09 Regulation and maintenance III (Digestive System, Metabolism, and Temperature Regulation)

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **14 blocks**
Status: **Published**

General Overview, Course Description or Course Philosophy

Anatomy and Physiology is the study of the structure and function of the human body. This course follows a sequential development of the major body systems in an organized and structured curriculum. The course is designed to give the students a selective overview of human anatomical structure and an analysis of human physiological principles. Labs will include slide work, dissection of various animals and studies of the human skeleton. The course will also use computer simulated dissection.

Medical Terminology is embedded in the study of Anatomy & Physiology and teaches words that pertain to body systems, anatomy, physiology, medical processes and procedures and a variety of diseases. It provides specialized language for the health care team, enabling health care workers to communicate in an accurate, articulate and concise manner. This course is designed to give the students a comprehensive knowledge of word construction, definition and use of terms related to all areas of medical science. The course includes but is not limited to terms related to anatomy of the human body, functions of health and disease, and the use of language in diagnosing and treating conditions related to all of the human body systems. This course replaces the earlier study of Latin and Greek for future healthcare professionals, as it focuses words used in the medical fields.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

- Science is a body of knowledge and skills acquired through systematic experimentation and observation to describe natural phenomena; or, more simply it is a “way of knowing”. Observations, data recording and analysis are used to categorize, represent and interpret the natural world.
- Humans rely upon interdependent body systems to maintain homeostasis through the exchange of materials with the environment.
- Living systems, from the organismal to the cellular level, demonstrate the complementary nature of structure and function.

CONTENT AREA STANDARDS

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-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms

	maintain homeostasis.
9-12.HS-LS1-1.6.1	students investigate systems by examining the properties of different materials, the structures of different components, and their interconnections to reveal the system's function and/or solve a problem. They infer the functions and properties of natural and designed objects and systems from their overall structure, the way their components are shaped and used, and the molecular substructures of their various materials.
9-12.HS-LS1-1.LS1.A.1	Systems of specialized cells within organisms help them perform the essential functions of life.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

CCSS.Math.Content.HSS-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
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-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
CCSS.ELA-Literacy.RST.11-12.1	Cite specific 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.
VHEL.9-12.9.4.12.H.(3).6	Read, interpret, and extract information from medical records and documents, applying knowledge of medical terminology and codes to facilitate the abstraction, coding, and other use of key information.
VHEL.9-12.9.4.12.H.(5).4	Summarize and explain the ethical, moral, and legal issues related to biotech research, product development, and product use in society.
VHEL.9-12.9.4.12.H.16	Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions.
VHEL.9-12.9.4.12.H.45	Apply ethical reasoning to a variety of situations in order to make ethical decisions.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- Specific cells and tissues make up the digestive system and perform specific roles in the physiology of ingestion, digestion and excretion.
- How homeostasis is maintained in the digestive system.
- Diseases and disorders of the digestive system can affect human health.
- The role of nutrition, metabolism and temperature regulation in maintaining human health.
- Each system of the body has a specific set of medical terminology that is required.

Procedural Knowledge

Students will be able to:

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    - Demonstrate the principles of body mechanics for positioning, transferring and transporting of patients/clients, and perform them without injury to the patient/client or self.
    - Utilize communication strategies to answer patient/client questions and concerns on planned procedures and goals
    - Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.
    - Construct an explanation based on evidence how a systems of specialized cells within organisms help them perform the essential functions of life.
    - Construct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
    - Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
    - Read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
    - Investigate or design a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.
    - 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.
    - Read and comprehend science/technical texts in the grades 11-CCR text complexity band independently and proficiently.
    - Demonstrate language arts knowledge and skills required to pursue the full range of postsecondary education and career opportunities.
    - Demonstrate mathematics knowledge and skills required to pursue the full range of postsecondary education and career opportunities.
    - Identify transferable career skills and design alternate career plans.
    - Evaluate and use information resources to accomplish specific occupational tasks.
    - Communicate information within a healthcare classroom and demonstrate how to convey this information to appropriate departments and professionals in a timely manner to facilitate sharing of key diagnostic information used in treating patients.
    - Apply the quantitative and qualitative terminology and codes for a range of medical information and analyze the information for designated purposes in order to facilitate the flow of information among individuals in a healthcare environment.
    - Interpret verbal and nonverbal cues/behaviors to enhance communication.
    - Apply active listening skills to obtain and clarify information.
    - Develop and interpret tables, charts, and figures to support written and oral communications.
    - Apply biochemistry, cell biology, genetics, mathematics, microbiology, molecular biology, organic chemistry, and statistics concepts to conduct effective biotechnology research and development.

- Employ critical thinking skills (e.g., analyze, synthesize, and evaluate) independently and in teams to solve problems and make decisions.
- Apply ethical reasoning to a variety of situations in order to make ethical decisions.
- Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- 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.
- 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.
- Summarize, represent, and interpret data on a single count or measurement variable.
- Fit a function to the data; use functions fitted to data to solve problems in the context of the data.
- Use effective oral and written communication strategies for creating, expressing, and interpreting information and ideas that incorporate technical terminology and information.

EVIDENCE OF LEARNING

Formative Assessments

- Informal checks for understanding
- Exit tickets
- Do now
- Homework (Chapter Outcome Outlines)
- Study guide questions.
- Video Overviews with guided notes
- Discuss terminology words and pronunciation.
- Give practice in both pronunciation and understanding the words.
- Provide students with handouts for in-class collaborative work
- Crossword Puzzles, Word Searches and case studies pertinent to the unit and have students analyze and define medical terms.
- StudyWare Games and Quizzes as time permits
- Current events in Healthcare: Discussion Circle

Summative Assessments

- Laboratory histology activity on digestive tissue and pathological conditions of the GI Tract
- Digestive Stations lab
- POGIL on Metabolic Activity
- Presentation on digestive disorders
- Case Study analysis
- Chapter test on the Digestive System and Metaolism
- Benchmarks – departmental benchmark given at the end of MP1 and MP3 based on lab practices
- Alternative Assessments
    - Lab inquiries and investigations
    - Lab Practicals
    - Exploratory activities based on phenomenon
    - Gallery walks of student work
    - Creative Extension Projects
    - Build a model of a proposed solution
    - Let students design their own flashcards to test each other
    - Keynote presentations made by students on a topic
    - Portfolio

RESOURCES (Instructional, Supplemental, Intervention Materials)

Erhlich Text : Chapter 8

Erhlich Instructor's Manual Ch.8 Resources:

Crossword Puzzles, Word Searches and case studies

Chapter Quizzes, Tests

Cengage StudyWare CD-ROM :

Chapter 8 games and quizzes

YouTube Crash Course Video Links for Unit 8:

The Digestive System: CrashCourse Biology #28

https://youtu.be/s06XzaKqELk

Digestive System, Part 1: Crash Course A&P #33

https://youtu.be/yIoTRGfcMqM

Digestive System, part 2: Crash Course A&P #34

Digestive manipulatives

https://youtu.be/pqgcEIaXGME

Digestive System, part 3: Crash Course A&P #35

https://youtu.be/jGme7BRkpuQ

INTERDISCIPLINARY CONNECTIONS

- Integrate quantitative or technical information expressed in words in a text. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
- Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- Experimentation
- Social Emotional Learning
- Enginereering

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.