Unit 5: Absorption and Excretion

Content Area: **Science**
Course(s): **Anatomy/Physiology Lab Honors**
Time Period: **4th Marking Period**
Length: **5 Weeks**
Status: **Published**

Unit Overview

This unit is designed to describe the general functions of the digestive system, the respiratory system, and the urinary system; discussion of the relationships of previous units will be included.

Transfer

Students will be able to independently use their learning to.....

- Understand the pathway of digestion.

- What overeating and undereating do to the body.

- What kind of diet is best?

- The lungs are tri lobed on the right side and bilobed on the left to make room for the heart.

- What emphysema and lung cancer actually do to the lungs.

- The kidneys are actually higher up in the back of the body than assumed.

- Diabetes mellitus is a major cause of kidney disease and kidney failure.

For more information, read the following article by Grant Wiggins.

http://www.authenticeducation.org/ae_bigideas/article.lasso?artid=60

Meaning

Understandings

Students will understand that.....

- Digestion actually begins in the mouth, both physically and chemically.

- The digestive system includes the mouth, pharynx, esophagus, stomach, small intestine, large intestine and anus, but also associated organs such as the pancreas, liver and gallbladder.

- Most of digestion occurs in the small intestine.

- The liver can regenerate itself.

- Hepatitis is an inflammation of the liver.

- Lactose intolerance means that one is missing the enzyme lactase that enables someone to digest lactose.

- The large intestine has little or no digestive function.

- Breathing is also called ventilation, where there is movement of air in/out of the lungs.

- Breathing in is referred to as inspiration and breathing out is referred to as expiration.

- Emphysema is a chronic disease usually caused by prolonged exposure to tobacco smoke.

- A spirometer can be used to measure respiratory air volumes.

- The urinary system includes the kidneys, ureters, urinary bladder, and urethra, where the flow of urine is in this order.

- The primary function of the kidneys is to help maintain homeostasis by regulating the composition and the volume of the extracellular fluid.

- Dialysis can be used to help remove metabolic wastes that the kidneys can no longer remove.

Essential Questions

Students will keep considering.....

- How is food moved through the alimentary canal?

- What are the major causes of peptide ulcers?

- What are some of the liver's major functions?

- How does someone develop gallstones and what are they?

- What structures in the small intestine increases surface area that relates to absorption?

- Why do feces have a pungent odor?

- What is meant by a "balanced diet"?

- How are gases exchanged in the lungs?

- What is the pathway of ventilation?

- Why is emphysema considered a chronic lung disease and lung cancer isn't?

- Why does physical exercise increase breathing?

- How do the kidneys remove metabolic waste?

- Where does the processof urine formation begin?

- What prevents urine from backing up from the urinary bladder into the ureters?

Application of Knowledge and Skill

Students will know...

Students will know.....

- What the organs of the digestive system system are and their general functions.

- How peristalsis occurs and where.

- The different types of peptide ulcers and causes.

- Identify some of the major types of hepatitis and causes.

- Identify digestive diseases, such as lactose intolerance, and causes.

- Identify the major parts of the small and large intestine.

- What is meant by a "balanced diet".

- Identify the respiratory organs and how respiration occurs.

- Differentiate between inspiration and expiration.

- Differentiate among the lung diseases.

- Identify how the spirometer works.

- List the urinary system organs and the general functions of each.

- Trace the pathway of blood through the major vessels in a kidney.

- Explain the process and control of micturition.

Students will be skilled at...

Students will be skilled at.....

- Using models and animal dissections, identify digestive system organs.

- Using mini labs, identify some of the digestive enzymes at work.

- Compare and contrast different diets to understand which ones are suitable.

- Using models and animal dissections, identify respiratory organs.

- Using the microscope, differentiate among lung tissue, including normal, lung cancer, and emphysema patients.

- Using the spirometer, identify different breathing mechanisms and tests.

- Using models and animal dissections, identify urinary system organs.

- Using animal dissections, identify kidney structures.

- Using coloring models, students will be able to indicate the direction of blood flow through a nephron.

Academic Vocabulary

alimentary canal peristalsis palate palantine pharyngeal dentin enamel salivary glands pharynx

esophagus

stomach sphincter gastrin stomach pepsin amylase pancreatic jiuce hepatic hepatitis bile emulsify duodenum

jejunum ileum villi cecum colon essential nutrients respiration ventilation nasal sinuses larynx alveoli trachea

glottis epiglottis bronchus inspiration expiration tidal volume emphysema lung cancer spirometer renal medulla

cortex nephron glomerulus micturition

Learning Goal 1

Students will be able to describe the general functions of the digestive system and the roles that digestive organs play in the digestive process.

Proficiency Scale

HPE.2.1.12.B.CS1	Applying basic nutritional and fitness concepts to lifestyle behaviors impacts wellness.
SCI.HS-LS1-2	Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Target 1

Students will be able to describe the general functions of the digestive system and the major digestive organs associated with it.

Target 2

Students will be able to explain how the contents of the alimentary canal.

Target 3

Students will be able to describe how digestive secretions are regulated.

Target 4

Students will be able to explain how the products of digestion are absorbed.

Target 5

Students will be able to describe different types of digestive diseases and how a healthy diet may be beneficial patients with those problems.

Learning Goal 2

Students will be able to identify the respiratory organs and the functions of those organs, the dangers of tobacco smoke, and how different breathing tests are performed.

Proficiency Scale

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

Target 1

Students will be able to identify and describe organs of the respiratory system and the general functions of this system.

Target 2

Students will be able to explain the mechanisms of inspiration and expiration and how to perform some of the normal breathing tests.

Target 3

Students will be able to differentiate among lung diseases.

Learning Goal 3

Students will be able to list the general functions of the urinary system, to describe the structures of the kidneys, and the process of micturition.

Proficiency Scale

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

Target 1

Students will be able to list and describe the organs of the urinary system and the functions of each.

Target 2

Students will be able to describe the locations and structures of the kidneys.

Target 3

Students will be able to trace the pathway of blood through the major vessels in a kidney.

Target 4

Students will be able to explain the process and control of micturition.

Formative Assessment and Performance Opportunities

Labs, worksheets including coloring and labeling, homework and classwork activities, group activities

Summative Assessment

The unit assessment will be created collaboratively and used for every student in the course. In addition, there will be other assessments in the form of labs, pen and paper test, and quizzes.

Accommodations/Modifications

Provide additional diagrams of the excretory system

Pair struggling students with a study partner

Allow students to use vocabulary lists and diagrams to complete assignments

Unit Resources

Hole's Essentials of Human Anatomy and Physiology 11th Edition

21st Century Life and Careers

CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

Interdisciplinary Connections

LA.SL.11-12.5	Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
LA.WHST.11-12.7	Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
LA.WHST.11-12.8	Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.