

# 10 Regulation and Maintenance IV (Urinary System and Osmoregulation)

Content Area: **Science**  
Course(s):  
Time Period: **Full Year**  
Length: **6 Blocks**  
Status: **Published**

## **General Overview, Course Description or Course Philosophy**

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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**

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- Living systems, from the organismal to the cellular level, demonstrate the complementary nature of structure and function.
- Many diseases are caused by organisms such as bacteria and viruses and other microbes, whereas others are caused by intrinsic failures of one or more body systems.
- Biotechnology is the use of biological knowledge to solve human problems.

## **CONTENT AREA STANDARDS**

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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-LS1-1.6.1	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.
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.

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

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CCSS.Math.Content.HSS-ID.B.6.a	Fit a function to the data; use functions fitted to data to solve problems in the context of the data.
CCSS.Math.Content.HSS-ID.C.9	Distinguish between correlation and causation.
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).1	Communicate health/medical information accurately and within legal/regulatory guidelines to uphold the strictest standards of confidentiality.
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.17	Employ critical thinking and interpersonal skills to resolve conflicts.
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**

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### **Declarative Knowledge**

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Students will understand that:

- Specific cells and tissues make up the structure of the urinary system and perform specific roles in the physiology of urinary output.
- The urinary system has a specific role in osmoregulation.
- Disease or injury to the urinary system affects human health.
- Each system of the body has a specific set of medical terminology that is required.
- 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.

## Procedural Knowledge

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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.
- 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.
- 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.
- Interpret verbal and nonverbal cues/behaviors to enhance communication.
- Develop and interpret tables, charts, and figures to support written and oral communications.
- 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.
- Identify transferable career skills and design alternate career plans.
- Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- 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.
- Identify a full range of career and postsecondary education opportunities within the career cluster.

## **EVIDENCE OF LEARNING**

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### **Formative Assessments**

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- 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**

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- Laboratory activity stations examining the histology of the Urinary System and various tissue types
- Dissection of the Kidney
- Urinalysis Laboratory Activity
- POGIL-Osmoregulation
- Quiz on the Urinary System
- Abbreviations quiz
- Case Study analysis
- Chapter test on the Urinary System and Osmoregulation
- 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)**

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Erhlich Text : Chapter 9

Erhlich Instructor's Manual Ch.9 Resources:

Crossword Puzzles, Word Searches and case studies

Chapter Quizzes, Tests

Cengage StudyWare CD-ROM :

Chapter 9 games and quizzes

YouTube Crash Course Video Links for Unit 9:

The Excretory System: From Your Heart to the Toilet - CrashCourse Biology #29

<https://youtu.be/WtrYotjYvtU>

Urinary System, part 1: Crash Course A&P #38

<https://youtu.be/l128tW1H5a8>

Urinary System, part 2: Crash Course A&P #39

<https://youtu.be/DlqyyvTI3k>

Classroom Manipulative: Model of the Kidneys

## **INTERDISCIPLINARY CONNECTIONS**

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- 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
- Engineering

## **ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS**

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See link to Accommodations & Modifications document in course folder.