

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 attend a field trip to a local university to take a tour of a cadaver lab. Also, students may have an opportunity to complete dissections of the eyeball, heart, and possibly 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

Weeks 1 & 2:

Introduction to Anatomy and Physiology (Overview of body systems & the language of anatomy)

Weeks 3 & 4:

Begin The Special Senses

Weeks 5 & 6:

Complete The Special Senses

Weeks 7 & 8:

The Digestive System

Weeks 9 & 10:

The Urinary System

Weeks 11 & 12:

The Respiratory System

Weeks 13 & 14:

The Cardiovascular System

Weeks 15 & 16:

The Reproductive System

Weeks 17 & 18:

Final dissections and review for the final exam

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

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: An Introduction to Anatomy

Time frame: 2 weeks

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

Anchor(s) or adopted anchor: 3.1.10.A8, 3.1.12.A1, 3.1.12.A5, 3.1.12.A6

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

- Differentiate the terms “anatomy” and “physiology” in definition and examples
- Arrange the levels of anatomical organization from simple to complex (atom to organism)
- 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
- Describe necessary life functions and explain how they work to maintain homeostasis in the body
- Compare and contrast the major cell types in the human body
- Compare and contrast the four tissue types in the human body

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

- Guided outline on the Introduction to Anatomy
- Diagrams packet including anatomical terminology, body cavities, and body regions
- Directional Terms practice and discussion
- Body regions practice and discussion
- Body landmarks practice and discussion
- “Do You Know Your Body?” activity

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: Senses and The Internal Viscera

Unit: The Special Senses

Time frame: 2 weeks

State Standards: 3.1.10.A, 3.1.12.A

Anchor(s) or adopted anchor: 3.1.10.A5, 3.1.12.A1, 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 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 from cornea to brain
- To differentiate between the outer, middle, and inner ear
- To follow the pathway of sound through the ear from auditory canal to brain
- To describe how chemoreceptors function in taste and olfaction
- To sign the alphabet using American Sign Language

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

- Application Project on The Special Senses
- Guided outline on the Special Senses
- Diagrams packet including muscles of the eye, accessory structure of the eye, the eyeball, the outer, middle, and inner ear, the tongue, and the taste bud
- Extrinsic eye muscle movements demonstration
- Blind simulation of daily activities (listening and motor components)
- Sign Language lesson (alphabet and common words)
- Foldable pertaining to the physiology of vision and the physiology of hearing
- Sheep eye dissection lab
- Developmental Concerns of the Special Senses (strabismus, otosclerosis, etc.)
- Systems in Sync Discussion

Extensions:

- Blind Walk
- "This is How We Roll" Wheelchair experience
- Olfaction Lab
- Medical Mondays: Careers in A&P / Medical Scans (MRI's, X-Rays, CT scans) and Technologies

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Materials & Resources:

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- Labs / Lab supplies

Assessments:

- Tests
- Homework / Class notes
- Labs
- Student participation

Curriculum Scope & Sequence

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

Unit: The Digestive System

Time frame: 2 weeks

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

Anchor(s) or adopted anchor: 3.1.10.A5, 3.1.12.A1, 3.1.12.A2, 3.1.12.A5, 3.1.12.A6, 3.1.12.A7, 3.1.12.A8

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
- List several factors that influence metabolic rate, and indicate the effect of each

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

- Application Project of The Digestive System
- Guided outline on the digestive system
- Diagrams packet including the alimentary canal overview, the 3 pharynx regions, the macro and micro anatomy of the stomach, the liver and accessory structures, and the small and large intestines
- Curiosities of the Digestive System activity
- 21 Terms of the digestive system from food to waste practice
- Developmental Concerns of the Digestive System (celiac, Crohn's, etc.)
- Systems in Sync Discussion

Extensions:

- Viewing of the digestive system dissection with Dr. Gunther von Hagens
- Medical Mondays: Nutrition / Stress

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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: Senses and The Internal Viscera

Unit: The Urinary System

Time frame: 2 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:

- Identify the 3 types of waste that the urinary system eliminates
- In addition to elimination of waste, discuss the other functions of the urinary system
- Describe the main regions of the kidney and the 3 other organs/structures that make up the urinary system
- To explain the structure and function of a nephron
- To describe how urine is produced as it travels through the nephron

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

- Application Project of The Urinary System
- Guided outline on the urinary system
- Diagrams packet including the 4 organs, internal anatomy of the kidney, the nephron, and the urinary bladder
- Urinary flow chart connecting the cardiovascular and urinary systems
- Developmental Concerns of the Urinary System (bladder cancer, kidney stones, etc.)
- Systems in Sync Discussion

Extensions:

- Kidney dissection
- Medical Mondays: Nutrition / Stress

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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: Senses and The Internal Viscera

Unit: The Cardiovascular System

Time frame: 2 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:

- To identify and describe the structures and functions of blood
- To identify and locate the main structures of the heart including the connective tissue layers, the 4 chambers, 4 valves, and major arteries and veins
- To differentiate between systemic and pulmonary circulation
- To 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
- To describe the blood-clotting process

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

- Application Project of The Cardiovascular System
- Guided outline of the cardiovascular system
- Diagrams packet including pulmonary and systemic circulation, the connective tissue layers of the heart, the internal heart anatomy, and the capillary beds
- Cardiovascular foldable
- Blood flow practice activity (with laminated cards)
- Heart dissection lab
- Developmental Concerns of the Cardiovascular System (heart attack, congenital heart defects, etc.)
- Systems in Sync Discussion

Extensions: Medical Mondays: Vital Signs / Cancer

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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: Senses and The Internal Viscera

Unit: The Respiratory System

Time frame: 2 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:

- 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

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

- Application Project of The Respiratory System
- Guided outline of the respiratory system
- Diagrams packet including nasal, oral, and pharyngeal cavities, macro and microanatomy of the lungs, and points of gas exchange
- Respiratory foldable detailing the physiology of pressure changes in the lungs
- Developmental Concerns of the Respiratory System (COPD, apnea, etc.)
- Systems in Sync Discussion

Extensions:

- Spirometry Lab (respiratory volumes and capacity)
- Medical Mondays: Vital Signs / Cancer

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: Senses and The Internal Viscera

Unit: The Reproductive System

Time frame: 2 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:

- 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

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

- Application Project on The Reproductive System
- Guided outline on the Reproductive System / Pregnancy from conception to birth
- Developmental Concerns of the Reproductive System (uterine cancer, miscarriage, etc.)
- Systems in Sync Discussion

Extensions:

- “The Reproductive System” packet
- Medical Mondays: The Apgar Score / Aging

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