MOORESTOWN TOWNSHIP PUBLIC SCHOOLS
MOORESTOWN, NEW JERSEY

Moorestown High School
Science Department

Honors Anatomy and Physiology
Grade 12

Date: July 2022
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Course Description and Fundamental Concepts

Honors Anatomy and Physiology is a laboratory oriented course involving the detailed study of the structure and function of the following mammalian body systems: Skeletal, Muscular, Digestive, Excretory, Circulatory, Lymphatic, Reproductive, Respiratory, Endocrine, Nervous and general and special senses. The laboratory will emphasize the skills and procedures necessary to perform successful dissection. The main specimen used to study the systems previously mentioned will be *Felis domestica* (domestic cat), as well as portions of *Bos taurus* (cow) specimens for the cardiac and special senses, and *Ovis aries* (sheep) for respiratory and nervous system identification.

This course is highly recommended for those interested in the healthcare fields of medicine, nursing, physical therapy and animal research. Those interested in veterinary science would also benefit from this study. Medical professionals from the community are also utilized for instruction and introduction to current practices and techniques in the medical field.The class meets for five single periods and one double period a week.

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New Jersey Student Learning Standards (NJSLS)

Subject/Content Standards
Include grade appropriate subject/content standards that will be addressed

Standard #	Standard Description
HS-LS1 From Molecule to Organisms: Structure and Process	
HS-LS1-1	Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism system level such as nutrient uptake, water delivery , and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.
HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise, stomata response to moisture and temperature, and root development in response to water levels.
HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
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.
HS-LS3 Heredity: Inheritance and Variation of Traits	
HS-LS3-1	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
HS-LS3-2	Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. [Clarification Statement: Emphasis is on using data to support arguments for the way variation occurs.]

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English Companion Standards

List grade-level appropriate companion standards for History, Social Studies, Science and Technical Subjects (CTE/Arts) 6-12. English Companion Standards are required in these subject/content areas.

Unit Addressed	Standard #	Standard Description
1,2,3,4,5,6,7,8,9 10,11,12	*RST.11-12.1*	*Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS1-1),(HS-LS1-6),(HS-LS3-1),(HS-LS3-2)*
1	*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. (HS-LS3-1)*
1	*WHST.9-12.1*	*Write arguments focused on discipline-specific content. (HS-LS3-2)*
1,2,3,4,5,6,7,8,9 10,11,12	*WHST.9-12.2*	*Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1- 1),(HS-LS1-6)*
1,2,3,4,5,6,7,8,9 10,11,12	*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. (HSLS1-3)*
1,2,3,4,5,6,7,8,9 10,11,12	*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)*
1,2,3,4,5,6,7,8,9, 10,11,12	*WHST.9-12.9*	*Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS-1-1),(HS-LS1-6)*
1,2,3,4,5,6,7,8,9, 10,11,12	*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),(HS-LS1-4),(HS-LS1-5),(HS-LS1-7)*

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Career Awareness, Exploration, Preparation, and Training (Standard 9.2)
List appropriate units below for which standards will be addressed

By Grade 12		
Unit Addressed	**Core Idea**	**Standard / Description**
1-13	There are strategies to improve one's professional value and marketability.	***9.2.12.CAP.1**: Analyze unemployment rates for workers with different levels of education and how the economic, social, and political conditions of a time period are affected by a recession.* ***9.2.12.CAP.2**: Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.* ***9.2.12.CAP.3**: Investigate how continuing education contributes to one's career and personal growth.*
	Career planning requires purposeful planning based on research, self-knowledge, and informed choices.	***9.2.12.CAP.4**: Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.* ***9.2.12.CAP.5**: Assess and modify a personal plan to support current interests and postsecondary plans.* ***9.2.12.CAP.6**: Identify transferable skills in career choices and design alternative career plans based on those skills.* ***9.2.12.CAP.7**: Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.* ***9.2.12.CAP.8**: Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, drug tests) used by employers in various industry sectors.* ***9.2.12.CAP.9**: Locate information on working papers, what is required to obtain them, and who must sign them.* ***9.2.12.CAP.10**: Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).*

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		9.2.12.CAP.11*: Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.*
	An individual's income and benefit needs and financial plan can change over time.	***9.2.12.CAP.12****: Explain how compulsory government programs (e.g., Social Security, Medicare) provide insurance against some loss of income and benefits to eligible recipients.* ***9.2.12.CAP.13****: Analyze how the economic, social, and political conditions of a time period can affect the labor market.*
	Securing an income involves an understanding of the costs and time in preparing for a career field, interview and negotiation skills, job searches, resume development, prior experience, and vesting and retirement plans.	***9.2.12.CAP.14****: Analyze and critique various sources of income and available resources (e.g., financial assets, property, and transfer payments) and how they may substitute for earned income.*
	Understanding income involves an analysis of payroll taxes, deductions and earned benefits.	***9.2.12.CAP.15****: Demonstrate how exemptions, deductions, and deferred income (e.g., retirement or medical) can reduce taxable income.* ***9.2.12.CAP.16****: Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.* ***9.2.12.CAP.17****: Analyze the impact of the collective bargaining process on benefits, income, and fair labor practice.* ***9.2.12.CAP.18****: Differentiate between taxable and nontaxable income from various forms of employment (e.g., cash business, tips, tax filing and withholding).* ***9.2.12.CAP.19****: Explain the purpose of payroll deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay, including the cost of employee benefits to employers and self-employment income.* ***9.2.12.CAP.20****: Analyze a Federal and State Income Tax Return.*

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	There are ways to assess a business's feasibility and risk and to align it with an individual's financial goals.	***9.2.12.CAP.21****: Explain low-cost and low-risk ways to start a business.* ***9.2.12.CAP.22****: Compare risk and reward potential and use the comparison to decide whether starting a business is feasible.* ***9.2.12.CAP.23****: Identify different ways to obtain capital for starting a business*

Life Literacies and Key Skills (Standard 9.4)
List appropriate units below for which standards will be addressed

By Grade 12		
Unit Addressed	**Core Idea**	**Standard / Description**
1-13	**Creativity and Innovation**: With a growth mindset, failure is an important part of success.	***9.4.12.CI.1****: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).*
2	**Creativity and Innovation**: Innovative ideas or innovation can lead to career opportunities.	***9.4.12.CI.2:*** *Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).* ***9.4.12.CI.3:*** *Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).*
4,5,6,8,9,10	**Critical Thinking and Problem-solving:** Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.	***9.4.12.CT.1:*** *Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).* ***9.4.12.CT.2:*** *Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).* ***9.4.12.CT.3:*** *Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).* ***9.4.12.CT.4:*** *Participate in online strategy and planning sessions for course-based, school-based, or other projects and determine the strategies that contribute to effective outcomes.*

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	Digital Citizenship: Laws govern the use of intellectual property and there are legal consequences to utilizing or sharing another's original works without permission or appropriate credit.	***9.4.12.DC.1****: Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).* ***9.4.12.DC.2****: Compare and contrast international differences in copyright laws and ethics*
	Digital Citizenship: Laws govern many aspects of computing, such as privacy, data, property, information, and identity. These laws can have beneficial and harmful effects, such as expediting or delaying advancements in computing and protecting or infringing upon people's rights.	***9.4.12.DC.3****: Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).* ***9.4.12.DC.4****: Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3).* ***9.4.12.DC.5****: Debate laws and regulations that impact the development and use of software.*
1-13	**Digital Citizenship:** Cultivating online reputations for employers and academia requires separating private and professional digital identities.	***9.4.12.DC.6****: Select information to post online that positively impacts personal image and future college and career opportunities.*
	Digital Citizenship: Digital communities influence many aspects of society, especially the workforce. The increased connectivity between people in different cultures and different career fields have changed the nature, content, and responsibilities of many careers.	***9.4.12.DC.7****: Evaluate the influence of digital communities on the nature, content and responsibilities of careers, and other aspects of society (e.g., 6.1.12.CivicsPD.16.a).*
	Digital Citizenship: Network connectivity and computing capability extended to objects, sensors and everyday items not normally considered computers allows these devices to generate, exchange, and consume data with minimal human intervention. Technologies such as Artificial Intelligence (AI) and blockchain can help minimize the effect of climate change.	***9.4.12.DC.8****: Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.*

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	Global and Cultural Awareness: Solutions to the problems faced by a global society require the contribution of individuals with different points of view and experiences.	***9.4.12.GCA.1:*** *Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).*
1-13	**Information and Media Literacy:** Advanced search techniques can be used with digital and media resources to locate information and to check the credibility and the expertise of sources to answer questions, solve problems, and inform the decision-making.	***9.4.12.IML.1:*** *Compare search browsers and recognize features that allow for filtering of information.* ***9.4.12.IML.2:*** *Evaluate digital sources for timeliness, accuracy, perspective, credibility of the source, and relevance of information, in media, data, or other resources (e.g., NJSLSA.W8, Social Studies Practice: Gathering and Evaluating Sources.*
1-13	**Information and Media Literacy:** Digital tools such as artificial intelligence, image enhancement and analysis, and sophisticated computer modeling and simulation create new types of information that may have profound effects on society. These new types of information must be evaluated carefully	***9.4.12.IML.3****: Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8)* ***9.4.12.IML.4****: Assess and critique the appropriateness and impact of existing data visualizations for an intended audience (e.g., S-ID.B.6b, HS-LS2-4).*
	Information and Media Literacy: In order for members of our society to participate productively, information needs to be shared accurately and ethically.	***9.4.12.IML.5****: Evaluate, synthesize, and apply information on climate change from various sources appropriately (e.g., 2.1.12.CHSS.6, S.IC.B.4, S.IC.B.6, 8.1.12.DA.1, 6.1.12.GeoHE.14.a, 7.1.AL.PRSNT.2).* ***9.4.12.IML.6****: Use various types of media to produce and store information on climate change for different purposes and audiences with sensitivity to cultural, gender, and age diversity (e.g., NJSLSA.SL5).*
	Information and Media Literacy: Accurate information may help in making valuable and ethical choices.	***9.4.12.IML.7****: Develop an argument to support a claim regarding a current workplace or societal/ethical issue such as climate change (e.g., NJSLSA.W1, 7.1.AL.PRSNT.4).*

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	Information and Media Literacy: Media have embedded values and points of view.	***9.4.12.IML.8****: Evaluate media sources for point of view, bias, and motivations (e.g., NJSLSA.R6, 7.1.AL.IPRET.6).* ***9.4.12.IML.9****: Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4).*
1-13	**Technology Literacy:** Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is helpful in selecting the best tool for a given task.	***9.4.12.TL.1****: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specific task (e.g., W.11-12.6.).* ***9.4.12.TL.2****: Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data.*
1-13	**Technology Literacy:** Collaborative digital tools can be used to access, record and share different viewpoints and to collect and tabulate the views of groups of people.	***9.4.12.TL.3****: Analyze the effectiveness of the process and quality of collaborative environments.* ***9.4.12.TL.4****: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem (e.g., 7.1.AL.IPERS.6).*

Interdisciplinary Connections (2020 NJSLS)
List any other content standards addressed as well as appropriate units. All arts integration connections may be listed within this chart.

Visual & Performing Arts Integration (Standard 1)
List appropriate units below for which standards (1.1 through 1.5) may be addressed

Unit Addressed	Artistic Process	Anchor Standard
1-13	**Creating**	*Anchor Standard 1: Generating and conceptualizing ideas.* *Anchor Standard 2: Organizing and developing ideas.* *Anchor Standard 3: Refining and completing products.*
1-13	**Connecting**	*Anchor Standard 10: Synthesizing and relating knowledge and personal experiences to create products.* *Anchor Standard 11: Relating artistic ideas and works within societal, cultural, and historical contexts to deepen understanding.*

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1-3	**Performing/ Presenting/ Producing**	*Anchor Standard 4: Selecting, analyzing, and interpreting work.* *Anchor Standard 5: Developing and refining techniques and models or steps needed to create products.* *Anchor Standard 6: Conveying meaning through art.*
	Responding	*Anchor Standard 7: Perceiving and analyzing products.* *Anchor Standard 8: Applying criteria to evaluate products.* *Anchor Standard 9: Interpreting intent and meaning.*

Other Interdisciplinary Content Standards
List appropriate units below for any other content/standards that may be addressed

Unit Addressed	Content / Standard #	Standard Description
1	*Math / MP.2*	*Reason abstractly and quantitatively. (HS-LS3-2)*
4,5,6,7,8,9,10,11, 12	*Math / MP.4*	*Model with mathematics. (HS-LS1-4)*
4,5,6,7,8,9,10,11, 12	*Math / HSF-IF.C.7*	*Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (HS-LS1-4)*
4,5,6,7,8,9,10,11, 12	*Math /HSF-BF.A.1*	*Write a function that describes a relationship between two quantities. (HS-LS1-4)*

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Pacing Guide (All Dates are approximate based on the school calendar)

Unit/ Topic	Month (w/Approx number of Teaching Days)
Unit 1 - Introduction to the Human Body ● Anatomical terms ● General system overview	**September** **(~19 days)**
Unit 2 - Histology Unit ● CAMS ● Tissues ○ Epithelium ○ Connective ○ Muscle ○ Nervous	**October** **(~19 days)**
Unit 3 - Integumentary ● Layers ● Major structures ● Glands ● Accessory structures	
Unit 4 - Skeletal System and Articulations ● Formation of bone ● Appendicular skeleton ● Axial skeleton ● Articulations	**November** **(~16 days)**
Unit 5 - Muscular System ● Muscle anatomy and general function	
Unit 5 - Muscular System (Cont'd) ● Muscle physiology	**December** **(~15 days)**
Unit 6 - Nervous System ● Neuron structure ● Brain structure	
Unit 6 - Nervous System (Cont'd) ● Action potentials ● Cell types ● Spinal nerves ● Autonomic Nervous System	**January** **(~18 days)**

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Unit 7 - General and Special Senses • General senses comparison • Gustatory, olfaction, visual, auditory, and equilibrium	**February** **(~18 days)**
Unit 8 - Blood/Cardiac Physiology/Vasculature • Blood composition, cellular structure, and hemostasis • Heart anatomy • Cardiac conduction	
Unit 8 - Blood/Cardiac Physiology/Vasculature (Cont'd) • EKG • Blood vessels and circulation	**March** **(~15-20 days)**
Unit 9 - Immunology and Respiratory System • Lymph formation/function/structures • Non-specific and specific immunity	
Unit 9 - Immunology and Respiratory System (Cont'd) • Structure • Respiratory physiology	
Unit 10 - Digestive System • Major and accessory structures • Absorption and processing	**April** **(~15-20 days)**
Unit 11 - Urinary System • Structure • Renal physiology	
Unit 12 - Human Reproductive System • Structure • Hormonal control • Gestation and birth • Contraceptives and STI	**May** **(~18 days)**
Unit 13 - Cat Dissection Unit • Muscle anatomy	
Unit 13 - Cat Dissection Unit (Cont'd) • Internal structures	**June** **(~15 days)**

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Units Scope and Sequence

Unit 1: Introduction to the Human Body

Learning Goals: What do I want my students to learn?

Standards

NJSLS - HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- Understanding of anatomical terminology, methods of homeostasis, and human systems

Learning Objectives

Students will be able to…

- Utilize anatomical terminology in reference to anatomical position
- Know the general functions of the 11 human systems

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Unit 2: Histology

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How Does Histology Identification For Surgical And Clinical Practices Aid Clinicians?
- How does the function of the different CAMs (Cell Adhesion Molecules) cause multiple common tissue disorders?

Learning Objectives

Students will be able to…

- Identify histology under microscope
- Based on physical description, identify the types and location of a tissue
- Identify and model the 5 major CAMs

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Unit 3: Integumentary System

Learning Goals: What do I want my students to learn?

Standards

NJSLS

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How is the integumentary system function determined by the type of tissue found there?

Learning Objectives

Students will be able to…
- Recognize the parts of integumentary system and glandular function
- Understand how structure relates to function of integumentary system
- Utilize the Rule of Nines in clinical settings

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Unit 4: Skeletal System and Articulations

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How does the formation of bone relate to articulations and human movement?
- How does the differentiation of tissue relate to the function of Osseous Tissue?

Learning Objectives

Students will be able to…
- Differentiate between intramembranous ossification and endochondral ossification
- Identify bones of the body, fossa, foramen, and processes
- Model the different articulation movements

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Unit 5: Muscle Physiology

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- What are the series of events that lead to a successful action potential and muscle contraction?

Learning Objectives

Students will be able to…
- Identify the anatomy of a muscle cell in terms of function
- Recreate the steps to create, sustain, stop, and alter an action potential

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Unit 6: Nervous System

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- What are the major structures of the CNS and PNS?
- What do the structures of the CNS and PNS do?

Learning Objectives

Students will be able to…

- Understand the connection between form and function of the CNS
- Connect how the CNS communicates with the PNS
- Identify what structure is involved with a particular physiological response

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Unit 7: General and Special Senses

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- What is the difference between a general and special sense?
- How do the types of special senses work?

Learning Objectives

Students will be able to…

- Classify the types of general senses
- Identify the parts of special senses and their physiology
- Identify conditions where homeostasis of special senses are disrupted

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Unit 8: Blood/Cardiac Physiology/Vasculature

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

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NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How does cardiac function relate to structure of the vasculature system and hematology?

Learning Objectives

Students will be able to…

- Identify the components and functions of blood
- Trace the pathway of blood through the heart during an action potential and conduction cycle
- Identify the differences between the vascular structures and relate it to their function
- Have a basic understanding of the medicinal interactions with cardiac function

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Unit 9: Immunology and Respiratory System

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How does the immune system function in relation to the cardiovascular system and lungs?
- How does the respiratory system aid hematology?

Learning Objectives

Students will be able to…
- Understand the difference between innate and acquired immunity
- Trace the steps for activation of immune response
- Identify the connection between blood and immune function
- Articulate respiratory system function as it relates to chances in environmental stimuli

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Unit 10: Digestive System

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How do we get energy from the food we eat?
- How is food modified in the digestive system?

Learning Objectives

Students will be able to…

- Connect the structures and functions of the digestive system to the foods they eat

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Unit 11: Urinary System

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- What steps occur in the creation of urine?

Learning Objectives

Students will be able to…
- Identify the parts of a kidney
- Trace a molecule through the blood/kidney/bladder
- Recognize conditions that alter output of urine

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Unit 12: Human Reproductive System

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
NJSLS - Career Awareness, Exploration, Preparation, and Training
NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How do the differences in gender allow for the creation of new human life?

Learning Objectives

Students will be able to…
- Identify male/female anatomy and physiological differences between structures
- Know the function of the different structures
- Understand the hormonal cycle in both male and female
- Trace the pathway from ovulation to conception and birth

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Unit 13: Cat Dissection

Learning Goals: What do I want my students to learn?

Standards

NJSLS -

HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis

HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
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NJSLS - Life Literacies and Key Skills
NJSLS - Interdisciplinary Standards

Fundamental Concepts / Big Ideas

- How are the mammalian body systems connected anatomically?

Learning Objectives

Students will be able to…
- Dissect *Felis domesticus*
- Identify body systems
- Demonstrate use of dissection technology and skills

Please contact the Content Supervisor for any questions.

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