

## Wilson Area School District Planned Course Guide

**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:** Kelsey Rinehart

## Curriculum Map

### **August:**

- Overview of Body Systems and Cells
- The Language and Organ Systems of Anatomy

### **September:**

- The Language and Organ Systems of Anatomy (cont.)
- The Integumentary System

### **October:**

- The Muscular System
- The Skeletal System

### **November:**

- The Skeletal System (cont.)
- The Nervous System

### **December:**

- The Immune/Lymphatic System
- The Endocrine System

### **January:**

- The Endocrine System (continued)
- Final Dissection and Exam Review

**Total School Days Needed = 45**

## 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
- First Aid Manual (5th Ed.)  
American College of Emergency Physicians; 2014

**Teacher Resources:**

- Formative
- Google Apps
- Ted Ed
- Crash Course Anatomy
- Jeopardy Labs
- 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:** 8 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B, 3.1.9-12.C

**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
- Identify major cells and tissues of the body and their functions and characteristics.
- Define homeostasis and explain its importance

**Core Activities:** Students will complete/participate in the following:

- Warm-Ups (edpuzzle, google form questions, short activities)
- Notes
- Diagram packet
- Body regions practice
- Body landmarks practice
- Directional Terms practice
- Classifications of tissues packet
- Microscope Lab; Microscopic observation and identification of epithelial, connective, muscle, and nervous tissues

**Extensions:**

- “The Human Body: An Orientation” packet
- Autopsy Lab

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Teacher led class discussions
- Cooperative learning with labs and activities
- Independent Research

**Materials & Resources:**

- Textbooks
- Slideshows
- Autopsy and Microscope Lab Supplies
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Test
- Homework
- Classwork
- Class notes
- Labs and activities

## Curriculum Scope & Sequence

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

**Unit:** The Integumentary System

**Time frame:** 5 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B

**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 various membranes which encase major body cavities and organs.
- 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
- Identify and describe various developmental conditions affecting the integumentary system.

**Core Activities:** Students will complete/participate in the following:

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Integumentary System)
- Notes
- Diagram packet
- Membranes practice
- Anatomy of the Skin Investigation
- Integumentary System Research
- Integumentary Stations Lab
- Developmental Concerns of the Integumentary System (impetigo, eczema, etc.)

**Extensions:**

- “The Integumentary System” packet
- Case Study
- Viruses and Bacteria / Sun vs. Sunless Tanning Research

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Teacher led class discussions
- Independent Research
- Cooperative learning with labs and activities

**Materials & Resources:**

- Textbooks
- Slideshows
- Labs / Lab supplies
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Test
- Homework
- Classwork
- Class notes
- Labs and activities
- Project

## Curriculum Scope & Sequence

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

**Unit:** The Muscular System

**Time frame:** 7 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B, 3.1.9-12.G, 3.1.9-12.J

**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
- List the various joints located throughout the body and describe and demonstrate their movements.

**Core Activities:** Students will complete/participate in the following:

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Muscular System)
- Notes and diagram packet
- Developmental Concerns of the Muscular System (muscular dystrophy, fibromyalgia, etc.)
- Skeletal Naming Reading and Practice
- Building a Skeletal Muscle Model Project
- Joints Research Chart
- Gross Anatomy of Muscles Practice

**Extensions:**

- “The Muscular System” packet
- Muscular foldable
- Muscular Model ID lab
- Case Study

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Cooperative learning with labs and activities
- Teacher and student led class discussions
- Independent Research

**Materials & Resources:**

- Textbooks
- Slideshows
- Lab supplies
- Muscular system models
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Tests
- Homework
- Classwork
- Class notes
- Labs and activities
- Project

## Curriculum Scope & Sequence

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

**Unit:** The Skeletal System

**Time frame:** 6 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B

**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/yellow marrow and spongy/compact bone.
- Differentiate between the various fractures associated with bone injury.
- Explain the processes of bone remodeling and hematopoiesis

**Core Activities:** Students will complete/participate in the following:

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Skeletal System)
- Notes
- Diagram packet
- Developmental Concerns of the Skeletal System (scoliosis, osteoporosis, etc.)
- Classification of Bones Practice
- Skeletal Foldable
- Bone Regeneration Investigation Worksheet - Students will soak chicken bones in 3 different liquids and record their results. Students will then use a worksheet to investigate their results to understand how bone is created and broken down.
- Fractures Practice Worksheet
- Disarticulated Skeleton Lab - Students will identify the individual bones of the human skeleton and assemble it back to originality.

**Extensions:**

- "The Skeletal System" packet
- This or That worksheet
- Skeletal Model ID lab
- Exercise / Anabolic Steroid Doping Research
- Case Study

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions
- Independent Research

**Materials & Resources:**

- Textbooks
- Slideshows
- Labs / Lab supplies
- Skeletal Models
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Tests
- Homework
- Classwork
- Class notes
- Labs and activities
- Project

## Curriculum Scope & Sequence

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

**Unit:** The Nervous System

**Time frame:** 8 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B, 3.1.9-12.C

**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
- Explain the steps of an action potential
- Label diagrams of a nerve cell and other structures associated with the nervous system

**Core Activities:** Students will complete/participate in the following:

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Nervous System)
- Notes
- Diagrams packet
- Nervous Structures packet
- Developmental Concerns of the Nervous System (cerebral palsy, spina bifida, etc.)
- Sheep Brain Dissection
- Nervous System Foldable

**Extensions:**

- “The Nervous System” packet
- Nervous Stations Virtual Lab
- Action Potential Practice Worksheets (2)
- This or That Comparison Worksheet
- Case Study
- PA Immunizations / Brain Tricks Research

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Cooperative learning labs / Activities
- Teacher and student led class discussions
- Independent Research

**Materials & Resources:**

- Textbooks
- Slideshows
- Labs / Lab supplies
- Nervous System - Brain Model
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Tests
- Homework
- Classwork
- Class notes
- Labs and activities
- Project

## Curriculum Scope & Sequence

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

**Unit:** The Immune System

**Time frame:** 6 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B, 3.1.9-12.C

**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-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Immune System)
- Notes
- Diagrams packet
- Developmental Concerns of the Immune System (leukemia, AIDS)
- Lymphatic System Research - Students will conduct an online webquest to find detailed information on the lymphatic system and how it functions with other body systems.
- Innate vs Adaptive Defense Comparison - Students will do a comparison of innate vs adaptive defense by using an online simulation that will allow students to investigate the immune system at a microscopic level.

**Extensions:**

- “The Immune System” packet
- Immune foldable
- Case Study
- Debate: Vaccine Use and Effectiveness

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Teacher and student led class discussions
- Independent Research

**Materials & Resources:**

- Textbooks
- Slideshows
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Tests
- Homework
- Classwork
- Class notes
- Project

## Curriculum Scope & Sequence

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

**Unit:** The Endocrine System

**Time frame:** 5 days

**State Standards:** 3.1.6-8.A, 3.1.6-8.B, 3.1.6-8.C, 3.1.6-8.H, 3.1.9-12.B, 3.1.9-12.C

**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-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Endocrine System)
- Notes
- Diagrams packet
- Developmental Concerns of the Endocrine System (thyroid disease, cushing's syndrome)
- Endocrine Research Packet
- Fetal Pig Dissection

**Extensions:**

- "The Endocrine System" packet
- Endocrine foldable
- Allergies / Holistic Medicine Research

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

- Direct instruction
- Cooperative learning lab
- Teacher and student led class discussions
- Independent Research

**Materials & Resources:**

- Textbooks
- Slideshows
- Labs / Lab supplies
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Tests
- Homework
- Classwork
- Class notes
- Lab
- Project