

Science Georgia Standards of Excellence
SCIENCE - Human Anatomy & Physiology

The Science Georgia Standards of Excellence are designed to provide foundational knowledge and skills for all students to develop proficiency in science. The Project 2061's *Benchmarks for Science Literacy* and the follow up work, *A Framework for K-12 Science Education* were used as the core of the standards to determine appropriate content and process skills for students. The Science Georgia Standards of Excellence focus on a limited number of core disciplinary ideas and crosscutting concepts which build from Kindergarten to high school. The standards are written with the core knowledge to be mastered integrated with the science and engineering practices needed to engage in scientific inquiry and engineering design. Crosscutting concepts are used to make connections across different science disciplines.

The Science Georgia Standards of Excellence drive instruction. Hands-on, student-centered, and inquiry-based approaches should be the emphasis of instruction. The standards are a required minimum set of expectations that show proficiency in science. However, instruction can extend beyond these minimum expectations to meet student needs.

Science consists of a way of thinking and investigating, as well a growing body of knowledge about the natural world. To become literate in science, students need to possess sufficient understanding of fundamental science content knowledge, the ability to engage in the science and engineering practices, and to use scientific and technological information correctly. Technology should be infused into the curriculum and the safety of the student should always be foremost in instruction.

Human anatomy and physiology is designed to continue student investigations that began in grades K-8 and high school biology. This curriculum is extensively performance and laboratory based. It integrates the study of the structures and functions of the human body, however rather than focusing on distinct anatomical and physiological systems (respiratory, nervous, etc.) instruction should focus on the essential requirements for life. Areas of study include organization of the body; protection, support and movement; providing internal coordination and regulation; processing and transporting; and reproduction, growth and development. Whenever possible, careers related to medicine, research, healthcare and modern medical technology should be emphasized throughout the curriculum. Case studies concerning diseases, disorders and ailments (i.e. real-life applications) should be emphasized.

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SAP1. Obtain, evaluate, and communicate information to analyze anatomical structures of the human body.

- a. Develop and use models to demonstrate the orientation of structures and regions of the human body.
- b. Construct an explanation about the relationship between a body structure (i.e., cells, tissues, organs, and organ systems) and its function within the human body.

SAP2. Obtain, evaluate, and communicate information to analyze the structure and function of the integumentary, skeletal, and muscular systems.

- a. Construct an explanation about the relationship between the structures of the integumentary system and their role in protection, eliminating waste products, and regulating body temperature.
- b. Develop and use models to relate the structure of the skeletal system to its functional role in movement, protection, and support.
- c. Develop and use models to determine the relationship between structures of the muscular system and their role in movement and support.
- d. Ask questions about how the interdependence of the integumentary, skeletal, and muscular systems makes support, protection, and movement possible.

(Clarification statement: Questions should address the homeostatic mechanisms, as well as the effects of and responses to aging, diseases, and disorders).

SAP3. Obtain, evaluate, and communicate information to explain the coordination of information processing in the endocrine and nervous systems.

- a. Ask questions to investigate how the structures of the nervous system support the function of information processing (detection, interpretation, and response).
- b. Analyze and interpret data to explain how the hormones of the endocrine system regulate physical and chemical processes to maintain a stable internal environment.

(Clarification statement: This should include positive and negative feedback mechanisms, e.g. heart rate, blood sugar, childbirth, temperature, growth, etc.)

- c. Ask questions about how the interdependence of the endocrine and nervous systems makes information processing (detection, interpretation and response) possible.

(Clarification statement: Questions should address the homeostatic mechanisms, as well as the effects of and responses to aging, diseases, and disorders).

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SAP4. Obtain, evaluate, and communicate information to analyze the processing of matter and energy in the cardiovascular, respiratory, digestive and urinary systems.

- a. Plan and carry out an investigation to explore the structures and role of the cardiovascular and respiratory systems in obtaining oxygen, transporting nutrients, and removing waste.
- b. Develop and use models to explain the relationship between the structure and function of the digestive and urinary systems as they utilize matter to derive energy and eliminate waste.
- c. Ask questions about the interdependence of the cardiovascular, respiratory, urinary and digestive systems.

(Clarification statement: Questions should address the homeostatic mechanisms, as well as the effects of and responses to aging, diseases, and disorders).

SAP5. Obtain, evaluate, and communicate information to analyze the role of the reproductive system as it pertains to the growth and development of humans.

- a. Ask questions to gather and communicate information about how the structures of the reproductive system allow for production of egg and sperm, fertilization, and the development of offspring.

(Clarification statement: Regulation of the functions by hormones should be addressed in this standard.)

- b. Develop and use models to describe the stages of human embryology and gestation.
- c. Ask questions about how the reproductive system makes growth and development possible.

(Clarification statement: Questions should address the homeostatic mechanisms, as well as the effects of and responses to aging, diseases, and disorders).