Title of planned course: Anatomy and Physiology: Muscles, Messengers, and More

Subject Area: Science

Grade Level: 12

Course Description: This rigorous senior-level course includes a detailed study of the structures and functions of the following human body systems: the integumentary system (skin), the muscular system, the skeletal system, the nervous system, the immune/lymphatic system, and the endocrine system. Introductory anatomical terminology will also be taught. Students may have an opportunity to attend a field trip to a local university to take a tour of a cadaver lab. Also, students may have an opportunity to complete a dissection of the fetal pig. This course is recommended for students who plan to major in the medical field, but is not meant to serve as a substitute for AP level Biology, Chemistry, and Physics classes.

Time/Credit for this Course: Half Year / 0.5 Credit

Curriculum Writing Committee: Jennifer Burd
Curriculum Map

August:
  Overview of body systems
  The language of anatomy and human body orientations

September:
  Human body orientations continued
  The Integumentary System
  Medical Mondays: Viruses and Bacteria / Sun vs. Sunless Tanning

October:
  The Muscular System
  The Skeletal System
  Medical Mondays: Exercise / Anabolic Steroid Doping

November:
  The Nervous System
  The Immune/Lymphatic System
  Medical Mondays: PA Immunizations / Brain Tricks

December:
  The Endocrine System
  Medical Mondays: Allergies / Holistic Medicine

January:
  Final dissections, practical, and review for the final exam
Wilson Area School District  
Planned Course Materials

**Course Title:** Anatomy and Physiology: Muscles, Messengers, and More

**Textbook:** *Essentials of Human Anatomy and Physiology*, Elaine N. Marieb; Pearson

**Supplemental Books:**
- *Essentials of Human Anatomy and Physiology Laboratory Manual (6th Ed.)*  
  Elaine N. Marieb; Pearson; 2015
- *Anatomy and Physiology Coloring Workbook: A Complete Study Guide (11th Ed.)*  
  Elaine N. Marieb; Pearson; 2015
- Biology; Miller and Levine; Pearson 2010

**Teacher Resources:**
- Biodigital Human App
- Ted Ed
- Crash Course Anatomy
- Biozone A&P Workbook
Curriculum Scope & Sequence

Planned Course: Anatomy and Physiology: Muscles, Messengers, and More

Unit: The Language and Organ Systems of Anatomy

Time frame: 2 weeks

State Standards: 3.1.10.A, 3.1.12.A


Essential content/objectives: At the end of the unit, students will be able to:
- Identify body systems based on structures and functions
- Use proper anatomical terminology to describe body directions, surfaces, body planes, and relationships between structures
- Locate the major body cavities and list the chief organs in each cavity
- Define homeostasis and explain its importance

Core Activities: Students will complete/participate in the following:
- Warm-Up Review
- Notes shells and diagrams packet
- Body regions practice
- Body landmarks practice
- Directional Terms practice

Extensions:
- “The Human Body: An Orientation” packet
- Play-Doh terminology activity

Remediation:
- Manipulation of Biodigital Human App for Review

Instructional Methods:
- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions

Materials & Resources:
- Textbooks
- Slideshows
- Labs / Lab supplies

Assessments:
- Tests
- Homework
- Class notes
- Labs
- Student participation
Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Muscles, Messengers, and More

**Unit:** The Integumentary System

**Time frame:** 2 weeks

**State Standards:** 3.1.10.A, 3.1.12.A


**Essential content/objectives:** At the end of the unit, students will be able to:
- Compare and contrast the structure, function, and location of the major body tissues
- Identify and describe the structures, functions, and locations of the epidermis, dermis, and hypodermis
- Explain the importance of the accessory structures of the integumentary system

**Core Activities:** Students will complete/participate in the following:
- Warm-Up Review
- Application Project (The Integumentary System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Integumentary System (impetigo, eczema, etc.)
- Systems in Sync Discussion
- Microscopic observation and identification of epithelial, connective, muscle, and nervous tissues

**Extensions:**
- “The Integumentary System” packet
- Integumentary foldable
- Medical Mondays: Viruses and Bacteria / Sun vs. Sunless Tanning

**Remediation:**
- Manipulation of Biodigital Human App for Review

**Instructional Methods:**
- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions

**Materials & Resources:**
- Textbooks
- Slideshows
- Labs / Lab supplies

**Assessments:**
- Tests
- Homework
- Class notes
- Labs
- Student participation
Curriculum Scope & Sequence

Planned Course: Anatomy and Physiology: Muscles, Messengers, and More

Unit: The Muscular System

Time frame: 3 weeks


Essential content/objectives: At the end of the unit, students will be able to:
- Describe similarities and differences in the structure and function of the three types of muscle tissue and indicate where they are found in the body
- Describe the microscopic structure of skeletal muscle and explain the sliding filament model of muscle contraction
- Name and locate the major muscles of the human body
- Explain the three processes that muscles use to generate ATP for contractions

Core Activities: Students will complete/participate in the following:
- Warm-Up Review
- Application Project (The Muscular System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Muscular System (muscular dystrophy, fibromyalgia, etc.)
- Systems in Sync Discussion

Extensions:
- “The Muscular System” packet
- Muscular foldable
- Muscular Model ID lab
- Medical Mondays: Exercise / Anabolic Steroid Doping

Remediation:
- Manipulation of Biodigital Human App for Review

Instructional Methods:
- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions

Materials & Resources:
- Textbooks
- Slideshows
- Labs / Lab supplies
Assessments:
- Tests
- Homework
- Class notes
- Labs
- Student participation
Curriculum Scope & Sequence

Planned Course: Anatomy and Physiology: Muscles, Messengers, and More

Unit: The Skeletal System

Time frame: 3 weeks

State Standards: 3:1.10.A, 3.1.12.A

Anchor(s) or adopted anchor: 3.1.10.A5, 3.1.12.A5, 3.1.12.A6, 3.1.12.A8

Essential content/objectives: At the end of the unit, students will be able to:
- Differentiate between the axial and appendicular skeletons and to locate the 206 bones of the adult body
- To classify the 4 types of bones based on shape and location
- Describe the microscopic structure of bone and compare and contrast between red and yellow marrow
- Explain the processes of bone remolding and hematopoiesis

Core Activities: Students will complete/participate in the following:
- Warm-Up Review
- Application Project (The Skeletal System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Skeletal System (scoliosis, osteoporosis, etc.)
- Systems in Sync Discussion

Extensions:
- “The Skeletal System” packet
- Skeletal foldable
- Skeletal Model ID lab
- Medical Mondays: Exercise / Anabolic Steroid Doping

Remediation:
- Manipulation of Biodigital Human App for Review

Instructional Methods:
- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions

Materials & Resources:
- Textbooks
- Slideshows
- Labs / Lab supplies

Assessments:
- Tests
- Homework
- Class notes
- Labs
- Student participation
Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Muscles, Messengers, and More

**Unit:** The Nervous System

**Time frame:** 3 weeks

**State Standards:** 3:1.10.A, 3.1.12.A

**Anchor(s) or adopted anchor:** 3.1.10.A5, 3.1.10.A8, 3.1.12.A5, 3.1.12.A6, 3.1.12.A8

**Essential content/objectives:** At the end of the unit, students will be able to:
- Differentiate between the CNS and PNS
- Describe the structures and functions of the brain, spinal cords, and neurons
- Explain the pathway of a nerve impulse
- Label diagrams of a nerve cell and other structures associated with the nervous system

**Core Activities:** Students will complete/participate in the following:
- Warm-Up Review
- Application Project (The Nervous System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Nervous System (cerebral palsy, spina bifida, etc.)
- Systems in Sync Discussion

**Extensions:**
- “The Nervous System” packet
- Nervous foldable
- Identification of the Cranial Nerves
- Medical Mondays: PA Immunizations / Brain Tricks

**Remediation:**
- Manipulation of Biodigital Human App for Review

**Instructional Methods:**
- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions

**Materials & Resources:**
- Textbooks
- Slideshows
- Labs / Lab supplies

**Assessments:**
- Tests
- Homework
- Class notes
- Labs
- Student participation
Curriculum Scope & Sequence

Planned Course: Anatomy and Physiology: Muscles, Messengers, and More

Unit: The Immune System

Time frame: 3 weeks

State Standards: 3.1.10.A, 3.1.12.A

Anchor(s) or adopted anchor: 3.1.10.A5, 3.1.10.A8, 3.1.12.A5, 3.1.12.A6, 3.1.12.A8

Essential content/objectives: At the end of the unit, students will be able to:
- Describe the structures and functions of the immune system and their relationship to the lymphatic system
- To differentiate between specific and nonspecific immunity
- To identify the cells associated with immunity and how they work to protect against pathogens
- To identify general strategies the body uses to protect itself from pathogens including internal and external structures

Core Activities: Students will complete/participate in the following:
- Warm-Up Review
- Application Project (The Immune System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Immune System (leukemia, AIDS)
- Systems in Sync Discussion

Extensions:
- “The Immune System” packet
- Immune foldable
- Medical Mondays: PA Immunizations / Brain Tricks

Remediation:
- Manipulation of Biodigital Human App for Review

Instructional Methods:
- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions

Materials & Resources:
- Textbooks
- Slideshows
- Labs / Lab supplies

Assessments:
- Tests
- Homework
- Class notes
- Labs
- Student participation
Curriculum Scope & Sequence

Planned Course: Anatomy and Physiology: Muscles, Messengers, and More

Unit: The Endocrine System

Time frame: 3 weeks

State Standards: 3.1.10.A, 3.1.12.A

Anchor(s) or adopted anchor: 3.1.10.A5, 3.1.10.A8, 3.1.12.A5, 3.1.12.A6, 3.1.12.A8

Essential content/objectives: At the end of the unit, students will be able to:
  ● To explain how the endocrine system is critical to maintaining homeostasis
  ● To describe the purpose of a hormone and how it conveys messages throughout the body
  ● To distinguish between an endocrine gland and exocrine gland
  ● To describe the functions of some of the main hormones found in the human body

Core Activities: Students will complete/participate in the following:
  ● Warm-Up Review
  ● Application Project (The Endocrine System)
  ● Notes Shells and diagrams packet
  ● Developmental Concerns of the Endocrine System (thyroid disease, cushing’s syndrome)
  ● Systems in Sync Discussion

Extensions:
  ● “The Endocrine System” packet
  ● Endocrine foldable
  ● Medical Mondays: Allergies / Holistic Medicine

Remediation:
  ● Manipulation of Biodigital Human App for Review

Instructional Methods:
  ● Direct instruction
  ● Cooperative learning labs / Activities
  ● Teacher and student led class discussions

Materials & Resources:
  ● Textbooks
  ● Slideshows
  ● Labs / Lab supplies

Assessments:
  ● Tests
  ● Homework
  ● Class notes
  ● Labs
  ● Student participation