

Unit 5 Metabolic Processing Systems

Content Area: **Science**
Course(s):
Time Period: **Marking Period 2**
Length: **3-4 weeks**
Status: **Published**

Summary

Introduction: Metabolism includes all the processes by which the body synthesizes new materials for growth and repair and produces energy. Numerous systems support metabolic processes by providing raw materials and removing waste on a continuous basis. The raw materials include oxygen, water, and nutrients. Oxygen is brought into the body by the respiratory system. Water and nutrients are available to cells by the digestive system. The digestive system and urinary system work together to rid the body of waste products which are factors the body cannot use as a source of energy.

Revision Date: July 2019

Standards

LA.WHST.9-10.1.A	Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
LA.WHST.9-10.1.C	Use transitions (e.g., words, phrases, clauses) to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
LA.WHST.9-10.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
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.
SCI.HS-LS1-3	Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
SCI.HS-LS1-6	Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
SCI.HS-LS3-1	Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.
SCI.HS-LS1-7	Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.
SCI.HS-PS3-3	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
WRK.9.2.12.CAP	Career Awareness and Planning
TECH.9.4.2.CT	Critical Thinking and Problem-solving Career planning requires purposeful planning based on research, self-knowledge, and informed choices.

Range of Reading and Level of Text Complexity

Integration of Knowledge and Ideas

Craft and Structure

Key Ideas and Details

Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.

Essential Questions

- How do the six processes of digestion prepare food for our cells?
- Why are the organs in the digestive system specialized?
- How the digestive system work together with the respiratory and urinary systems to rid the body of metabolic waste?
- What are the structural features of the urinary system, particularly the kidneys?

Objectives

- Students will know the role of each organ in the digestive system and how they help to maintain homeostasis.
- Students will know how long digestion takes based on the foods ingested.
- Students will know how our cells receive the energy needed to grow and develop.
- Students will know how waste is created and expelled from the body.
- Students will know how our blood is cleaned through the subunits of our kidneys.
- Students will be skilled at identifying the types of metabolism.
- Students will know how the urinary system helps to balance pH and maintain the body's fluid composition.
- Students will be skilled at relating the intake of oxygen to the production of energy.

Learning Plan

- Preview the essential questions and connect to the learning throughout the unit.
- Discussion on the events of breathing.
- Distinguish the difference between respiration and cellular respiration.

- Describe how the respiratory system is a pathway that carries materials to the lungs.
- Describe how the lungs bring oxygen to cells and remove carbon dioxide.
- Discuss how the cardiovascular system helps to transport all the materials needed from these systems around the body
- Identify the two categories of the digestive system
- Define the six processes of digestion.
- Explain how the urinary system filters the blood and removes waste materials.
- Describe how the urinary system maintains an acid-base balance in the body.

Assessment

- demonstrate a clear understanding of how the respiratory system brings oxygen into the bloodstream and removes metabolic waste-Benchmark
- describe the structural features of the lung- Formative Assessment
- analyze and sketch the organs of the respiratory system- Benchmark
- research- research and present project on the effects of smoking- Summative Assessment
- create a flow chart describing the six processes of digestion-Formative Assessment
- identify the function of the accessory organs in the digestive system-Formative Assessment
- define filtration, absorption, and secretion-Summative Assessment
- analyze and label the structures of the kidneys- Summative Assessment
- unit test -Summative Assesment
- unit quizzes - Formative Assessment
- group project identifying the different types metabolism and how metabolic waste is removed- Alternative Assessment

Materials

-THE HUMAN BODY-CONCEPTS-book

-Skeleton Model and Skull Model

-Brain Model

-Model of the upper body

-Model of the digestive system

-Posters of body systems

Modifications

https://docs.google.com/spreadsheets/d/1E_I0eIDeaF6WtKTNCenA8E5bPhmPn27MEY8IaxsRoCU/edit?usp=sharing