

HUMAN PHYSIOLOGY STANDARDS AND BENCHMARKS 2013-2014

STANDARDS:

- **Standard 1:** Scientific Investigation – Discover, invent, and investigate using the skills necessary to engage in the scientific process.
- **Standard 2:** Nature of Science – Understand that science, technology, and society are interrelated.
- **Standard 3:** Structure and Function —Understand cells, tissues, and orientation.
- **Standard 4:** Organ Systems—Understand the functions of various organ systems.
- **Standard 5:** Interdependence of Body Systems—Understand the interdependence of body systems and the hazards associated with system failure and aging.

BENCHMARKS FOR STANDARDS:

Standard 1:

- BS.1.1 Describe how a testable hypothesis may need to be revised to guide a scientific investigation
- BS.1.2 Design and safely implement an experiment, including the appropriate use of tools and techniques to organize, analyze, and validate data
- BS.1.3 Defend and support conclusions, explanations, and arguments based on logic, scientific knowledge, and evidence from data
- BS.1.4 Determine the connection(s) among hypotheses, scientific evidence, and conclusions
- BS.1.5 Communicate the components of a scientific investigation, using appropriate techniques
- BS.1.7 Revise, as needed, conclusions and explanations based on new evidence
- BS.1.8 Describe the importance of ethics and integrity in scientific investigation
- BS.1.9 Explain how scientific explanations must meet a set of established criteria to be considered valid

Standard 2:

- BS.2.1 Explain how scientific advancements and emerging technology have influenced society
- BS.2.2 Compare the risks and benefits of potential solutions to technological issues

Standard 3:

- BS.3.1 Analyze, using evidence, the process of cellular division as it relates to human physiology
- BS. 3.2 Explain how cells, tissues, and organs maintain homeostasis through cellular transport mechanisms
- BS. 3.3 Classify the various types of human tissue (e.g., muscle, epithelial, connective, nervous) by structure and function
- BS. 3.4 Use correct terminology (e.g., proximal, dorsal, medial, lateral, visceral, superficial, deep) to describe the orientation of body parts and regions

Standard 4:

- BS. 4.1 Evaluate the function of the various structures within the circulatory system in transportation and cellular support
- BS. 4.2 Determine the function of the various structures of the respiratory system in gas exchange
- BS. 4.3 Evaluate the structure and function of the digestive system in transportation and absorption of nutrients
- BS. 4.4 Explain how the excretory system regulates body wastes
- BS. 4.5 Explain how the muscular system functions (e.g., locations, origins, insertions, muscle groups, types of muscles)
- BS. 4.6 Explain how the skeletal system functions to support and protect the body

- BS. 4.7 Relate the structure of the integumentary system to its functions
- BS. 4.8 Trace and describe the pathway of a neural impulse
- BS. 4.9 Explain how the central nervous system functions in regulating physiological activities
- BS. 4.10 Describe the relationship between the peripheral nervous system and how the body responds to maintain a stable internal environment
- BS. 4.11 Compare the reproductive organs in the male and female body in terms of structure and function
- BS. 4.12 Determine the role of the reproductive system in human growth and development
- BS. 4.13 Trace the development of a human from the formation of gametes, fertilization, embryonic development, and gestation
- BS. 4.14 Determine the role of hormones and feedback loops in bodily functions

Standard 5:

- BS. 5.1 Analyze the interdependence of various body systems to each other
- BS. 5.2 Determine the relationship between the skeletal and muscular systems
- BS. 5.3 Identify potential system failures due to the effects of aging
- BS. 5.4 Explain how a disorder in any major organ system affects normal body function