



Anatomy and Physiology Teaching & Learning Framework

Unit 1 2 weeks BL/4 weeks yr	Unit 2 3 weeks BL/6 wks yr	Unit 3 2 weeks BL/4 weeks yr	Unit 4 2 weeks BL/4 weeks yr	Unit 5 2 weeks BL/4 weeks yr	Unit 6 2 weeks BL/4 weeks yr	SLO Exam	Unit 7: 3 weeks BL/6 wks yr
Unit 1: Body Organization and Tissues SAP1	Unit 2: Protection, Support, Movement SAP2, SAP4	Unit 3: Nervous & Endocrine System SAP3	Unit 4: Cardiovascular & Respiratory System SAP4	Unit 5: Immune System SAP4	Unit 6: Digestive and Urinary Systems SAP4		Unit 7: Reproductive System SAP5
<p>SAP1. Students will analyze anatomical structures in relationship to their physiological functions.</p> <p>a. Apply correct terminology when explaining the orientation of body parts and regions.</p> <p>b. Investigate the interdependence of the various body systems to each other and to the body as a whole.</p> <p>c. Explain the role of homeostasis and its mechanisms as these relate to the body as a whole and predict the consequences of the failure to maintain homeostasis.</p> <p>d. Relate cellular metabolism and transport to homeostasis and cellular reproduction.</p> <p>e. Describe how structure and function are related in terms of cell and tissue types.</p>	<p>SAP2. Students will analyze the interdependence of the integumentary, skeletal, and muscular systems as these relate to the protection, support and movement of the human body.</p> <p>a. Relate the structure of the integumentary system to its functional role in protecting the body and maintaining homeostasis.</p> <p>b. Explain how the skeletal structures provide support and protection for tissues, and function together with the muscular system to make movements possible.</p> <p>SAP4e-Describe the effects of aging on body systems.</p>	<p>SAP3. Students will assess the integration and coordination of body functions and their dependence on the endocrine and nervous systems to regulate physiological activities.</p> <p>a. Interpret interactions among hormones, senses, and nerves which make possible the coordination of functions of the body.</p> <p>b. Investigate the physiology of electrochemical impulses and neural integration and trace the pathway of an impulse, relating biochemical changes involved in the conduction of the impulse.</p> <p>c. Describe how the body perceives internal and external stimuli and responds to maintain a stable internal environment, as it relates to biofeedback.</p>	<p>SAP4. Students will analyze the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.</p> <p>b. Analyze, and explain the relationships between the respiratory and cardiovascular systems as they obtain oxygen needed for the oxidation of nutrients and removal of carbon dioxide.</p> <p>d. Examine various conditions that change normal body functions (e.g. tissue rejection, allergies, injury, diseases and disorders) and how the body responds.</p> <p>e. Describe the effects of aging on body systems.</p>	<p>SAP4. Students will analyze the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.</p> <p>d. Examine various conditions that change normal body functions (e.g. tissue rejection, allergies, injury, diseases and disorders) and how the body responds.</p> <p>e. Describe the effects of aging on body systems.</p>	<p>SAP4. Students will analyze the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.</p> <p>What role does metabolism play in digestion? What is the function of the kidneys? What is urine composed of? What is the structure and function of the bladder, ureters, and urethra?</p>		<p>SAP5. Students will analyze the role of the reproductive system as it pertains to the growth and development of humans.</p> <p>a. Explain how the functions of the reproductive organs are regulated by hormonal interactions.</p> <p>b. Describe the stages of human embryology and gestation including investigation of gestational and congenital disorders, miscarriage, cleft palate, hydrocephaly, fetal alcohol syndrome).</p> <p>c. Describe the stages of development from birth to adulthood (i.e. neonatal period, infancy, childhood, adolescence and puberty, & maturity).</p>



Anatomy and Physiology Standards

The Georgia Standards of Excellence are designed to provide students with the knowledge and skills for proficiency in science. The Project 2061's *Benchmarks for Science Literacy* is used as the core of the curriculum to determine appropriate content and process skills for students. The GPS is also aligned to the National Research Council's *National Science Education Standards*. Technology is infused into the curriculum. The relationship between science, our environment, and our everyday world is crucial to each student's success and should be emphasized.

The Georgia Standards of Excellence should drive instruction. Hands-on, student-centered, and inquiry-based approaches should be the emphasis of instruction. This curriculum is intended as a required curriculum that would show proficiency in science, and instruction should extend beyond the curriculum to meet the student needs.

The hands-on nature of the science curriculum standards increases the need for teachers to use appropriate precautions in the laboratory and field. The guidelines for the safe use, storage, and disposal of chemicals must be observed. Safety of the student should always be foremost in science instruction.

Science consists of a way of thinking and investigating and includes a growing body of knowledge about the natural world. To become literate in science, therefore, students need to acquire understandings of both the Characteristics of Science and its Content. The Georgia Performance Standards for Science require that instruction be organized so that these are treated together. Therefore, A CONTENT STANDARD IS NOT MET UNLESS APPLICABLE CHARACTERISTICS OF SCIENCE ARE ALSO ADDRESSED AT THE SAME TIME. For this reason, they are presented as co-requisites.

Anatomy and Physiology

Co-Requisite – Content

SAP1. Students will analyze anatomical structures in relationship to their physiological functions.

- a. Apply correct terminology when explaining the orientation of body parts and regions.
- b. Investigate the interdependence of the various body systems to each other and to the body as a whole.
- c. Explain the role of homeostasis and its mechanisms as these relate to the body as a whole and predict the consequences of the failure to maintain homeostasis.
- d. Relate cellular metabolism and transport to homeostasis and cellular reproduction.
- e. Describe how structure and function are related in terms of cell and tissue types.

SAP2. Students will analyze the interdependence of the integumentary, skeletal, and muscular systems as these relate to the protection, support and movement of the human body.

- a. Relate the structure of the integumentary system to its functional role in protecting the body and maintaining homeostasis.
- b. Explain how the skeletal structures provide support and protection for tissues, and function together with the muscular system to make movements possible.

SAP3. Students will assess the integration and coordination of body functions and their dependence on the endocrine and nervous systems to regulate physiological activities.



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- a. Interpret interactions among hormones, senses, and nerves which make possible the coordination of functions of the body.
- b. Investigate the physiology of electrochemical impulses and neural integration and trace the pathway of an impulse, relating biochemical changes involved in the conduction of the impulse.
- c. Describe how the body perceives internal and external stimuli and responds to maintain a stable internal environment, as it relates to biofeedback.

SAP4. Students will analyze the physical, chemical, and biological properties of process systems as these relate to transportation, absorption and excretion, including the cardiovascular, respiratory, digestive, excretory and immune systems.

- a. Describe the chemical and physical mechanisms of digestion, elimination, transportation, and absorption within the body to change food and derive energy.
- b. Analyze and explain the relationships between the respiratory and cardiovascular systems as they obtain oxygen needed for the oxidation of nutrients and removal of carbon dioxide.
- c. Relate the role of the urinary system to regulation of body wastes (i.e. water electrolyte balance, volume of body fluids).
- d. Examine various conditions that change normal body functions (e.g. tissue rejection, allergies, injury, diseases and disorders) and how the body responds.
- e. Describe the effects of aging on body systems.

SAP5. Students will analyze the role of the reproductive system as it pertains to the growth and development of humans.

- a. Explain how the functions of the reproductive organs are regulated by hormonal interactions.
- b. Describe the stages of human embryology and gestation including investigation of gestational and congenital disorders (e.g. ectopic pregnancy, miscarriage, cleft palate, hydrocephaly, fetal alcohol syndrome).
- c. Describe the stages of development from birth to adulthood (i.e. neonatal period, infancy, childhood, adolescence and puberty, and maturity).

Co-Requisite – Characteristics of Science Habits of Mind

SCSh1. Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

- a. Exhibit the above traits in their own scientific activities.
- b. Recognize that different explanations often can be given for the same evidence.
- c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

SCSh2. Students will use standard safety practices for all classroom laboratory and field investigations.

- a. Follow correct procedures for use of scientific apparatus.
- b. Demonstrate appropriate technique in all laboratory situations.
- c. Follow correct protocol for identifying and reporting safety problems and violations.

SCSh3. Students will identify and investigate problems scientifically.

- a. Suggest reasonable hypotheses for identified problems.
- b. Develop procedures for solving scientific problems.
- c. Collect, organize, and record appropriate data.
- d. Graphically compare and analyze data points and/or summary statistics.



- e. Develop reasonable conclusions based on data collected.
- f. Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.

SCSh4. Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.

- a. Develop and use systematic procedures for recording and organizing information.
- b. Use technology to produce tables and graphs.
- c. Use technology to develop, test, and revise experimental or mathematical models.

SCSh5. Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.

- a. Trace the source on any large disparity between estimated and calculated answers to problems.
- b. Consider possible effects of measurement errors on calculations.
- c. Recognize the relationship between accuracy and precision.
- d. Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.
- e. Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.

SCSh6. Students will communicate scientific investigations and information clearly.

- a. Write clear, coherent laboratory reports related to scientific investigations.
- b. Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.
- c. Use data as evidence to support scientific arguments and claims in written or oral presentations.
- d. Participate in group discussions of scientific investigation and current scientific issues.

The Nature of Science

SCSh7. Students analyze how scientific knowledge is developed. Students recognize that:

- a. The universe is a vast single system in which the basic principles are the same everywhere.
- b. Universal principles are discovered through observation and experimental verification.
- c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.
- d. Hypotheses often cause scientists to develop new experiments that produce additional data.
- e. Testing, revising, and occasionally rejecting new and old theories never ends.

SCSh8. Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:

- a. Scientific investigators control the conditions of their experiments in order to produce valuable data.
- b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.
- c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.
- d. The merit of a new theory is judged by how well scientific data are explained by the new theory.



SCIENCE

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- e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.
- f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.

SCSh9. Students will enhance reading in all curriculum areas by:

a. Reading in all curriculum areas

- Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
- Read both informational and fictional texts in a variety of genres and modes of discourse.
- Read technical texts related to various subject areas.

b. Discussing books Discuss messages and themes from books in all subject areas.

- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing. Recognize the features of disciplinary texts.

c. Building vocabulary knowledge

- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.