Unit 01: ORGANIZATION OF THE BODY

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 1**
Length: **3 weeks**
Status: **Published**

Standards and Phenomena

Science Standards

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Life Literacies and Key Skills / Social Emotional Learning

HE.9-12.2.1.12.EH.1	Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
HE.9-12.2.1.12.EH.3	Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).
HE.9-12.2.1.12.SSH.4	Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).
HE.9-12.2.2.12.N.2	Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
HE.9-12.2.2.12.N.3	Analyze the unique contributions of each nutrient class (e.g., fats, carbohydrates, protein, water, vitamins, minerals) to one's health and fitness.
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.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).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

TECH.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).

Phenomena

If a person has gotten into a car accident and is injured upside down in the vehicle, how could an Emergency Response worker use anatomical terminology to document the victim's injuries so that someone else (not present) could envision where the injuries are?

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

Using Mathematics and Computational Thinking

Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

SCI.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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Crosscutting Concepts

Energy and Matter

Cause and Effect

Systems and System Models

Patterns

Scale, Proportion, and Quantity

Structure and Function

Transfer Goals

Living organisms are composed of cellular units that carry out the functions required for life. These essential concepts will unify and form the bedrock fo rthe study of the human body: the complementary of structure and function, the hierarchy of structural organization, and homeostasis.

Essential Questions

- How can specific body locations be identified using directional terms?
- What are the necessary functions required to sustain life?
- What are the subdivisions of anatomy and physiology?
- How does the principle of complementarity relate to essential life functions?
- What are the components and functions of the 11 body systems?
- What are the survival needs of a human?
- Why is homeostasis so significant?

Understandings

- The human body, from the cellular to the organ system level, demonstrates the complementary nature of structure and function
- In order to properly comprehend this subject, anatomy and physiology must be studied together

Critical Knowledge and Skills

Knowledge

- How to describe anatomy and physiology and their subdivisions
- The function and components of the 11 body systems
- All the survival needs of the body
- What happens to the body when homeostasis is out of balance
- How to use directional terms to describe body locations

Skills

- Explain the principle of complementarity
- List all the levels of structural organization in the human body and explain their relationships
- Describe the functional characteristics necessary to maintain life in humans
- Define homeostasis and explain its significance
- Model and describe the importance of anatomical position

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on directional terms
- Quiz on organ system functions

School Summative Assessment Plan

- Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=KqgTERrYbQ4

www.youtube.com/watch?v=y2N_b0qwvxY

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
  - Used for universal access to class notes and Power Points

- **One to One Student laptops**
  - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
  - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the gifted students are to be given enrichment questions.

  - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

  - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

English Language Learners (N.J.A.C.6A:15)

- Within each lesson, the English language learners are given three levels of questioning. Each level is accommodating to the level of learning that the individual student(s) is learning at:

  - Beginning

  - Intermediate

  - Advanced

- All assignments can be created in the student's native language if needed.

- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Work with the I&RS Team to reach the needs of students.

- Mentors provided

- Offer additional supports as needed (after school help, parent contact, frequent checks for understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding
- Preferred seating assignments
- Multiple representations - encourage and allow tables, graphic organizers, etc.
- Hard copy of notes
- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
- Repeat/rephrase instructions as needed

Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes, root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in a human's anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the 4 types of anatomy
- Interactive notes and discussion on the different types of physiology
- Interactive notes and discussion on the levels of structural organization
- RQ on types of anatomy
- RQ on types of physiology

Week 2:

- Interactive notes and discussion on the major functions and structures of all 11 body systems
- Co-op pairs research - body system functions
- RQ on major structures of each system
- Interactive notes and discussion on the orientation and directional terms

Week 3:

- Think-pair-share Directional terms activity
- Interactive notes and discussion on the three body planes
- Interactive notes and discussion on the 3 body cavities
- Interactive notes and discussion on the 8 necessary life functions and the 6 human survival needs
- RQ on orientation terms
- RQ on necessary life functions reading
- RQ on human survival needs
- CO-op unit review
- TEST - Organization of the Body

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Unit 02: TISSUES: THE LIVING FABRIC

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 1**
Length: **3 weeks**
Status: **Published**

Standards and Phenomena

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Phenomena

Understanding types of tissues allows you to monitor potential tissue damage, such as bedsores, in patients.

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

Using Mathematics and Computational Thinking

Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Transfer Goals

Living organisms are composed of cellular units that carry out the functions required for life. These essential concepts will unify and form the bedrock for the study of the human body: complementarity of structure and function, the hierarchy of structural organization, and homeostasis.

Essential Questions

- How does the body heal itself?
- How does the matix and cellularity of each type of connective tissue determine its function and location?
- How does the structure and arrangement of epithelia cells relate to their function and location within the body?
- How does the structure of cartilage make it such a good transitional tissue?
- How does the structure of the 4 types of tissue in the body relate to its function?
- Which type of muscle tissue does what specific function?

Understandings

- Groups of cells that are similar in structure and perform a common or related function are called tissues
- Histology complements the study of gross anatomy; together they provide the structural basis for understanding organ physiology.
- Individual body cells are specialized to benefit the body as a whole.

Critical Knowledge and Skills

Knowledge

- All the structural and functional characteristics of epithelial tissue.
- The four functions of connective tissue.
- The three types of fibers found in connective tissue.
- The functions of the three types of muscle tissue.
- The three main steps of tissue repair.
- The embryonic origin of each tissue class.

Skills

- Name, classify, and describe the various types of epithelia, and indicate their chief functions and locations.
- Indicate common characteristics of connective tissue and list and describe its structural elements.
- Describe the types of connective tissue found in the body and indicate their characteristic functions.
- Indicate the general characteristics of nervous tissue.
- Compare and contrast the structures and body locations of the three types of muscle tissue.
- Outline the process of tissue repair involved in normal healing.
- Describe tissue changes that occur with age.
- Differentiate between exocrine and endocrine glands; and between multicellular and unicellular glands

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on types of CT
- Quiz on steps of tissue repair

School Summative Assessment Plan

- Tissue Lab
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=psq5PrralhI

www.youtube.com/watch?v=O0ZvbPak4ck

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
  - Used for universal access to class notes and Power Points

- **One to One Student laptops**
  - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
    - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the gifted students are to be given enrichment questions.

    - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

    - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

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- Within each lesson, the English language learners are given three levels of questioning. Each level is accommodating to the level of learning that the individual student(s) is learning at:

    - Beginning

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- All assignments can be created in the student's native language if needed.
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- Mentors provided
- Offer additional supports as needed (after school help, parent contact, frequent checks for

understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding
- Preferred seating assignments
- Multiple representations - encourage and allow tables, graphic organizers, etc.
- Hard copy of notes
- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
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Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on functions and characteristics of epithelial tissue
- RQ 4 types of tissue
- Research apical vs basal / superficial vs deep
- Interactive notes and discussion on 6 classes of CT based on cellular arrangement

Week 2:

- Interactive notes and discussion on functions and locations of 8 types of CT
- Diagram 6 cellular arrangements of CT
- RQ locations of CT
- Reading on characteristics of CT
- Interactive notes and discussion on functions and and locations of all types of CT
- Research types of cartilage
- RQ on outline of all CT types

Week 3:

- Interactive notes and discussion on 3 types of cartilage and 3 types of muscle
- RQ functions of cartilage
- Reading on tissue repair
- Interactive notes and discussion on tissue repair
- Co-op chap review
- Unit Test

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Unit 03: THE INTEGUMENTARY SYSTEM

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 1**
Length: **3 weeks**
Status: **Published**

Standards and Phenomena

Science Standards

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Phenomena

•Understanding the integumentary system will help you evaluate and treat injuries to the skin such as burns

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

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Disciplinary Core Ideas

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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Structure and Function

Stability and Change

Scale, Proportion, and Quantity

Transfer Goals

The integumentary systems covers the body acting as a barrier thus protecting us from the external environment. THe system also plays a major role in homeostasis.

Essential Questions

- How is the skin affected by disease and damage?
- How do integumentary structures protect and help regulate the body?
- How does the anatomy of skin relate to its function?

Understandings

- The organization of integumentary tissue and structures relate to their function
- The skin protects the body by being a physical barrier

Critical Knowledge and Skills

Knowledge

- All the different types of cells found in skin
- The layers of skin
- The role skin has in temperature regulation
- The accessory organs of skin and their physiology
- The various disorders affecting skin
- How different parts of the skin are colored by various pigments
- The structure and many functions of different hairs located throughout the body

Skills

- Identify the accessory skin structures and explain their function
- Explain the causes, symtoms, and affects of the 3 types of burns
- Explain moles, freckles, acne, and skin cancer

- Describe the various disorders affecting skin
- Explain the major types of skin cancer and be able to explain the importance of the ABCDE rule
- Describe the structure and function of the various types of glands located in the skin

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on 5 layers of the epidermis
- Quiz on types of sweat/oil glands

School Summative Assessment Plan

- Skin Disorder Research Paper
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=z5VnOS9Ke3g

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Google Images

Supplementary Resources

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- Provide a copy of grading rubrics for projects/labs
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Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse

environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the 4 main types of cells found in the epidermis
- Reading on 5 layers of epidermis
- RQ cells / layers of epidermis
- Interactive notes and discussion on the structures and functions of all parts of the dermis
- RQ dermal structures

Week 2:

- Interactive notes and discussion on the 3 major skin pigments
- Reading on different sweat glands
- Interactive notes and discussion on all appendages of the skin
- RQ on eccrine vs apocrine glands
- Interactive notes and discussion on structure and function of hair
- Research on functions of the integument

Week 3:

- Interactive notes and discussion on 3 major functions of the integumentary system
- RQ on hair growth
- Interactive notes and discussion on homeostatic imbalances of the skin
- Reading on skin cancers
- RQ on the 3 degrees of burns
- Co-op chapter review
- Unit Test

Unit 04: SKELETAL SYSTEM

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 2**
Length: **3 weeks**
Status: **Published**

Standards and Phenomena

Science Standards

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TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem

	solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).
TECH.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).

Phenomena

- Understanding bone anatomy and the process of bone remodeling allows you to work effectively with patients with bone diseases such as osteoporosis

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

Using Mathematics and Computational Thinking

Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Transfer Goals

There are 206 individual bones that combine to support and protect the human body; being able to identify and locate each of these bones is essential to the study of anatomy and physiology.

Essential Questions

- How do the 206 bones in the human body connect with each other?
- How do the shape of different vertebrae and ribs relate to their function?
- How do the skull, atlas, and axis work together to allow all types of head movement?
- What determines if a bone is in the axial or appendicular skeleton?

Understandings

- The human body is composed of 206 individual bones all working in conjunction with each other
- In order to fully comprehend this subject, anatomy & physiology must be studied together

Critical Knowledge and Skills

Knowledge

- Which bones are part of the axial skeleton and which are part of the appendicular skeleton
- The names of all the bones that make up the skull
- How to identify and name each individual vertebrae
- How to distinguish all ribs from each other
- Which arm and leg bones are the "left" one vs the "right" one

Skills

- Label all cranial and facial bones
- Identify and orient all bones of the shoulder, arm and hand

- Identify and orient all bones of the hip, leg and foot
- Distinguish all phalanges from each other based on their location

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on skull bones
- Quiz on numbering the vertebrae

School Summative Assessment Plan

- Bone Practical
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=UPrxQkjjExI

www.youtube.com/watch?v=QJwORUokEXc

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
    - Used for universal access to class notes and Power Points

- **One to One Student laptops**
    - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
    - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the gifted students are to be given enrichment questions.

  - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

  - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

English Language Learners (N.J.A.C.6A:15)

- Within each lesson, the English language learners are given three levels of questioning. Each level is accommodating to the level of learning that the individual student(s) is learning at:

  - Beginning

  - Intermediate

  - Advanced

- All assignments can be created in the student's native language if needed.

- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Work with the I&RS Team to reach the needs of students.

- Mentors provided

- Offer additional supports as needed (after school help, parent contact, frequent checks for understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding

- Preferred seating assignments

- Multiple representations - encourage and allow tables, graphic organizers, etc.
- Hard copy of notes
- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
- Repeat/rephrase instructions as needed

Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse

environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on axial vs appendicular skeleton
- Identify all bones of the skull
- RQ axial vs appendicular bones
- Reading on bones of the vertebral column
- Interactive notes and discussion on all vertebral bones
- RQ 5 classes of vertebrae

Week 2:

- Interactive notes and discussion on sternum and rib-cage
- RQ on pairs of ribs
- Co-op labeling of all appendicular bones
- Interactive notes and discussion on all shoulder, arm, hand and finger bones
- Research total numbers of bones in various body locations
- RQ upper extremity bones

Week 3:

- Interactive notes and discussion on all hip, leg, foot and toe bones
- RQ on lower extremity bones
- Co-op informal bone review
- Independent formal bone review
- Unit Test

Unit 05: BONES and JOINTS

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 2**
Length: **3 weeks**
Status: **Published**

Transfer Goals

Bones are the basic units of structure in the body. Bones heal themselves very efficiently. Bones start growing in the 8th week of development and do not stop growing until after adolescence. Joints allow the body to move; muscle acts on bones (as levers) to create all movement.

Essential Questions

- How do the various types of bone fractures become healed?
- How does bone growth determine body size?
- What are the different classifications of joints?
- What are the symptoms of various homeostatic imbalances of bones?
- What happens to a joint when it suffers different types of injuries?

Understandings

- Distinguish all phalanges from each other based on their location
- Bone growth is essential to body growth
- Joints allow the body to move.
- The specific structure of a joint determines the type of movement allowed by that joint.

Standards and Phenomena

Science Standards

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Life Literacies and Key Skills / social Emotional learning

HE.9-12.2.1.12.EH.1	Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
HE.9-12.2.1.12.EH.3	Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).
HE.9-12.2.1.12.SSH.4	Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).
HE.9-12.2.2.12.N.2	Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
HE.9-12.2.2.12.N.3	Analyze the unique contributions of each nutrient class (e.g., fats, carbohydrates, protein, water, vitamins, minerals) to one's health and fitness.
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.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).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
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Phenomena

•Understanding the nature of joints will help you treat patients with injuries such as ankle sprains

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

Using Mathematics and Computational Thinking

Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

SCI.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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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Critical Knowledge and Skills

Knowledge

- The functional properties of the 3 types of cartilage
- The gross anatomy of a typical long bone and functions of all of its various parts
- The process of long bone growth that occurs at the epiphyseal plates (endochondral ossification)
- All of the steps of fracture repair
- The names and examples of fibrous, cartilaginous, and synovial joints
- The 3 natural factors that stabilize joints
- The six types of synovial joints based on the movement allowed

Skills

- Compare and contrast the structure of the 4 bone classes and provide examples from each class.
- List and describe six important functions of bones.

- Describe the histology of compact and spongy bone.
- Describe osteogenesis.
- Classify joints structurally and functionally.
- Name and describe the common body movements.
- Name the most common joint injuries and discuss the symptoms and problems associated with each.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on endochondral ossification
- Quiz on 6 synovial joints

School Summative Assessment Plan

- Arthritis Research Paper
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=5YYmYx7HZpU

www.youtube.com/watch?v=DLxYDoN634c

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
  - Used for universal access to class notes and Power Points

- **One to One Student laptops**
  - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
  - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the gifted students are to be given enrichment questions.

  - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

  - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

English Language Learners (N.J.A.C.6A:15)

- Within each lesson, the English language learners are given three levels of questioning. Each level is accommodating to the level of learning that the individual student(s) is learning at:

  - Beginning

  - Intermediate

  - Advanced

- All assignments can be created in the student's native language if needed.

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At-Risk Students (N.J.A.C.6A:8-4.3c)

- Work with the I&RS Team to reach the needs of students.

- Mentors provided

- Offer additional supports as needed (after school help, parent contact, frequent checks for understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding
- Preferred seating assignments
- Multiple representations - encourage and allow tables, graphic organizers, etc.
- Hard copy of notes
- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
- Repeat/rephrase instructions as needed

Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the 3 types of cartilage
- Interactive notes and discussion on the types and functions of bone
- RQ cartilage
- Diagram and label all major parts of a long bone
- Research endochondral ossification
- RQ endochondral ossification

Week 2:

- Interactive notes and discussion on the 4 steps of fracture repair
- RQ on fracture repair
- Interactive notes and discussion on the 3 types of joints and all examples of each
- Group research on functions of synovial joints
- RQ synovial joints

Week 3:

- Interactive notes and discussion on all types of movement
- Co-op examples of all types of movement
- Research on 6 types of synovial joints from least to most movement allowed
- Interactive notes and discussion on common joint injuries
- Co-op chapter review
- Unit Test

Unit 06: REPRODUCTIVE SYSTEMS and HUMAN DEVELOPMENT

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 3**
Length: **3 weeks**
Status: **Published**

Transfer Goals

The reproductive system is unique among the organ systems. It can be generally nonfunctional during the first 10 to 15 years of life. It is also capable of interacting with the complementary system of the opposite gender.

Essential Questions

- What are the effects of LH, FSH, estrogen, and progesterone?
- What are the effects of androgens?
- What are the glands of the male reproductive system?
- What are the major functions of the ovaries?
- What are the major functions of the testes?
- What happens to the menstrual cycle when an egg is fertilized?
- What is the anatomy of a testis?
- What is the anatomy of spermatozoa?
- What is the anatomy of the internal genitalia of the female?
- What is the hormonal regulation of the female reproductive system?
- What is the hormonal regulation of the male reproductive system?
- What is the menstrual cycle?
- Why are females more at risk for PID than males?

Understandings

- Hormones regulate the male and female reproductive systems.
- Accessory glands are important to the male and female reproductive systems
- There are a number of different sexually transmitted diseases.
- There are several important structures necessary for the successful functioning of both reproductive systems

Standards and Phenomena

Science Standards

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Life Literacies and Key Skills / Social Emotional Learning

HE.9-12.2.1.12.EH.1	Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
HE.9-12.2.1.12.EH.3	Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).
HE.9-12.2.1.12.SSH.4	Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).
HE.9-12.2.2.12.N.2	Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
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TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
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TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
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Phenomena

- How do humans develop from a fertilized egg into a fetus?

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

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Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

SCI.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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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Critical Knowledge and Skills

Knowledge

- The anatomy and functioning of the male and female reproductive systems.
- The secondary sex characteristics of males ans females.
- Functioning of menstruation.
- Function of erection and ejaculation.
- The common disorders of the reproductive system.
- The normal development of zygote, embryo, and fetus.
- The causes and effects of various STDs.

Skills

- Label the parts of the female and male reproductive system.
- Explain the female role in reproduction.
- Explain the menstrual cycle.
- Explain the male role in reproduction.
- Explain the role of hormones in the male and female reproductive systems.
- Discuss the various diseases that are sexually transmitted.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on days/events of the menstrual cycle
- Quiz on types of twins

School Summative Assessment Plan

- STD Research
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=QSN5gfbzgwc

www.youtube.com/watch?v=BtsSbZ85yiQ

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Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

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- Performance Task

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Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on structure and function of the female reproductive system
- RQ on menstrual cycle events
- Research when and how many eggs girls produce
- RQ parts and functions of female reproductive system
- Interactive notes and discussion on structure and function of male reproductive system

Week 2:

- RQ parts and functions of male reproductive system
- Interactive notes and discussion on the treacherous journey of the sperm
- Co-op research on types and creation of different kinds of twins
- Interactive notes and discussion on cloning and early embryonic development
- Research why blood types can't mix and the chorionic villi
- RQ blood mixing

Week 3:

- Interactive notes and discussion on the effects of pregnancy on the mother
- RQ effects of pregnancy on the mother
- Interactive notes and discussion on the 3 stages of parturition and what hapens to the baby right after birth
- Research on Apgar score and head first vs breech birth
- RQ on head-first and breech birth
- Co-op chapter review
- Unit Test

Unit 07: THE NERVOUS SYSTEM

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 3**
Length: **3 weeks**
Status: **Published**

Transfer Goals

The nervous system is the master controlling and communicating system of the body. Every thought, action, and emotion reflects its activity. Its cells communicate by electrical and chemical signals, which are rapid and specific, and usually cause almost immediate responses.

Essential Questions

- How does the brain work to store and retrieve information?
- How does the neuron carry an impulse?
- How is an impulse created, how does it get propagated, and what happens when it reaches its destination?
- What are the components of the two divisions of the nervous system?

Understandings

- The neuron is the major cell type of the nervous system
- The nervous system is divided into 2 parts: the central nervous system and the peripheral nervous system
- The nervous system uses both chemical and electrical signals to relay information

Standards and Phenomena

Science Standards

SCI.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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HE.9-12.2.2.12.N.3	Analyze the unique contributions of each nutrient class (e.g., fats, carbohydrates, protein, water, vitamins, minerals) to one's health and fitness.
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Phenomena

•Understanding neurotransmitter function will help you be aware of how drugs affect a patient's nervous system

•Understanding the central nervous system contributes to your work with brain and spinal cord injuries such as stroke

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

Using Mathematics and Computational Thinking

Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Critical Knowledge and Skills

Knowledge

- How to explain the functional and structural divisions of the nervous system
- The types of neuroglia and be able to cite their functions
- How graded potentials and action potentials are generated and propagated
- How to name the major lobes, fissures, and functional areas of the brain
- How to describe the location of the diencephalon, brain stem, and cerebellum and name their subdivisions and functions
- The meninges, cerebrospinal fluid, and the blood brain barrier all play a protective role in the CNS
- All the major spinal cord traumas and disorders

Skills

- Define neuron, describe its structural components, and relate each to a functional role
- Define resting membrane potential and describe its electrochemical basis
- Name the major regions of the brain
- Explain lateralization and cerebral dominance
- Locate the limbic and reticular formations and explain the role of each system
- Compare and contrast the stages and categories of memory
- Describe the gross and microscopic structure of the spinal cord

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on structure of a neuron
- Quiz on graded vs action potentials

School Summative Assessment Plan

- Brain Dissection Practical
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=qPix_X-9t7E&start_radio=1&list=RDqPix_X-9t7E

www.youtube.com/watch?v=kMKc8nfPATI&list=PLl-wDlRcbldTiXMxcqpvbpziIgSAM5_my

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
  - Used for universal access to class notes and Power Points

- **One to One Student laptops**
  - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
    - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the gifted students are to be given enrichment questions.

    - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

    - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

English Language Learners (N.J.A.C.6A:15)

- Within each lesson, the English language learners are given three levels of questioning. Each level is accommodating to the level of learning that the individual student(s) is learning at:

    - Beginning

    - Intermediate

    - Advanced

- All assignments can be created in the student's native language if needed.
- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Work with the I&RS Team to reach the needs of students.
- Mentors provided
- Offer additional supports as needed (after school help, parent contact, frequent checks for

understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding
- Preferred seating assignments
- Multiple representations - encourage and allow tables, graphic organizers, etc.
- Hard copy of notes
- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
- Repeat/rephrase instructions as needed

Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the 8 divisions of the nervous system
- Interactive notes and discussion on the 6 neuroglia
- RQ divisions of the NS
- Diagram, label and describe neuron and its functions
- Research graded vs action potentials
- RQ action vs graded potentials

Week 2:

- Interactive notes and discussion on major structures of the brain
- RQ parts of the brain
- Interactive notes and discussion on lateralization and cerebral dominance
- Research on functional brain systems

Week 3:

- Interactive notes and discussion on protection of the brain
- Interactive notes and discussion on brain injuries
- RQ on brain injuries
- Interactive notes and discussion on structure and function of the spainal cord
- Brain dissection
- Co-op chapter review
- Chapter Test

Unit 08: THE EYE

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 4**
Length: **3 weeks**
Status: **Published**

Transfer Goals

Secondary only to the brain, the eye is the most complex part of the nervous system: 50% of the brain is used to process vision and 70% of your body's sensory neurons are located in the eye.

Essential Questions

- How does lens shape affect the bending of light?
- How does light travel to and through the eye?
- What are the fundamental differences between distant and close vision?
- What does each of the layers of the eyeball contribute to the process of sight?
- What happens to a normal human eye as someone ages?

Understandings

- The eye is the major sense organ of the body
- Light rays must reach the back of the eye in order for something to be "seen"
- Any number of disorders could lead to poor eyesight or even blindness

Standards and Phenomena

Science Standards

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Life Literacies and Key Skills / Social Emotional Learning

HE.9-12.2.1.12.EH.1	Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
HE.9-12.2.1.12.EH.3	Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).
HE.9-12.2.1.12.SSH.4	Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).
HE.9-12.2.2.12.N.2	Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
HE.9-12.2.2.12.N.3	Analyze the unique contributions of each nutrient class (e.g., fats, carbohydrates, protein, water, vitamins, minerals) to one's health and fitness.
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.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).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).
TECH.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).

Phenomena

•Understanding the anatomy and physiology of the eye helps to identify diseases such as glaucoma

Science and Engineering Practices

Planning and Carrying Out Investigations

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Obtaining, Evaluating, and Communicating Information

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Engaging in Argument from Evidence

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Disciplinary Core Ideas

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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Critical Knowledge and Skills

Knowledge

- The structure and function of the exterior eye parts
- The parts of and functions of each of the 3 layers of the eyeball
- How the six eye muscles work in conjunction to move the eye
- How light gets refracted and reflected
- How the rods and cones each perceive stimuli

Skills

- Diagram the 6 eye muscles and describe the function of each
- Describe how the eye stays moist and lubricated
- Distinguish amongst opaque, translucent, and transparent
- List the colors of the visible spectrum in their order of energy
- Describe all the ways and times light gets bent before its perceived by the retina

- Compare/Contrast hyperopia and myopia
- Label and describe the major structures of the eye

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on the 6 eye muscles
- Quiz on 3 layers of the eyeball

School Summative Assessment Plan

- Eye Dissection Practical
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=o0DYP-u1rNM

www.youtube.com/watch?v=cTZl2qnzifc

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
    - Used for universal access to class notes and Power Points

- **One to One Student laptops**
    - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
    - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

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  - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

  - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

English Language Learners (N.J.A.C.6A:15)

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  - Beginning

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  - Advanced

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- Mentors provided

- Offer additional supports as needed (after school help, parent contact, frequent checks for understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding

- Preferred seating assignments

- Multiple representations - encourage and allow tables, graphic organizers, etc.
- Hard copy of notes
- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
- Repeat/rephrase instructions as needed

Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse

environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the major parts of the eye
- Interactive notes and discussion on the 6 main eye muscles
- RQ parts of the eye
- Research eyes on side of head vs both eyes in the front of head
- Interactive notes and discussion on Types of eye movement and eye muscle disorders

Week 2:

- Interactive notes and discussion on the structure and function of the 3 layers of the eyeball
- Research pupil movement and how
- RQ 3 layers of eyeball
- Interactive notes and discussion on vitreous vs aqueous humors
- RQ on lens shapes

Week 3:

- Interactive notes and discussion on visible light, how to "see" something, and eye disorders
- RQ close vs distant vision
- Eye dissection
- RQ myopia vs hyperopia
- Co-op unit review
- Chapter Test

Unit 09: THE DIGESTIVE SYSTEM

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 4**
Length: **3 weeks**
Status: **Published**

Transfer Goals

A healthy digestive system is essential to maintaining life because it converts foods into the raw materials that build and fuel the body's cells. The digestive system takes in food, breaks it down into nutrient molecules, absorbs these molecules into the bloodstream, and then rids the body of the indigestible remains.

Essential Questions

- What are the four tissue layers of the alimentary canal?
- What are the six essential activities related to digestion?
- What is the difference between peristalsis and segmentation?
- What is the function of the major organs of the digestive system?
- Which organs are part of the alimentary canal and which are accessory organs?
- Why are sphincters located at strategic locations along the digestive system?

Understandings

- The digestive system is made up of alimentary canal organs and accessory digestive organs
- There are 6 major processes occurring during digestive activities.
- Each organ in the digestive system has its own structure and function but none work independently of the others.

Standards and Phenomena

Science Standards

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SCI.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.

Life Literacies and Key Skills / Social Emotional Learning

HE.9-12.2.1.12.EH.1	Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
HE.9-12.2.1.12.EH.3	Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).
HE.9-12.2.1.12.SSH.4	Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).
HE.9-12.2.2.12.N.2	Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
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TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
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Phenomena

- What happens if you swallow a marble?

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

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Asking Questions and Defining Problems

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Disciplinary Core Ideas

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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Critical Knowledge and Skills

Knowledge

- The difference between organs of the alimentary canal and accessory organs.
- The anatomy and basic functions of the mouth, pharynx, larynx, and esophagus.
- The functions of saliva and how salivation is regulated.
- The mechanisms of chewing and swallowing.
- The role of the liver and gall bladder in the digestive process.
- How defecation is regulated by the valves and sphincters located in the rectum.
- All of the various homeostatic imbalances of the digestive system and the symptoms of each.

Skills

- List and define the major processes occurring during digestive system activity.
- Describe the tissue composition and the general function of each of the four layers of the alimentary canal.
- List the different types of teeth and their numbers of each and their functions.
- Describe the anatomy and basic functions of the stomach, small and large intestine.
- List all digestive enzymes, stating where each is introduced into the alimentary canal and what type of nutrient each one breaks down.
- List all the parts of the alimentary canal (including all sphincters) in order from mouth to anus.

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on 6 digestive processes
- Quiz on ordering the organs of the alimentary canal

School Summative Assessment Plan

- Cat Dissection Practical
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=yIoTRGfcMqM

www.youtube.com/watch?v=nM5kMSjBrmw

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Supplementary Resources

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Technology Integration and Differentiated Instruction

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LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the 6 parts of the digestive process
- Reading 4 layers of the alimentary canal
- RQ on the digestive process
- Interactive notes and discussion on 4 layers of the alimentary canal
- Research teeth - structures and functions in other animals

Week 2:

- Interactive notes and discussion on all structures of the digestive system
- RQ on tongue and saliva
- Diagram functioning of epiglottis
- Interactive notes and discussion on deglutition
- Research segmentation vs peristalsis

Week 3:

- Interactive notes and discussion on liver functions and homeostatic imbalances of it
- Interactive notes and discussion on improper functioning of the digestive system
- RQ anal sphincters and rectal valves
- Cat Dissection
- Co-op unit review
- Chapter Test

Unit 10: CARDIOVASCULAR SYSTEM

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 4**
Length: **3 weeks**
Status: **Published**

Standards and Phenomena

Science Standards

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Life Literacies and Key Skills / Social Emotional Learning

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TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

TECH.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).

Phenomena

•Understanding how the body controls blood pressure helps to measure a patient's blood pressure accurately

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

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Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Transfer Goals

The cardiovascular and the respiratory systems are innately intertwined. The respiratory system brings in oxygen and releases carbon dioxide, while the cardiovascular system transports both of these gases to and from every one of the trillions of cells in the human body

Essential Questions

- What are the most common cardiovascular disorders?
- How does blood flow through the heart and body?
- What role does the carviovascular system play in metabolism?

Understandings

- That blood flows through 2 circuits: the systemic and the pulmonary.
- The chambers, valves, and muscle of the heart all work in conjunction to pump blood throughout the body.
- The heartbeat is controlled by a complex series of electrical signals constantly sent from the brain
- How different disorders will affect various functions of the cardiovascular system

Critical Knowledge and Skills

Knowledge

- All the structures, chambers, and valves of the heart
- If the blood is oxygenated or not at any specific place in either of the 2 circuits
- Blood is mainly water (plasma) that contains many suspended cells and molecules within it
- The flow of blood is broken into 2 different circuits - both starting and ending at the heart

Skills

- Identify all structures of the heart
- List and describe the various components of blood
- Starting at any location within the body, they will be able to trace the flow of blood through all of the vessels, chambers, valves, and body parts - ending up back where they started

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on the 4 chambers of the heart
- Quiz on the order of blood flow

School Summative Assessment Plan

- Cat Dissection Practical
- End of Unit Test

Primary Resources

Marieb & Hoehn Textbook (8th edition)

YouTube Video clips

www.youtube.com/watch?v=NJzJKvkWWDc

www.youtube.com/watch?v=X9ZZ6tcxArI

Google Images

Supplementary Resources

Edmodo

Technology Integration and Differentiated Instruction

Technology Integration

- **Edmodo**
    - Used for universal access to class notes and Power Points

- **One to One Student laptops**
    - All students within the West Deptford School District are given a computer, allowing for 21st century learning to occur within every lesson/topic.

- **Additional Support Videos**
    - Supplemental educational videos related to daily lessons

Differentiated Instruction

Gifted Students (N.J.A.C.6A:8-3.1)

- Within each lesson, the gifted students are to be given enrichment questions.

  - These questions are to extend the knowledge of each portion of the lesson.

- Performance Task

  - Additional practice will be provided for students that exhibit a higher level of thinking for the concepts.

English Language Learners (N.J.A.C.6A:15)

- Within each lesson, the English language learners are given three levels of questioning. Each level is accommodating to the level of learning that the individual student(s) is learning at:

  - Beginning

  - Intermediate

  - Advanced

- All assignments can be created in the student's native language if needed.

- Work with ELL Teacher to allow for all assignments to be completed with extra time.

At-Risk Students (N.J.A.C.6A:8-4.3c)

- Work with the I&RS Team to reach the needs of students.

- Mentors provided

- Offer additional supports as needed (after school help, parent contact, frequent checks for understanding, etc.)

Special Education Students (N.J.A.C.6A:8-3.1)

- Frequent checks for understanding

- Preferred seating assignments

- Multiple representations - encourage and allow tables, graphic organizers, etc.

- Hard copy of notes

- Extend the time needed to complete assignments/assessments
- Provide a copy of grading rubrics for projects/labs
- Provide a copy of a model representation for projects
- Clarification of directions/instructions
- Use of technology when appropriate
- Repeat/rephrase instructions as needed

Interdisciplinary Connections

MATH - Interpretation of data / Analysis of graphs

LANGUAGE ARTS - Reading assignments from a college level textbook / Analyzing prefixes, suffixes and root words

SOCIAL STUDIES - Medical treatments can vary based on culture and region of origin

WORLD LANGUAGES - Discuss language of origin for root words

VISUAL/PERFORMING ARTS - N/A

APPLIED TECHNOLOGY - (see the Technology Standards for the Unit)

BUSINESS EDUCATION - (see the Career Readiness Practices for the Unit)

GLOBAL AWARENESS - Slight differences in human anatomy & physiology can be caused by the diverse environmental factors found in the varied geographic locations around the world

Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the different types of blood cells
- Interactive notes and discussion on veins, arteries, and capillaries
- RQ on blood cells
- Reading on flow of blood

Week 2:

- Interactive notes and discussion on the structure of the heart
- Interactive notes and discussion on the 4 chambers, the 4 valves, and all the major blood vessels associated with the heart
- RQ Heart chambers
- Research in co-op pairs the flow of blood from place to place until it returns to where you started

Week 3:

- Diagram the heart showing all blood flow
- Interactive notes and discussion on pulmonary vs system circuit
- RQ on blood flow
- RQ on external respiration
- Cat Dissection
- Co-op unit review
- TEST - Cardiovascular System

Unit 11: RESPIRATORY SYSTEM

Content Area: **Science**
Course(s): **ANAT PHYS HONORS**
Time Period: **Marking Period 4**
Length: **3 weeks**
Status: **Published**

Standards and Phenomena

Science Standards

SCI.HS-LS1-4	Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.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.

Life Literacies and Key Skills / Social Emotional Learning

HE.9-12.2.1.12.EH.1	Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
HE.9-12.2.1.12.EH.3	Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).
HE.9-12.2.1.12.SSH.4	Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).
HE.9-12.2.2.12.N.2	Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
HE.9-12.2.2.12.N.3	Analyze the unique contributions of each nutrient class (e.g., fats, carbohydrates, protein, water, vitamins, minerals) to one's health and fitness.
TECH.9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
TECH.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).
TECH.9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
TECH.9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
TECH.9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

TECH.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).

Phenomena

•Understanding the anatomy and function of the respiratory system will help in assessing and treating patients with respiratory disorders.

Science and Engineering Practices

Planning and Carrying Out Investigations

Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Developing and Using Models

Using Mathematics and Computational Thinking

Asking Questions and Defining Problems

Engaging in Argument from Evidence

Analyzing and Interpreting Data

Disciplinary Core Ideas

SCI.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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Crosscutting Concepts

Cause and Effect

Systems and System Models

Energy and Matter

Patterns

Scale, Proportion, and Quantity

Structure and Function

Stability and Change

Transfer Goals

Respiration is a vital processes. The intake of oxygen and expulsion of carbon dioxide are necessary for the human body to function properly.

Essential Questions

- How does the respiratory system aid in metabolism?
- How do individual oxygen molecules get to each one of your trillions of cells?
- Why do each of the cells in the human body need oxygen?

Understandings

- Gas exchange in the lungs is critical for metabolic processes.
- Respiration is divided into 4 distinct steps

Critical Knowledge and Skills

Knowledge

- The functions of all of the respiratory structures
- How bronchi get smaller and smaller until they terminate in the alveoli
- All 5 functions of the nose/nasal cavity
- How the epiglottis functions to correctly route food, liquid, and air into the appropriate tubes
- How the pitch and volume of a sound are regulated

Skills

- Describe the 4 parts of respiration
- Diagram flow of air from the nose to the alveoli
- Draw and label major lung parts
- Diagram internal respiration labeling both membranes involved and which gasses are going from where to where
- Explain why the pulmonary veins and arteries are different from all other blood vessels in the body

Assessment and Resources

School Formative Assessment Plan (Other Evidence)

- Daily mini-quizzes on assigned readings and/or content of previous day's lesson.
- Answers to teacher assigned research questions dealing with current or future lessons.
- Frequent in-class questioning
- Quiz on functions of the nose
- Quiz on internal respiration

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Learning Plan / Pacing Guide

Week 1:

- Interactive notes and discussion on the 4 parts of respiration
- RQ on 4 parts of respiration
- Interactive notes and discussion on the functions of the nose
- Co-op research on physical, chemical, and sensory blockades that stop debris from entering the lungs
- RQ on 4 types of respiration

Week 2:

- Interactive notes and discussion on the 2 types of mucosa
- Interactive notes and discussion on the pharynx, larynx, epiglottis, vocal cords, and trachea
- Research why smoking causes "smokers cough"
- RQ on 2 types of mucosa
- Reading on internal respiration details
- Interactive notes and discussion on primary through terminal bronchi

Week 3:

- Interactive notes and discussion on respiratory membrane
- Interactive notes and discussion on structure of lungs
- RQ on divisions of bronchi
- Reading assignment on pulmonary circuit
- RQ on parts of the lung
- Cat Dissection
- Co-op unit review
- TEST - Respiratory System