized cells. The sequence of genes contains instructions that code for proteins. (LS1.A) ● Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1) ● Groups of specialized cells (tissues) use proteins to carry out functions that are essential to the organism. (LS1.A) 	
Science and Engineering Practices	Crosscutting Concepts
Using Mathematics and Computational Thinking	Systems and System Models

<ul style="list-style-type: none"> • Use mathematical and/or computational representations of phenomena or design solutions to support explanations. (HS-LS2-1) • Use mathematical representations of phenomena or design solutions to support and revise explanations. (HS-LS2-2) <p>Engaging in Argument from Evidence Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments. (HS-LS2-6)</p>	<ul style="list-style-type: none"> • Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS1-2)
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Interdisciplinary Connections

English Language Arts/Literacy	
<ul style="list-style-type: none"> • Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. 	
Mathematics	
<ul style="list-style-type: none"> • Evaluate the validity of evidence and reasoning that support claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem, verifying the data when possible and corroborating or challenging conclusions with other sources of information. 	

English Language Arts	Mathematics
<p>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-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.7 (HS-LS2-6)</p> <p>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. RST.11-12.8 (HS-LS2-6)</p> <p>Write informative/explanatory texts, including the narration of historical events, scientific</p>	<p>Reason abstractly and quantitatively. MP.2 (HS-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Model with mathematics. MP.4 (HS-LS2-1),(HS-LS2-2)</p> <p>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-LS2-1),(HS-LS2-2)</p> <p>Define appropriate quantities for the purpose of descriptive modeling. HSN.Q.A.2 (HS-LS2-1),(HS-LS2-2)</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. HSN.Q.A.3 (HS-LS2-1),(HS-LS2-2)</p> <p>Represent data with plots on the real number line. HSS-ID.A.1 (HS-LS2-6)</p>

procedures/ experiments, or technical processes. WHST.9-12.2 (HS-LS2-1),(HS-LS2-2)	Understand statistics as a process for making inferences about population parameters based on a random sample from that population. HSS-IC.A.1 (HS-LS2-6)
New Jersey Student Learning Standards	
Technology	
<i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.	8.1.12.D.1
Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.	8.1.12.D.2
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards	
21st Century Life and Career Skills	
<i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6

Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
skin, epidermis, dermis, hypodermis, integumentary system, keratin, melanin, apocrine glands, eccrine glands, sebaceous glands, sweat glands, homeostasis	
Evidence of Learning	
Suggested Assessments:	
<ul style="list-style-type: none"> ● Reading/ Worksheets/ Quiz ● Cooperative Learning ● Quizzes ● Benchmarks ● Outline/Notes ● Vocabulary Assessments/ Application of Vocabulary ● Class discussion ● Participation ● Notebook Check 	
Learning Activities:	
<ul style="list-style-type: none"> ● Differentiated Instructional Groups and Activities ● Small group/ large group discussion ● Investigation of key concepts & principles ● Anchor Activities ● Labs ● Culminating Projects 	
Work individually and collaboratively to explore key concepts:	
What are the different parts of the integumentary system?	
<ul style="list-style-type: none"> ● Label the epidermis, dermis, and hypodermis. ● Sequence the layers of the epidermis. ● Describe the role of keratin. ● Describe the function of melanin and its effect on vitamin D production. ● Recognize and name the layers and structures found in the dermis. ● Identify the components of the hypodermis. 	
What is the purpose of the integumentary system?	
<ul style="list-style-type: none"> ● Key Vocabulary: Skin, integumentary system, keratin, melanin ● Describe the function of the vertebrate integumentary system 	
How are the accessory organs of the skin important in the body's homeostasis?	
<ul style="list-style-type: none"> ● Describe the distribution and function of the sebaceous and sweat glands. 	

- Compare and contrast apocrine and eccrine glands.
- Describe the structure and function of hair and nails.

Instructional Materials:

Primary Text

- Smartboards
- Internet
- Lab Supplies
- Notebooks
- Index Cards

Secondary Texts:

- Supplemental Readings/ Articles based on student interest/discussion
- http://www.the-scientist.com/?articles.list/categoryNo/2625/category/The-Scientist/tagNo/3326.6/tags/human-anatomy_disease-medicine/
- <http://www.scoop.it/t/anatomy-physiology-articles>

Teacher Resources:

- Skin Deep- <http://sciencenetlinks.com/interactives/skindeep/yourskin/yourskin.html>
- Integumentary Quiz- <https://quizlet.com/subject/anatomy-and-physiology-in-high-school-integumentary-system/>
- On-line Skin Diagram- http://media.pearsoncmg.com/bc/bc_marieb_ehap_9/activities/chapter4/Act4A.html
- Skin as an Organ- <http://sciencenetlinks.com/esheets/skin-as-an-organ/>
- Skin Diagram- <http://www.innerbody.com/anatomy/integumentary>

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

<u>Gifted and Talented</u>	<u>English Language Learners</u>
<p><i>(content, process, product, and learning environment)</i></p> <p>Extension Activities:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various 	<p>Modifications:</p> <ul style="list-style-type: none"> ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers

<p>backgrounds and cultures (e.g. multiple representation and multimodal experiences).</p> <ul style="list-style-type: none"> ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking 	
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home 	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students

- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

with multiple entry points and multiple ways to demonstrate their understandings.

- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide a copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.

	<ul style="list-style-type: none"> ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication <p>Modifications for Assessments:</p> <ul style="list-style-type: none"> ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments
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Benway School	
Unit 5	
Content Area: Anatomy and Physiology	
Unit Title: Skeletal System	
Grade Level: 11-12	
Unit Overview: At the end of the unit students will be able identify the bones of the human skeleton and describe the various functions of the bone tissue. This knowledge will be obtained through differentiated strategies and rigorous course study.	
Recommended Pacing: 30 days	
Student Learning Objectives/Performance Expectations	NJSLs
The students will be able to identify the bones of the skeletal system.	HS-LS1-2
The students will be able to distinguish between the axial and appendicular bones	HS-LS1-2
The students will be able to examine the histology of bone tissue	HS-LS1-2
New Jersey Student Learning Standards/Disciplinary Core Ideas	
LS1.A: Structure and Function	
<ul style="list-style-type: none"> ● Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2) ● Regions of DNA called genes determine the structure of proteins, which carry out the essential functions of life through systems of specialized cells. The sequence of genes contains instructions that code for proteins. (LS1.A) 	

<ul style="list-style-type: none"> • Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1) • Groups of specialized cells (tissues) use proteins to carry out functions that are essential to the organism. (LS1.A) 	
Science and Engineering Practices	Crosscutting Concepts
<p>Using Mathematics and Computational Thinking</p> <ul style="list-style-type: none"> • Use mathematical and/or computational representations of phenomena or design solutions to support explanations. (HS-LS2-1) • Use mathematical representations of phenomena or design solutions to support and revise explanations. (HS-LS2-2) <p>Engaging in Argument from Evidence evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments. (HS-LS2-6)</p>	<p>Systems and System Models</p> <ul style="list-style-type: none"> • Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS1-2)
Interdisciplinary Connections	
<p>English Language Arts/Literacy</p> <ul style="list-style-type: none"> • Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. <p>Mathematics</p> <ul style="list-style-type: none"> • Evaluate the validity of evidence and reasoning that support claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem, verifying the data when possible and corroborating or challenging conclusions with other sources of information. 	
English Language Arts	Mathematics
<p>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-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video,</p>	<p>Reason abstractly and quantitatively. MP.2 (HS-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Model with mathematics. MP.4 (HS-LS2-1),(HS-LS2-2)</p> <p>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</p>

<p>multimedia) in order to address a question or solve a problem. RST.11-12.7 (HS-LS2-6)</p> <p>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. RST.11-12.8 (HS-LS2-6)</p> <p>Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.9-12.2 (HS-LS2-1),(HS-LS2-2)</p>	<p>graphs and data displays. HSN.Q.A.1 (HS-LS2-1),(HS-LS2-2)</p> <p>Define appropriate quantities for the purpose of descriptive modeling. HSN.Q.A.2 (HS-LS2-1),(HS-LS2-2)</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. HSN.Q.A.3 (HS-LS2-1),(HS-LS2-2)</p> <p>Represent data with plots on the real number line. HSS-ID.A.1 (HS-LS2-6)</p> <p>Understand statistics as a process for making inferences about population parameters based on a random sample from that population. HSS-IC.A.1 (HS-LS2-6)</p>
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New Jersey Student Learning Standards Technology <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	Indicator
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.	8.1.12.D.1
Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.	8.1.12.D.2
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards 21st Century Life and Career Skills <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	Indicator
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5

Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	Indicator
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
Skeletal system, axial skeleton, appendicular skeleton, osteocytes, ossification, bone tissue, compact bone, spongy bone, long bone, innervation, vascularity, functions, bone growth and formation, types of fractures	
Evidence of Learning	
Suggested Assessments:	
<ul style="list-style-type: none"> ● Reading/ Worksheets/ Quiz ● Cooperative Learning ● Quizzes ● Outline/Notes ● Vocabulary Assessments/ Application of Vocabulary ● Class discussion ● Participation ● Notebook Check 	
Learning Activities:	
<ul style="list-style-type: none"> ● Differentiated Instructional Groups and Activities ● Small group/ large group discussion ● Investigation of key concepts & principles ● Anchor Activities ● Labs ● Culminating Projects 	
Work individually and collaboratively to explore key concepts:	
What are the various functions of the skeletal system?	
<ul style="list-style-type: none"> ● Describe how the skeletal system helps maintain homeostasis in the human body. 	

- Recognize the degree of innervation and vascularity of the parts of the skeletal system.
- Functions: support, protection, movement, storage and blood cell formation

What tissues make up a bone?

- Name the four main classifications of bones.
- Compare and contrast compact and spongy bone.
- Describe the gross anatomy of a long bone.
- Describe microscopic anatomy of bone tissue.
- Describe how osteoclasts and osteoblasts work together to maintain bone homeostasis.
- Describe the process of bone growth and formation.
- Compare and contrast the various types of fractures.

What bones belong to the axial skeleton?

- Key Vocabulary: Skeletal system, axial skeleton, appendicular skeleton, osteocytes, ossification
- Distinguish between bones of the axial skeleton and bones of the appendicular skeleton.
- Identify the major bones of the axial and appendicular skeleton

What bones belong to the appendicular skeleton?

- Key Vocabulary: Skeletal system, axial skeleton, appendicular skeleton, osteocytes, ossification
- Distinguish between bones of the axial skeleton and bones of the appendicular skeleton.
- Identify the major bones of the axial and appendicular skeleton

Instructional Materials:

Primary Text:

- Smartboards
- Internet
- Lab Supplies
- Notebooks
- Index Cards

Secondary Texts:

- Supplemental Readings/ Articles based on student interest/discussion
- <http://www.the-scientist.com/?articles.list/categoryNo/2625/category/The-Scientist/tagNo/3326.6/tags/human-anatomy,disease-medicine/>
- <http://www.scoop.it/t/anatomy-physiology-articles>

Teacher Resources:

- Bone Matrix- https://www.biologycorner.com/anatomy/skeletal/bone_matrix_coloring.html
- Bone Webquest- <https://www.biologycorner.com/projects/bones/index.html>
- Long Bone- <https://quizlet.com/48936200/07-long-bone-anatomy-flash-cards/>
- Hand bones- https://www.biologycorner.com/anatomy/skeletal/aging_hand_coloring.pdf
- Interactive Skeleton- http://www.bbc.co.uk/science/humanbody/body/interactives/3d_jigsaw_02/index.shtml?skeleton
- Bone Quiz- https://www.biologycorner.com/quiz/qz_skeletal.html

- Bone index- <http://msjensen.cbs.umn.edu/webanatomy/skeletal/default.html>
- On line Bone diagrams- <http://bogglesworldesl.com/skeletalsystem.htm>

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

<p align="center"><u>Gifted and Talented</u> (<i>content, process, product, and learning environment</i>)</p>	<p align="center"><u>English Language Learners</u></p>
<p>Extension Activities:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques 	<p>Modifications:</p> <ul style="list-style-type: none"> ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers

<ul style="list-style-type: none"> ● Provide assessments at a higher-level of thinking 	
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)</i></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily ● Student requires use of other assistive technology device <p>Modifications for Homework and Assignments:</p> <ul style="list-style-type: none"> ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. 	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Structure lessons around questions that are authentic, relate to students’ interests, social/family background and knowledge of their community. ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide a copy of class notes ● Preferential seating to be mutually determined by the student and teacher

- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

Benway School	
Unit 6	
Content Area: Anatomy and Physiology	
Unit Title: Muscular System	
Grade Level: 11-12	
Unit Overview: At the end of the unit students will be able identify muscles of the human body, describe the structure of the muscle tissue and explain how a muscle contracts. Students will identify the anatomy of a preserved vertebrate. This knowledge will be obtained through differentiated strategies and rigorous course study.	
Recommended Pacing: 30 days	
Student Learning Objectives/Performance Expectations	NJSLS
The students will be able to describe the anatomy of muscle tissue.	HS-LS1-2
The students will be able to explain the steps of muscle contraction.	HS-LS1-2
The students will be able to identify the way the nervous and muscular systems work together.	HS-LS1-2
The students will be able to identify the major muscles of the human body.	HS-LS1-2
The students will be able to identify the anatomy of a preserved vertebrate.	HS-LS1-2
New Jersey Student Learning Standards/Disciplinary Core Ideas	
LS1.A: Structure and Function	
<ul style="list-style-type: none"> ● Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2) ● Regions of DNA called genes determine the structure of proteins, which carry out the essential functions of life through systems of specialized cells. The sequence of genes contains instructions that code for proteins. (LS1.A) ● Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1) ● Groups of specialized cells (tissues) use proteins to carry out functions that are essential to the organism. (LS1.A) 	
Science and Engineering Practices	Crosscutting Concepts
Using Mathematics and Computational Thinking <ul style="list-style-type: none"> ● Use mathematical and/or computational representations of phenomena or design solutions to support explanations. (HS-LS2-1) 	Systems and System Models <ul style="list-style-type: none"> ● Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. (HS-LS1-2)

<ul style="list-style-type: none"> Use mathematical representations of phenomena or design solutions to support and revise explanations. (HS-LS2-2) <p>Engaging in Argument from Evidence evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments. (HS-LS2-6)</p>	
Interdisciplinary Connections	
<p>English Language Arts/Literacy</p> <ul style="list-style-type: none"> Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. <p>Mathematics</p> <ul style="list-style-type: none"> Evaluate the validity of evidence and reasoning that support claims that complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem, verifying the data when possible and corroborating or challenging conclusions with other sources of information. 	
English Language Arts	Mathematics
<p>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-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST.11-12.7 (HS-LS2-6)</p> <p>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. RST.11-12.8 (HS-LS2-6)</p> <p>Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST.9-12.2 (HS-LS2-1),(HS-LS2-2)</p>	<p>Reason abstractly and quantitatively. MP.2 (HS-LS2-1),(HS-LS2-2),(HS-LS2-6)</p> <p>Model with mathematics. MP.4 (HS-LS2-1),(HS-LS2-2)</p> <p>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-LS2-1),(HS-LS2-2)</p> <p>Define appropriate quantities for the purpose of descriptive modeling. HSN.Q.A.2 (HS-LS2-1),(HS-LS2-2)</p> <p>Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. HSN.Q.A.3 (HS-LS2-1),(HS-LS2-2)</p> <p>Represent data with plots on the real number line. HSS-ID.A.1 (HS-LS2-6)</p> <p>Understand statistics as a process for making inferences about population parameters based on</p>

	a random sample from that population. HSS-IC.A.1 (HS-LS2-6)
New Jersey Student Learning Standards Technology <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	Indicator
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.	8.1.12.D.1
Evaluate consequences of unauthorized electronic access (e.g., hacking) and disclosure, and on dissemination of personal information.	8.1.12.D.2
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards 21st Century Life and Career Skills <i>(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)</i>	Indicator
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	Indicator
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9

Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
muscle fibers, smooth muscle, skeletal muscle, cardiac muscle, tendon, neuromuscular junction, action potential, sarcomere	
Evidence of Learning	
Suggested Assessments:	
<ul style="list-style-type: none"> ● Muscular System <ul style="list-style-type: none"> ○ Reading ○ Worksheets ○ Quiz ○ Test ● Cooperative Learning ● Cat Practical ● Quizzes ● Outline/Notes ● Vocabulary Assessments/ Application of Vocabulary ● Class discussion ● Participation ● Notebook Check 	
Learning Activities:	
<ul style="list-style-type: none"> ● Differentiated Instructional Groups and Activities ● Small group/ large group discussion ● Investigation of key concepts & principals ● Anchor Activities ● Labs ● Culminating Projects 	
Work individually and collaboratively to explore key concepts:	
What are the functions of the muscular system?	
<ul style="list-style-type: none"> ● Structure & function: 3 types of muscles ● Microscopic make up of a skeletal muscle 	
What are the parts of a muscle?	
<ul style="list-style-type: none"> ● Describe the anatomy and histology, including ultrastructure, of muscle tissues. ● Describe how the muscular system helps maintain homeostasis in the human body. ● Identify the functions of the muscular system. ● Recognize the degree of innervation and vascularity of the parts of the muscular system. 	
How do the nervous and muscular systems communicate?	
<ul style="list-style-type: none"> ● Describe signal transmission across a myoneural junction 	

How does a muscle contract?

- List the steps involved in the sliding filament theory of muscles contraction

What are the major muscles of the body?

- Identify the major muscles of the human body on a model or diagram.
- Demonstrate the different types of body movements.
- Explain the interactions of different muscle during a movement.
- Identify pertinent muscles and their attachments

How does the anatomy of a cat compare with that of a human?

- Compare human anatomy with that of another mammal.
- Thoroughly explore all body systems

Instructional Materials:

Primary Text: Principles of Anatomy and Physiology

- Smartboards
- Internet
- Lab Supplies
- Notebooks
- Index Cards

Secondary Texts:

- Supplemental Readings/ Articles based on student interest/discussion
- <http://www.the-scientist.com/?articles.list/categoryNo/2625/category/The-Scientist/tagNo/326,6/tags/human-anatomy,disease-medicine/>
- <http://www.scoop.it/t/anatomy-physiology-articles>

Teacher Resources:

- Sarcomere- https://www.biologycorner.com/anatomy/muscles/sarcomere_coloring.html,
- Sliding Filament- <https://www.biologycorner.com/worksheets/sliding-filament-coloring.html>
- Muscle System- https://www.biologycorner.com/anatomy/muscles/ch8_studyguide.html
- Crossword- https://www.biologycorner.com/anatomy/muscles/muscle_anatomy_crossword.html
- Muscles On-line- <http://www.getbodysmart.com/ap/muscularsystem/menu/menu.html>
- Cat Dissection Handouts - <http://www.cascade.k12.mt.us/view/3810.pdf>

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

Gifted and Talented
(content, process, product, and learning environment)
Extension Activities:

English Language Learners
Modifications:

- Modified assignments
- Native language translation (peer, online assistive technology, translation device, bilingual dictionary)

<ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking 	<ul style="list-style-type: none"> ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers
<p style="text-align: center;"><u>Students with Disabilities</u> <i>(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)</i></p> <p>Modifications for Classroom:</p>	<p style="text-align: center;"><u>Students at Risk of School Failure</u></p> <p>Modifications for Classroom:</p> <ul style="list-style-type: none"> ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments,
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and

Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).

- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide a copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments