

## Anatomy and Physiology

Anatomy High School standards should address the following topics: the levels of organization in the body, and the structure and function of all cells, tissues and organs that make up 11 major body systems, including skin and body membranes, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, excretory, and reproductive systems. Students should understand the interactions of each organ system with each other, as well as the disorders and imbalances that can affect all body systems.

Topic/ Unit: Chapter 1- AN ORIENTATION TO THE BODY

Standard 1.1 Anatomy and Physiology definitions and the relationships between the two topics

Concept The structure and function of organs determines their relationship within an organism

Assessment The branch of biological science that determines how organs function is termed \_\_\_\_\_.

Activity TBA

Resources Text, overhead, video

Standard 1.2 Levels of structural organization in the body

Concept The human body exhibits many levels of structural complexity

Assessment What is an organ?

Activity TBA

Resources Text, overhead

Standard 1.3 11 organ systems and the major functions of each

Concept Each of the 11 organ systems is equally important at keeping an organism alive.

Activity Lab- Organ Systems Overview

Assessment Elimination of metabolic wastes is a function of the \_\_\_\_\_ system.

Resources Text, overhead, video, human torso model

Standard 1.4 Maintaining life in the human organism

Concept List the functions that humans must perform to maintain life, and the survival needs of the human body

Assessment The force exerted on the body by the weight of air is termed \_\_\_\_\_.

Activity TBA

Resources text, overhead, video

Standard 1.5 Maintaining homeostasis in the body

Concept The body functions interact to maintain a relatively stable internal environment via homeostatic control mechanisms as a closed loop system

Assessment The control mechanism that responds to a stimulus by decreasing its intensity is called a \_\_\_\_\_ mechanism.

Activity TBA

Resources text, overhead, video

Standard 1.6 Anatomical positions and surface anatomy

Concept regional, directional, body planes, sections, and cavities

Assessment The right and left iliac regions are lateral to the \_\_\_\_\_ region.

Activities LAB- The Language of Anatomy  
Resources Text, overheads, video, human torso model

Topic/ Unit Chapter 2- CHEMISTRY OF THE BODY

Chemistry is introduced to the subject of anatomy and physiology as a way to demonstrate the importance of physical reactions in chemistry as they pertain to the body as well as biochemical metabolic pathways in physiology.

Standard 2.1 Matter in body systems

Concept Matter can take on different forms in the body and can undergo physical and chemical changes. Additionally, there are four elements that form the majority of matter in living things- C, H, O, and N

Assessment Describe an example of a chemical change in the digestive system.

Activity TBA

Resource text, overhead, video

Standard 2.2 Patterns of chemical reactions- synthesis, decomposition, exchange

Concept Chemical reactions involve the creating or breaking of bonds in one of three recognizable patterns in the body- synthesis reactions, exchange reactions, and decomposition reactions.

Assessment  $AB + CD \rightarrow AD + BC$  is an example of a \_\_\_\_\_ reaction,

Activity N/A

Resource text, overhead, video

Standard 2.3 Chemical composition of living matter

Concept There are inorganic compounds that make up body weight and essential for necessary life functions such as acids and bases, salts, water

Concept There are organic compounds that make up body weight and are essential for necessary life functions categorized as carbohydrates, lipids, proteins, nucleic acids, and ATP.

Assessment Cellular cytoplasm consists mainly of \_\_\_\_\_.

Activity N/A

Resource text, overhead, video

Topic/ Unit Chapter 3- CELLS AND TISSUES

Cells carry out all the chemical activities needed to sustain life. All body cells have a specific structure and function that makes them distinctive. The four types of tissues found in the body provide for a division of labor among body cells. The arrangement of tissues in an organ determines its structure and function.

Standard 3.1 Anatomy of generalized animal cell

Concept Relate the three major cell regions (nucleus, cytoplasm, and cell membrane) to a cell model, and describe them and list the function of each as well as all organelles of a generalized animal cell.

Assessment Which of the following is NOT true about the cell membrane:

- it consists of 2 lipid bilayers
- its lipid components are primarily phospholipids and cholesterol
- it contains proteins for specialized functions
- it allows water-soluble materials to pass through easily

Activity LAB- The Cell- Anatomy and Division

Resource	Text, overhead transparencies slides of cell/slide projector, microscope, cell slides, cell model.
Standard 3.2	The physiology of cells
Concept	Most cells have the ability to metabolize nutrients, digest foods, dispose of wastes, reproduce, grow, move, and respond to a stimulus. Many of these functions rely on the actions of membrane transport, protein synthesis, and cell division.
Assessment	A solution that contains a greater amount of solutes than a cell is considered a _____ solution: <ul style="list-style-type: none"> <li>a. hypotonic</li> <li>b. hypertonic</li> <li>c. isotonic</li> <li>d. interstitial</li> </ul>
Activity	LAB- Cell Membrane and Transport Mechanisms
Resource	Text, overhead transparencies, lab demonstrations
Standard 3.3	Diversity of cells in the body
Concept	The trillions of cells in the human body consist of 200 unique types that vary greatly in size, shape, and function. The shape of cells as well as the abundance of various organelles relate to their function in the body.
Assessment	Which example demonstrates a cell that fights disease: <ul style="list-style-type: none"> <li>a. oocyte</li> <li>b. adipocyte</li> <li>c. macrophage</li> <li>d. osteocyte</li> </ul>
Activity	LAB- Classification of Cells
Resource	Text, overhead transparencies, slides/slide projector
Standard 3.4	Tissues are groups of cells that are similar in structure and function
Concept	The four major types of tissues- epithelial, connective, nervous, and muscle- act to cover, support, move and control the body
Assessment	Which tissue type forms the connective tissue layer beneath the skin? <ul style="list-style-type: none"> <li>a. osseous</li> <li>b. adipose</li> <li>c. nervous</li> <li>d. vascular</li> </ul>
Activities	LAB- Classification of Tissues
Resource	Text, overhead transparencies, slides/slide projector