

## Treasure Coast Science Scope and Sequence 2012-2013

Course: Anatomy and Physiology Honors    Course Code: 2000360    Quarter: 2A

**Topic(s) of Study:** Skeletal System

**Bodies of Knowledge:** Nature of Science and Life Science

**Standard(s):** 1: Practice of Science, 14: Organization and Development of Living Organisms

**Essential Questions** What are functions of the skeletal system? How are bones formed and maintained? What diseases are associated with this system? What are the factors that can affect personal and public health? : How do scientists design an investigation to answer a scientific question and communicate their findings?

[Syllabus: Click here](#)

[Resources: Click here](#)

[CCSS Literacy Standards: Click here](#)

NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGET
SC.912.L.14.12: Describe the anatomy and histology of bone tissue. Cognitive Complexity: Low	I Skeletal Cartilages A. Basic Structure, Types, and Locations B. Growth of Cartilage	<ul style="list-style-type: none"> <li>Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.</li> <li>Describe the functional properties of the three types of cartilage tissues. (I)</li> <li>Explain how cartilage grows. (I)</li> </ul>
SC.912.L.14.13: Distinguish between bones of the axial skeleton and the appendicular skeleton. Cognitive Complexity: Low	II Classification of Bones A. Two Major Divisions B. Shape 1. Long Bones 2. Short Bones 3. Flat Bones 4. Irregular Bones	<ul style="list-style-type: none"> <li>Name the major regions of the skeleton and describe their relative functions. (II)</li> <li>Compare and contrast the structure of the four bone classes and provide examples of each. (II)</li> </ul>
SC.912.L.14.14: Identify the major bones of the axial and appendicular skeleton. Cognitive Complexity: Low		<ul style="list-style-type: none"> <li>List and describe the five functions of bones. (III)</li> </ul>
SC.912.L.14.15: Identify major markings (such as foramina, fossae, tubercles, etc.) on a skeleton. Explain why these markings are important. Cognitive Complexity: Moderate	III Functions of Bones IV Bone Structure A. Gross Anatomy B. Microscopic Anatomy C. Chemical Composition	<ul style="list-style-type: none"> <li>Describe the functional importance to bone markings. (IV)</li> <li>Describe the gross anatomy of a typical long bone and flat bone. (IV)</li> <li>Describe the histology of compact and spongy bone. (IV)</li> <li>Discuss the chemical composition of bone. (IV)</li> </ul>
SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive	V Bone Development A. Formation of the Bony Skeleton B. Postnatal Bone Growth	<ul style="list-style-type: none"> <li>Compare and contrast intramembranous ossification and endochondral ossification. (V)</li> <li>Compare the location and remodeling functions of the osteoblasts, osteocytes, and osteoclasts. (VI)</li> <li>Describe the steps of fracture repair. (VI)</li> </ul>

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<p>Complexity: High</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> <li>1.pose questions about the natural world,</li> <li>2.conduct systematic observations,</li> <li>3.examine books and other sources of information to see what is already known,</li> <li>4.review what is known in light of empirical evidence,</li> <li>5.plan investigations,</li> <li>6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs),</li> <li>7.pose answers, explanations, or descriptions of events,</li> <li>8.generate explanations that explicate or describe natural phenomena (inferences),</li> <li>9.use appropriate evidence and reasoning to justify these explanations to others,</li> <li>10.communicate results of scientific investigations, and</li> <li>11.evaluate the merits of the explanations produced by others.</li> </ol> <p>Cognitive Complexity: High</p> <p>HE.912.C.1.3: Evaluate how environment and personal health are interrelated.</p>	<p>VI Bone Homeostasis: Remodeling and Repair</p> <p>VII Homeostatic Imbalances of Bones</p> <ol style="list-style-type: none"> <li>A. Osteomalacia and Rickets</li> <li>B. Osteoporosis</li> <li>C. Paget’s Disease</li> </ol> <p>VIII Developmental Aspects of Bones</p> <ol style="list-style-type: none"> <li>A. Embryonic</li> <li>B. At Birth</li> <li>C. Childhood, Young Adults, and Old Age</li> </ol> <p>IX The Axial Skeleton</p> <ol style="list-style-type: none"> <li>A. The Skull</li> <li>B. The Vertebral Column</li> <li>C. The Thoracic Cage</li> </ol> <p>X The appendicular Skeleton</p> <ol style="list-style-type: none"> <li>A. The Pectoral (Shoulder) Girdle</li> <li>B. The Upper Limb</li> <li>C. The Pelvic (Hip) Girdle</li> <li>D. The Lower Limb</li> </ol> <p>XI Joints</p> <p>XII Developmental Aspects of the Skeleton</p>	<ul style="list-style-type: none"> <li>• Contrast the disorders of bone remodeling seen in osteoporosis, osteomalacia, and Paget’s disease. (VII)</li> <li>• Describe the timing and cause of changes in bone architecture and bone mass throughout life. (VIII)</li> <li>• Name the three major parts of the axial and appendicular skeletons and describe their relative positions. (IX, X)</li> <li>• Name, identify, and describe the skull bones. (IX)</li> <li>• Describe the structure of the vertebral column, lists the components, and describe its curvature. (IX)</li> <li>• Name and describe the bones of the thoracic cage. (IX)</li> <li>• Identify bones forming the pectoral girdle and relate their structure and arrangement to the function of this girdle. (X)</li> <li>• Identify important bone markings on the pectoral girdle. (X)</li> <li>• Identify or name the bones of the upper limbs and their important markings. (X)</li> <li>• Name the bones contributing to the os coxae and relate the pelvic girdle’s strength to its function. (X)</li> <li>• Describe the difference in the male and female pelvis and relate these to functional differences. (X)</li> <li>• Identify the lower limb bones and their important markings. (X)</li> <li>• Define fontanelles and indicate their significance. (X)</li> <li>• Name the three major categories of joints and compare the amount of movement allowed by each. (XI)</li> <li>• Describe how skeletal proportions change throughout life. (XII)</li> <li>• Discuss how age-related skeletal changes may affect health. (XII)</li> </ul>
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# Treasure Coast Science Scope and Sequence 2012-2013

Course: Anatomy and Physiology Honors

Course Code: 2000360

Quarter: 2B

**Topic(s) of Study:** Muscular System

**Bodies of Knowledge:** Nature of Science and Life Science

**Standard(s):** 1: Practice of Science, 14: Organization and Development of Living Organisms, 18: Matter and Energy Transformation

**Essential Questions:** Why is the muscular system important? How do muscles contract? What diseases are associated with this system? What are the factors that can affect personal and public health? How do scientists design an investigation to answer a scientific question and communicate their findings?

[Concept Map\(s\): Click here](#)

[Syllabus: Click here](#)

[Resources: Click here](#)

[CCSS Literacy Standards: Click here](#)

NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	Targets
SC.912.L.14.11: Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue. Cognitive Complexity: Moderate	I Overview of Muscle Tissues A. Types of Muscle Tissues B. Special Characteristics of Muscle Tissue C. Muscle Functions	<ul style="list-style-type: none"> <li>Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.</li> <li>Compare and contrast the basic types of muscle tissue. (I)</li> <li>List four important functions of muscle tissue. (I)</li> </ul>
SC.912.L.14.16: Describe the anatomy and histology, including ultrastructure, of muscle tissue. Cognitive Complexity: Moderate	II Skeletal Muscle Tissue A. Gross Anatomy B. Microscopic Anatomy C. Sliding Filament Model of Muscle Contraction D. Physiology of Skeletal Muscle Fiber	<ul style="list-style-type: none"> <li>Describe the gross structure of a skeletal muscle. (II)</li> <li>Describe the microscopic structure and functional roles of the myofibrils, sarcoplasmic reticulum, and T tubule(s) of skeletal muscle fibers. (II)</li> <li>Describe the sliding filament model of muscle contraction. (II)</li> <li>Explain how muscle fibers are stimulated to contract by describing events that occur at the neuromuscular junction. (II)</li> </ul>
SC.912.L.14.17: List the steps involved in the sliding filament of muscle contraction. Cognitive Complexity: Moderate	E. Contraction of a Skeletal Muscle F. Muscle Metabolism G. Force of Muscle Contraction H. Velocity and Duration of Muscle Contraction I. Effect of Exercise on Muscle Contraction	<ul style="list-style-type: none"> <li>Describe how action potential is generated. (II)</li> <li>Explain how smooth, graded contractions of a skeletal muscle are produced. (II)</li> <li>Differentiate between isometric and isotonic contractions. (II)</li> </ul>
SC.912.L.14.18: Describe signal transmission across a myoneural junction. Cognitive Complexity: Moderate	III Smooth Muscle Tissue A. Microscopic	<ul style="list-style-type: none"> <li>Describe the ways in which ATP is generated during skeletal muscle contraction. (II)</li> <li>Define oxygen deficit and muscle</li> </ul>
SC.912.L.14.19: Explain the physiology of skeletal muscle. Cognitive Complexity: Moderate		
SC.912.L.14.20: Identify the major muscles of the human on a model or diagram. Cognitive		

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<p>Complexity: Low</p> <p>SC.912.L.18.6: Discuss the role of anaerobic respiration in living things and in human society. Cognitive Complexity: Moderate</p> <p>SC.912.L.18.8: Identify the reactants, products, and basic functions of aerobic and anaerobic cellular respiration. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive Complexity: High</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> <li>1.pose questions about the natural world,</li> <li>2.conduct systematic observations,</li> <li>3.examine books and other sources of information to see what is already known,</li> <li>4.review what is known in light of empirical evidence,</li> <li>5.plan investigations,</li> <li>6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical</li> </ol>	<p>Structure</p> <p>B. Contraction of Smooth Muscle</p> <p>C. Type of Smooth Muscle</p> <p>IV Developmental Aspects of Muscles</p> <p>V Interaction of Skeletal Muscles in the Body</p> <p>VI Naming Skeletal Muscles</p> <p>VII Muscle Mechanics</p> <p>VIII Major Skeletal Muscles of the Body</p>	<p>fatigue. (II)</p> <ul style="list-style-type: none"> <li>• Describe the factors that influence the force, velocity, and duration of skeletal muscle contraction. (II)</li> <li>• Describe three types of skeletal muscle fiber and explain the relative value of each. (II)</li> <li>• Compare and contrast the effects of aerobic and resistance exercise on the skeletal muscles and on other body systems. (II)</li> <li>• Compare the gross and microscopic anatomy of smooth muscle fibers to that of skeletal muscle fibers. (III)</li> <li>• Compare and contrast the contractile mechanisms and the means of activation of skeletal and smooth muscles in the body. (III)</li> <li>• Distinguish between single-unit and multi-unit smooth muscle structurally and functionally. (III)</li> <li>• Describe the embryonic development of muscle tissues and the changes that occur in skeletal muscles with age. (IV)</li> <li>• Describe the function of prime movers, antagonists, synergists, and fixators. (V)</li> <li>• List the criteria used in naming muscles and provide an example to illustrate the use of each criterion. (VI)</li> <li>• Name the common patterns of muscle fascicle arrangement and relate these to power generation. (VII)</li> <li>• Define lever and explain how a lever operating at a mechanical advantage differs from one operating at a mechanical disadvantage. (VII)</li> <li>• Name the three types of level systems and indicate the arrangement of effort, fulcrum, and load in each. (VII)</li> <li>• Name and identify the major muscles of the human body and state the origin, insertion, and action of each. (VIII)</li> <li>• Describe muscular dystrophy impact on individual health.</li> </ul>
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representations of data, including data tables and graphs),  
7.pose answers, explanations, or descriptions of events,  
8.generate explanations that explicate or describe natural phenomena (inferences),  
9.use appropriate evidence and reasoning to justify these explanations to others,  
10.communicate results of scientific investigations, and  
11.evaluate the merits of the explanations produced by others. Cognitive Complexity: High

HE.912.C.1.4: Analyze how heredity and family history can impact personal health.

MA.912.S.3.2: Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following:

bar graphs

line graphs

stem and leaf plots

circle graphs

histograms

box and whisker plots

scatter plots and

cumulative frequency (ogive)

graphs. Cognitive Complexity:

High

# Treasure Coast Science Scope and Sequence 2012-2013

Course: Anatomy and Physiology Honors

Course Code: 2000360

Quarter: 2C

**Topic(s) of Study:** Nervous System and Sensory Organs

**Bodies of Knowledge:** Nature of Science and Life Science

**Standard(s):** 1: Practice of Science, 14: Organization and Development of Living

**Essential Questions:** Why is the nervous system important? How does the CNS and the PNS work together? How are reflex arcs different from a regular nerve transmission? What diseases are associated with the nervous system? Why are sensory organs important? What are the factors that can affect personal and public health? How do scientists design an investigation to answer a scientific question and communicate their findings?

[Concept Map\(s\): Click here](#)

[Syllabus: Click here](#)

[Resources: Click here](#)

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NGSSS	OUTLINE OF CONTENT (CONCEPT/SKILLS)	TARGETS
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<p>SC.912.L.14.21: Describe the anatomy, histology, and physiology of the central and peripheral nervous systems and name the major divisions of the nervous system. Cognitive Complexity: Moderate</p>	<p>I Functions and Divisions of the Nervous Systems  A. The Central Nervous System  B. The Peripheral Nervous System</p>	<ul style="list-style-type: none"> <li>• Define a scientific problem or question based on the specific body of knowledge correlated to the anatomy and physiology honors science course.</li> <li>• List the basic functions of the nervous system. (I)</li> <li>• Explain the structural and functional divisions of the nervous system. (I)</li> <li>• List the types of neuroglia and cite their functions. (II)</li> <li>• Define neuron, describe its important structural components, and relate each to a functional role. (II)</li> </ul>
<p>SC.912.L.14.22: Describe the physiology of nerve conduction, including the generator potential, action potential, and the synapse. Cognitive Complexity: Moderate</p>	<p>II Histology of Nervous Systems  A. Neuroglia  B. Neurons</p>	
<p>SC.912.L.14.23: Identify the parts of a reflex arc. Cognitive Complexity: Low</p>	<p>III Membrane Potentials  A. Basic Principles of Electricity  B. The Role of Membrane Ion Channels  C. The Resting Membrane Potential  D. Membrane Potential  E. Conduction Velocity</p>	<ul style="list-style-type: none"> <li>• Differentiate between a nerve and a tract, and between a nucleus and a ganglion. (II)</li> <li>• Explain the importance of the myelin sheath and describe how it is formed in the central and peripheral nervous systems. (II)</li> <li>• Classify neurons structurally and functionally. (II)</li> </ul>
<p>SC.912.L.14.25: Identify the major parts of a cross section through the spinal cord. Cognitive Complexity: Low</p>	<p>IV The Synapse</p>	
<p>SC.912.L.14.27: Identify the functions of the major parts of the brain, including the meninges, medulla, pons, midbrain, hypothalamus, thalamus, cerebellum and cerebrum. Cognitive Complexity: Low</p>	<p>V Neurotransmitters and Their Receptors</p>	<ul style="list-style-type: none"> <li>• Define resting membrane potential and describe its electrochemical basis. (III)</li> <li>• Compare and contrast graded potentials and action potentials. (III)</li> <li>• Explain how action potentials are generated and propagated along neurons. (III)</li> </ul>
<p>SC.912.L.14.28: Identify the major functions of the spinal cord. Cognitive Complexity: Low</p>	<p>VI Basic Concepts of Neural Integration  A. Organization of Neurons  B. Types of Circuits  C. Patterns of Neural Processing</p>	
<p>SC.912.L.14.49: Identify the major functions associated with the sympathetic and parasympathetic nervous systems. Cognitive Complexity:</p>	<p>VII Developmental Aspects of Neurons  Central Nervous System (CNS)  VIII The Brain  A. Embryonic Development  B. Regions and</p>	<ul style="list-style-type: none"> <li>• Define absolute and relative refractory periods. (III)</li> <li>• Define saltatory conduction and contrast it to conduction along unmyelinated fibers.(III)</li> <li>• Define synapse. Distinguish between electrical and chemical synapses by structure and by the way they transmit information. (IV)</li> <li>• Distinguish between excitatory and inhibitory postsynaptic potentials. (IV)</li> <li>• Describe how synaptic events are integrated and modified. (IV)</li> <li>• Define neurotransmitter and name several classes of neurotransmitters. (V)</li> </ul>

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<p>Moderate</p> <p>SC.912.L.14.50: Describe the structure of vertebrate sensory organs. Relate structure to function in vertebrate sensory systems. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.6: Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health. Cognitive Complexity: High</p> <p>SC.912.L.14.11: Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue. Cognitive Complexity: Moderate</p> <p>SC.912.L.14.18: Describe signal transmission across a myoneural junction. Cognitive Complexity: Moderate</p> <p>SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following:</p> <ol style="list-style-type: none"> <li>1.pose questions about the natural world,</li> <li>2.conduct systematic observations,</li> <li>3.examine books and other sources of information to see what is already known,</li> </ol>	<p>Organization</p> <p>C. Ventricles</p> <p>D. Cerebral Hemispheres</p> <p>E. Diencephalon</p> <p>F. Brain Stem</p> <p>G. Cerebellum</p> <p>H. Functional Brain Systems</p> <p>IX Higher Mental Functions</p> <p>A. Brain Wave Patterns and the EEG</p> <p>B. Consciousness</p> <p>C. Sleep and Sleep-Awake Cycles</p> <p>D. Memory</p> <p>X Protection of the Brain</p> <p>A. Meninges</p> <p>B. Cerebrospinal Fluid</p> <p>C. Blood-Brain Barrier</p> <p>D. Homeostatic Imbalances of the Brain</p> <p>XI The Spinal Cord</p> <p>A. Embryonic Development</p> <p>B. Gross Anatomy and Protection</p> <p>C. Cross- Sectional Anatomy</p> <p>D. Spinal Cord Trauma and Disorders</p> <p>XII Diagnostics Procedures for Assessing CNS Dysfunction</p> <p>XIII Developmental Aspects of the CNS</p> <p>The Peripheral Nervous System(PNS) and Reflex</p>	<ul style="list-style-type: none"> <li>• Describe common patterns of neuronal organization and processing. (VI)</li> <li>• Distinguish between serial and parallel processing. (VI)</li> <li>• Describe how neurons develop and form synapses. (VII)</li> <li>• Describe the process of brain development. (VIII)</li> <li>• Name the major regions of the adult brain.</li> <li>• Name and locate the ventricles of the brain. (VIII)</li> <li>• List the major lobes, fissures, and functional areas of the cerebral cortex. (VIII)</li> <li>• Explain lateralization of hemisphere function. (VIII)</li> <li>• Differentiate between commissures, association fibers, and projection fibers. (VIII)</li> <li>• Describe the general function of the basal nuclei (basal ganglia). (VIII)</li> <li>• Describe the location of the diencephalon, and name its subdivisions and functions. (VIII)</li> <li>• Identify the three major regions of the brain stem, and note the functions of each area. (VIII)</li> <li>• Describe the structure and function of the cerebellum. (VIII)</li> <li>• Locate the limbic system and the reticular formation, and explain the role of each functional system. (VIII)</li> <li>• Define EEG and distinguish between alpha, beta, theta, and delta brain waves. (IX)</li> <li>• Describe consciousness clinically. (IX)</li> <li>• Compare and contrast the events and importance of slow-wave and REM sleep, and indicate how their patterns change through life. (IX)</li> <li>• Compare and contrast the stages and categories of memory. (IX)</li> <li>• Describe the relative roles of the major</li> </ul>
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<p>4.review what is known in light of empirical evidence, 5.plan investigations, 6.use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7.pose answers, explanations, or descriptions of events, 8.generate explanations that explicate or describe natural phenomena (inferences), 9.use appropriate evidence and reasoning to justify these explanations to others, 10.communicate results of scientific investigations, and 11.evaluate the merits of the explanations produced by others. Cognitive Complexity: High</p> <p>HE.912.C.1.3: Evaluate how environment and personal health are interrelated.</p> <p>HE.912.C.1.4: Analyze how heredity and family history can impact personal health</p> <p>MA.912.S.3.2: Collect, organize, and analyze data sets, determine the best format for the data and present visual summaries from the following: bar graphs line graphs stem and leaf plots circle graphs histograms</p>	<p>Activity XIV Sensory Receptors and Sensation     A. Sensory Receptors     B. Sensory Integration</p> <p>XV Transmission Lines: Nerves and Their Structure and Repair     A. Nerves and Associated Ganglia     B. Cranial Nerves     C. Spinal Nerves</p> <p>XVI Motor Endings and Motor Activity     A. Peripheral Motor Endings     B. Motor Integration: From Intention to Effect</p> <p>XVII Reflex Activity     A. The Reflex Arc     B. Spinal Reflexes</p> <p>XVIII Developmental Aspects of the PNS</p> <p>The Autonomic Nervous System (ANS)</p> <p>XIX Introduction     A. Comparison of the Somatic and Autonomic Nervous System     B. Divisions of the ANS</p> <p>XX ANS Anatomy     A. Parasympathetic Division     B. Sympathetic Division     C. The Visceral Sensory Neurons</p>	<p>brain structures believed to be involved in declarative and procedural memories. (IX)</p> <ul style="list-style-type: none"> <li>• Describe how meninges, cerebrospinal fluid, and the blood-brain barrier protect the CNS. (X)</li> <li>• Describe the formation of cerebrospinal fluid, and follow its circulatory pathway. (X)</li> <li>• Indicate the cause (if known) and major signs and symptoms of cerebrovascular accidents, Alzheimer’s disease, Parkinson’s disease, and Huntington’s disease. (X)</li> <li>• Describe the embryonic development of the spinal cord. (XI)</li> <li>• Describe the gross and microscopic structure of the spinal cord. (XI)</li> <li>• List the major spinal cord tracts, and classify each as a motor or sensory tract. (XI)</li> <li>• Distinguish between flaccid and spastic paralysis, and between paralysis and paresthesia. (XI)</li> <li>• List and explain several techniques used to diagnose brain disorders. (XII)</li> <li>• Indicate several maternal factors that can impair development of the nervous system in an embryo. (XIII)</li> <li>• Explain the effects of aging on the brain. (XIII)</li> <li>• Define peripheral nervous system and list its components. (XIV)</li> <li>• Classify general sensory receptors by structure, stimulus detected, and body location. (XIV)</li> <li>• Outline the events that lead to sensation and perception. (XIV)</li> <li>• Describe receptor and generator potentials and sensory adaptation. (XIV)</li> <li>• Describe the main aspects of sensory perception. (XIV)</li> <li>• Define ganglion and indicate the</li> </ul>
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<p>box and whisker plots scatter plots and cumulative frequency (ogive) graphs. Cognitive Complexity: High</p>	<p>XXI ANS Physiology A. Neurotransmitters and Receptors B. Cholinergic and Adrenergic Receptors C. Interactions of the Automatic Divisions D. Control of Autonomic Functioning</p> <p>XXII Homeostatic Imbalances of the ANS</p> <p>XXIII Developmental Aspects of the ANS</p> <p>The Sensory Organs XXIV The Eye and Vision A. Vision B. Accessory Structures of the Eye C. Structure of the Eyeball D. Physiology of Vision</p> <p>XXV The Chemical Senses: Taste and Smell A. Chemoreceptors B. The Olfactory Epithelium and the Sense of Smell C. Taste Buds and the Sense of Taste D. Homeostatic Imbalances of the Chemical Senses</p> <p>XXVI The Ear: Hearing and Balance A. Structure of the Ear B. Physiology of Hearing</p>	<p>general body location of ganglia. (XV)</p> <ul style="list-style-type: none"> <li>• Describe the general structure of a nerve. (XV)</li> <li>• Follow the process of nerve regeneration. (XV)</li> <li>• Name the 12 pairs of cranial nerves; indicate the body region and structures innervated by each. (XV)</li> <li>• Describe the formation of a spinal nerve and the general distribution of its rami. (XV)</li> <li>• Define plexus. (XV)</li> <li>• Name the major plexuses and describe the distribution and function of the peripheral nerves arising from each plexus.(XV)</li> <li>• Compare and contrast the motor endings of somatic and autonomic nerve fibers. (XVI)</li> <li>• Outline the three levels of the motor hierarchy. (XVI)</li> <li>• Compare the roles of the cerebellum and basal nuclei in controlling motor activity. (XVI)</li> <li>• Name the components of a reflex arc and distinguish between autonomic and somatic reflexes. (XVII)</li> <li>• Compare and contrast stretch, flexor, crossed-extensor, and Golgi tendon reflexes. (XVII)</li> <li>• Describe the developmental relationship between the segmented arrangement of peripheral nerves, skeletal muscles, and skin dermatomes. (XVIII)</li> <li>• List the changes that occur in the peripheral nervous system with aging. (XVIII)</li> <li>• Define autonomic nervous system and explain its relationship to the peripheral nervous system. (XIX)</li> <li>• Compare the somatic and autonomic nervous systems relative to effectors, efferent pathways, and neurotransmitters released. (XIX)</li> </ul>
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	<p>C. Homeostatic Imbalances of Hearing</p> <p>D. Equilibrium and Orientation</p> <p>XXVII Developmental Aspects of the Sensory Organs</p>	<ul style="list-style-type: none"> <li>• Compare and contrast the functions of the parasympathetic and sympathetic divisions. (XIX)</li> <li>• For the parasympathetic and sympathetic divisions, describe the site of CNS origin, locations of ganglia, and general fiber pathways. (XX)</li> <li>• Define cholinergic and adrenergic fibers, and list the different types of their receptors. (XXI)</li> <li>• Describe the clinical importance of drugs that mimic or inhibit adrenergic or cholinergic effects. (XXI)</li> <li>• State the effects of the parasympathetic and sympathetic divisions on the following organs: heart, blood vessels, gastrointestinal tract, lungs, adrenal medulla, and external genitalia. (XXI)</li> <li>• Describe autonomic nervous system controls. (XXI)</li> <li>• Explain the relationship of some types of hypertension, Raynaud’s disease, and autonomic dysreflexia to disorders of autonomic functioning. (XXII)</li> <li>• Describe some effects of aging on the autonomic nervous system. (XXIII)</li> <li>• Describe the structure and function of accessory eye structures, eye layers, the lens, and humors of the eye. (XXIV)</li> <li>• Outline the causes and consequences of cataracts and glaucoma. (XXIV)</li> <li>• Trace the pathway of light through the eye to the retina, and explain how light is focused for distant and close vision. (XXIV)</li> <li>• Outline the causes and consequences of astigmatism, myopia, hyperopia, and presbyopia. (XXIV)</li> <li>• Describe the events involved in the stimulation of photoreceptors by light, and compare and contrast the roles of rods and cones in vision. (XXIV)</li> <li>• Compare and contrast light and dark adaptation. (XXIV)</li> </ul>
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|  |  | <ul style="list-style-type: none"><li>• Trace the visual pathway to the visual cortex, and briefly describe the steps in visual processing. (XXIV)</li><li>• Describe the location, structure, and afferent pathways of taste and smell receptors, and explain how these receptors are activated. (XXV)</li><li>• Describe the structure and general function of the outer, middle, and internal ears. (XXVI)</li><li>• Describe the sound conduction pathway to the fluids of the internal ear, and follow the auditory pathway from the spiral organ (of Corti) to the temporal cortex. (XXVI)</li><li>• Explain how one is able to differentiate pitch and loudness, and localize the source of sounds. (XXVI)</li><li>• List possible causes and symptoms of otitis media, deafness, and Ménière's syndrome. (XXVI)</li><li>• Explain how the balance organs of the semicircular canals and the vestibule help maintain dynamic and static equilibrium. (XXVI)</li><li>• List changes that occur in the special sense organs with aging. (XXVII)</li></ul> |
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