Scope and Sequence – Human Anatomy & Physiology 1: 1st Quarter

**Subject: Human Anatomy & Physiology I Content: Science Unit 1: Foundations of Anatomy & Physiology**

**Time AZ Standard Vocabulary Learning Goal/Success Criteria Essential Question(s) Resources/Notes \_\_\_\_\_**

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| 2 Weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.**Plus HS+B.L1U1.7**[**Develop and use models**](https://www.nap.edu/read/13165/chapter/7#56)to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal). | AnatomyPhysiologyAtomsCellsTissuesOrganOrgan systemOrganisms**Systems:**Integumentary Skeletal Muscular Nervous Endocrine CardiovascularLymphaticRespiratoryDigestiveUrinaryreproductivedigestionmetabolismexcretionreproductionresponsivenessmovement | LG: Students will understand the relationship between anatomy and physiology. SC: Students will define the terms anatomy and physiology. Students will explain how structure determines the function of the parts of the body.LG: Students will know the structural organization of the human body and the different organ systems.SC: Students will list the different levels of structural organization from atoms to organisms. Students will explain how each level is related to the next. Students will identify the different organ systems within the human body. Students will briefly describe the function of each organ system.LG: Students will understand the important functions in the body in order for an organism to survive.SC: Students will identify the necessary life functions. Students will describe how each life function is important to maintaining life in a body. Students will describe other survival needs for a body system. | How are anatomy and physiology related?What are the major functions of each the organ systems in the body? What is the organizational structure of living things? | Essentials of A&P Ch 1 pg 2-12<http://www.anatomylearning.com/WebGl2019/browser.php>Essentials Wkbk Review Sheet Exercise 2 – Pg 17-18Graphic organizers for systems and structural organization <https://www.worksheetworks.com/miscellanea/graphic-organizers.html> |
| 2 Weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.**Plus HS+B.L1U1.7**[**Develop and use models**](https://www.nap.edu/read/13165/chapter/7#56)to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal). | HomeostasisReceptorControl centerEffectorNegative and positive feedback mechanismsHomeostatic imbalanceAnatomical positionDirectional termsSectionPlaneSaggital sectionMedian/midsaggitalFrontal sectionCoronal sectionTransverseCross sectionPlantar**Cavities:**DorsalCranialSpinalVentralThoracicDiaphragmMediastinumAbdominopelvicAbdominalpelvic | LG: Students will understand why it is important for a body to maintain homeostasis and how the body naturally regulates itself to maintain homeostasis.SC: Students will create a model of the mechanisms that maintain homeostasis in the body. Students will explain the difference between positive and negative feedback mechanisms. LG: Students will know how the body is divided up into sections in order to make it easier to describe the location of body structures.SC: Students will define the anatomical positions and directional terms used for location on the human body. Students will define the regional terms and body planes/sections. Students will use these terms to locate specified body structures. Students will create models of specified body structures using the appropriate anatomical position and directional term.LG: Students will know the differences between the dorsal and ventral body cavities and know what structures are contained within each. SC: Students will identify the differences between the dorsal and ventral body cavities. Students will create models of each cavity and label the structures within each. | Why is it important for a body to maintain homeostasis? How do negative and positive feedback mechanisms affect the body’s ability to regulate itself?Why do scientists use the language of anatomy when talking about body structures on the human body? Which body structures are located within the dorsal or ventral body cavities? | Graphic organizer for anatomical positions, directional terms, and body planes/sectionsA&P Coloring Wkbk pg 8-13Essentials Wkbk Exercise 1 pg 1-6Essentials Wkbk Review Sheet Exercise 1 – Pg 7-8Have students draw or create model of body planes/sections, anatomical positionsVocabulary QuizUnit TestMicroscope labReceptor LabFingerprint Lab |
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**Subject: Human Anatomy & Physiology I Content: Science Unit 2: Cells to Tissue**

**Time AZ Standard Vocabulary Learning Goal/Success Criteria Essential Question(s) Resources/Notes \_\_\_\_\_**

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| 1 Week  | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.**Plus HS+B.L1U1.7**[**Develop and use models**](https://www.nap.edu/read/13165/chapter/7#56)to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal). | CellsNucleusNuclear envelope/membraneNuclear poresNucleoliChromatin/chromosomesPlasma membraneCytoplasmOrganellesMitochondriaEndoplasmic reticulumRibosomesGolgi apparatus | LG: Students will use models to understand the structure of cells and its organelles. They will understand how the structure affects the function of each organelle and the role they play in overall cellular function.SC: Students will identify and describe the structure of the organelles within a cell. Students will create models of a cell properly labeled. Students will explain the function of the organelle in relation to its structure.LG: Students will understand how substances are transported across cell membranes.SC: Students will identify the different types of cell transport. Students will distinguish between active and passive transport. Students will create models for diffusion and osmosis. | How does the structure of a cell’s organelles relate to its function? How does the structure of the cell relate to its function within the body?How are substances transported in and out of a cell and why is it important to understand the methods of transport?  | Microscope labReceptor LabFingerprint Lab<https://www.wiley.com/legacy/college/boyer/0470003790/animations/cell_structure/cell_structure.htm><https://www.cpalms.org/Public/PreviewResourceLesson/Preview/129033>Cell structure & function:Essentials A&P Text pgs 65-83Lab manual – Pg 19-22, pg 29-36A&P Coloring Wkbk pg 33-35, pg 38-39<https://www.cpalms.org/Public/PreviewResourceLesson/Preview/127786><https://www.cpalms.org/Public/PreviewResourceLesson/Preview/127175> |
| 1 week | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.**Plus HS+B.L1U1.7**[**Develop and use models**](https://www.nap.edu/read/13165/chapter/7#56)to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal). | Cell life cycleInterphaseCell divisionMitosisCytokinesisProphaseMetaphaseAnaphaseTelophaseCentromereMitotic spindleGeneEnzymesRNADNAtRNArRnamRNAtranscriptioncodonstranslationanticodon | LG: Students will understand the process of cell division.SC: Students will identify the phases of mitosis. Students will explain what is occurring during each phase of mitosis.LG: Students will understand how proteins are synthesized during mitosis. They will understand the roles of RNA, tRNA, rRNA, and mRNA.SC: Students will identify and label the codons involved in transcription. Students will describe the roles of tRNA, rRNA, mRNA. Students will create models of the transcription and translation process in DNA. | Why is understanding how cell division occurs important to understanding the functions of organ systems? | Cell division models – can be drawings of each phaseA&P Coloring Wkbk pg 41-44Lab Manual – Pg 22-27<https://www.biologycorner.com/anatomy/>HOOK: <https://www.cpalms.org/Public/PreviewResourceUrl/Preview/41589> |
| 1 week | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.**Plus HS+B.L1U1.7**[**Develop and use models**](https://www.nap.edu/read/13165/chapter/7#56)to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal). | TissuesEpithelial tissue/epitheliumApical surfaceBasement membraneStratified epitheliumSimple epitheliumRegenerationfibrosis | LG: Students will understand how tissues are classified and know the differences between each type.SC: Students will describe the way that tissues are classified. Students will identify characteristics for each type of tissue. Students will identify the type of cells found in each type of tissue.LG: Students will understand the two processes for tissue repair. SC: Students will explain the process of tissue repair.  | Why is understanding the different types of tissue important to understanding how the organs in the body function?Why is differentiation of tissues necessary to maintain homeostasis? How does form follow function as it relates to tissues? What determines whether tissue regenerates or is replaced by scars? | <https://www.biologycorner.com/anatomy/>Essentials A&P Text pg 88-104A&P Coloring Wkbk pg 45-50Essentials Wkbk Review Sheet Exercise 5 – pg 49-54 |
| 2 weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis.**Plus HS+B.L1U1.7**[**Develop and use models**](https://www.nap.edu/read/13165/chapter/7#56)to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms (plant and animal). | Integumentary systemIntegumentKeratinEpidermisDermisSubcutaneous tissueHypodermismelanin | LG: Students will know that the integumentary system contains various parts. They will understand how those parts play an important role in maintaining a body’s homeostasis. SC: Students will model the layers of the integumentary system. Students will explain how the structure of the skin allows it to protect the body. Students will explain how the skin helps the body maintain homeostasis through its various parts. LG: Students will understand how disruption of homeostasis can occur through imbalances in the skin. SC: Students will investigate ways that imbalances can occur in the skin.Students will explore how burns can disrupt internal homeostasis. Students will distinguish between the different types of skin cancer. Students will use the ABCDE rule to recognize skin abnormalities. LG: Students will know the types of membranes and how their form determines their function. They will understand how each membrane plays a role in homeostasis.SC: Students will identify the types of body membranes. Students will describe the form and function of each type of body membrane. Students will explain how the function of each membrane contributes to homeostasis. | Why is the skin such a vital organ to the human body? How does the skin help maintain internal homeostasis?How can disruptions in the skin’s homeostasis effect internal homeostasis?What purpose do body membranes serve in maintaining homeostasis? | Essentials A&P Text – pg 110-129Essentials Lab Manual – pg 63-66A&P Coloring Wkbk pg 57-60, pg 65-66<https://www.biologycorner.com/anatomy/chap5.html><https://www.cpalms.org/Public/PreviewResourceLesson/Preview/130024>[https://www.ck12.org/section/The-Integumentary-System-::of::-TE-MS-Skin-Bones-and-Muscles-::of::-CK-12-Life-Science-For-Middle-School-Teachers-Edition/](https://www.ck12.org/section/The-Integumentary-System-%3A%3Aof%3A%3A-TE-MS-Skin-Bones-and-Muscles-%3A%3Aof%3A%3A-CK-12-Life-Science-For-Middle-School-Teachers-Edition/)<https://www.biointeractive.org/classroom-resources/biology-skin-color><https://docs.google.com/document/d/1dQ47rkRqsF1y_8HB5yjX76xug-x1Jym-XaJOcJxyuZY/edit> |

Scope and Sequence - Human Anatomy & Physiology 1:2nd Quarter

**Subject: Human Anatomy & Physiology I Content: Science Unit 3: Skeleton & Articulations**

**Time AZ Standard Vocabulary Learning Goals/Success Criteria Essential Question(s) Resources/Notes**

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| 2weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | Axial skeletonAppendicular skeletonCompact boneSpongy boneLong & short bonesFlat bonesIrregular bonesYellow & red marrowFracturesOssificationOsteoblastsOsteoclastsBone remodeling | LG: Students will understand how the structure of a bone determines its function. SC: Students identify the different functions of the bones in the body. Students will classify bones based on their structure. They will explain the structure of the long bones. LG: Students will know the processes involved in bone formation, growth and remodeling.SC: Students will explain the process of bone formation. Students will investigate how bone remodeling maintains homeostasis within the skeletal system. Students will identify homeostatic imbalances that can affect homeostasis in the skeletal system. | How is the structure of bone related to its function?How does the skeletal system help the body maintain homeostasis? | HOOK: <https://youtu.be/PJ7A6Nw0My4>Essentials A&P Text – pg134-143Lab Manual – pg 70 activity 1Essentials Coloring WkBk – pg 73-74<https://www.biologycorner.com/anatomy/chap7.html><http://www.anatomylearning.com/WebGl2019/browser.php>[https://www.ck12.org/c/biology/skeletal-diseases/lecture/How-the-Body-Works:-Repair-of-Bone/?referrer=concept\_details](https://www.ck12.org/c/biology/skeletal-diseases/lecture/How-the-Body-Works%3A-Repair-of-Bone/?referrer=concept_details) |
| 2.5 weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | SkullCraniumFacial bonesSaggital sutureCoronal sutureTemporal bonesOccipital boneSphenoid boneOptic canalEthmoid boneFacial bonesVertebraeVertebral column (spine)Cervical vertebraeThoracic vertebraeLumbar vertebraeSacrumCoccyxThoracic cageSternumRibs | LG: Students will know the bones within the axial skeleton. They will know how imbalances in this region of the body can affect homeostasis.SC: Students will label diagrams of the bones in the skull, spine, and the thoracic cage. Students will describe the function of the bones found in those major regions. Students will investigate homeostatic imbalances that can affect different portions of the axial skeleton. | What roles to the bones in the axial skeleton play in the human body?What are some imbalances that can affect the bones in the axial skeleton? | <https://www.biologycorner.com/anatomy/chap7.html>Flash cardsDiagrams for labelingEssentials Coloring WkBk – pg 77-84<http://www.anatomylearning.com/WebGl2019/browser.php><https://www.geneseocsd.org/Page/1063> |
| 2.5 weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | ClavicleShoulder girdlePectoral girdleScapulaeHumerusRadiusUlnaCarpal bonesMetacarpalsPhalangesCoxal bonesIliumIschiumPubic boneFemurTibiaFibulaTarsusTarsal bonesMetatarsals | LG: Students will know the bones within the appendicular skeleton. They will know the structure and function of the bones in this section of the body.SC: Students will label diagrams of appendicular portions of the human skeleton. Students will relate form to function for each of the bones in the upper and lower limbs. Students will distinguish between male and female pelvic bone area.  | What roles to the bones in the appendicular skeleton play in the human body? | <https://www.wlwv.k12.or.us/cms/lib/OR01001812/Centricity/Domain/1341/ACTIVITY%20-%20Skeletal%20System%20Review.pdf><http://www.anatomylearning.com/WebGl2019/browser.php><https://www.biologycorner.com/anatomy/chap7.html>Essentials A&P Text – pg 158-166Lab Manual Pg 105 – 108Essentials A&P Coloring Wkbk – pg 85-93Diagrams for labelingModel bones for examination<https://www.teachengineering.org/lessons/view/van_skeletal_system_less2> |
| 1 week | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | FusionOsteoporosisRheumatoid ArthritisOsteoarthritisBone spursGout | LG: Students will know what changes occur within the structure of bones in the human body as we age. SC: Students will identify the bones found in an infant’s skeletal system. Students will identify where fusion of bones occur as a child gets older. Students will identify and label the bones in an adult’s skeletal system as compared to an infant.LG: Students will understand how bones change as humans age and what diseases can affect the bones as we age.SC: Students will research different ailments of the bones. They will identify when these ailments generally affect people (at what age group). Students will describe common bone diseases that affect the elderly. | What changes occur in bones as you age? | <https://www.teachengineering.org/activities/view/van_skeletal_system_activity1><https://www.teachengineering.org/lessons/view/van_skeletal_system_less1>Essentials A&P Text – pg 174-176<https://www.ck12.org/biology/joints/rwa/Turned-To-Stone/?referrer=concept_details><https://www.ck12.org/c/biology/skeletal-diseases/lesson/Skeletal-System-Diseases-and-Disorders-Advanced-BIO-ADV/?referrer=concept_details><https://sites.google.com/a/coe.edu/kelsey-jipp-practicum/lesson-5> |
| 1 week | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | JointsArticulationsSynarthrosesAmphiarthrosesDiarthrosesFibrousCartilaginousSynovialPlane jointHinge jointPivot jointCondyloid jointSaddle jointBall-and-socket joint | LG: Students will understand how joints are classified and will be able to identify the different types of joints in the body.SC: Students will use the appropriate classification labels of joints in context. Students will define the difference between synarthroses, amphiarthroses, and diarthroses. Students will describe the differences between fibrous, cartilaginous, and synovial joints. Students will differentiate between the shapes of synovial joints. | What are the strengths and limitations of the body's joints? | Essentials A &P Text – pg 166-172Lab Manual pg 115-116, pg 109 – 112Essentials A&P Coloring Text – pg 95—98<https://www.ck12.org/biology/joints/lecture/Joints-of-the-Skeleton/?referrer=concept_details><https://www.ck12.org/biology/joints/lesson/Skeletal-System-Joints-MS-LS/?referrer=concept_details><https://www.ck12.org/assessment/tools/geometry-tool/plix.html?eId=SCI.BIO.916&questionId=55c29b6eda2cfe78a9fc55ff&artifactID=2116525&plix_redirect=1> |
| **Unit Test** |

Scope and Sequence-Human Anatomy & Physiology 1:3rd Quarter

**Subject: Human Anatomy & Physiology I Content: Science Unit: Movement**

**Time AZ Standard Vocabulary Learning Goals/Success Criteria Essential Question(s) Resources/Notes**

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| 1week | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | Muscle fibersSkeletal muscle fibersStriated muscleVoluntary muscleEndomysiumPerimysiumFascicleEpimysiumTendonsAponeurosesSmooth muscleCardiac muscle | LG: Students will know the similarities and differences in the structure and function of the three types of muscle tissue, and indicate where they are found in the body.SC: Students will describe each of the 3 types of muscle tissue. Students will create a model of how the 3 types of tissue are structurally different.LG: Students will understand the sliding filament theory of muscle contraction. SC: Students will identify the parts of the muscle involved in the sliding filament theory. Students will use diagrams to explain the roles of the myosin myofilament, actin myofilament, protein complex, ATP, and Calcium ions play in the filament theory. | How do the cells of the three types of muscle tissue differ? How does this difference relate their function in the body?How does the siding filament theory explain how muscles contract?How does the structure of a sarcomere explain the sliding filament theory? | Essentials A&P Text – pg 183-189<https://www.youtube.com/watch?v=ousflrOzQHc>Lab Manual – pg 125-126<https://www.biologycorner.com/worksheets/sliding-filament-coloring.html> |
| 1.5 week | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | Graded responsesUnfused/FusedIncomplete/completeTetanusMuscles twitchesCreatine phosphateAerobic respirationLactic acidAnaerobic glycolysisMuscle fatigueOxygen deficitIsotonic contractionsIsometric contractionsMuscle toneAerobicResistance exercisesOriginInsertionFlexionExtensionRotationAbductionAdductionCircumduction | LG: Students will understand how whole muscles react to stimuli through graded response and how to differentiate between normal contractions and muscle twitches. SC: Students will define graded response. Students will identify the phases that occur in muscle twitches. Students will explain the difference between graded response movement and muscle twitches.LG: Students will understand what energy is used during muscle movement and what can cause muscle fatigue and oxygen deficits.SC: Students will define what ATP is. Students will define ACh and how it is used to contract muscles. Students will investigate the three pathways for ATP regeneration. Students will define muscle fatigue and its causes. Students will describe what happens when muscles experience oxygen deficit.LG: Students will know the different types of muscle contractions and explain how certain types of exercises effect the muscles.SC: Students will differentiate between isotonic and isometric contractions. Students will describe the effects of aerobic and anaerobic exercise on muscles.LG: Students will know the common and special movements that can be made by the muscular system.SC: Students will model each type of movement and describe what is occurring with the muscles during each movement.  | Why is it important to understand the difference between graded responses and muscle twitches?Why should people utilize multiple types of exercise for muscle development?What type and how is energy used in the contraction of muscles? | Essentials A&P Text – pg 194-202<https://www.pearson.com/content/dam/one-dot-com/one-dot-com/us/en/higher-ed/en/products-services/course-products/marieb-10e-info/pdf/marieb-0321927028-chapter9.pdf><https://docs.google.com/document/d/14nLyD4o7Sg-OxndLyXBC1v6OBU9gkYf4XkyQ41tQscA/edit> |
| 1.5 weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | CircularConvergentParallelFusiformPennateUnipennateBipennatemultipennate Facial musclesNeck musclesAnterior Posterior | LG: Students will know major muscles names and how their form determines function. SC: Students will practice identifying muscles of the body. Students will investigate the origin and the insertion of the muscle. | How does a muscles form affect its function? | <http://www.anatomylearning.com/WebGl2019/browser.php>Essentials A&P Text – pg 202-218Lab Manual pg 129-141, pg 143, 146-147<https://www.biologycorner.com/anatomy/muscles/muscles_coloring.html> |
| 2 weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | Nervous systemSensory inputIntegrationMotor outputCentral nervous systemPeripheral nervous systemSensory, afferent divisionMotor, efferent divisionDendriteAxonMultipolar neuronBipolar neuronUnipolar neuron | LG: Students will understand the structure and function of the nervous system and they are classified. They will know the parts of the central and peripheral nervous systems. SC: Students will identify which parts of the nervous system are part of the central or peripheral systems. Students will create a graphic organizer to organize the functional classification system of the nervous system. LG: Students will know the structure of neurons and will understand how each part plays a functional role in the transmission of signals.SC: Students will identify and label the parts to a neuron. Students will compare and contrast axons to dendrites. Students will describe the function of the neurotransmitters. Students will describe the importance of the myelin sheath and the role it plays in nerve conduction.LG: Students will know some ways that the nervous system can be disrupted and the effects that can occur.SC: Students will investigate imbalances in the nervous system. Students will explain how these disruptions can affect the function of the nervous system. | How is the nervous system important in maintaining homeostasis in the body?What is the importance of neurotransmitters and the myelin sheath? | HOOK: <https://youtu.be/snO68aJTOpM>Essentials A&P Text – pg 228-236Essentials Coloring Text – pg 131-135<http://www.anatomylearning.com/WebGl2019/browser.php><https://www.biologycorner.com/anatomy/nervous/neuron_label.html><https://www.biologycorner.com/anatomy/nervous/nerve_cells_coloring.html><https://betterlesson.com/lesson/631858/neuron-structure-and-function><https://neuron.illinois.edu/curriculum-units> |
| 3 weeks | **Essential HS.L1U1.20** [**Ask questions**](https://www.nap.edu/read/13165/chapter/7#54) **and/or make predictions** based on observations and evidence to demonstrate how cellular organization, structure, and function allow organisms to maintain homeostasis | Nerve impulsessynapsePolarizedDepolarizationGraded potentialAction potentialRepolarizationReflexesReflex arcsSomatic reflexesAutonomic reflexesCerebral cortexHemispheresCerebrumParietal lobeOccipital lobeTemporal lobeFrontal lobeGray matterHypothalamusPituitary glandEpithalamusBrain stemMidbrainMedulla oblongata | LG: Students will understand the difference between graded potential and action potential. They will know how action potentials are propagated. SC: Students will research the difference between graded potential and action potential. Students will create a model of the propagation of action potential signals. LG: Students will understand the role synapses play in maintaining homeostasis in the body.SC: Students will define synapse. Students will create a model of a synapse. Students will investigate how neurons communicate at chemical synapses. Students will explain how stimuli are transmitted at the synapse. LG: Students will understand the functional anatomy of the brain.SC: Students will identify and label the different parts of the brain. Students will explain the function of each portion of the brain. LG: Students will understand the effects of brain injuries on homeostasis.SC: Students will research different injuries that can occur to the brain. Students will explain how those injuries can affect the body and its normal functions.  | How are action potentials generated and propagated?How do synapses help maintain homeostasis in the body? Why is it important to understand the major regions of the brain and their function?How can traumatic brain injuries affect the functions of the body? | Parts of Brain Hook: <https://www.youtube.com/watch?v=cu7A8LIzL1o><https://www.biologycorner.com/anatomy/nervous/brain_label.html><http://www.cpalms.org/Public/PreviewResourceLesson/Preview/130138><http://brainu.org/movies><http://brainu.org/neuroscience-concepts-activities-grade-level-high-school-grades-9-12><http://headsup.scholastic.com/teachers/lessons/lesson-wiring-your-brain><https://www.biologycorner.com/anatomy/nervous/phineas.html><http://www.bri.ucla.edu/outreach/project-brainstorm/brain-injury-lesson-plan> |
| **Unit Test** |

Scope and Sequence- Human Anatomy & Physiology: 4th Quarter

Arizona HS Science standards from Strand 1 (Inquiry Process), Strand 2 (History and Nature of Science) and Strand 3 (Science in Personal and Social Perspective) as well as the AZ Common Core Science Literacy Standards will be taught throughout the year through reading informational texts, through laboratory activities including designing labs and writing lab reports and through direct instruction. They are not mentioned in the below scope and sequence unless that standard is at the main focus of the lesson taught.

NGSS Coming Soon…

Subject: Human Anatomy & Physiology Content: Science Unit: Senses and Blood (Fourth Quarter)

**Time AZ Standard NGSS Skills to Master Essential Question(s) Assessments/Notes**

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|  4 weeks | **Concept 5: Matter, Energy, and Organization in Living Systems (Including Human Systems)****Understand the organization of living systems, and the role of energy within those systems**. PO 2. Describe the role of organic and inorganic chemicals (e.g., carbohydrates, proteins, lipids, nucleic acids, water, ATP) important to living things.PO 5. Describe the levels of organization of living things from cells, through tissues, organs, organ systems, organisms, populations, and communities to ecosystems. |  | Describe the structure and function of accessory eye structures, eye layer, the lens and humors of the eye.Trace the pathway of light thru the retina and explain how it is focused for vision.Diagram the events of stimulation and sight.Discuss some diseases of the eye.Explain how vision is corrected.Describe the location and function of taste and smell receptors.Describe the structure and function of the outer, middle and internal ears.Explain how the balance organs of the semicircular canals and the vestibule help maintain dynamic and static equilibrium. | How do rods and cones differ in functionality?Where is the fovea centralis and why is it important?How does the eye compensate for the blind spot?What are some of the effects aging has on special sense organs?What structure in the ear allows for pressure to be equalized?Why do babies get frequent ear infections?What is the purpose of installing tubes in babies’ ears who experience frequent ear infections?What factors go into helping the body maintain balance? Explain each of their roles in maintaining balance?Why can’t you taste when you have a cold?Why does your nose run when you cry?  | Vision labOphthalmoscopeOtoscopeBlind spot detection labPeripherial vision labVocabulary quizzesFormative assessmentSpecial senses assessment |
| 4 weeks | **Concept 5: Matter, Energy, and Organization in Living Systems (Including Human Systems)****Understand the organization of living systems, and the role of energy within those systems**. PO 2. Describe the role of organic and inorganic chemicals (e.g., carbohydrates, proteins, lipids, nucleic acids, water, ATP) important to living things.PO 5. Describe the levels of organization of living things from cells, through tissues, organs, organ systems, organisms, populations, and communities to ecosystems. |  | Describe the composition and physical characteristics of whole blood.Explain why blood is classified as a connective tissue.Describe the function of each of the components of blood and how they help maintain homeostasis.Discuss the function and composition of plasma.Describe the role of all formed elements in maintaining homeostasis.Explain the physiological factors which lead to the formation of formed elements.Explain how homeostasis regulates the production of formed elements.Describe the process of hemostasis. List factors that limit clot formation and prevent undesirable clotting.Describe ABO and Rh blood groups. Demonstrate the transfusion reactions. | How much blood does the average human contain?Which body organ prompts bone marrow to make more red blood cells?What effect does altitude have on the amount of red blood cells?How is the used by athletes?What is blood doping?What is the main function of white blood cells? Of platelets?How could you tell if blood types were compatible if no anti-serum was available?Why are the RBC and WBC levels of cancer patients monitored closely? |  Blood transfusion labCounting platelets labFormative assessmentsVocabulary quizzesBlood sugar lab |
| 2 weeks | **Concept 5: Matter, Energy, and Organization in Living Systems (Including Human Systems)****Understand the organization of living systems, and the role of energy within those systems**. PO 2. Describe the role of organic and inorganic chemicals (e.g., carbohydrates, proteins, lipids, nucleic acids, water, ATP) important to living things.PO 5. Describe the levels of organization of living things from cells, through tissues, organs, organ systems, organisms, populations, and communities to ecosystems. |  |  |  |  |
| **Unit Test** |