



**CAREER & TECHNICAL
EDUCATION**

HIGH SCHOOL SPORTS MEDICINE 1 ANATOMY & PHYSIOLOGY

ACADEMIC & PROFESSIONAL SKILLS STANDARDS

CATALINA FOOTHILLS SCHOOL DISTRICT

Approved by the Governing Board

May 24, 2018

STANDARDS FOR SPORTS MEDICINE 1

ANATOMY & PHYSIOLOGY

Grades: 10-12

Anatomy & Physiology: Sports Medicine 1 introduces students to the basics of sports medicine and rehabilitation therapies. It is a hands-on inquiry-based laboratory course that helps students discover the wonders of the human body. The structures and functions of the major body systems will be explored from a subcellular level to a multi-cellular organism level. Students will gain extensive knowledge of the human body through lecture, research and reading, and laboratory investigations, including two major dissections. They will learn the basics of anatomy and physiology, CPR, first aid, types and prevention of sports-related injuries, and rehabilitation. Students will also explore medical and allied healthcare careers. This course is a good introduction for students who are interested in a career in any healthcare pathway.

SCIENTIFIC INQUIRY

- SP1-A-P.1.1 Apply the essential skills of scientific inquiry to develop knowledge and understanding of scientific ideas and how scientists study the natural world.
 - Ask or respond to scientifically-oriented questions.
 - Develop a testable question or hypothesis based upon evidence of scientific principles, probability and/or modeling appropriate to the scientific domain being investigated.
 - Formulate explanations based on evidence.
 - Connect explanations to scientific knowledge.
 - Communicate and justify explanations.
- SP1-A-P.1.2 Describe and be able to use tools related to investigation of anatomy and physiology (required: (i.e. scalpels, probes, forceps, scissors (sharp and blunt), blood pressure cuff, stethoscopes, Vernier equipment).
- SP1-A-P.1.3 Perform labs and dissections in a safe manner, selecting appropriate tools and equipment.

SYSTEMS THINKING

- SP1-A-P.1.1 Explain how a system's components change over time (for example: human development) (Change Over Time).
- SP1-A-P.2.2 Explain the causal relationships in a system as being either positive or negative feedback relationships (for example: hormonal regulation) (Interdependencies).
- SP1-A-P.2.3 Explain reasons why specific behaviors result from the organization of a system (for example: effect of neural transmitters on human behavior) (System-as-Cause).

MACROMOLECULES

- SP1-A-P.3.1 Compare the properties and functions of proteins, lipids, nucleic acids, carbohydrates, water, atoms, molecules, macromolecules.
- SP1-A-P.3.2 Describe the spatial relationship and interaction of an organism's components from atom to organism.
- SP1-A-P.3.3 Describe the nutritional concepts used to evaluate dietary intake and physical composition (for example: 6 basic components of food [proteins, carbohydrates, fats, vitamins, minerals, water]).
- SP1-A-P.3.4 Explain nutritional concepts in relation to basic nutrient caloric intake.

- SP1-A-P.3.5 Explain nutrition and exercise as related to special populations (for example: diabetics, vegetarianism, and athletes who gain and lose weight).

HISTOLOGY

- SP1-A-P.4.1 Compare tissue types, structures and functions (epithelial, connective, muscular, nervous).
- SP1-A-P.4.2 Classify tissue types.
- SP1-A-P.4.3 Compare fiber types (collagen, elastic, reticular).
- SP1-A-P.4.4 Explain the purpose of each tissue in areas throughout the body.

DISEASE AND DISORDERS

- SP1-A-P.5.1 Explain the effects of diseases and disorders on a part, system and/or organism as a whole.
- SP1-A-P.5.2 Connect the effects of a disease or disorder to various systems and their reactions.
- SP1-A-P.5.3 Apply genetic effects on the overall performance of body systems.

ORGANIZATION AND HOMEOSTASIS

- SP1-A-P.6.1 Infer the function of a body part (organ, tissue, etc.) based on its structure.
- SP1-A-P.6.2 Explain the interaction of the components within a body system and between systems to maintain homeostasis.
- SP1-A-P.6.3 Determine the effects of disorders or malfunctions of a body part on the homeostasis of the part, system and/or organism.
- SP1-A-P.6.4 Describe how organs can perform functions in multiple body systems.
- SP1-A-P.6.5 Explain cause, signs, symptoms, and treatment of environmentally-related emergencies (e.g., effects of heat and cold).

MEDICAL TERMINOLOGY

- SP1-A-P.7.1 Compare terms based on their context within the body system.
- SP1-A-P.7.2 Use anatomical terms correctly based on information provided.
- SP1-A-P.7.3 Define terms associated with disease and body systems.
- SP1-A-P.7.4 Determine locations of organs, symptoms, etc., using directional terms, planes and sections.

PROTECTION, SUPPORT, AND MOVEMENT: INTEGUMENTARY SYSTEM

- SP1-A-P.8.1 Analyze the pathologies of the integumentary system and how the system works to repair itself.
- SP1-A-P.8.2 Relate the structures of the integumentary system to maintenance of body temperature and safe boundaries.
- SP1-A-P.8.3 Explain the effects of the sun and aging on the integumentary system.

PROTECTION, SUPPORT, AND MOVEMENT: SKELETAL SYSTEM

- SP1-A-P.9.1 Apply the functions of bone cells to the formation, growth and remodeling of bone tissue.
- SP1-A-P.9.2 Differentiate variations in skeletal structure between male and females and age-related changes.
- SP1-A-P.9.3 Categorize joint types based on their range of motion.
- SP1-A-P.9.4 Explain how bone structure relates to the five functions of bone (support, protection, movement, storage and blood cell formation).
- SP1-A-P.9.5 Construct a skeleton based on an understanding of bone type and function.
- SP1-A-P.9.6 Describe the purpose of various compounds and minerals in bone formation (for example: calcium, vitamins).

PROTECTION, SUPPORT, AND MOVEMENT: MUSCULAR SYSTEM

- SP1-A-P.10.1 Explain anabolic and catabolic processes involved in exercise, muscle growth and atrophy.
- SP1-A-P.10.2 Outline the sliding filament theory and its key structures.
- SP1-A-P.10.3 Apply understanding of muscle types to the functioning of various organs.
- SP1-A-P.10.4 Describe key structures and events that take place within the neuromuscular junction.

INTEGRATION AND REGULATION: SPECIAL SENSES

- SP1-A-P.11.1 Explain the physiological basis of olfactory (smell) and gustatory (taste) discrimination.
- SP1-A-P.11.2 Articulate the roles of the structures of the ear in hearing and equilibrium.
- SP1-A-P.11.3 Explain the functions of the internal and accessory structures of the eye.
- SP1-A-P.11.4 Outline the pathways of the senses to the brain.

INTEGRATION AND REGULATION: ENDOCRINE SYSTEM

- SP1-A-P.12.1 Describe how hormones help to maintain homeostasis.
- SP1-A-P.12.2 Differentiate between the actions of steroid hormones and nonsteroid hormones.
- SP1-A-P.12.3 Explain negative feedback and its role in regulating blood levels of hormones.

INTEGRATION AND REGULATION: CARDIOVASCULAR SYSTEM

- SP1-A-P.13.1 Explain the pathway of blood flow through the cardiovascular system.
- SP1-A-P.13.2 Compare the types of blood vessels based on their structure and function.
- SP1-A-P.13.3 Explain the function(s) of the heart valves.
- SP1-A-P.13.4 Apply knowledge of diffusion to gas exchange through the body.
- SP1-A-P.13.5 Perform simulations of standard tests used in blood type identification and determine the correct blood type.
- SP1-A-P.13.6 Summarize blood cell formation and disorders that can increase or decrease the number of cells produced.

INTEGRATION AND REGULATION: LYMPHATIC SYSTEM AND BODY DEFENSES

- SP1-A-P.14.1 Describe the functions of the structures of the lymphatic system.
- SP1-A-P.14.2 Explain the functional relationship between the lymphatic system and the cardiovascular and immune systems.
- SP1-A-P.14.3 Describe the role of white blood cells, antigens and antibodies in the immune response.
- SP1-A-P.14.4 Describe the mechanism of a vaccination.

INTEGRATION AND REGULATION: DIGESTIVE SYSTEM

- SP1-A-P.15.1 Describe the function of the six basic nutrients (carbohydrates, protein, lipids, water, vitamins, minerals).
- SP1-A-P.15.2 Describe the enzymatic breakdown of food substrates and where this process occurs in the body.
- SP1-A-P.15.3 Explain how the microvilli, villi, lacteals, and capillaries work together in absorption in the small intestine.

INTEGRATION AND REGULATION: RESPIRATORY SYSTEM

- SP1-A-P.16.1 Apply knowledge of diffusion to explain the pathway of gas exchange between the blood and the lungs, and the blood and the body tissues (internal vs. external respiration).
- SP1-A-P.16.2 Explain the key phases involved in inhalation and exhalation.

FIRST AID AND CPR

- SP1-A-P.17.1 Assess vital signs (normal vs abnormal) (for example: pulse, respirations, skin, pupils, blood pressure).
- SP1-A-P.17.2 Perform CPR (cardiopulmonary respiration) and AED (automated external defibrillator) procedures for infants, children, and adults.
- SP1-A-P.17.3 Demonstrate safety and infection control:
 - Describe how to maintain a safe and sanitary treatment area, including the use of disinfectants, antiseptics, and sanitization techniques.
 - Identify body fluids that require universal precaution.
 - Use guidelines for universal precautions to avoid contact with body fluids (for example: use of Personal Protective Equipment PPE).
 - Describe how to dispose of wound care cleaning supplies and sharps.
 - Use proper hand-washing techniques.
- SP1-A-P.17.4 Describe common open and closed skin wounds, including controlled bleeding control techniques (e.g., abrasions, incisions, lacerations, punctures, and blisters).

PROFESSIONAL SKILLS: PROFESSIONALISM & ORGANIZATIONAL CULTURE

- SP1-A-P.18.1 Demonstrate professionalism in the workplace (being on time, proper dress, courteousness).
 - Follow protocol(s) related to behavior, appearance, and other expectations.
 - Explain the importance of “dress for success.”
- SP1-A-P.18.2 Represent the school [or organization] in a positive manner, demonstrating the school’s [or organization’s] mission and core values.

- Communicate the mission and core values of the school [or organization].
 - Perform work with a positive attitude.
- SP1-A-P.18.3 Demonstrate respect for personal and professional boundaries (distinguish between personal and work-related matters).
 - Distinguish between personal and work-related matters.
- SP1-A-P.18.4 Interact respectfully with others (cross-cultural, intergenerational, individuals with disabilities); act with integrity.
 - Address challenges with sensitivity.
- SP1-A-P.18.5 Produce high quality work that reflect professional pride and contributes to organizational success.
 - Create work products in a timely manner that are high quality and positively represent the organization.
- SP1-A-P.18.6 Take initiative to develop skills and improve work performance.
 - Identify and apply strategies to improve my performance.

PROFESSIONAL SKILLS: COMPLEX COMMUNICATION (TRADITIONAL AND DIGITAL)

- SP1-A-P.19.1 Communicate effectively in preparation for a diverse work environment (required: style, format, and medium appropriate to audience/culture/generation, purpose and context; accuracy; use of appropriate technical/industry language; to resolve conflicts; address intergenerational differences/challenges; persuade others).
 - Use appropriate verbal and nonverbal modes of communication.
 - Address communications in a style that is appropriate to the audience and situation.
 - Respond in a timely manner to communications.
- SP1-A-P.19.2 Use documentation (for example: itineraries and schedules) to plan and meet client needs.
- SP1-A-P.19.3 Use appropriate technologies and social media to enhance or clarify communication.
 - Use professional etiquette and follow applicable laws and regulations for web-, email-, and social media-based communications.
 - Verify the accuracy of information and authority of sources.
- SP1-A-P.19.4 Use a variety of interpersonal skills, including tone of voice and appropriate physical gestures (for example: eye contact, facing the speaker, active listening) during conversations and discussions to build positive rapport with others.
 - Demonstrate appropriate active listening skills.
- SP1-A-P.19.5 Pose and respond to questions, building upon others' ideas in order to enhance the discussion; clarify, verify, or challenge ideas and conclusions with diplomacy.
 - Ask questions to obtain accurate information.

PROFESSIONAL SKILLS: SELF-INITIATIVE AND SELF-DIRECTION

- SP1-A-P.20.1 Apply the skills and mindset of self-direction/self-regulation to accomplish a task or project.
 - Establish priorities and set challenging, achievable goals.
 - Create a plan with specific timelines for completion to achieve the goals.
 - Take initiative to select strategies, resources and/or learning opportunities to accomplish the task(s) in the plan.
 - Identify the success criteria/metrics to determine the effectiveness of the outcome for each goal.
 - monitor progress/productivity and self-correct during the learning process.
- SP1-A-P.20.2 Select and use appropriate technologies to increase productivity.

- Use appropriate technology tools and resources to create and deliver a product.
- SP1-A-P.20.3 Exercise initiative and leadership (for example: recognize and engage individual strengths, plan for unanticipated changes, pursue solutions/improvements).
 - Reflect upon learning (strengths and weaknesses) and use feedback to modify work or improve performance.
 - Persist when faced with obstacles or challenges.

PROFESSIONAL SKILLS: CRITICAL THINKING AND INNOVATION

- SP1-A-P.21.1 Identify problems and use strategies and resources to innovate and/or devise plausible solutions.
 - Use relevant criteria to eliminate ineffective solutions or approaches and select those that are plausible; put selected alternatives through trials to determine their helpfulness or benefit.
- SP1-A-P.21.2 Take action or make decisions supported by evidence and reasoning.
 - Evaluate sources of evidence, the accuracy and relevance of information, and the strengths of arguments.
 - Demonstrate ethical reasoning and judgment by clearly sharing multiple perspectives on why the proposed course of action is ethically the best decision.
 - Identify factors that affect one's objectivity or rationality (for example: prejudices, disposition, etc.).
 - Use inquiry and reflection to take action.
 - Explain why a proposed course of action is ethically the best decision.
- SP1-A-P.21.3 Transfer knowledge/skills from one situation/context to another.
 - Apply knowledge and skills in new contexts.

PROFESSIONAL SKILLS: COLLABORATION

- SP1-A-P.22.1 Take responsibility for any role on a team and accurately describe and perform the duties of each role, including leadership.
 - Assess project needs and work with a team in a positive manner to create a final project.
 - Build team relationships.
- SP1-A-P.22.2 Integrate diverse ideas, opinions, and perspectives of the team and negotiate to reach workable solutions.
 - Contribute personal strengths to a project.
 - Respect the contributions of others.
 - Utilize technologies that promote collaboration and productivity, as appropriate or needed.
- SP1-A-P.22.3 Prioritize and monitor individual and team progress toward goals, making sufficient corrections and adjustments when needed.
 - Proactively solicit feedback; accept and show appreciation for constructive feedback.
 - Act upon feedback to achieve team goals.
 - Develop a plan for improving individual participation and group productivity.
- SP1-A-P.22.4 Submit high-quality products that meet specifications for assigned tasks.
 - Critique and reflect on individual and collaborative strengths and weaknesses.