

## Wilson Area School District Planned Course Guide

**Title of planned course:** Anatomy and Physiology: Senses and The Internal Viscera

**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 senses, the digestive system, the urinary system, the respiratory system, the cardiovascular system, and the reproductive system. Introductory anatomical terminology will also be taught. Students may have an opportunity to complete dissections of the eyeball, heart, kidney and possibly a 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

### **January:**

Overview of body systems

The Language and Organ Systems of Anatomy

### **February:**

The Language and Organ Systems of Anatomy (cont.)

The Special Senses

### **March:**

The Digestive System

The Urinary System

### **April:**

The Respiratory System

The Cardiovascular System

### **May:**

The Reproductive System

Final dissection, practical, and review for the final exam

**Total School Days Needed = 45**

## Wilson Area School District Planned Course Materials

**Course Title:** Anatomy and Physiology: Senses and The Internal Viscera

**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: Senses and The Internal Viscera

**Unit:** The Language and Organ Systems of Anatomy

**Time frame:** 5 days (depending on student rollover from first semester)

**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:**

- Tests
- Homework
- Classwork
- Class notes
- Lab
- Participation

## Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Senses and The Internal Viscera

**Unit:** The Special Senses

**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:

- To identify and describe the structures and functions of each of the organs involved with the special senses, including sight, hearing, equilibrium, smell, and taste
- To differentiate between the fibrous, vascular, and sensory layers of the eyeball
- To follow the pathway of light through the eye
- To differentiate between the outer, middle, and inner ear
- To follow the pathway of sound through the ear
- To describe how chemoreceptors function in taste and olfaction
- To construct a model on how sensory receptors respond to stimuli by sending messages to the brain for immediate response or storage.

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

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Special Senses)
- Notes Shells and diagrams packet
- Developmental Concerns of the Special Senses (strabismus, otosclerosis, etc.)
- Sheep Eye dissection
- Human Eye Foldable
- Structure and Function - Practice Worksheets

**Extensions:**

- "The Special Senses" packet
- Sign Language lesson (alphabet and common words)
- Sense Test Lab
- Case Study
- Virtual Eye Dissection
- Careers in A&P / Medical Scans (MRI's, X-Rays, CT scans) and Technologies Research

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Senses and the Internal Viscera

**Unit:** The Digestive 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.G, 3.1.6-8.H, 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.F

**Essential content/objectives:** At the end of the unit, students will be able to:

- Name the organs of the alimentary canal and the accessory digestive organs and identify each on a diagram/model
- Identify the overall function of the digestive system as digestion and absorption of foodstuffs, and describe the general activities of each digestive system organ
- Name the deciduous and permanent teeth and describe the basic anatomy of a tooth
- Describe the function of local hormones in the digestive process
- List the major enzymes or enzyme groups produced by the digestive organs or accessory glands and name the foodstuffs on which they act
- Describe how food molecules are rearranged through chemical breakdown to support growth
- List several factors that influence metabolic rate, and indicate the effect of each
- Describe how body temperature is regulated via homeostatic mechanisms.
- Explain how elements combine to form amino acids necessary for life function.

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

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Digestive System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Digestive System (celiac, Crohn's, etc.)
- Digestive System Stations Lab - Investigate the digestive system by looking at imaging and slides of organs, tissues, and abnormalities of the digestive system.
- Macromolecules - Digestion Lab
- Anatomy for Beginners - Cadaver Video Essay

**Extensions:**

- "The Digestive System" packet
- Digestive foldable
- Nutrition / Stress - Research
- Case Study

**Remediation:**

- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Senses and The Internal Viscera

**Unit:** The Urinary 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:

- Identify the 3 types of waste that the urinary system eliminates
- Describe the main regions and functions of the kidney and the 3 other organs/structures that make up the urinary system
- Explain the structure and function of a nephron and how urine is produced as it travels through the nephron
- Describe the steps of filtration, reabsorption and secretion.
- Explain how the urinary system contributes to homeostatic regulation.
- Construct a model describing how the urinary system interacts with other systems.
- List the pathway that blood flows through the urinary system from largest to smallest vessel.

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

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Urinary System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Urinary System (bladder cancer, kidney stones, etc.)
- Urinary flowchart
- Kidney Dissection

**Extensions:**

- "The Urinary System" packet
- Nutrition / Stress Research
- Urinary System Webquest
- Case Study

**Remediation:**

- Manipulation of Biodigital Human App for Review
- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Senses and The Internal Viscera

**Unit:** The Respiratory 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.C, 3.1.9-12.G, 3.1.9-12.J

**Essential content/objectives:** At the end of the unit, students will be able to:

- Name the organs forming the respiratory passageway from the nasal cavity to the lungs and describe the function of each
- Explain how the respiratory muscles cause volume changes that lead to airflow into and out of the lungs (breathing)
- Define the following respiratory volumes: tidal volume, vital capacity, expiratory reserve volume, inspiratory reserve volume, and residual air
- Describe the process of gas exchange in the lungs and tissues
- Describe how oxygen and carbon dioxide are transported in the blood
- Use a model to illustrate how cellular respiration is a reaction whereby bonds between food molecules and oxygen are broken to form energy.
- Describe how the body produces energy during anaerobic conditions.

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

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Respiratory System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Respiratory System (COPD, apnea, etc.)
- Spirometry Lab (respiratory volumes and capacity)

**Extensions:**

- "The Respiratory System" packet
- Vital Signs / Cancer - Research
- Technologies in the Respiratory System - Project
- Case Study
- Modeling of a Lung - Lab

**Remediation:**

- Manipulation of Biodigital Human App for Review
- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Senses and The Internal Viscera

**Unit:** The Cardiovascular 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:

- To identify and describe the structures and functions of the components of the cardiovascular system including organs, tissues, and blood.
- To identify and locate the main structures of the heart including the 4 chambers, 4 valves, and major arteries and veins
- Differentiate between systemic, pulmonary, cardiac and micro circulation.
- Trace the flow of blood through the heart, lungs, and body
- To identify the body's major arteries and veins and name the body region supplied by each
- Describe the blood-clotting process
- Differentiate between the different layers of tissue which comprise the heart

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

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Cardiovascular System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Cardiovascular System (heart attack, congenital heart defects, etc.)
- Heart Dissection
- Conduction System Simulation
- Blood Vessels and Components of Blood Research

**Extensions:**

- "The Cardiovascular System" packet
- Cardiovascular foldable
- Vital Signs / Cancer - Research

**Remediation:**

- Manipulation of Biodigital Human App for Review
- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

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

**Materials & Resources:**

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

**Assessments:**

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

## Curriculum Scope & Sequence

**Planned Course:** Anatomy and Physiology: Senses and The Internal Viscera

**Unit:** The Reproductive 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.E, 3.1.6-8.H, 3.1.6-8.M, 3.1.9-12.B, 3.1.9-12.C, 3.1.9-12.D, 3.1.9-12.Q

**Essential content/objectives:** At the end of the unit, students will be able to:

- To identify and describe the structures and functions of the male and female reproductive systems
- To differentiate between spermatogenesis and oogenesis
- To trace the pathway of fetal development from zygote to birth
- Review how sexual reproduction and the process of meiosis produces genetic diversity
- Describe how positive and negative genetic variations are produced from meiosis, errors during replications, or mutations caused by environmental factors.

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

- Warm-Ups (edpuzzle, google form questions, short activities)
- Application Project (The Reproductive System)
- Notes Shells and diagrams packet
- Developmental Concerns of the Reproductive System (uterine cancer, miscarriage, etc.)
- Pregnancy Journal - Rigorous investigation of pregnancy from week 1 to 40.

**Extensions:**

- “The Reproductive System” packet
- The Apgar Score / Aging - Research
- Case Study

**Remediation:**

- Manipulation of Biodigital Human App for Review
- JeopardyLabs Review
- After school review and tutoring

**Instructional Methods:**

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

**Materials & Resources:**

- Textbooks
- Slideshows
- Labs / Lab supplies
- Reproductive Walkthrough - Large Pamphlet
- Edpuzzle/Youtube
- Google documents - Worksheets/Packets/Test/Google Forms

**Assessments:**

- Tests
- Classwork
- Class notes
- Projects