TRUMBULL PUBLIC SCHOOLS

Trumbull, Connecticut

ANATOMY AND PHYSIOLOGY
Grade 12
Science Department

2020

(Last revision date: 2013)

Curriculum Writing Team

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Anatomy and Physiology
Grade 12
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CORE VALUES AND BELIEFS

The Trumbull High School community engages in an environment conducive to learning which believes that all students will **read and write effectively**, therefore communicating in an articulate and coherent manner. All students will participate in activities **that present problem-solving through critical thinking**. Students will use technology as a tool applying it to decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will promote **independent thinkers and learners**. We believe **ethical conduct** to be paramount in sustaining the welcoming school climate that we presently enjoy.

Approved 8/26/2011

INTRODUCTION & PHILOSOPHY

Anatomy and Physiology allows students to acquire an in-depth understanding of the workings of the human body and the interrelationships of its various parts. Structure, function, and pathology of the body's organ systems will be studied. Introductory concepts such as anatomical directions and homeostasis will also be covered. Each unit will include activities/labs to enhance the study of anatomy and physiology. Dissections are integral to this course.

This senior elective course is designed to provide any interested student the opportunity to further his/her study of the human body following Biology. The course is especially recommended for students who are considering pursuit of health or bioscience occupations. As a result, field trips to related sites and presentations by outside speakers are included to enhance career awareness and preparation.

Anatomy and Physiology may be taken at the Advanced College-Preparatory or the Honors level; for Honors credit, a student will produce additional current event assignments and, each marking period, complete a project related to the body systems covered during that time.

COURSE GOALS

The following course goals derive from the 2013 Next-Generation Science Standards.

NGSS.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of itneracting systems that provide specific functions within multicellular organisms.
NGSS.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

The following course goals derive from the 2010 Connecticut Core Standards.

CCS.ELA-Literacy.RST.11-12.1	Cite strong and thorough textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

CCS.ELA-Literacy.RST.11-12.2	Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
CCS.ELA-Literacy.RST.11-12.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
CCS.ELA-Literacy.RST.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
CCS.ELA-Literacy.RST.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
CCS.ELA-Literacy.RST.11-12.8	Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
CCS.ELA-Literacy.RST.11-12.9	Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
CCS.ELA-Literacy.RST.11-12.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.

The following course goal derives from the 2016 International Society for Technology in Education Standards.

ISTE Knowledge Constructor (Standard 3)	Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.

COURSE ENDURING UNDERSTANDINGS

Students will understand that . . .

- the anatomy of an organ is directly related to its function.
- organ systems within the body are interrelated and require each other to be successful.
- science and technology affect the quality of our lives.
- science discoveries are still being made, and continued research is a vital component of keeping people/patients healthy.
- a broad spectrum of careers in the medical field exist, and the pathways to those careers vary.

COURSE ESSENTIAL QUESTIONS

- How are organisms structured to ensure efficiency and survival?
- How can scientific knowledge help the medical community intervene when an organ or body system stops working properly?

COURSE KNOWLEDGE & SKILLS

Students will know . . .

- the differences among anatomy, physiology, and pathology.
- orientational and directional terms used to describe body structure locations.
- which organs belong to each organ system.
- the function(s) of each organ system.
- major diseases/disorders associated with each organ system.
- the overall organization of organ systems within the body.

Students will be able to . . .

- analyze and interpret data.
- collaborate and communicate with others.
- develop and use models.
- research and present information about careers in the medical field.
- evaluate and communicate current events related to anatomy and physiology.
- respond respectfully and thoughtfully to classmates' ideas.

COURSE SYLLABUS

Course Name

Anatomy and Physiology

Level

Honors or Advanced College-Preparatory

Prerequisites

for Honors: Completion of Honors Biology or Advanced Placement Biology with a grade of B+ or better, or permission of Department Chair

for Advanced College-Preparatory: Completion of ACP Integrated Physical Science, ACP Biology, and ACP Chemistry with a grade of B or better

Materials Required

None

General Description of the Course

Anatomy and Physiology allows students to acquire an in-depth understanding of the workings of the human body and the interrelationships of its various parts. Structure, function, and pathology of the body's organ systems will be studied. Introductory concepts such as anatomical directions and homeostasis will also be covered. Each unit will include activities/labs to enhance the study of anatomy and physiology. Dissections are integral to this course. The course is especially recommended for students who are considering pursuit of health or bioscience occupations. As a result, field trips to related sites and presentations by outside speakers are included to enhance career awareness and preparation. Anatomy and Physiology may be taken at the Advanced College-Preparatory or the Honors level; for Honors credit, a student will produce additional current event assignments and, each marking period, complete a project related to the body systems covered during that time.

Assured Assessments

Formative Assessments:

- Lab completion (Units 1, 5, 6)
- Project exploring careers in the health field (Unit 1)
- Current events assignment (Unit 1)
- Diagnosis of patients (Unit 2)
- Completion of key questions (Units 3, 4, 9)
- Game related to systems studied (Unit 3)
- Creation of three-dimensional models (Units 5, 7)
- Card sort (Unit 8)

Summative Assessments:

- Unit test (Units 1, 2, 3, 4, 5, 6, 7, 8, 9)
- End-of-year fetal pig dissection (Units 2, 3, 4, 5, 6, 7, 8, 9)

Core Texts

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.
- Brain Dissection Lab
- Cow Eye Dissection Lab
- Gummy Bear Dissection Lab
- Heart Dissection Lab
- Touch Receptors of the Skin Lab

UNIT 1
An Introduction to Body Structure and Function

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Illustrate the hierarchical organization of itneracting systems by completing the hierarchy of life stations activity.
NGSS.HS-LS1-3	Complete an exploring homeostasis lab to provide evidence that feedback mechanisms maintain homeostasis.
CCS.ELA-Literacy.RST.11-12.1 CCS.ELA-Literacy.RST.11-12.2 ISTE Knowledge Constructor (Standard 3)	Summarize and react to an anatomy and physiology-related current events article of their choosing, citing specific evidence from the article to support their analysis, and then respond in writing to their classmates' thoughts.
CCS.ELA-Literacy.RST.11-12.2 CCS.ELA-Literacy.RST.11-12.3	Determine central ideas of text about different types of tissues, summarize informational text, and follow a complex multistep procedure to explore epithelial and connective tissues.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key anatomical terms during a practice dissection lab.
CCS.ELA-Literacy.RST.11-12.7	Integrate and evaluate information from various websites to determine what tissues are and how the main types of human body tissues differ.
CCS.ELA-Literacy.RST.11-12.9 ISTE Knowledge Constructor (Standard 3)	Synthesize information from the textbook and the Internet to explore a career in the health field of their choice, and then share their findings with classmates.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the tissues, organs, and organ systems of a fetal pig as both independent and interacting structures required for survival.

Unit Essential Questions

- What is the relationship between anatomy and physiology?
- What are the levels of structural organization in the body?
- What anatomical terminology is used when discussing the body?
- What are the major organ systems in the human body?
- How does the body maintain homeostasis?

- What is the structure and function of each type of tissue found in the human body?

Scope and Sequence

- Structural levels of organization
- Anatomical terminology
- Organ systems and the general role each plays
- Homeostasis (positive and negative feedback)
- Tissues (epithelial, connective, muscle, nervous)

Assured Assessment

Formative Assessment:

- Students will complete the Gummy Bear Dissection Lab to assess their understanding of anatomical terminology.
- Students will complete a project exploring careers in the health field.
- Students will complete a current events assignment.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the unit's topics.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.
- Gummy Bear Dissection Lab

Supplemental

- *Crash Course*. Online videos about anatomical terms, homeostasis, and tissues. https://www.youtube.com/user/crashcourse. Web.
- Connective Tissue Lab
- Epithelial Tissue Lab
- Hierarchy of Living Things card sort
- Microscope slides: Various tissues
- Muscular and Nervous Tissue Lab

Time Allotment

- Approximately 2-3 weeks

UNIT 2
The Integumentary System & Body Membranes

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Complete the Touch Receptors of the Skin Lab to illustrate how the number of receptors in the skin varies based on the body location tested.
CCS.ELA-Literacy.RST.11-12.2 CCS.ELA-Literacy.RST.11-12.10	Determine central ideas of text about the integumentary system and summarize information presented in the textbook.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key skin structures using integumentary system diagrams, scientific texts, and questions.
CCS.ELA-Literacy.RST.11-12.7	Integrate and evaluate diagrams and a virtual skin dissection to solve case studies.
CCS.ELA-Literacy.RST.11-12.9	Synthesize information from the textbook and the Internet about types and amounts of skin receptors found in various parts of the body.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the integumentary system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How does the structure of the integumentary system relate to its function?
- What are potential causes and consequences of a damaged/ineffective integumentary system?

Scope and Sequence

- Epidermis and dermis
- Accessory organs of the skin
- Functions of the integumentary system
- Skin disorders and infections
- Burns and burn injuries

Assured Assessment

Formative Assessment:

- Students will diagnose patients while completing the Integumentary Case Studies activity, allowing the teacher to assess student application of knowledge of integumentary disorders/diseases.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the integumentary system.
- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.
- Touch Receptors of the Skin Lab

Supplemental

- *Crash Course*. Online videos about the integumentary system. https://www.youtube.com/user/crashcourse. Web.
- Fingerprint Analysis Lab
- Indiana University. "Virtual Skin Dissection Lab." https://anat215.sitehost.iu.edu/virtuallab/?scrlybrkr=1290328c. Accessed November 23, 2020. Web.
- Microscope slides: Skin

Time Allotment

- Approximately 3 weeks

UNIT 3
The Skeletal System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Complete and explain diagrams of the microscopic structure of bone as well as both divisions of the skeletal system.
CCS.ELA-Literacy.RST.11-12.10	Using the textbook, complete a skeletal system vocabulary assignment that includes defining key terms and applying their understanding of each term.
CCS.ELA-Literacy.RST.11-12.1 CCS.ELA-Literacy.RST.11-12.2 ISTE Knowledge Constructor (Standard 3)	Summarize and react to an anatomy and physiology-related current events article of their choosing, citing specific evidence from the article to support their analysis, and then respond in writing to their classmates' thoughts.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key terms associated with long bones using diagrams, scientific texts, and questions.
CCS.ELA-Literacy.RST.11-12.8	Evaluate diagnoses of patients with various types of bone fractures and skeletal system disorders.
CCS.ELA-Literacy.RST.11-12.9	Synthesize information from notes, videos, practice, and readings to complete a skeletal identification lab.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the skeletal system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How is the skeletal system used to move and support the human body?
- What are potential causes and consequences of a damaged/ineffective skeletal system?

Scope and Sequence

- Functions of the skeletal system
- Types of bones
- Gross and microscopic anatomy of a long bone
- Bone growth and repair
- Gross anatomy of both the axial and the appendicular skeletal divisions
- Types of body movement

- Major disorders associated with the skeletal system

Assured Assessment

Formative Assessment:

- Students will individually complete Microscopic Anatomy of a Long Bone questions as an exit slip or opener after discussion of the topic as a whole class, allowing the teacher to determine individual and whole-group needs / possible misunderstandings.
- Students will play a game as a whole group that involves someone calling out a type of body movement and everyone else in the class demonstrating that movement.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the skeletal system.
- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.

Supplemental

- *Crash Course*. Online videos about the skeletal system. https://www.youtube.com/user/crashcourse. Web.
- Microscope slides: Bone, ligament, tendon
- "Skeletal System." http://www.bozemanscience.com/skeletal-system. Accessed November 23, 2020. Web.
- Skeleton, bone, and joint models

Time Allotment

- Approximately 5 weeks

UNIT 4
The Muscular System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Use the Sliding Filament Model to show how muscle occurs on a microscopic level, and label diagrams of muscles in the human body.
CCS.ELA-Literacy.RST.11-12.10	Using the textbook, complete a muscular system introduction and vocabulary assignment that includes defining key terms and applying their understanding of each term.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key skeletal muscle and sarcomere terms through reading of scientific texts and examination of diagrams.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the muscular system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How do muscles of the human body create force and motion?
- What are potential causes and consequences of a damaged/ineffective muscular system?

Scope and Sequence

- Functions of the muscular system
- Types of muscle tissue
- Microscopic structure of skeletal muscle; sarcomere, motor unit
- Skeletal muscle contractions; Sliding Filament Model
- Types of body movements
- Gross anatomy of skeletal muscles

Assured Assessment
Formative Assessment:

- Students will individually complete Microscopic Structure of Muscle questions as an exit slip or opener after discussion of the topic as a whole class, allowing the teacher to determine individual and whole-group needs / possible misunderstandings.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the muscular system.
- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.

Supplemental

- *Crash Course*. Online videos about the muscular system. https://www.youtube.com/user/crashcourse. Web.
- Human torso model
- Microscope slides: Muscle tissues, tendon

Time Allotment

- Approximately 5 weeks

UNIT 5
The Nervous System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Create a physical model of a neuron, and use action potential graphs to illustrate the process that allows the movement of signals throughout the human body.
CCS.ELA-Literacy.RST.11-12.2	Using the textbook as a guide, summarize the steps that allow transmission of a nerve impulse.
CCS.ELA-Literacy.RST.11-12.3	Follow a complex multistep procedure to explore the concepts of the reflex arc and visual function.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key nervous system terms through reading of scientific texts and examination of diagrams.
CCS.ELA-Literacy.RST.11-12.5	Create a flowchart showing how the components of the nervous system are classified.
CCS.ELA-Literacy.RST.11-12.8	Evaluate hypotheses and data from a mini-lab introducing the nervous system, then analyze the data and draw conclusions.
CCS.ELA-Literacy.RST.11-12.9	Synthesize information from notes, readings, and practice to complete brain and cow eye dissection labs.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the nervous system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How does the human body receive, interpret, and send information throughout itself?
- What are potential causes and consequences of a damaged/ineffective nervous system?

Scope and Sequence

- Functions of the nervous system
- Organization of the nervous system (organs and divisions)
- Nervous system cells (structures and functions)
- Nerve impulses / action potentials
- Synapses
- Reflex arcs

- Brain
- Disorders of the nervous system
- General sense organs
- Special sense organs and disorders

Assured Assessment
Formative Assessment:

- Students will create three-dimensional models of a neuron to demonstrate the anatomy of a neuron and the movement of an impulse through one.
- Student understanding of brain and eye anatomy will be formatively assessed using the Brain Dissection Lab and the Cow Eye Dissection Lab.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the nervous system.
- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources
Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.
- Brain Dissection Lab
- Cow Eye Dissection Lab

Supplemental

- Brain Hat Lab
- *Crash Course*. Online videos about the nervous system. https://www.youtube.com/user/crashcourse. Web.
- Microscope slides: Nervous system tissue
- Reflex Arc Lab
- Visual Function Lab

Time Allotment

- Approximately 6 weeks

UNIT 6
The Cardiovascular System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Develop and use a model of the heart to illustrate how blood is pumped to the lungs and throughout the body to cells of other organ systems.
CCS.ELA-Literacy.RST.11-12.10	Using the textbook, complete a cardiovascular system vocabulary assignment that includes defining key terms and applying their understanding of each term.
CCS.ELA-Literacy.RST.11-12.1 CCS.ELA-Literacy.RST.11-12.2 ISTE Knowledge Constructor (Standard 3)	Summarize and react to an anatomy and physiology-related current events article of their choosing, citing specific evidence from the article to support their analysis, and then respond in writing to their classmates' thoughts.
CCS.ELA-Literacy.RST.11-12.2 CCS.ELA-Literacy.RST.11-12.3	Follow a complex multistep procedure to explore the concept of blood pressure.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of anatomical terms related to the heart using scientific texts.
CCS.ELA-Literacy.RST.11-12.7	Integrate information from notes, readings, and video clips to complete a blood transfusion lab.
CCS.ELA-Literacy.RST.11-12.8	Evaluate EKG, heartbeat sound, or blood pressure data to diagnose a patient.
CCS.ELA-Literacy.RST.11-12.9	Synthesize information from notes, readings, and practice to complete the Heart Dissection Lab.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the cardiovascular system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How does the structure of the cardiovascular system relate to its function?
- What are potential causes and consequences of a damaged/ineffective cardiovascular system?

Scope and Sequence

- Composition and functions of blood

- Hemostasis
- Blood types (ABO and Rh) and transfusions
- Heart anatomy and physiology
- Systemic and pulmonary circulation
- Heart disorders
- Blood vessel anatomy and physiology
- Blood vessel disorders
- Physiology of circulation

Assured Assessment
Formative Assessment:

- Student understanding of heart anatomy will be formatively assessed using a Heart Dissection Lab.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the cardiovascular system.
- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources
Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.
- Heart Dissection Lab

Supplemental

- CPR lesson
- *Crash Course*. Online videos about the cardiovascular system. https://www.youtube.com/user/crashcourse. Web.
- Microscope slides: Heart tissue, blood vessels, blood
- "The Heart and Circulatory System – How They Work." *YouTube* uploaded by Mayo Clinic on June 19, 2013. https://www.youtube.com/watch?v=CWFyxn0qDEU. Accessed November 23, 2020. Web.
- "How the Heart Works 3D Video." *YouTube* uploaded by mohaalimp on January 20, 2011. https://www.youtube.com/watch?v=oHMmtqKgs50. Accessed November 23, 2020. Web.
- "How to Read an Electrocardiogram (ECG/EKG)." *YouTube* uploaded by Interactive Biology on April 1, 2011. https://www.youtube.com/watch?v=4vkbywows-o. Accessed November 23, 2020. Web.

Time Allotment

- Approximately 5 weeks

UNIT 7
The Respiratory System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Create a concept map relating the function of the respiratory system to other body systems.
NGSS.HS-LS1-3	Plan and conduct an investgiation about breathing and heart rates.
CCS.ELA-Literacy.RST.11-12.10	Using the textbook, complete a respiratory system vocabulary assignment that includes defining key terms and applying their understanding of each term.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key respiratory system terms through reading of scientific texts and examination of diagrams.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the respiratory system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How does the respiratory system exchange gases with blood to keep a human's cells alive?
- What are potential causes and consequences of a damaged/ineffective respiratory system?

Scope and Sequence

- Respiratory system physiology
- Respiratory system anatomy
- Types of respiration
- Respiratory system disorders

Assured Assessment

Formative Assessment:

- Students will create their own models of the respiratory system that accurately depict respiratory anatomy and relates the respiratory system to the cardiovascular system.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the respiratory system.

- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.

Supplemental

- *Crash Course*. Online videos about the respiratory system. https://www.youtube.com/user/crashcourse. Web.
- Microscope slides: Respiratory structures
- Working lung model

Time Allotment

- Approximately 2-3 weeks

UNIT 8
The Digestive System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Draw and label a model of the gastrointestinal tract to illustrate the locations in which each phase of digestion occurs.
CCS.ELA-Literacy.RST.11-12.10	Using the textbook, complete a digestive system vocabulary assignment that includes defining key terms and applying their understanding of each term.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key digestive system terms through reading of scientific texts.
CCS.ELA-Literacy.RST.11-12.7	Use all activities from the unit to diagnose patients with a specific digestive disorder based on their symptoms.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the digestive system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How does the human digestive system help transform the food we eat into the energy our bodies require?
- What are potential causes and consequences of a damaged/ineffective digestive system?

Scope and Sequence

- Types of digestion
- Digestive system anatomy
- Digestive system physiology
- Digestive system disorders

Assured Assessment

Formative Assessment:

- Students will participate in the Digestive System Vocab Magic card sort; they will be asked to correctly organize cards to match each digestive system structure with its function and picture.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the digestive system.

- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.

Supplemental

- *Crash Course*. Online videos about the digestive system. https://www.youtube.com/user/crashcourse. Web.
- Microscope slides: Digestive tissues

Time Allotment

- Approximately 2-3 weeks

UNIT 9
The Reproductive System

Unit Goals

At the completion of this unit, students will:

NGSS.HS-LS1-2	Use graphs of various female hormone levels and endometrium thickness to illustrate the stages of the female hormone cycle as they relate to ovulation and concpetion.
CCS.ELA-Literacy.RST.11-12.4	Determine the meaning of key reproductive system terms through reading of scientific texts.
CCS.ELA-Literacy.RST.11-12.9	In the end-of-year fetal pig dissection, synthesize information to examine the reproductive system of a fetal pig as both an independent system and as one of the interacting structures required for survival.

Unit Essential Questions

- How does our reproductive system allow the production of offspring?
- What are potential causes and consequences of a damaged/ineffective reproductive system?

Scope and Sequence

- Male reproductive system anatomy and physiology
- Female reproductive system anatomy and physiology
- Female hormone cycle (endocrine-dependent)
- Fertilization, pregnancy, and birth
- Reproductive system disorders

Assured Assessment

Formative Assessment:

- Students will interpret, compare, and answer questions about side-by-side graphs that show fluctuations of various hormone levels and thickness of the endometrium during the ovarian cycle to demonstrate their understanding of the female hormone cycle and its relationship to pregnancy.

Summative Assessment:

- Students will complete a unit test to demonstrate their level of understanding of the anatomy, physiology, and pathology of the reproductive system.
- In the end-of-year fetal pig dissection, students will synthesize information from this unit, along with information from all other units.

Resources

Core

- Marieb, Elaine N. *Essentials of Human Anatomy and Physiology*. 10th ed. San Francisco: Cummings, 2012. Print.

Supplemental

- *Crash Course*. Online videos about the reproductive system. https://www.youtube.com/user/crashcourse. Web.
- Microscope slides: Reproductive tissues and structures
- "Reproductive System." http://www.bozemanscience.com/reproductive-system. Accessed November 23, 2020. Web.

Time Allotment

- Approximately 2-3 weeks

COURSE CREDIT

One credit in science
One class period daily for a full year

PREREQUISITES

for Honors: Completion of Honors Biology or Advanced Placement Biology with a grade of B+ or better, or permission of Department Chair
for Advanced College-Preparatory: Completion of ACP Integrated Physical Science, ACP Biology, and ACP Chemistry with a grade of B or better

ASSURED STUDENT PERFORMANCE RUBRICS

- Trumbull High School School-Wide Writing Rubric (attached)
- Trumbull High School School-Wide Problem-Solving Rubric (attached)
- Trumbull High School School-Wide Independent Learning and Thinking Rubric (attached)
- Exploring Careers in the Health Field Project Rubric (attached)
- Anatomy of a Neuron Project Rubric (attached)

Trumbull High School School-Wide Writing Rubric

Category/ Weight	Exemplary 4 Student work:	Goal 3 Student work:	Working Toward Goal 2 Student work:	Needs Support 1-0 Student work:
Purpose X_____	• Establishes and maintains a clear purpose • Demonstrates an insightful understanding of audience and task	• Establishes and maintains a purpose • Demonstrates an accurate awareness of audience and task	• Establishes a purpose • Demonstrates an awareness of audience and task	• Does not establish a clear purpose • Demonstrates limited/no awareness of audience and task
Organization X_____	• Reflects sophisticated organization throughout • Demonstrates logical progression of ideas • Maintains a clear focus • Utilizes effective transitions	• Reflects organization throughout • Demonstrates logical progression of ideas • Maintains a focus • Utilizes transitions	• Reflects some organization throughout • Demonstrates logical progression of ideas at times • Maintains a vague focus • May utilize some ineffective transitions	• Reflects little/no organization • Lacks logical progression of ideas • Maintains little/no focus • Utilizes ineffective or no transitions
Content X_____	• Is accurate, explicit, and vivid • Exhibits ideas that are highly developed and enhanced by specific details and examples	• Is accurate and relevant • Exhibits ideas that are developed and supported by details and examples	• May contain some inaccuracies • Exhibits ideas that are partially supported by details and examples	• Is inaccurate and unclear • Exhibits limited/no ideas supported by specific details and examples
Use of Language X_____	• Demonstrates excellent use of language • Demonstrates a highly effective use of standard writing that enhances communication • Contains few or no errors. Errors do not detract from meaning	• Demonstrates competent use of language • Demonstrates effective use of standard writing conventions • Contains few errors Most errors do not detract from meaning	• Demonstrates use of language • Demonstrates use of standard writing conventions • Contains errors that detract from meaning	• Demonstrates limited competency in use of language • Demonstrates limited use of standard writing conventions • Contains errors that make it difficult to determine meaning

Trumbull High School School-Wide Problem-Solving Rubric

Category/ Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Understanding X_____	• Student demonstrates clear understanding of the problem and the complexities of the task	• Student demonstrates sufficient understanding of the problem and most of the complexities of the task	• Student demonstrates some understanding of the problem but requires assistance to complete the task	• Student demonstrates limited or no understanding of the fundamental problem after assistance with the task
Research X_____	• Student gathers compelling information from multiple sources including digital, print, and interpersonal	• Student gathers sufficient information from multiple sources including digital, print, and interpersonal	• Student gathers some information from few sources including digital, print, and interpersonal	• Student gathers limited or no information
Reasoning and Strategies X_____	• Student demonstrates strong critical thinking skills to develop a comprehensive plan integrating multiple strategies	• Student demonstrates sufficient critical thinking skills to develop a cohesive plan integrating strategies	• Student demonstrates some critical thinking skills to develop a plan integrating some strategies	• Student demonstrates limited or no critical thinking skills and no plan
Final Product and/or Presentation X_____	• Solution shows deep understanding of the problem and its components • Solution shows extensive use of 21st-century technology skills	• Solution shows sufficient understanding of the problem and its components • Solution shows sufficient use of 21st-century technology skills	• Solution shows some understanding of the problem and its components • Solution shows some use of 21st-century technology skills	• Solution shows limited or no understanding of the problem and its components • Solution shows limited or no use of 21st-century technology skills

Trumbull High School School-Wide
Independent Learning and Thinking Rubric

Category/ Weight	Exemplary 4	Goal 3	Working Toward Goal 2	Needs Support 1-0
Proposal X_____	• Student demonstrates a strong sense of initiative by generating compelling questions, creating uniquely original projects/work	• Student demonstrates initiative by generating appropriate questions, creating original projects/work	• Student demonstrates some initiative by generating questions, creating appropriate projects/work	• Student demonstrates limited or no initiative by generating few questions and creating projects/work
Independent Research & Development X_____	• Student is analytical, insightful, and works independently to reach a solution	• Student is analytical, and works productively to reach a solution	• Student reaches a solution with direction	• Student is unable to reach a solution without consistent assistance
Presentation of Final Product X_____	• Presentation shows compelling evidence of an independent learner and thinker • Solution shows deep understanding of the problem and its components • Solution shows extensive and appropriate application of 21st-century skills	• Presentation shows clear evidence of an independent learner and thinker • Solution shows adequate understanding of the problem and its components • Solution shows adequate application of 21st-century skills	• Presentation shows some evidence of an independent learner and thinker • Solution shows some understanding of the problem and its components • Solution shows some application of 21st-century skills	• Presentation shows limited or no evidence of an independent learner and thinker • Solution shows limited or no understanding of the problem and its components • Solution shows limited or no application of 21st-century skills

Anatomy and Physiology
Exploring Careers in the Health Field Rubric

	Points Possible	Points Earned
RESEARCH ASPECT		
Job description / daily tasks	4	
Education Requirements: • Years of schooling • Sampling of required classes • Degrees/certifications required	3	
At least two schools offering this degree/certification	3	
Estimated cost of education (tuition & books)	2	
Salary: • Starting salary in CT • Potential salary after years of experience (if per hour, calculate 40-hour work week)	2	
Job outlook	2	
Personal qualities needed to be successful in this field	2	
VISUAL ASPECT		
Name of chosen occupation is clear & noticeable immediately	1	
Neat & organized / Easy to find information	3	
Effort & pride in work are obvious	2	
Creative; includes more than just words	2	
TOTAL SCORE	25	

Anatomy and Physiology
Anatomy of a Neuron Project Rubric

Component	Completed (check off when done)	Points Possible	Self Score	Teacher Score
Labels or Key		**7**		
Model is functional (impulse can be sent through)		**2**		
Dendrites		**2**		
Cell Body (Soma)		**2**		
Axon		**2**		
Synaptic Knobs		**2**		
Schwann Cells		**2**		
Nodes of Ranvier		**2**		
Neurotransmitters		**2**		
Effort is obvious		**2**		
	TOTAL	**25**		