Unit 01: Introduction to the Human Body

Content Area: **Science**
Course(s): **Anatomy/Physiology**
Time Period: **September**
Length: **46 periods**
Status: **Published**

Unit Overview

- The body is composed of parts that can be considered at different levels of organization. The chemistry of living organisms is called biochemistry. A cell continuously carries on metabolic processes.

Career Readiness, Life Literacies & Key Skills

WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

Enduring Understandings

- Life is maintained with the combined efforts of all body systems, and no one body system may be excluded for survival
- Organisms respond to internal and external stimuli and possess control mechanisms that detect deviations and make corrective actions. If these mechanisms fail, the organism will die.
- The function of the human body organ systems is reflected in the micro and macro structure of tissues and organs.
- There is a universal language that can be used to describe body parts and directional terms.

Essential Questions

- How are anatomy & physiology related?
- How do multicellular body cells specialize to perform specific functions that help maintain homeostasis and benefit the body as a whole?
- How do the different systems in the body keep you alive?
- How does your body know when something is wrong, and how does it fix it?
- What does it mean to be alive?
- What is the relevance of the specialized language used by anatomists and medical personnel and how is it demonstrated?
- Why is organization important for the proper function of the human body?

Lesson Titles

- Anatomical terminology (1 period)
- Cell cycle (2 periods)
- Cell transport (3 periods)
- Characteristics of life (1 period)
- Composite cell/cell organelles (2 periods)
- Connective tissues (2 periods)
- Energy (1 period)
- Enzymes (2 periods)
- Epithelial tissues (2 periods)
- Lab-Body organization and terminology (2 periods)
- Lab-Care and use of the compound microscope (2 periods)
- Lab-Cellular structure (2 periods)
- Lab-Connective tissues (2 periods)
- Lab-Epithelial tissues (2 periods)
- Lab-Muscle and nervous tissue (2 periods)
- Lab-The cell cycle (2 periods)
- Levels of organization (1 period)
- Maintenance of life (1 period)
- Metabolic processes (2 periods)
- Muscle tissues (2 periods)
- Nervous tissues (2 periods)
- Nucleic acids and protein synthesis (2 periods)
- Organic/Inorganic (2 periods)
- Organization of the human body (2 periods)
- Structure of matter (2 periods)

Standards/Indicators/Student Learning Objectives (SLOs):

- Define anatomy and physiology and explain how they are related
- Define homeostasis and explain its importance to survival
- Describe the general characteristics and functions of epithelial tissue
- Describe the general characteristics and functions of nervous tissue
- Describe the general characteristics of a composite cell
- Describe the general characteristics of connective tissue
- Describe the general functions of each organ system
- Distinguish among the three types of muscle tissue
- Explain how enzymes control metabolic processes
- Explain how substances move into and out of cells

- Explain how the components of a cell's membrane provide its function
- Explain how the study of living material depends on the study of chemistry

9-12.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
9-12.HS-LS1-1.LS1.A	Structure and Function
9-12.HS-LS1-1.LS1.A.1	Systems of specialized cells within organisms help them perform the essential functions of life.
9-12.HS-LS1-2.LS1.A.1	Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.
9-12.HS-LS1-3.LS1.A.1	Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.
9-12.HS-LS1-1.LS1.A.2	All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.
9-12.HS-LS1-4.LS1.B	Growth and Development of Organisms
9-12.HS-LS1-4.LS1.B.1	In multicellular organisms individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells. Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism.

Equity Considerations

Asian American and Pacific Islander Mandate

Students will examine several Asian Americans who have contributed to the human body advancements such as Peter Tsai, found of the N95 respirator.

https://ideas.ted.com/8-asian-americans-and-pacific-islanders-whose-innovations-have-changed-your-life-really/

LGBTQ and Disabilities Mandate

Students will examine Dr. Josephine Baker and her contributions to the medical field, particularly hygiene and how it effects the human body.

LGBTQ:

Sir Francis Bacon (1561–1626)

Florence NightingaleFrancis Bacon | Philosophy, Scientific Method, & Facts | Britannica(1820-1910)

George Washington Carver (1861-1943)

Sara Josephine Baker (1873-1945)

Alan Turing (1912-1954)

Allan Cox (1926-1987)

Sally Ride (1951-2012)

Ben Barres (1954-2017)

Ruth Gates (1962-2018)

Tim Cook (1960)

STEM

Disabilities:

Leonardo da Vinci (1452-1519)- Dyslexia

Isaac Newton (1664-1727)- Epilepsy

Thomas Edison (1847-1931)- Hearing

Charles Darwin (1809-1882)- Stutter, Dyslexia

Alexander Graham Bell (1847-1922)- Deaf

Albert Einstein (1879-1955)- Aspergers

Florence B. Seibert (1897-1991)- Mobility

Stephen Hawking (1942-2019)- ALS

John Forbes Nash (1928-2015)- Schizophrenia

Temple Grandin (1947)- Autism

Climate Change

Students will engage in conversation and activities centered around how climate change affects the human body.

https://www.scientificamerican.com/article/what-climate-change-does-to-the-human-body/

SCI.HS-ESS3-5	Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.
SCI.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
SCI.HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Inter-Disciplinary Connections:

LA.RH.11-12.4	Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
LA.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.
LA.RST.11-12.5	Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
LA.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.
LA.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.
LA.WHST.11-12.2.E	Provide a concluding paragraph or section that supports the argument presented.
LA.WHST.11-12.9	Draw evidence from informational texts to support analysis, reflection, and research.
HPE.2.1.12.C	Diseases and Health Conditions
HPE.2.1.12.C.1	Determine diseases and health conditions that may occur during one's lifespan and identify prevention and treatment strategies.
9-12.HS-PS1	Matter and Its Interactions
9-12.HS-PS1-1.PS1.A	Structure and Properties of Matter
9-12.HS-PS1-1.PS1.A.1	Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons.
9-12.HS-PS1-1.PS1.A.2	The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating

	patterns of this table reflect patterns of outer electron states.
9-12.HS-PS1-2.PS1.B	Chemical Reactions

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Care and Use of Microscope Lab
- Cell City Project
- Cell Transport Webquest
- Connective Tissue Lab
- Epithelial Tissue Lab
- Group Work
- Note Taking/Discussion
- Powerpoint
- Scientific Method Lab
- Slide presentation
- Student Presentation
- Video clips
- Webquest
- YouTube

ELL Modifications:

- Be flexible with time frames and deadlines
- Focus on domain specific vocabulary and keywords
- Group students
- Repeat, reword, clarify
- Use real objects when possible

IEP & 504 Modifications:

- allowing student to take notes in class for reinforcement but also providing a copy of notes to study from
- Focus on domain specific vocabulary and keywords
- providing study guides
- rewording questions so that there are not higher level vocabulary within the question

G&T Modifications:

- Additional reinforcement activities

- Ask students' higher level questions that require students to look into causes and experiences
- Determine where students' interests lie and capitalize on their inquisitiveness.

At Risk Modifications:

- Additional help during tutoring/Delsea One/Academic Enrichment
- Non-verbal redirection of behaviors
- Study guides

Alternate Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Benchmark Assessment

Skills-based assessment
Reading response
Writing prompt
Lab practical

Formative Assessment:

- Anticipatory set
- Cell model
- Closure Activity
- Demo-Diffusion
- Homework

- Lab Report
- Question of the day
- Teacher Observation of Student Activity

Summative Assessment:

- Cell Project
- Cells Test
- Cellular Metabolism Test
- Chemistry Quiz
- Chemistry Test
- Intro. to Anatomy Test
- Marking period 1 Test
- Metabolism Quiz
- Organelle Quiz
- Tissues Test

Resources & Materials:

- Cell Cycle Lab-Mitosis Slides
- Cheek Cell Lab
- Compound Microscope
- Google classroom
- Textbook
- Tissue Lab- Epithelial, Muscle, Connective, and Nervous Tissue slides

Technology:

- Chromebook
- https://phs.sumnerschools.org/images/2016_PDFs/Tomlinson/cell-transport-webquest-2.pdf
- Internet
- Microscope

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.1.12.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.12.E	Research and Information Fluency: Students apply digital tools to gather, evaluate, and

	use information.
TECH.8.1.12.E.CS4	Process data and report results.