

HILLSBOROUGH TOWNSHIP SCHOOL DISTRICT

SCIENCE CURRICULUM

ANATOMY & PHYSIOLOGY

AUGUST 2021

**Hillsborough Township Public Schools**  
**Anatomy & Physiology Curriculum**

<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Introduction to Human Anatomy and Physiology		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b> Topically Relevant (example - Covid, Vaccinations, current events)</p> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>● How are anatomy and physiology related?</li> <li>● Why is it important to maintain homeostasis in the body?</li> <li>● How is structure and function related?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>● Students will be able to explain the connection between anatomy and physiology.</li> <li>● Students will understand that many different body systems interact to maintain homeostasis in multicellular organisms.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>● HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> <li>● HS-LS1-4 Use a model to illustrate the role of cellular division and differentiation in producing and maintaining complex organisms composed of tissues and organs that work together to meet the needs of the whole organism.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>● Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● Feedback mechanisms maintain a living</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>● 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</li> </ul>

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<p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>	<p>different scales.</p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

<p><b>Math:</b></p> <ul style="list-style-type: none"> <li>MP.2 Reason abstractly and quantitatively.</li> <li>HMP.4 Model with mathematics.</li> <li>HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</li> <li>HSF-BF.A.1 Write a function that describes a relationship between two quantities.</li> <li>HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.</li> </ul> <p><b>ELA</b></p> <ul style="list-style-type: none"> <li>RST.11-12.8 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.</li> <li>RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</li> <li>RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative <b>data</b>, video, multimedia) in order to address a question or solve a problem.</li> </ul> <p><b>Computer Science and Design Thinking</b></p> <ul style="list-style-type: none"> <li>8.1.12.DA.5 Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.</li> <li>8.2.12.ETW.1 Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation, and maintenance of a chosen product</li> </ul>
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- 8.2.12.ETW.2 Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment

**Career Readiness, Life Literacies, and Key Skills**

- 9.3.ST.1 Apply engineering skills in a project that requires project management, process control and quality assurance. 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST.3 Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- 9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

**Social-Emotional Learning Competencies**

- **Self Management:** Recognize the skills needed to establish and achieve personal and educational goals.
- **Social Awareness:** Recognize and identify the thoughts, feelings, and perspectives of others.
- **Social Awareness:** Demonstrate an understanding of the need for mutual respect when viewpoints differ.
- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Develop a model of the major body cavities. Use this model to identify and describe the body using proper anatomical terminology.	Full size model of body cavities and proper anatomical terms.	Diagrams and presentations of human models and human body system presentations.
Develop a model of the major body cavities. Use this model to identify and describe the body using proper anatomical terminology.	Poster project of the structures and functions of one of the human body systems.	Presentations and sharing of class models.
Develop and use human body models to investigate levels of organization of the human body.	Manipulatives of levels of organization and use of plastic anatomical models.	Group solutions for organizations of body systems.
		Test - Introduction to Anatomy & Physiology

**Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate**

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Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:

- Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.

<b>Common Assessment(s)</b>	<b>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</b>
<b>Common:</b> Structure/Function of human body systems - general overview	<ul style="list-style-type: none"> <li>• All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.</li> </ul>

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Circulatory/Lymphatic System		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>• What happens to the function of your heart when you have clogged arteries?</li> <li>• NWP Blog - Clogged Arteries- Signs &amp; Symptoms</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• How are the structures of the circulatory system related to its function?</li> <li>• How do the other body systems aid in the functioning of the circulatory systems?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>• Students will know the relevant structures and functions of the circulatory system (blood, blood vessels and heart).</li> <li>• Students will be able to discuss how the circulatory system relates to the different types of body tissues.</li> <li>• Students will understand how the circulatory system helps maintain homeostasis in the cells of the body.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>• HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> <li>• HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>• Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Feedback mechanisms maintain a living</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• 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</li> </ul>

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<p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>	<p>different scales.</p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

<p><b>Math</b></p> <ul style="list-style-type: none"> <li>MP.2 Reason abstractly and quantitatively.</li> <li>MP.4 Model with mathematics.</li> <li>HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</li> <li>HSF-BF.A.1 Write a function that describes a relationship between two quantities.</li> <li>HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.</li> </ul> <p><b>ELA</b></p> <ul style="list-style-type: none"> <li>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)</li> </ul>
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- RST.11-12.7 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.11-12.8 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.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**Computer Science and Design thinking**

- 8.1.12.DA.5 Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
- 8.2.12.ETW.1 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.ETW.2 Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.

**Career Readiness, Life Literacies, and Key Skills**

- 9.3.ST.1 Apply engineering skills in a project that requires project management, process control and quality assurance. 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST.3 Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- 9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

**Social-Emotional Learning Competencies**

- **Self Management:** Recognize the skills needed to establish and achieve personal and educational goals.
- **Social Awareness:** Recognize and identify the thoughts, feelings, and perspectives of others.
- **Social Awareness:** Demonstrate an understanding of the need for mutual respect when viewpoints differ.
- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Use an animal heart model to investigate the anatomy and physiology of the human heart.	Heart Dissection	Lab Analysis



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Carry out an investigation using blood smears to analyze and interpret data on normal and sickle cells.	Let's Diagnose Them: Blood Smears	Lab Analysis
Carry out an investigation to compare and contrast blood cells and blood vessels.	Microscope Investigation of blood and blood vessel slides.	Lab Analysis
Obtain and communicate information on conditions or diseases that affect the anatomy and /or physiology of the human Circulatory/Lymphatic system.	Circulatory System Disease Presentation	Circulatory System Disease/Disorder/Condition Project
		Structures and functions of the heart quiz, Circulatory System Test
<b>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate</b>		
<p>Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:</p> <ul style="list-style-type: none"> <li>Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.</li> </ul>		
<b>Common Assessment(s)</b>	<b>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate</b>	
<b>Common:</b> Structure and Function - explain the structure and function relationship of a particular system which is affected by a disease.	<ul style="list-style-type: none"> <li>All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.</li> </ul>	

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Digestive System		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>Picture of a person eating. What happens to this food once it enters your body?</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>Why is nutrition important in maintaining human health?</li> <li>How are the structures of the digestive system related to its function?</li> <li>How do the other body systems aid in the functioning of the digestive system?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>Students will understand the relevant structures and functions of the digestive system.</li> <li>Students use models to illustrate how the interaction between systems provides specific functions in multicellular organisms.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> <li>HS-LS1-7 Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.</li> <li>HS-LS1-4 Use a model to illustrate the role of cellular division and differentiation in producing and maintaining complex organisms composed of tissues and organs that work together to meet the needs of the whole organism.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>Develop and use a model based on evidence to illustrate the relationships between systems or between components of a</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including</li> </ul>

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<p>system.</p> <p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>itself a component of the next level.</p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b></p> <ul style="list-style-type: none"> <li>As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products. As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment.</li> </ul>	<p>energy, matter, and information flows—within and between systems at different scales.</p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

- Math**
- MP.2 Reason abstractly and quantitatively.
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  - HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more

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complicated cases.

- HSF-BF.A.1 Write a function that describes a relationship between two quantities.
- HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.

**ELA**

- SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)
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- 9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

**Social-Emotional Learning Competencies**

- **Self Management:** Recognize the skills needed to establish and achieve personal and educational goals.
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- **Social Awareness:** Demonstrate an understanding of the need for mutual respect when viewpoints differ.
- **Responsible Decision -Making:** Develop, implement, and model effective problem-solving and critical thinking skills.

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<ul style="list-style-type: none"> <li>● <b>Relationship Skills:</b> Utilize positive communication and social skills to interact effectively with others.</li> </ul>		
Learning Targets	Investigations/Resources	Formative Assessment
Plan, develop and demonstrate a working model of the human digestive system.	Working model of the digestive system using household items.	Digestive System model.
Planning and carrying out an investigation of digestion.	Digestive system lab activity	Digestive system lab result analysis.
Obtaining, evaluating, and communicating information using the Healthy Feast activity.	Healthy feast project	Healthy feast project and recipe.
Obtain and communicate information on conditions or diseases that affect the anatomy and /or physiology of the human digestive system (e.g. obesity, food additives, diets etc.).	Digestive system disease presentation	Digestive system disease/disorder or condition project.
Carry out an investigation to examine the different body systems using an animal model.	Dissection	Dissection analysis
		Quiz on structure and function of the digestive system; Test on digestive system
<b>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate</b>		
<p>Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:</p> <ul style="list-style-type: none"> <li>● Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.</li> </ul>		
Common Assessment(s)	Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate	
<b>Common:</b> Structure and Function - explain the structure and function relationship of a particular	<ul style="list-style-type: none"> <li>● All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of</li> </ul>	

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system which is affected by a disease.

questions, reading questions aloud, word banks, and alternate testing sites.

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Integumentary System		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>● Picture of melanoma: Students identify what is wrong and use this to show how it is supposed to function when healthy.</li> <li>● Slide show: Melanoma pictures to help identify skin cancer</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>● What are the layers of the skin and the accessory structures of the skin?</li> <li>● What is the function of each layer of the skin and accessory structures?</li> <li>● How is the function of the skin affected by diseases/disorders or conditions?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>● Students will identify the different types of tissue in the integumentary system and how they function.</li> <li>● Students will understand how the integumentary system helps maintain homeostasis in the body.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>● HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> <li>● HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>● Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● Feedback mechanisms maintain a living</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>● 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</li> </ul>

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<p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>	<p>different scales.</p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

<p><b>Math</b></p> <ul style="list-style-type: none"> <li>MP.2 Reason abstractly and quantitatively.</li> <li>MP.4 Model with mathematics.</li> <li>HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</li> <li>HSF-BF.A.1 Write a function that describes a relationship between two quantities.</li> <li>HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.</li> </ul> <p><b>ELA</b></p> <ul style="list-style-type: none"> <li>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance</li> </ul>
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understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)

- RST.11-12.7 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.11-12.8 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.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**Computer Science and Design Thinking**

- 8.1.12.DA.5 Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
- 8.2.12.ETW.1 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.ETW.2 Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.

**Career Readiness, Life Literacies, and Key Skills**

- 9.3.ST.1 Apply engineering skills in a project that requires project management, process control and quality assurance. 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST.3 Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- 9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

**Social-Emotional Learning Competencies**

- **Self Management:** Recognize the skills needed to establish and achieve personal and educational goals.
- **Social Awareness:** Recognize and identify the thoughts, feelings, and perspectives of others.
- **Social Awareness:** Demonstrate an understanding of the need for mutual respect when viewpoints differ.
- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Design, construct and demonstrate a working model of the skin.	Working model of Skin using everyday materials (sponges, pipettes, etc.)	Model of skin

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Obtain and communicate information on diseases affecting the anatomy and/or physiology of the integumentary system.	Disease project  Microscope slides of skin	POGIL activity, Disease presentation
		Test on Integumentary system; skin disease presentation
<b>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</b>		
<p>Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:</p> <ul style="list-style-type: none"> <li>Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.</li> </ul>		
<b>Common Assessment(s)</b>	<b>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</b>	
<b>Common:</b> Structure and Function - explain the structure and function relationship of a particular system which is affected by a disease.	<ul style="list-style-type: none"> <li>All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.</li> </ul>	

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Muscular		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>• Pictures comparing a body builder physique vs. normal physique - what is the difference in muscle structure/function?</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• How does the Muscular System relate to the different types of tissues?</li> <li>• How does the structure of muscles relate to its function?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>• Students will be able to explain how the structures of muscles allow them to perform their relevant functions.</li> <li>• Students will be able to identify the different types of muscles and muscle tissues, name some of the more important muscles in the body and their functions in movement.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>• HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>• Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul> <p><b>Constructing Explanations and Designing Solutions</b></p>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>

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<ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>	<p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

**Math**

- MP.2 Reason abstractly and quantitatively.
- MP.4 Model with mathematics.
- HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- HSF-BF.A.1 Write a function that describes a relationship between two quantities.
- HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.

**ELA**

- SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)
- RST.11-12.7 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.11-12.8 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.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**Computer Science and Design Thinking**

- 8.1.12.DA.5 Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

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- 8.2.12.ETW.1 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.ETW.2 Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.

**Career Readiness, Life Literacies, and Key Skills**

- 9.3.ST.1 Apply engineering skills in a project that requires project management, process control and quality assurance. 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST.3 Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- 9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

**Social-Emotional Learning Competencies**

- **Self Management:** Recognize the skills needed to establish and achieve personal and educational goals.
- **Social Awareness:** Recognize and identify the thoughts, feelings, and perspectives of others.
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- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Understand the function of muscles in the body.	Planning and carrying out an investigation of the musculature of chicken wings to develop a model representing the interaction of specific muscles.	Lab - structure and function of a chicken wing
Investigate different types of muscle tissue to determine the structural differences.	Carry out an investigation to analyze samples of muscle tissue. Microscope slides of different types of muscle tissue	Microscopic investigation of muscle tissue.
Obtain and communicate information on diseases affecting the anatomy and/or physiology of the muscular system.	Muscular system disease presentation	Muscular system disease/disorder and condition presentation.
		Test on the Muscular System

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**Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate**

Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:

- Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.

**Common Assessment(s)**

**Assessment Modifications and/or Accommodations  
(ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate**

**Common:** Structure and Function - explain the structure and function relationship of a particular system which is affected by a disease.

- All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Respiratory System		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>Picture of smoker's lungs - How does the altered structure change its ability to function?</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>How does the respiratory system play a role in homeostasis?</li> <li>How are the structures of the respiratory system related to its function?</li> <li>How do the other systems aid in the functioning of the respiratory system?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>Students will know the relevant structures and functions of the parts of the respiratory system.</li> <li>How is gas exchanged in the respiratory system?</li> <li>What are the mechanics and control of breathing in the respiratory system?</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> <li>HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information</li> </ul>

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<p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<p>flows—within and between systems at different scales.</p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

<p><b>Math</b></p> <ul style="list-style-type: none"> <li>MP.2 Reason abstractly and quantitatively.</li> <li>MP.4 Model with mathematics.</li> <li>HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</li> <li>HSF-BF.A.1 Write a function that describes a relationship between two quantities.</li> <li>HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.</li> </ul> <p><b>ELA</b></p> <ul style="list-style-type: none"> <li>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)</li> </ul>
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- RST.11-12.7 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.
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Learning Targets	Investigations/Resources	Formative Assessment
Design an experiment focusing on respiratory changes by changing variables which would affect breathing rates.	Breathing Rate Lab	Analysis of lab data
Calculate lung capacity and analyze data for various “patients”.	Let’s Diagnose Them: Lung Capacity	Analysis of lab data

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Create a presentation about the effects of vaping on the respiratory system.	Vaping project	Creation of Vaping presentation
Obtain and communicate information on conditions or diseases that affect the anatomy and /or physiology of the human urinary/excretory system.	Respiratory System Disease Presentation	Respiratory system Disease/Disorder/Condition project
		Lab Quizzes, Test on Respiratory System
<b>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate</b>		
<p>Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:</p> <ul style="list-style-type: none"> <li>Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.</li> </ul>		
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<b>Common:</b> Structure and Function - explain the structure and function relationship of a particular system which is affected by a disease.	<ul style="list-style-type: none"> <li>All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.</li> </ul>	

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Skeletal System		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>Picture of a fractured bone. How does it heal and why is that essential to the bone’s function?</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>How does the skeletal system relate to the different types of tissues?</li> <li>How does the structure of the bones relate to its function?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>Students will be able to identify how the structure of bones contributes to their function in support and movement.</li> <li>Students will have an understanding of how the skeletal system relates to other systems in the function of the body.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul> <p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>Construct an explanation based on valid</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>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</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>Stability and Change</b></p>

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- 8.2.12.ETW.1 Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation, and maintenance of a chosen product.
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- **Responsible Decision-Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Understand the structures of the human skeletal system	Develop and use a pasta model to investigate the human skeleton.	Pasta skeleton Model
Understand the function of the bones in the human skeleton.	Analyze and/or interpret human x-rays in order to investigate broken or dislocated bones	X-ray lab activity
Obtain and communicate information on diseases affecting the anatomy and/or physiology of the skeletal system.	Skeletal system disease presentation.	Disease presentation.
		Identification of bone quiz; test on the skeletal system; skeletal system disease presentations.

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<b>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</b>	
<p>Individual accommodations and modifications in students' IEP and 504's will be followed and adhered to. Along with this:</p> <ul style="list-style-type: none"> <li>Group work and projects in this unit will be designed to allow the struggling learners to scaffold their learning and develop skills for working on larger projects by breaking down tasks. All students will be given opportunities to use different learning modalities to advance their understanding using varied strategies that accentuate their own learning style. Gifted learners will have the opportunity to challenge their problem solving skills by asking more complex questions and exploring concepts in greater depth.</li> </ul>	
<b>Common Assessment(s)</b>	<b>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When Appropriate</b>
<p><b>Common:</b> Structure and Function - explain the structure and function relationship of a particular system which is affected by a disease.</p>	<ul style="list-style-type: none"> <li>All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.</li> </ul>

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Tissues		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>• Growing tissues in a lab</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>• What are the structures (distinguishing characteristics) and functions of the 4 types of tissue in the human body?</li> <li>• Where are the different types of tissues located in the human body?</li> <li>• What are some examples of the tissue types?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>• Students will identify the types of tissue, their structures and functions.</li> <li>• Students will understand where each tissue is found in the body and why it is needed there.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>• HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>• Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul> <p><b>Constructing Explanations and Designing Solutions</b></p>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Feedback mechanisms maintain a living system’s internal conditions within certain limits and mediate behaviors, allowing it to</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>

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<ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>	<p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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**Interdisciplinary Connections: Math, ELA, and Computer Science and Design Thinking**

<p><b>Math:</b></p> <ul style="list-style-type: none"> <li>MP.2 Reason abstractly and quantitatively.</li> <li>MP.4 Model with mathematics.</li> <li>HSF-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.</li> <li>HSF-BF.A.1 Write a function that describes a relationship between two quantities.</li> <li>HSN.Q.A.2 Define appropriate quantities for the purpose of descriptive modeling.</li> </ul> <p><b>ELA</b></p> <ul style="list-style-type: none"> <li>SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-2)</li> <li>RST.11-12.7 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.</li> </ul>
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- RST.11-12.8 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.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

**Computer Science and Design Thinking**

- 8.1.12.DA.5 Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.
- 8.2.12.ETW.1 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.ETW.2 Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment.

**Career Readiness, Life Literacies, and Key Skills**

- 9.3.ST.1 Apply engineering skills in a project that requires project management, process control and quality assurance. 9.3.ST.2 Use technology to acquire, manipulate, analyze and report data.
- 9.3.ST.3 Describe and follow safety, health and environmental standards related to science, technology, engineering and mathematics (STEM) workplaces.
- 9.3.ST.4 Understand the nature and scope of the Science, Technology, Engineering & Mathematics Career Cluster and the role of STEM in society and the economy.

**Social-Emotional Learning Competencies**

- **Self Management:** Recognize the skills needed to establish and achieve personal and educational goals.
- **Social Awareness:** Recognize and identify the thoughts, feelings, and perspectives of others.
- **Social Awareness:** Demonstrate an understanding of the need for mutual respect when viewpoints differ.
- **Responsible Decision Making:** Develop, implement, and model effective problem-solving and critical thinking skills.
- **Relationship Skills:** Utilize positive communication and social skills to interact effectively with others.

Learning Targets	Investigations/Resources	Formative Assessment
Carry out an investigation to demonstrate proper use of the microscope in order to compare levels of organization in different organisms. Identify and describe cells and tissues in organs or body systems	Observing tissue slides using a microscope to compare and contrast different tissue types.	Cell/Tissue Lab -Identify and describe cells and tissues in a specific sample organ

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		Test - Cells and Tissues
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<b>Common Assessment(s)</b>	<b>Assessment Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate</b>	
<p><b>Common:</b> Structure and Function - explain the structure and function relationship of a particular system which is affected by a disease.</p>	<ul style="list-style-type: none"> <li>● All assessments will be modified in accordance with specifications from CST as enumerated in each student's educational plan. This may include, but is not limited to, extra time, clarification of questions, reading questions aloud, word banks, and alternate testing sites.</li> </ul>	

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<b>Unit Title</b>		<b>Time Frame/Pacing</b>
Urinary/Excretory System		20 days
<b>Phenomena/Anchoring Activity/Anchoring Question/Essential Questions</b>		
<p><b>Phenomena:</b></p> <ul style="list-style-type: none"> <li>● Patient undergoing dialysis treatment</li> </ul> <p><b>Essential Questions:</b></p> <ul style="list-style-type: none"> <li>● How does the Urinary/Excretory system play a role in homeostasis?</li> <li>● How are the structures of the urinary system related to its function?</li> <li>● How does the muscular system aid in the functioning of the urinary system?</li> </ul>		
<b>Enduring Understandings</b>		
<ul style="list-style-type: none"> <li>● Students develop a model in which they identify and describe the relevant parts (e.g., organ system, organs, and their component tissues) and processes (e.g., transport of fluids, motion) of urinary/excretory systems in multicellular organisms.</li> <li>● Students gain an understanding of the role of the urinary/excretory systems in maintaining homeostasis in the body.</li> </ul>		
<b>NJ Standards/NGSS Performance Expectations Taught and Assessed</b>		
<b>Students who demonstrate understanding can:</b>		
<ul style="list-style-type: none"> <li>● HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.</li> <li>● HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.</li> </ul>		
<b>3-Dimensional Learning Components</b>		
<b>Science and Engineering Practices</b>	<b>Disciplinary Core Ideas (DCI)</b>	<b>Crosscutting Concepts</b>
<p><b>Developing and Using Models</b></p> <ul style="list-style-type: none"> <li>● Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.</li> </ul>	<p><b>LS1.A: 1. Structure and Function</b></p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● Feedback mechanisms maintain a living</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>● 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</li> </ul>

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<p><b>Constructing Explanations and Designing Solutions</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><b>Planning and Carrying Out Investigations</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul>	<p>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.</p>	<p>different scales.</p> <p><b>Stability and Change</b></p> <ul style="list-style-type: none"> <li>Feedback (negative or positive) can stabilize or destabilize a system.</li> </ul> <p><b>Scale, Proportion and Quantity</b></p> <ul style="list-style-type: none"> <li>Recognize patterns observable at one scale may not be observable or exist at other scales, and some systems can only be studied indirectly as they are too small, too large, too fast, or too slow to observe directly. The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.</li> </ul>
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- RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- WHST.9-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-LS1-3)
- WHST.11-12.8 Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation. (HS-LS1-3)

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Learning Targets	Investigations/Resources	Formative Assessment
Construct a model of a kidney to demonstrate kidney function.	Kidney model activity.	Kidney model assessment
Carry out an investigation to analyze and interpret data obtained from a urinalysis.	Let's Diagnose Them: Urinalysis	Lab analysis
Evaluate information on people waiting for a kidney transplant. Communicate who should get the kidney based upon the evaluation	Who Gets the Kidney activity	Evaluation of patients for transplant.
Obtain and communicate information on conditions or diseases that affect the anatomy and /or physiology of the human urinary/excretory system.	Urinary/Excretory disease presentation	Urinary/Excretory disease/disorder/condition project.
Understand the structure and function of the kidney.	Kidney Dissection	Lab Analysis
		Test on the urinary system
<b>Instructional Modifications and/or Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504) When appropriate</b>		
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