

CENTRAL FLORIDA ASSESSMENT
COLLABORATIVE

Individual Test Item
Specifications

Anatomy & Physiology

2013

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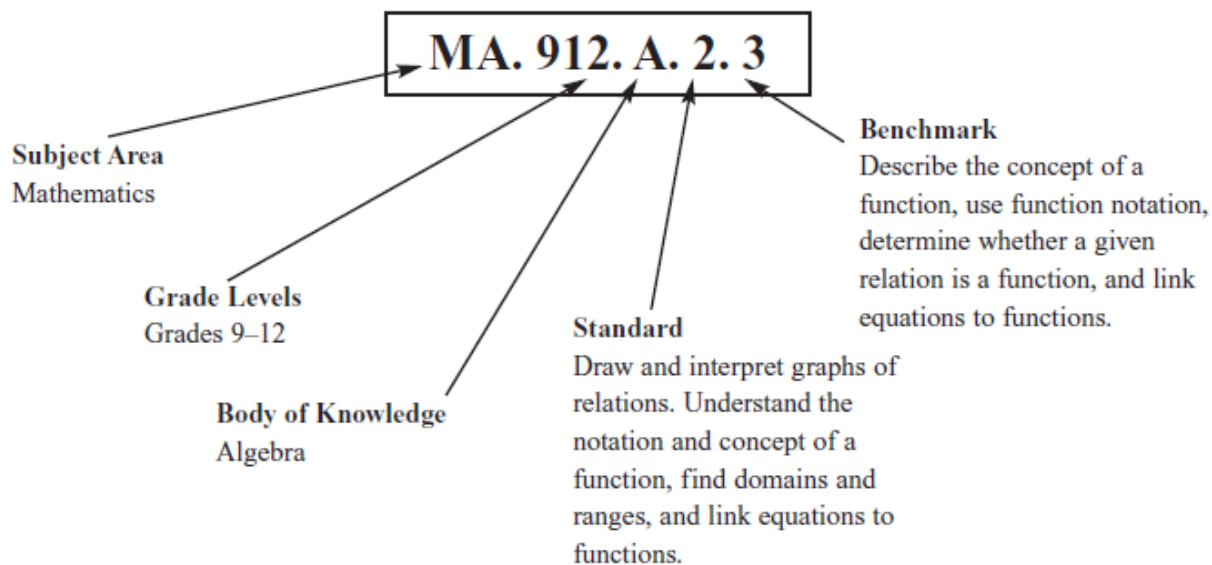
I. Guide to the Individual Benchmark Specifications

Content specific guidelines are given in the *Individual Benchmark Specifications* for each course. The *Specifications* contains specific information about the alignment of items with the NGSSS and CCSS. It identifies the manner in which each benchmark is assessed, provides content limits and stimulus attributes for each benchmark, and gives specific information about content, item types, and response attributes.

Benchmark Classification System

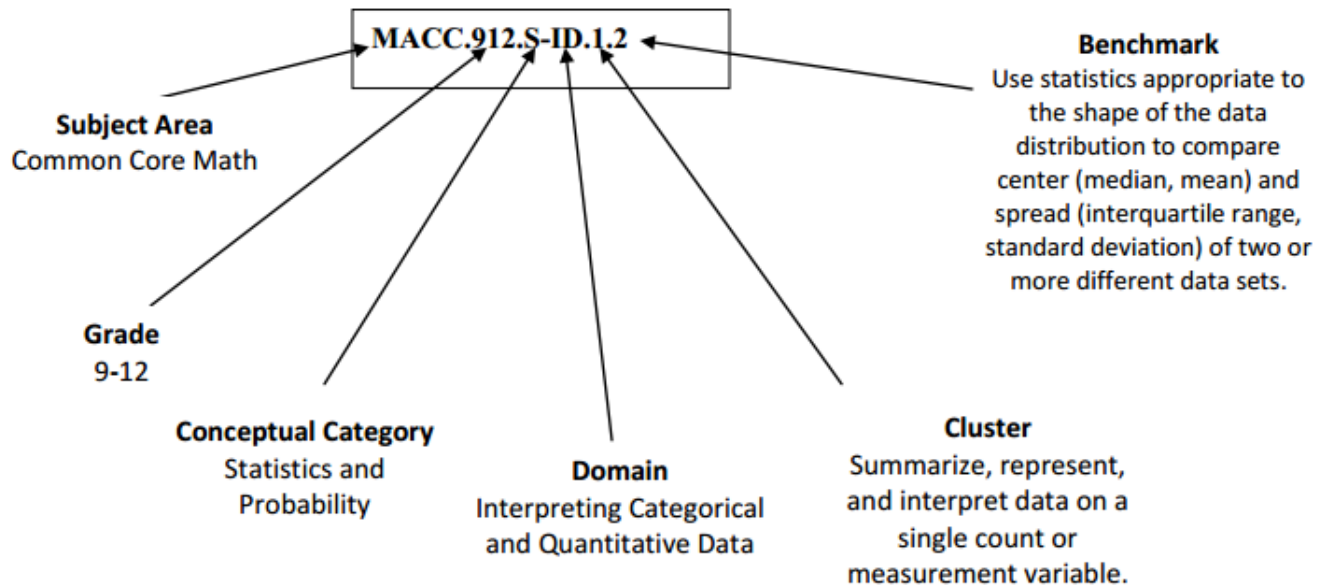
Each NGSSS benchmark is labeled with a system of letters and numbers.

- The two letters in the *first position* of the label identify the **Subject Area**.
- The number(s) in the *second position* represents the **Grade Level**.
- The letter in the *third position* represents the **Strand** or **Body of Knowledge**.
- The number in the *fourth position* represents the **Standard**.
- The number in the *last position* identifies the specific **Benchmark**.



Each CCSS benchmark is labeled with a system of letters and numbers.

- The four letters in the *first position* of the label identify the **Subject**.
- The number(s) in the *second position* represents the **Grade Level**.
- The letter(s) in the *third position* represents the **Category**.
- The number in the fourth position shows the **Domain**.
- The number in the *fifth position* identifies the **Cluster**.
- The number in the last position identifies the specific **Benchmark**.



Definitions of Benchmark Specifications

The *Individual Benchmark Specifications* provides standard-specific guidance for assessment item development for CFAC item banks. For each benchmark assessed, the following information is provided:

Reporting Category	is a grouping of related benchmarks that can be used to summarize and report achievement.
Standard	refers to the standard statement presented in the NGSSS or domain in the CCSS.
Benchmark	refers to the benchmark statement presented in the NGSSS or standard statement in the CCSS. In some cases, two or more related benchmarks are grouped together because the assessment of one benchmark addresses another benchmark. Such groupings are indicated in the Also Assesses statement.
Item Types	are used to assess the benchmark or group of benchmark.
Benchmark Clarifications	explain how achievement of the benchmark will be demonstrated by students. In other words, the clarification statements explain what the student will do when responding to questions.
Content Limits	define the range of content knowledge and that should be assessed in the items for the benchmark.
Stimulus Attributes	define the types of stimulus materials that should be used in the items, including the appropriate use of graphic materials and item context or content.
Response Attributes	define the characteristics of the answers that a student must choose or provide.
Sample Items	are provided for each type of question assessed. The correct answer for all sample items is provided.

II. Individual Benchmark Specifications

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.6
Benchmark	Explain the significance of genetic factors, environmental factors, and pathogenic agents to health from the perspectives of both individual and public health.
Also Assesses	SC.912.L.14.52
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to explain/identify how genetic factors, environmental factors or pathogenic agents cause diseases.
Content Limits	Items should be limited to how these factors affect specific organ systems
Stimulus Attributes	May include diagrams.
Response Attributes	low, moderate, high
Sample Item	<p>Non pathogenic agents such as peanuts and pollen are capable of causing the immune system to respond. When the immune system responds to non pathogenic agents, the response is referred to as:</p> <p style="margin-left: 40px;">A) an innate immunity B) hemophilia *C) an allergic reaction D) HIV/AIDS</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.11
Benchmark	Classify and state the defining characteristics of epithelial tissue, connective tissue, muscle tissue, and nervous tissue.
Also Assesses	SC.912.L.14.2; SC.912.L.14.12; SC.912.L.14.16; SC.912.L.14.40; SC.912.L.14.43; SC.912.L.14.43; SC.912.L.14.45
Item Types	Multiple Choice
Benchmark Clarification	<p>Students will be able to identify the different tissue types. Students will be able to explain the general functions of each of the different tissue types. Students will be able to classify the different tissue types based on given functions.</p> <p>HONORS: Students will be able to determine what type of epithelial tissues might be found in different organs (structure related to function). Students will be able to determine where different tissue types may be found on specific organs based on their functions.</p>
Content Limits	Epithelial tissue classification may include types of epithelial cells (squamous, cuboidal, or columnar) and structure (simple or stratified). Epithelial connections may be included as characteristics related to epithelial function. Identification of Connective tissues may include characteristics (specialized cells in specific matrix). Muscle tissue may include general distinctions between skeletal, smooth and cardiac muscle. Questions relating to connective tissue may include the ground substance consistency (from solid (bone), liquid (blood connective tissue), to gel-like ground substance as in cartilage), and may also discuss the fiber type present (collagen, reticular, and elastic.)
Stimulus Attributes	Item may contain diagrams/pictures of tissues.
Response Attributes	low, moderate, high
Sample Item	<p>Which tissue type performs peristalsis in the digestive system?</p> <p>A) stratified squamous epithelial tissue B) cardiac muscle tissue C) fluid connective tissue *D) smooth muscle tissue</p>

Reporting Category	Organisms and Populations
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.12
Benchmark	Describe the anatomy and histology of bone tissue.
Also Assesses	
Item Types	Multiple Choice
Benchmark Clarification	Students will differentiate the structure of compact bone and spongy bone. The main focus will be the basic unit of structure for each: an osteon for compact bone, and trabeculae for spongy bone.
Content Limits	Items should assess the differences between structure and tissue make up of bone tissue. Bone marrow storage may also be discussed as it is one of the functions of each bone tissue type. For example: Red bone marrow is stored in the spaces of trabeculae while yellow bone marrow is stored in the medullary cavity of compact bone tissue. (Functions may be up for discussion as the benchmark asks for anatomy (structure), however, when discussing histology; all the tissue types may be discussed including bone marrow.
Stimulus Attributes	Diagrams may be used to view and compare the "tree-like" rings of an osteon's structure, or the lattice-work structure of the trabeculae of spongy bone.
Response Attributes	None specified.
Sample Item	<p>Multiple Choice: Which of the following is a basic unit of compact bone:</p> <p>A) Osteocyte B) Trabeculae *C) Osteon D) Canaliculi</p> <p>Another sample question could include a diagram of an osteon and students have to match the components of an osteon (lamellae-*rings of calcified matrix, canaliculi-*tiny canals linking the lamellae, lacunae- *lake between the lamellae that hold the osteocyte, central Haversian canal- *allowing blood vessels and nerves to pass, osteocyte (stored within the lacunae) with their location on the diagram.</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.13
Benchmark	Distinguish between bones of the axial skeleton and the appendicular skeleton.
Also Assesses	SC.912.L.14.14
Item Types	Multiple Choice
Benchmark Clarification	Students will distinguish between the bones of the axial skeleton and the appendicular skeleton. Students will identify the major bones of the axial and the appendicular skeleton.
Content Limits	Items will assess the bones of human anatomy, and will not assess the bones of other vertebrates. Items will not include joints or deformations of the skeletal system. Items will not assess bone fractures. Items will not assess the functions of the major bones.
Stimulus Attributes	Illustrations or diagrams may be used.
Response Attributes	None specified
Sample Item	Which bones are associated with the axial skeleton? A) femur, patella, and tibia B) humerus, radius, and ulna C) tarsals, metatarsals, and phalanges *D) skull, ribs, and vertebra.

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.14
Benchmark	Identify the major bones of the axial and appendicular skeleton.
Also Assesses	SC.912.L.14.13
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the major bones of the axial and appendicular skeleton. Students will distinguish between the bones of the axial skeleton and the appendicular skeleton.
Content Limits	Items will not assess the function of the major bones of the axial and appendicular skeleton. Items will assess the bones of human anatomy, and will not include the bones of other vertebrates. Items will only assess the major bones (i.e. skull, ribs, sternum, sacrum, vertebra, clavicle, scapula, humerus, radius, ulna, femur, patella, tibia, fibula, carpals, tarsals, phalanges) and will not include the minor bones. Items will not include joints or deformations of the skeletal system. Items will not assess bone fractures. Items will not assess the functions of the major bones.
Stimulus Attributes	Illustrations or diagrams may be used.
Response Attributes	None specified
Sample Item	Which bone is associated with the forearm? * A) ulna B) humerus C) metacarpals D) tibia

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.15- Anatomy & Physiology Honors ONLY
Benchmark	Identify major markings (such as foramina, fossae, tubercles, etc.) on a skeleton. Explain why these markings are important.
Also Assesses	
Item Types	Multiple Choice, Short Answer
Benchmark Clarification	Students will identify major markings on a skeleton. Students will explain why these marking are important, such as foramen allowing blood vessels and nerves to pass, projections allowing for muscle attachment, and various shapes allowing for articulation such as condyles fitting into fossae.
Content Limits	Items are limited to skeleton markings. Items will assess markings on human bones, and will not assess markings on bones of other vertebrates. Items will not assess bone fractures. Items will not assess the functions of the skeletal system.
Stimulus Attributes	Illustrations or diagrams may be used.
Response Attributes	None specified
Sample Item	<p>Which bone marking is a sharp, slender, and pointed projection?</p> <p>A) crest B) facet C) sinus *D) spine</p> <p>Short Answer: Why are the sinus, fissure, and foramen important bone markings? (Answer: These are depressions and openings that allow blood vessels and nerves to pass through.)</p>

Reporting Category	Molecular & Cellular Biology
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.17
Benchmark	List the steps involved in the sliding filament of muscle contraction.
Also Assesses	SC.912.14.16
Item Types	Multiple Choice
Benchmark Clarification	Student will be able to list, in order, the steps,(Honors: including relevant molecules involved in those steps), of the sliding filament theory from nerve impulse to sarcomere shortening.
Content Limits	This item is limited to steps between the release of acetylcholine into the neuromuscular junction through interactions between myosin and actin.
Stimulus Attributes	This standard may include diagrams (sarcomere).
Response Attributes	Low, moderate, high
Sample Item	<p>What major proteins are involved in the sliding filament theory of muscle contraction?</p> <p>*A) actin and myosin B) collagen and actin C) myosin and elastin D) collagen and elastin</p>

Reporting Category	Molecular & Cellular Biology
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.18
Benchmark	Describe signal transmission across a myoneural junction.
Also Assesses	SC.912.L.14.2
Item Types	Multiple Choice
Benchmark Clarification	Students will demonstrate understanding of the molecular interactions in the neuromuscular junction between pre and post synaptic cells. Students should also be able to demonstrate an understanding of how other molecules (drugs of abuse) may interfere with these interactions.
Content Limits	This standard should not assess the physiology of a nerve impulse beyond the release of neurotransmitters into the myoneural synapse.
Stimulus Attributes	Diagrams may be used
Response Attributes	Moderate, high
Sample Item	Which neurotransmitter is involved in initiating muscle contraction in the neuromuscular junction? A) serotonin B) dopamine C) GABA *D) Acetylcholine

Reporting Category	Molecular & Cellular Biology
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.19- Anatomy & Physiology Honors ONLY
Benchmark	Explain the physiology of skeletal muscle.
Also Assesses	SC.912.L.18.4; SC.912.L.18.6; SC.912.L.18.8; SC.9112.L.14.16; SC.912.L.14.17
Item Types	Multiple Choice; Short Answer
Benchmark Clarification	Students will explain the interactions between all structures and chemicals involved in the sliding filament theory.
Content Limits	Items are limited to skeletal muscle contraction.
Stimulus Attributes	Illustrations or diagrams may be used
Response Attributes	Moderate, high
Sample Item	<p>Which chemical interacts with the troponin/tropomyosin complex to expose the attachment site of actin allowing cross-bridge formation?</p> <p>A) Na⁺</p> <p>B) acetylcholine</p> <p>*C) Ca⁺²</p> <p>D) sarcomere</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.20
Benchmark	Identify the major muscles of the human on a model or diagram.
Also Assesses	
Item Types	Multiple Choice
Benchmark Clarification	Given a diagram/picture, students will be able to identify the major muscles.
Content Limits	Limited to the major muscles of the human body. Examples of the MAJOR muscles are ones grouped by size such as Pectoralis major or action (primary mover) such as Rectus femoris is the major muscle responsible for extension of the leg at the knee joint.
Stimulus Attributes	Diagrams may be used
Response Attributes	Low, moderate
Sample Item	<p>Identification of major muscles on a diagram will require access to an unlabeled diagram of the musculature that is not copyright protected. This would be the preferred type of sample for this benchmark.</p> <p>Which major muscle is responsible for flexion of the arm?</p> <ul style="list-style-type: none"> A) Triceps brachii B) Deltoid C) Brachioradialis *D) Biceps brachii

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.21
Benchmark	Describe the anatomy, histology, and physiology of the central and peripheral nervous systems and name the major divisions of the nervous system.
Also Assesses	SC.912.L.14.23; SC.912.L.14.25; SC.912.L14.26
Item Types	Multiple Choice
Benchmark Clarification	Students will describe the anatomy, histology, and physiology of the central and peripheral nervous systems. Students will name the major divisions of the nervous system.
Content Limits	Items will be limited to assessing the anatomy, histology, and physiology of the central and peripheral nervous systems. Items will be limited to assessing the major divisions of the nervous system, which includes the structural classification (central and peripheral) and the functional classification (somatic and autonomic). Items will not assess defects in the nervous system.
Stimulus Attributes	None specified
Response Attributes	None specified
Sample Item	Which major region of the brain is responsible for speech, memory, emotional response, and consciousness? *A) cerebral hemispheres B) diencephalon C) brain stem D) cerebellum

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.22- Anatomy & Physiology Honors ONLY
Benchmark	Describe the physiology of nerve conduction, including the generator potential, action potential, and the synapse.
Also Assesses	SC.912.L.14.2
Item Types	Multiple Choice
Benchmark Clarification	Students will describe the physiology of nerve conduction, including the generator potential, action potential, and the synapse. Students will relate structure to function for the components of plant and animal cells. Students will explain the role of cell membranes as a highly selective barrier.
Content Limits	Items will assess the physiology of nerve conduction. Items will not assess the anatomy of nerve conduction. Items will not assess the types of cells in nervous tissue. Items will not assess the structure of a typical motor neuron. Items will not assess the classification of neurons.
Stimulus Attributes	None specified
Response Attributes	None specified
Sample Item	<p>What happens when a neuron is adequately stimulated?</p> <p>*A) The properties of the cell's plasma membrane change and allow the "gates" of sodium channels in the membrane to open.</p> <p>B) The properties of the cell's plasma membrane do not change and allow the "gates" of sodium channels in the membrane to open.</p> <p>C) The properties of the cell's plasma membrane do not change and closes the "gates" of the sodium channels.</p> <p>D) The properties of the cell's plasma membrane change and closes the "gates" of the sodium channels.</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.24
Benchmark	Identify the general parts of a synapse and describe the physiology of signal transmission across a synapse.
Also Assesses	SC.912.L.14.2
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the general parts of a synapse. Students will describe the physiology of signal transmission across a synapse. Students will relate structure to function for the components of plant and animal cells. Students will explain the role of cell membranes as a highly selective barrier.
Content Limits	Items will assess the vesicles and synaptic cleft. Items will assess how the transmission of an impulse is carried across a synapse.
Stimulus Attributes	Illustrations or diagrams may be used.
Response Attributes	None specified
Sample Item	<p>What type of transmission is occurring when an impulse is carried across a synapse?</p> <p>A) electrical B) chemical *C) electrochemical D) mechanical</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.27- Anatomy & Physiology Honors ONLY
Benchmark	Identify the functions of the major parts of the brain, including the meninges, medulla, pons, midbrain, hypothalamus, thalamus, cerebellum and cerebrum.
Also Assesses	SC.912.L.14.31
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the functions of the major parts of the brain.
Content Limits	Items are limited to the meninges, medulla, pons, midbrain, hypothalamus, thalamus, cerebellum, and cerebrum. Items will not assess the identification of the major parts of the brain. Items will assess the functions of the meninges, medulla, pons, midbrain, hypothalamus, thalamus, cerebellum, and cerebrum. Items will not assess the anatomy or physiology of the brain. Items will not assess brain dysfunctions. Items will not assess brain development.
Stimulus Attributes	Illustrations or diagrams may be used.
Response Attributes	None specified.
Sample Item	Which part of the brain is responsible for the regulation of body temperature, water balance, and metabolism? A) medulla B) cerebellum *C) hypothalamus D) thalamus

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.30
Benchmark	Compare endocrine and neural controls of physiology.
Also Assesses	SC.912.L.14.31
Item Types	Multiple Choice
Benchmark Clarification	Students will compare the differences between cell to cell communication via the synapse and long distance communication via hormones released into the circulatory and lymphatic systems.
Content Limits	This item will not assess cell communication via the details of signal transduction. This item will not include paracrine or cell-to-cell (gap junction) methods of cell communication. This item may address feedback control mechanisms.
Stimulus Attributes	None identified
Response Attributes	Low, moderate
Sample Item	<p>Compare the differences between neural and endocrine methods of cell communication:</p> <p>*A) hormones are released by endocrine glands and neurotransmitters are released by neurons.</p> <p>B) hormones are released by neurons and hormones are released by endocrine glands.</p>

	<p>C) hormones are released into the synapse</p> <p>D) neurotransmitters are released into the circulatory system.</p>
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Reporting Category	Organisms and Populations
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.31
Benchmark	Describe the physiology of hormones including the different types and the mechanisms of their action.
Also Assesses	SC.912.L.14.2; SC.912.L.14.36
Item Types	Multiple Choice
Benchmark Clarification	Students will describe the functions/role of each hormone its affect on the organ/organ system/ or body as a whole.
Content Limits	May include the role in communication a hormone may play in feedback systems.
Stimulus Attributes	Graphics may be used
Response Attributes	None specified
Sample Item	<p>Which of the following events stimulates the release of PTH from the parathyroid gland?</p> <p>A) calcitonin from the anterior pituitary gland B) TSH from the posterior pituitary gland C) low levels of glucose in the blood *D) low levels of calcium in the blood.</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.32
Benchmark	Describe the anatomy and physiology of the endocrine system.
Also Assesses	SC.912.L.14.29
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the major glands of the endocrine system, the hormones they release and the function of those hormones.
Content Limits	This item is limited to the most common endocrine glands and their hormones.
Stimulus Attributes	May include diagrams
Response Attributes	Low, moderate, high
Sample Item	<p>How does the endocrine system regulate blood glucose levels?</p> <p>A) The pancreas releases glucagon to lower blood glucose levels and releases insulin to elevate blood glucose levels.</p> <p>* B) The pancreas releases insulin to lower blood glucose levels and releases glucagon to increase blood glucose levels.</p>

	C) The liver releases glucagon to lower blood glucose levels and releases insulin to elevate blood glucose levels.
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	D) The liver releases insulin to lower blood glucose levels and releases glucagon to increase blood glucose levels.
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Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.33
Benchmark	Describe the basic anatomy and physiology of the reproductive system.
Also Assesses	SC.912.L.14.29; SC.912.L.16.13
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the major organs of the male and female reproductive systems. Students will describe the development of the male and female reproductive systems. Students will describe the mechanisms (hormonal) of control of the male and female reproductive systems. Students will describe human development from fertilization through adulthood. Students will explain the changes that occur during pregnancy (each trimester) for the developing embryo/fetus and the mother. Students will explain the process of parturition.
Content Limits	None specified
Stimulus Attributes	May include diagrams
Response Attributes	Low, moderate, high
Sample Item	Which of the following hormones might be used by a fertility clinic to help to enhance female fertility?

	<p>A) testosterone</p> <p>B) estrogen</p> <p>C) oxytocin</p> <p>* D) FSH (Follicle Stimulating Hormone)</p>
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Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.34
Benchmark	Describe the composition and physiology of blood, including that of the plasma and the formed elements.
Also Assesses	SC.912.L.14.35
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to identify the relative composition of blood (plasma vs formed elements). Students will be able to identify the major plasma proteins (honors: and their general functions). Students will be able to identify the formed elements in blood (honors and describe the functions of each).
Content Limits	This item does not assess the steps or molecules involved in coagulation.
Stimulus Attributes	May include diagram
Response Attributes	Low, moderate, high
Sample Item	<p>In blood, which of the formed elements are responsible for transporting oxygen on hemoglobin?</p> <p>A) platelets *B) erythrocytes C) plasma D) leukocytes</p>

Reporting Category	Molecular & Cellular Biology
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.35
Benchmark	Describe the steps in hemostasis, including the mechanism of coagulation. Include the basis for blood typing and transfusion reactions.
Also Assesses	SC.912.L.18.4
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to describe the heritable factors that determine ABO and Rh blood types (relevant RBC antigens). Students will be able to describe the relevant plasma proteins (antibodies) related to ABO blood typing and the significance in transfusion reactions. Students will describe the significance of Rh antigens and the formation of Rh antibodies as related to transfusion and pregnancy. Students will describe the role of coagulation, including the role of platelets, as an immediate response to injury.
Content Limits	Coagulation is limited to vascular responses and platelet response as a function of immediate injury response/repair.
Stimulus Attributes	May contain graphics, charts, data tables
Response Attributes	Low, moderate, high

Sample Item	<p>Which red blood cell antigens may be responsible for hemolytic disease of the newborn as a result of pregnancy?</p> <ul style="list-style-type: none">A) Rh positive mother and Rh negative fetusB) A positive mother and A positive fetus*C) Rh negative mother and Rh positive fetusD) A negative mother and A negative fetus
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Reporting Category	Molecules and Cells
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.36
Benchmark	Describe the factors affecting blood flow through the cardiovascular system.
Also Assesses	SC.912.L.14.31; SC.912.L.14.40; SC.912.L.14.39
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to describe those factors causing vasoconstriction, vasodilation, increased blood volume and reduced vascular volume. This may include temperature regulation, causes of atherosclerosis (cholesterol/arteriole plaques/elasticity loss), hormones/proteins (renin, ADH, angiotensin II, aldosterone, epinephrine, ANP) affecting blood vessels and blood volume.
Content Limits	None specified
Stimulus Attributes	None specified
Response Attributes	Low, moderate, high
Sample Item	Which of the following may cause hypertension because of its affect on blood flow in the cardiovascular system? * A) adrenaline causing vasoconstriction decreasing blood flow B) ADH causing a decrease in blood volume reducing blood flow C) vasoconstriction causing an increase in blood flow D) vasodilation causing an increase in blood flow

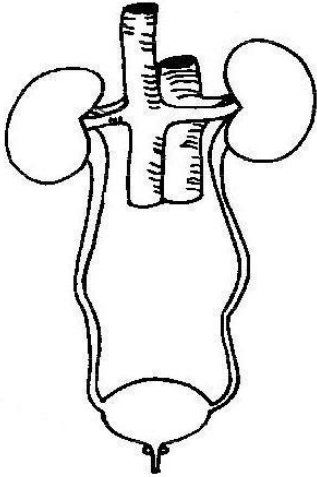
Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.39
Benchmark	Describe hypertension and some of the factors that produce it.
Also Assesses	SC.912.L.14.31; SC.912.L.14.36
Item Types	Multiple Choice
Benchmark Clarification	Student will be able to determine the relationship between those factors affecting blood flow and hypertension/cardiovascular diseases (SC.912.L.14.36)
Content Limits	This benchmark should be limited to vasoconstriction, vasodilation, hormones ADH and angiotensin II, and atherosclerosis.
Stimulus Attributes	Graphics may be used
Response Attributes	Moderate, high
Sample Item	ADH, Anti Diuretic Hormone, controls the reabsorption of water in the kidneys. ADH affects blood pressure by: A) causing hypertension by lowering blood volume *B) causing hypertension by increasing blood volume C) causing hypotension by increasing blood volume D) causing hypotension by causing vasoconstriction

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.42
Benchmark	Describe the anatomy and the physiology of the lymph system.
Also Assesses	SC.912.L.14.52
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to identify the major organs of the lymphatic system. Students will be able to describe the general function of each of those organs. Items may reference leukocytes involved in the immune systems (specifically lymphocytes).
Content Limits	Identified organs are limited to lymph vessels, lymph nodes, spleen, and GALT (MALT).
Stimulus Attributes	Diagrams may be used.
Response Attributes	Low, moderate
Sample Item	These organs are responsible for filtering lymph before it is returned to the circulatory system: A) GALT B) spleen C) lymph vessel *D) lymph nodes

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.44
Benchmark	Describe the physiology of the respiratory system including the mechanisms of ventilation, gas exchange, gas transport and the mechanisms that control the rate of ventilation.
Also Assesses	SC.912.L.14.52; SC.912.L.14.27; SC.912.P.12.10
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to identify the major organs of the respiratory system. Students will describe how and where gas exchange takes place. Students will explain control mechanisms for pulmonary ventilation. This may include pH monitoring by the nervous system. This may also include references to the gas laws. Students will describe mechanisms for the transport of gasses. This description may include descriptions of the structure and function of erythrocytes, hemoglobin, alveoli and capillaries. Students may also be required to describe how the environment may negatively impact the respiratory system.
Content Limits	Gas law content is limited to its relevance in pulmonary ventilation (pressure inversely proportional to volume)
Stimulus Attributes	Diagrams may be used.
Response Attributes	Low, moderate, high
Sample Item	When carbon dioxide levels in the blood rise, a fall in blood pH levels causes the brain to initiate pulmonary ventilation by: A) stimulating erythrocytes to grow larger B) stimulate alveoli to grow larger *C) stimulating the diaphragm to contract increasing lung volume D) stimulating the diaphragm to relax decreasing blood volume

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.46
Benchmark	Describe the physiology of the digestive system, including mechanical digestion, chemical digestion, absorption and the neural and hormonal mechanisms of control.
Also Assesses	SC.912.L.18.6; SC.912.L.18.8; SC.912.L.18.11; SC.912.L.18.2; SC.912.L.18.3
Item Types	Multiple Choice
Benchmark Clarification	Students will describe how (honors: and why) mechanical and chemical digestion takes place within the organs of the digestive system. Students will describe how (honors : add why) absorption takes place within the organs of the digestive system. Honors: this description will include when/where major macromolecules are extracted. This description will include when/where nutrients are absorbed. This benchmark should include the anatomy of the digestive system.
Content Limits	None specified
Stimulus Attributes	Diagrams and illustrations may be used.
Response Attributes	Low, moderate, high
Sample Item	<p>Amylase is an enzyme utilized to digest carbohydrates (starch) in:</p> <p>A) the stomach and large intestine *B) the mouth and duodenum (small intestine) C) the small intestine and the stomach D) the mouth and the large intestine</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.47
Benchmark	Describe the physiology of urine formation by the kidney.
Also Assesses	SC.912.L.14.31
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to describe the general function of the nephron. This includes the role of renal pressure on filtrate formation through reabsorption.
Content Limits	This item does not include what/where molecules are/are not absorbed into/out of the renal tubules.
Stimulus Attributes	Diagrams and illustrations may be used.
Response Attributes	Low, moderate, high
Sample Item	<p>The functional unit of the kidney responsible for filtering metabolic waste from the blood and maintaining homeostasis is:</p> <ul style="list-style-type: none"> *A) the nephron B) the medulla C) the calyx D) the ureter

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.48- Anatomy & Physiology Honors ONLY
Benchmark	Describe the anatomy, histology, and physiology of the ureters, the urinary bladder and the urethra.
Also Assesses	
Item Types	Multiple Choice
Benchmark Clarification	Students will describe the flow of urine through the urinary system.
Content Limits	This item will not require students to identify specific regions (or the molecules being moved) along the renal tubules.
Stimulus Attributes	Diagrams or illustrations may be used.
Response Attributes	Low, moderate, high
Sample Item	<p>Label the major parts of the urinary system. (kidney, ureter, bladder, urethra)</p>  <p>The muscular organ used to store urine until it can be eliminated from the body is:</p> <p>A) the urethra B) the ureters *C) the bladder D) the kidney</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.49
Benchmark	Identify the major functions associated with the sympathetic and parasympathetic nervous systems.
Also Assesses	
Item Types	Multiple Choice, Short Answer
Benchmark Clarification	Students will identify the major functions of the sympathetic and parasympathetic nervous systems.
Content Limits	Items will not assess the transmission of nerve impulses along the different pathways. Items will not assess the effector organs of the sympathetic and parasympathetic nervous systems. Items will not assess the anatomy on the sympathetic or parasympathetic nervous systems. Items will not assess the pathways involved during the transmission. Items will not assess the effects of the parasympathetic and sympathetic nervous systems.
Stimulus Attributes	None specified.
Response Attributes	None specified.
Sample Item	<p>What is the purpose of the sympathetic nervous system?</p> <p>*A) To mobilize the body during a time of fear B) To help the body conserve energy C) To allow the body to relax D) To decrease heart rate.</p> <p>Short Answer: Describe the difference between the major functions of the sympathetic and parasympathetic nervous systems. (Answer - The sympathetic nervous system helps the body during extreme conditions such as fear or rage. The parasympathetic nervous system helps the body to relax and conserve energy.)</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.50
Benchmark	Describe the structure of vertebrate sensory organs. Relate structure to function in vertebrate sensory systems.
Also Assesses	
Item Types	Multiple Choice; Short Answer
Benchmark Clarification	Students will describe the structure of vertebrate sensory organs. Students will relate structure to function in vertebrate sensory systems.
Content Limits	Items will be limited to human sensory organs. Items will be limited to the eye, the ear, and the olfactory and taste receptors. Items will not include infections or defects in the sensory systems. Items will be limited to the major structures of the sensory organs. Items will not include eye reflexes, or the five basic taste sensations.
Stimulus Attributes	None specified.
Response Attributes	None specified.
Sample Item	<p>Which region(s) of the ear serve in the process of hearing only?</p> <p>A) internal ear *B) external and middle ear C) external and internal ear D) middle and external ear.</p> <p>Short Answer: How is the eye protected? (Answer - The eye is protected externally by the eyebrow, eyelid, eyelashes, and glands which keep foreign material out of the eye and lubricate the eye. The eye is also protected internally by the sclera which is a thick layer of white connective tissue of the outermost layer of the eye.)</p>

Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.51
Benchmark	Describe the function of the vertebrate integumentary system.
Also Assesses	SC.912.L.16.8; SC.912.L.14.29; SC.912.L.14.36; SC.912.L.14.52
Item Types	Multiple Choice
Benchmark Clarification	Students will be able to describe the structure and development of the integumentary system. Students will be able to describe the functions of the integumentary system including sensory, protection and temperature regulation. Students should be able to describe all six functions of the integumentary system, including covering and lining, thermoregulation, cutaneous sensations, protection against microbial invasion, excretion, and absorption. Students should describe the structure of the skin, including the epidermis and the 5 epidermal strata (corneum, lucidum, granulosum, spinosum, and basale), types of cells in each of the layers (keratinocytes, Langerhans cells, melanocytes, Merkel cells), and the state in which the cells are in for each layer. Example: In stratum basale, the cells are germinating; in granulosum, the cells are dying by undergoing nuclear degeneration; in lucidum, the cells are dead; in corneum, the cells are dead and are continuously shedding. Students should distinguish the number of layers of cells, with stratum corneum consisting of 25-30 layers of dead keratinized cells.
Content Limits	The questions may include the process of keratinization. For non-Honors level courses, items should be limited to identification of functions of the integumentary system. For Honors level courses, items may require students to explain how the function is accomplished by describing how each anatomical structure (i.e. layers of the epidermis, dermis, or subcutaneous layer) contributes to any given function.
Stimulus Attributes	May include diagrams
Response Attributes	None specified.

Sample Item	<p>Which of the following accurately describes one of the functions of the integumentary system?</p> <ul style="list-style-type: none">*A) Capillaries may dilate at the skins surface to cool the body off.B) Capillaries may constrict at the skins surface to cool their body off.C) The sweat glands may release sweat to warm the body.D) Arrector pili may contract to cool the body. <p>An honors level item may be:</p> <p>Which of the following describes how the stratum granulosum contributes the function of the integumentary system as a protective covering for the body?</p> <ul style="list-style-type: none">A) The stratum granulosum is made completely of dead cells.B) The stratum granulosum cells are keratinized providing a waterproof barrier.*C) The stratum granulosum provides a constant source of new cells to replace dead cells that are lost daily.D) The stratum granulosum does not contribute to the skins function as a protective covering of the body.
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Reporting Category	Organisms/Populations/Ecosystems
Standard	Organization & Development of Living Organisms
Benchmark Number	SC.912.L.14.52
Benchmark	Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.
Also Assesses	SC.912.L.14.51; SC.912.L.14.35; SC.912.L.14.6
Item Types	Multiple Choice
Benchmark Clarification	Students will describe the factors involved in the immune system. These factors will include both nonspecific and specific defenses. Students will describe the role of the different types of leukocytes involved in the immune system. Students will describe the processes involved in an Acute Inflammatory Response. Students will describe the roles of innate and acquired immunity. Students will describe the process of immunity including the leukocytes and their roles involved in the process of antibody formation (T cells and B cells). Students will describe how HIV/AIDS affects the immune system. Students will describe autoimmune diseases, immunosuppressant therapies, congenital diseases and allergies manifest as a consequence of immune system function.
Content Limits	This item does not require students to identify specific modes of communication between the cells of the immune system. This item does not require students to identify or explain detailed methods of immunity development.
Stimulus Attributes	Graphics may be used
Response Attributes	None specified.
Sample Item	<p>Vaccines are developed to protect humans from infectious agents. What is the role of the immune system in this process?</p> <p>* A) Vaccines cause a safe exposure to the infectious agent and the immune system develops antibodies to that agent. B) Vaccines cause the infectious agent to spread. C) Vaccines are only available in the United States. D) Vaccines don't work.</p>

Reporting Category	Organisms and Populations/Ecosystems
Standard	Heredity & Reproduction
Benchmark Number	SC.912.L.16.10- Anatomy & Physiology Honors ONLY
Benchmark	Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.
Also Assesses	
Item Types	Multiple Choice
Benchmark Clarification	This item may describe how human health has improved because of advances made in biotechnology. Advances may be historical or modern.
Content Limits	This item will not require students to describe specific methodologies in biotechnology.
Stimulus Attributes	Graphics may be used
Response Attributes	None specified.
Sample Item	<p>Vaccines have had a significant impact on the life expectancy of humans. Which of the following statements provides evidence of this?</p> <p>A) Bacteria can no longer cause fatal infections.</p> <p>B) The number of viruses have decreased over the years.</p> <p>* C) Childhood vaccinations have prevented children from dying from infectious agents.</p> <p>D) Infectious agents can mutate in response to antibiotic therapy.</p>

Reporting Category	Organisms and Populations
Standard	Heredity & Reproduction
Benchmark Number	SC.912.L.16.13- Anatomy & Physiology Honors ONLY
Benchmark	Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy.
Also Assesses	SC.912.L.14.33
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the major organs of the male and female reproductive systems. Students will describe the development of the male and female reproductive systems. Students will describe the mechanisms (hormonal) of control of the male and female reproductive systems. Students will describe human development from fertilization through adulthood. Students will explain the changes that occur during pregnancy (each trimester) for the developing embryo/fetus and the mother. Students will explain the process of parturition.
Content Limits	This item will not require students to describe detailed steps in embryology.
Stimulus Attributes	Diagrams may be used
Response Attributes	None specified.
Sample Item	<p>SC.912.L.14.33 - Which of the following hormones might be used by a fertility clinic to help to enhance female fertility?</p> <p>A) testosterone B) estrogen C) oxytocin * D) FSH (Follicle Stimulating Hormone)</p> <p>SC.912.L.16.13 - Which of the following structures of the male reproductive system is considered to be the longest duct that extends from the scrotum and passes into the pelvic cavity:</p> <p>*A) ductus deferens B) epididymis C) ejaculatory duct D) urethra</p>

Reporting Category	Molecules and Cells
Standard	Matter & Energy Transformations
Benchmark Number	SC.912.L.18.1
Benchmark	Describe the basic molecular structures and primary functions of the four major categories of biological macromolecules.
Also Assesses	SC.912.L.18.6; SC.912.L.18.8; SC.912.L.18.11; SC.912.L.14.46
Item Types	Multiple Choice
Benchmark Clarification	Students will describe the major functions of four major macromolecules as basis for the function of the digestive system (nutrient extraction).
Content Limits	These items are limited the role of macromolecules as nutrients extracted in the digestive system. This item does not require students to identify the molecular structure of these organic molecules.
Stimulus Attributes	None specified.
Response Attributes	None specified.
Sample Item	Which of the following macromolecules are chemically digested in the mouth and used as our primary source of energy? A) amino acids B) nucleic acids C) lipids *D) carbohydrates

Reporting Category	Molecular & Cellular Biology
Standard	Matter & Energy Transformations
Benchmark Number	SC.912.L.18.2- Anatomy & Physiology Honors ONLY
Benchmark	Describe the important structural characteristics of monosaccharides, disaccharides, and polysaccharides and explain the functions of carbohydrates in living things.
Also Assesses	SC.912.L.18.1
Item Types	Multiple Choice
Benchmark Clarification	The focus of this benchmark in anatomy physiology is limited to the role of carbohydrates as nutrients. Students will describe the process of extracting these nutrients in the digestive system. Students will describe the role of different carbohydrates in maintaining homeostasis.
Content Limits	This item does not assess the molecular structure of carbohydrates.
Stimulus Attributes	None specified.
Response Attributes	Low, moderate, high
Sample Item	<p>Glucose is a monosaccharide absorbed by the digestive system as a result of carbohydrate digestion. This monosaccharide is important as it is utilized :</p> <ul style="list-style-type: none"> *A) in cellular respiration to generate ATP B) in urine formation C) as a major component of proteins D) in cell membrane structure

Reporting Category	Molecules and Cells
Standard	Matter & Energy Transformations
Benchmark Number	SC.912.L.18.11
Benchmark	Explain the role of enzymes as catalysts that lower the activation energy of biochemical reactions. Identify factors, such as pH and temperature, and their effect on enzyme activity.
Also Assesses	SC.912.L.18.4; SC.912.L.14.46
Item Types	Multiple Choice
Benchmark Clarification	Students will identify the enzymes (and their substrates) involved in chemical digestion in the different organs of the digestive system. *Addition: Students will identify factors affecting enzymatic activity such as a raise in temperature would cause the particles to collide more rapidly which would speed up the reaction. A temperature too high would denature the protein thus changing the shape thus changing the function of the enzyme. Enzymes like to work within a certain range of pH. Too low or too high pH would cause the enzyme to be inactive.
Content Limits	These items are limited to those enzymes and their substrates as they are related to nutrient extraction in the digestive system.
Stimulus Attributes	None specified
Response Attributes	None specified
Sample Item	Which of the following enzymes are responsible for breaking down starches? A) proteases B) lipases C) nucleases *D) amylase