

Unit Title: It's All About You: From Cells to Organisms

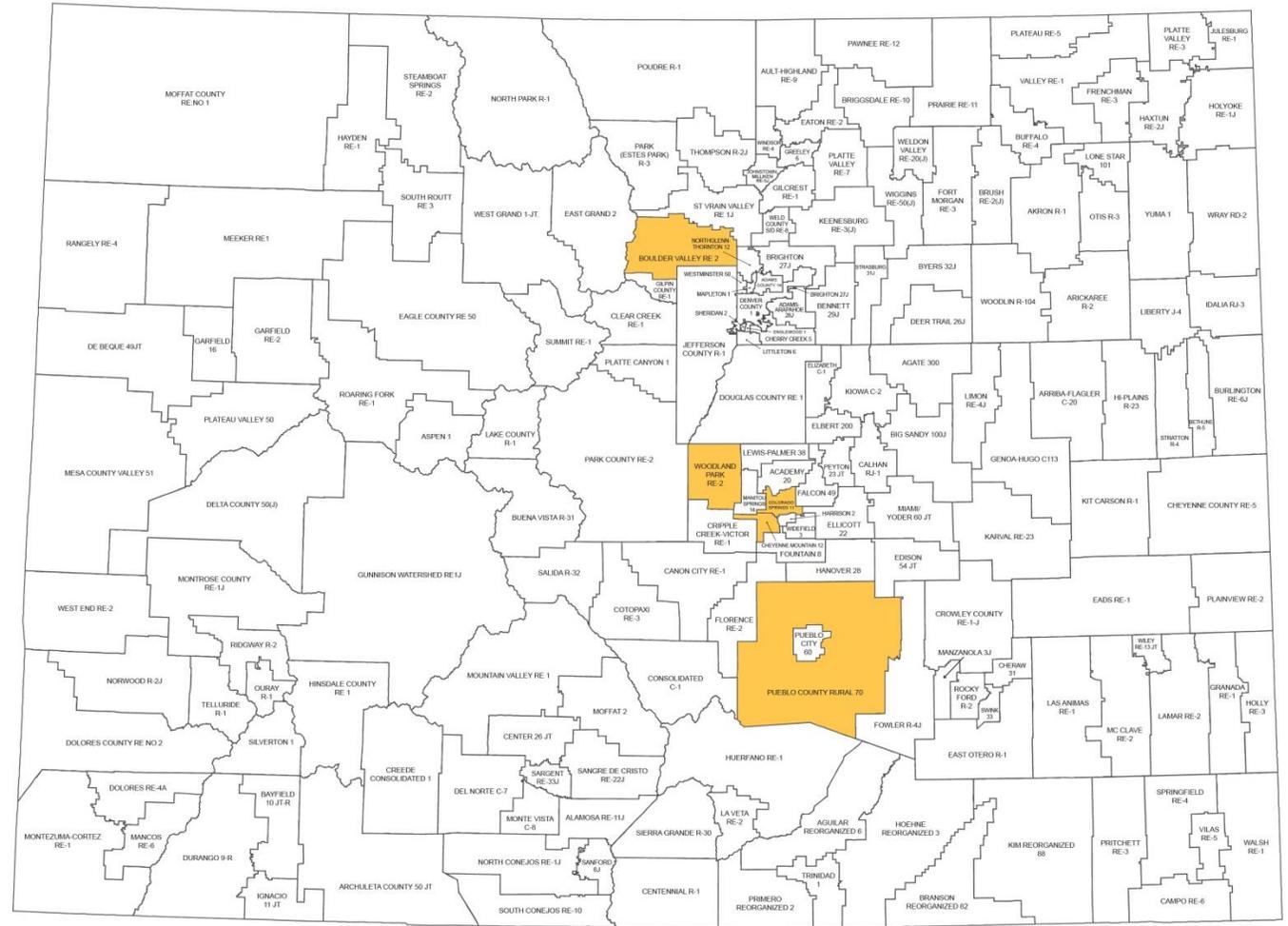
INSTRUCTIONAL UNIT AUTHORS

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Colorado's District Sample Curriculum Project

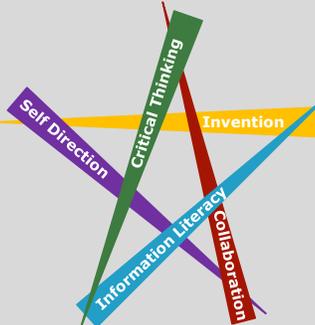
This unit was authored by a team of Colorado educators. The template provided one example of unit design that enabled teacher-authors to organize possible learning experiences, resources, differentiation, and assessments. The unit is intended to support teachers, schools, and districts as they make their own local decisions around the best instructional plans and practices for all students.

Colorado Teacher-Authored Sample Instructional Unit

Content Area	Science	Grade Level	7 th Grade
Course Name/Course Code			

Standard	Grade Level Expectations (GLE)	GLE Code
1. Physical Science	1. Mixtures of substances can be separated based on their properties such as solubility, boiling points, magnetic properties, and densities	SC09-GR.7-S.1-GLE.1
2. Life Science	1. Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment	SC09-GR.7-S.2-GLE.1
	2. The human body is composed of atoms, molecules, cells, tissues, organs, and organ systems that have specific functions and interactions	SC09-GR.7-S.2-GLE.2
	3. Cells are the smallest unit of life that can function independently and perform all the necessary functions of life	SC09-GR.7-S.2-GLE.3
	4. Photosynthesis and cellular respiration are important processes by which energy is acquired and utilized by organisms	SC09-GR.7-S.2-GLE.4
	5. Multiple lines of evidence show the evolution of organisms over geologic time	SC09-GR.7-S.2-GLE.5
3. Earth Systems Science	1. Major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions	SC09-GR.7-S.3-GLE.1
	2. Geologic time, history, and changing life forms are indicated by fossils and successive sedimentation, folding, faulting, and uplifting of layers of sedimentary rock	SC09-GR.7-S.3-GLE.2

Colorado 21st Century Skills



Critical Thinking and Reasoning: *Thinking Deeply, Thinking Differently*

Information Literacy: *Untangling the Web*

Collaboration: *Working Together, Learning Together*

Self-Direction: *Own Your Learning*

Invention: *Creating Solutions*

Reading & Writing Standards for Literacy in Science and Technical Subjects 6 - 12

Reading Standards

- Key Ideas & Details
- Craft And Structure
- Integration of Knowledge and Ideas
- Range of Reading and Levels of Text Complexity

Writing Standards

- Text Types & Purposes
- Production and Distribution of Writing
- Research to Construct and Present Knowledge
- Range of Writing

Unit Titles	Length of Unit/Contact Hours	Unit Number/Sequence
It's All About You: From Cells to Organisms	7-9 weeks	1

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Unit Title	It's All About You: From Cells to Organisms		Length of Unit	7-9 weeks
Focusing Lens(es)	Systems Structure and Function	Standards and Grade Level Expectations Addressed in this Unit	SC.09-GR.7-S.2-GLE.2 SC.09-GR.7-S.2-GLE.3	
Inquiry Questions (Engaging-Debatable):	<ul style="list-style-type: none"> Does structure follow function or does function follow structure in living organisms? How can the human body be explained as systems within systems? 			
Unit Strands	Life Science			
Concepts	Systems, Structure, Function, Interactions, Models, Scale, Cells, Human Body, Organism, Relationship			

Generalizations My students will Understand that...	Guiding Questions	
	Factual	Conceptual
The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism (SC.09-GR.7-S.2-GLE.2-EO.b;IQ.2)	What are the major body systems within the human body and the organs that make up each body system? (SC.09-GR.7-S.2-GLE.2-EO.a)	How do multiple different systems within the human body interact to perform an important function (for example: providing glucose to a neuron in the brain)? What is the most important component of a cell for it to still perform its functions as a cell? (SC.09-GR.7-S.2-GLE.3-EO.a)
Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level (SC.09-GR.7-S.2-GLE.2-EO.c;N.1)	What are the major components of a plant cell, animal cell, and a single-celled organism? (SC.09-GR.7-S.2-GLE.3-EO.b,c) What are the different organizational levels within an organism and examples of each? (SC.09-GR.7-S.2-GLE.3-EO.a)	What makes one model of an organ system or a cellular organelle better than another model? (SC.09-GR.7-S.2-GLE.3-EO.a,b) How are all living things both similar and different in terms of structure and function? (SC.09-GR.7-S.2-GLE.2-EO.b)
The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function (SC.09-GR.7-S.2-GLE.3-EO.a; IQ.1) and (SC.09-GR.7-S.2-GLE.2-EO.b)	What is the difference between plant cells, animal cells, and single-celled organisms? (SC.09-GR.7-S.2-GLE.3-EO.b,c)	How are structure and function related in a given organ or cellular organelle (for example: heart, cell membrane)?
Cells operate independently and interdependently to perform the necessary functions of life (SC.09-GR.7-S.2-GLE.3-EO.a, b)	What are the necessary functions for life? (SC.09-GR.7-S.2-GLE.3-EO.a; IQ.1)	How do cells extract energy from food and eliminate waste similar to the human body? (SC.09-GR.7-S.2-GLE.3-EO.c; IQ.3)

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Critical Content: My students will Know...	Key Skills: My students will be able to (Do)...
<ul style="list-style-type: none"> • The composition of the human body (atoms, molecules, cells, tissues, organs, and organ systems and their specific functions and interactions)(SC.09-GR.7-S.2-GLE.2) • The inter-related nature of structure and function in living things (SC.09-GR.7-S.2-GLE.2, 3) • The functions of cells as a the smallest unit of life that can function independently and perform all the necessary functions of life (SC.09-GR.7-S.2-GLE.3) • The similarities and differences between plant cells, animal cells, and single-celled organisms (SC.09-GR.7-S.2-GLE.3-EO.3) • The development and refinement of our t understanding of cells over centuries of studies by many scientists (SC.09-GR.7-S.2-GLE.3; N.1) • How each body system contributes to supporting the life of the organism (SC.09-GR.7-S.2-GLE.2;IQ.1) • The different body systems (SC.09-GR.7-S.2-GLE.2-EO.a) 	<ul style="list-style-type: none"> • Develop and design a scientific investigation about human body systems (SC.09-GR.7-S.2-GLE.2-EO.a) • Develop, communicate, and justify an evidence-based scientific explanation regarding the functions and interaction of the human body (SC.09-GR.7-S.2-GLE.2-EO.b) • Gather, analyze, and interpret data and models on the functions and interactions of the human body (SC.09-GR.7-S.2-GLE.2-EO.c) • Draw, label, describe, and explain the cell, its organelles, and their functions, in plant cells, animal cells, and single-celled organisms (SC.09-GR.7-S.2-GLE.3) • Gather, analyze, and interpret data and models on the different types of cells, their structures, components and functions (SC.09-GR.7-S.2-GLE.3-EO.a) • Develop, communicate, and justify an evidence-based scientific explanation regarding cell structures, components, and their specific functions (SC.09-GR.7-S.2-GLE.3-EO.b) • Compare and contrast the basic structures and functions of plant cells, animal cells, and single-celled organisms (SC.09-GR.7-S.2-GLE.3-EO.c) • Employ tools to gather, view, analyze, and report results for the scientific investigations of cells (SC.09-GR.7-S.2-GLE.3-EO.d)

<p>Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline. EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: <i>“Mark Twain exposes the hypocrisy of slavery through the use of satire.”</i></p>	
<p>A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):</p>	<p><i>The structure of an organ or an organelle helps it to perform its main function. For example, the heart is a muscular organ with multiple chambers that allow it to perform its function of pumping blood throughout the body.</i></p>
<p>Academic Vocabulary:</p>	<p>systems, structure, function, interactions, models, scale, compare, contrast</p>
<p>Technical Vocabulary:</p>	<p>cells, human body, organism, organelle, organ system, organ, tissue, atom, molecule</p>

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Unit Description:	This unit focuses on the structure and function from the cellular level to the organism within all living things including single-cell and multi-cell organisms. This unit describes homeostasis and interconnectedness of cellular organization to system functions. Beginning with cell theory, across the unit students investigate macromolecules, pro- and eukaryotic cells, active and passive transport, levels of organization, the structure and function of body systems, and the interconnectedness amongst systems. The unit culminates in a performance assessment that asks students to analyze the impacts of organ failure or disease on organ systems.
Considerations:	<p>Consideration: Homeostasis is not an isolated unit, but should be integrated throughout each organ system Inter-connectedness of organ systems should be constantly communicated as the teacher introduces additional systems Some organ systems are more closely related (e.g., Circulatory and Respiratory) and deserve more attention to those relationships The original units length of instruction was set at 7-9 weeks, however this instructional build-out may take closer to 9-11 weeks Teachers may consider adding photosynthesis and respiration to the beginning of this unit to ground the student in cellular energy</p> <p>Possible misconceptions: Atoms and Cells are the same thing (Basic Building Block of Matter vs. Basic Building Block of Life) All bacteria make us sick Digestion starts in the stomach Respiration and breathing are the same thing</p>
Unit Generalizations	
Key Generalization:	The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism
Supporting Generalizations:	Cells operate independently and interdependently to perform the necessary functions of life
	The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function
	Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level

Performance Assessment: <i>The capstone/summative assessment for this unit.</i>	
Claims: (Key generalization(s) to be mastered and demonstrated through the capstone assessment.)	The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism
Stimulus Material: (Engaging scenario that includes role, audience, goal/outcome and explicitly connects the key generalization)	<p>You are a healthcare professional at the local hospital and throughout the day you see many patients. Select four patient cases that most interest you, identify the primary system and discuss the key functions and organs of that system impacted in each case. Then evaluate the impact of at least two other organ systems that are either compromised* by or must compensate* for loss of homeostasis. You must present your findings (formal written report, oral presentation, etc.) and defend your answers using text evidence and specifically address concerns around structure and function.</p> <p>*compromised (work less efficiently) *compensate (work harder)</p>

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Product/Evidence: (Expected product from students)	Students will be presented with various case studies (role play, video, case files, etc.) demonstrating symptoms of systems that are not in homeostasis (e.g., broken femur, severe head ache [concussion], diarrhea, trouble breathing, etc.). Students must analyze the primary system impacted then evaluate at least two other systems that are either compromised by or must compensate for loss of homeostasis. They must present their findings (formal written report, oral presentation, etc.) and support their choices using text evidence and specifically address concerns around structure and function.
Differentiation: (Multiple modes for student expression)	<ul style="list-style-type: none"> • The teacher may provide multiple choice questions for the identification of organ systems for each scenario. • The teacher may provide framed sentences for responses to questions. • The teacher may provide reading materials at various Lexile levels. • The teacher may allow oral presentation in place of written report. • The teacher may allow students to choose one other system to evaluate instead of two. • The teacher may modify the number of case studies. • The teacher may guide student choices of case studies based on level of difficulty. <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning.)</p> <ul style="list-style-type: none"> • To extend this work, students will research an actual diagnosis and course of treatment OR apply their understanding of the case studies with those of plants/ecosystems OR choose more than two systems that interact with the primary system.

Texts for independent reading or for class read aloud to support the content	
Informational/Non-Fiction	Fiction
<p><i>Cellular Biology: Organelles, Structure, Function</i> - April Chloe Terrazas [lexile level 640-860]</p> <p><i>Dr. Frankenstein's Human Body Book</i> - Richard Walker [lexile level 730-960]</p> <p><i>The Book of Blood</i> - HP Newquist [lexile level 860-1010]</p> <p><i>Invincible Microbe : Tuberculosis and the Never-ending Search for a Cure</i> - Jim Murphy and Alison Blank Houghton Mifflin [lexile level 1200]</p> <p><i>Kids Human Body Books</i> (series) - Seymour Simon [lexile level 890-1130]</p> <p><i>Alive: The Living, Breathing Human Body Book</i> - DK Publishing [lexile level 640-860]</p> <p><i>The Magic School Bus: Inside the Human Body</i> - Joanna Cole Scholastic [lexile level AD520]</p> <p><i>Bones: Skeletons and How They Work</i> - Steve Jenkins Scholastic [lexile level 640-860]</p>	<p><i>The Blood Hungry Spleen</i> - Allen Wolf [lexile level 730-960]</p> <p><i>The Way We Work</i> - David Macaulay [lexile level 860-1010]</p> <p><i>Fever 1793</i> - Laurie Halse Anderson 2000 Simon & Schuster [lexile level 580]</p> <p><i>Matilda Bone</i> - Karen Cushman 2000 Clarion [lexile level 850]</p> <p><i>The Apprenticeship of Lucas Whitaker</i> - Cynthia DeFelice 1996 Farrar/Sunburst [lexile level 830]</p> <p><i>Mind Games</i> - Jeanne Marie Grunwell 2003. Houghton [lexile level 760]</p>

Ongoing Discipline-Specific Learning Experiences				
1.	Description:	Think like a scientist: Scientific method and experimentation	Teacher Resources:	<p>http://www.brainpopjr.com/science/scienceskills/scientificmethod/grownups.weml (Near middle of page teacher resources page with activities)</p> <p>http://undsci.berkeley.edu/teaching/misconceptions.php (A list of common misconceptions about the nature of science)</p>

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				<p>http://undsci.berkeley.edu/teaching/ (Tips for introducing and teaching scientific method and experimentation)</p> <p>http://www.livescience.com/6727-invisible-gorilla-test-shows-notice.html (Video in which most people fail to observe large “gorilla” moving across room)</p> <p>http://www.shodor.org/succeed-1.0/forensic/teacher/lessons/observation.html (Lesson plan devoted to developing observation skills)</p> <p>http://blogs.loc.gov/teachers/2011/06/look-again-challenging-students-to-develop-close-observation-skills/ (Library of Congress brief of tools for helping students develop observation skills)</p>
			Student Resources:	<p>http://www.brainpopjr.com/science/scienceskills/scientificmethod/grownups.weml (At top of page student link for movie and activities about scientific method)</p> <p>http://www.glencoe.com/sites/common_assets/science/virtual_labs/E16/E16.html (Virtual lab to practice use of scientific method and experimentation)</p> <p>http://www.brainpop.com/science/scientificinquiry/scientificmethod/preview.weml (Movie and quiz for scientific method/inquiry)</p> <p>http://lifelife.com/5960811/how-to-develop-sherlock-holmes-like-powers-of-observation-and-deduction (Explanation of tools to increase observation skills with hook related to Sherlock Holmes)</p>
	Skills:	Gather, analyze and interpret data Analyze experimental results with respect to their support of the hypothesis Identify possible sources of error	Assessment:	The students will be assessed within the learning experiences
2.	Description:	Working like a scientist: Laboratory Skills	Teacher Resources:	<p>http://www.flinnsci.com/teacher-resources/teacher-resource-videos/minute-videos/biology-minute-videos/teaching-dissection-safety/ (Dissection safety videos.)</p> <p>http://edtech2.boisestate.edu/pattymcginnis/592/Files/506%20Lesson%201%20Virtual%20Tour%20of%20the%20Microscope.pdf (Complete lab activity to introduce the microscope and its use)</p>
			Student Resources:	<p>http://www.mhhe.com/biosci/genbio/virtual_labs/BL_16/BL_16.html (Virtual frog dissection lab)</p> <p>http://edtech2.boisestate.edu/pattymcginnis/506/Cell_Site/506_microscope.html (History of microscope)</p> <p>http://www.udel.edu/biology/ketcham/microscope/scope.html (Virtual tour of the microscope)</p>
	Skills:	Using a microscope and slides Investigate structure through dissections Practice laboratory safety skills	Assessment:	The students will be assessed within the learning experiences

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3.	Description:	Communicating like a scientist: Read critically, extract main ideas, and recognize root words	Teacher Resources:	http://www.learnthat.org/pages/view/roots.html (Root words and affix dictionary-medical) http://www.dummies.com/how-to/content/common-latin-and-greek-roots-in-biology-vocabulary.html (Root words and affix dictionary -biology) http://www.dummies.com/how-to/content/common-latin-and-greek-roots-in-biology-vocabulary.html (Biology vocabulary builder website)
			Student Resources:	http://www.learnthat.org/pages/view/roots.html (Root words and affix dictionary-medical) http://www.dummies.com/how-to/content/common-latin-and-greek-roots-in-biology-vocabulary.html (Root words and affix dictionary -biology) http://www.dummies.com/how-to/content/common-latin-and-greek-roots-in-biology-vocabulary.html (Biology vocabulary builder website)
	Skills:	Identify prefixes and suffixes Identify and use cognates Comprehension of academic vocabulary Identify key points and themes	Assessment:	The student will demonstrate their understanding of key scientific language through white board checks, quizzes, Pictionary, charades, etc.

Prior Knowledge and Experiences
Students must have a basic understanding of structure and function, the names and functions of body organs, the concept of cause and effect, photosynthesis, organism, models and their uses, atomic structure, living versus nonliving, metric system, scale, and the difference between qualitative and quantitative data.
Vertical Articulation: The last time students have seen the concepts within this unit was in 5 th grade and 2 nd -PK.

Learning Experience # 1
Instructional Timeframe: Weeks 1

Learning Experience # 1	
The teacher may lead a discussion on the cell theory so that students can understand that cells are the basic unit of life and that there are living and nonliving things.	
Generalization Connection(s):	The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function Cells operate independently and interdependently to perform the necessary functions of life
Teacher Resources:	http://www.timeline-help.com/the-cell-theory-timeline.html (Cell theory timeline)

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Student Resources:	http://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_explorcharac/tdc02_doc_explorcharac.pdf (Chart/ Checklist to help distinguish between living and nonliving things.) http://ed.ted.com/lessons/the-wacky-history-of-cell-theory (Cell theory video with questions in a Think section) http://www.youtube.com/watch?v=KuJqqiATlqw (Cell theory video/ song) http://www.teacherspayteachers.com/Product/Cell-Theory-Cell-Intro-Match-Game-361644 (Cell Theory matching activity. FREE on teachers' pay teachers)	
Assessment:	Students will record observations (written or drawings) in their science notebook and take a quiz on differentiating living and nonliving things.	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may allow the use of sentence frames http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)	The student may report observations verbally The student may draw pictures of observations of specimens The student may manipulate pictures into living and nonliving
Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may have students research Robert Hooke to identify his contributions to the cell theory and find similarities and differences between living and nonliving things	The student may write a eulogy for Robert Hooke to describe his contributions to the cell theory and present to the class
Critical Content:	<ul style="list-style-type: none"> • Cell theory • Cells are the basic unit of life • Robert Hooke 	
Key Skills:	<ul style="list-style-type: none"> • Identify cells as the basic unit of life • Compare and contrast living and nonliving things 	
Critical Language:	Cell, theory, differentiate, identify, living, nonliving, observations, compare and contrast, life, identify	

Learning Experience # 2 - 4
Instructional Timeframe: Weeks 1-3

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Learning Experience # 2		
The teacher may introduce the concept of macromolecules (lipids, proteins, nucleic acids, and carbohydrates) in cells so that the students can understand the components of living things as a progression from the atomic, to the molecular , to the cellular level.		
Generalization Connection(s):	Cells operate independently and interdependently to perform the necessary functions of life The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function	
Teacher Resources:	http://www.lessonplansinc.com/proteins_lipids_carbohydrates_lesson_plans.php (Lesson plans to teach each macromolecule) http://new.schoolnotes.com/files/mcguirelg/Biomoleculechartcompleted.doc (Chart describing basic functions of macromolecules)	
Student Resources:	http://www.chem4kids.com/files/bio_intro.html (Website written for kids discussing the roles of macromolecules and other topics in biochemistry) http://www.youtube.com/watch?v=nt9u7CfVoc4 (YouTube song made by a high school student about types of molecules) http://quizlet.com/8460014/carbohydratesproteinslipids-nucleic-acids-flash-cards/# (Flashcards for vocabulary)	
Assessment:	The students will use a cluster web to recall and identify a specific macromolecule and its role. http://eltbakery.edublogs.org/2010/01/12/graphic-organizers/ (Cluster web graphic organizer example)	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may pre-teach vocabulary (sound-it-out guide) The teacher may provide visual notes of roles (i.e., cell phone = communication, car = transport, etc.) The teacher may provide a word bank for quiz http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning.)	The student may use visuals/images to complete the graphic organizer
Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may provide research materials for students to relate importance of macromolecules at the cellular level to how the body acquires macromolecules through food, and why good nutrition might be important http://healthyeating.sfgate.com/description-difference-between-carbohydrates-proteins-lipids-nucleic-acids-7424.html (Site about macromolecules) The teacher may allow students to create comic strips to personify macromolecules	The student may write a story using an analogy for each macromolecule and present to the class

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Critical Content:	<ul style="list-style-type: none"> Roles of carbohydrates, proteins, lipids, nucleic acids and water within the cell
Key Skills:	<ul style="list-style-type: none"> Summarize the roles of the different macromolecules with a cell. Recall and identify macromolecules
Critical Language:	Lipids, proteins, nucleic acids, carbohydrates, water, macromolecules, recall, identify, summarize

Learning Experience # 3	
<p>The teacher may provide various opportunities to examine the similarities and differences between eukaryotic and prokaryotic cells so that the students can analyze, compare and contrast, and summarize the relationship between structure and function within a prokaryotic and eukaryotic cell.</p>	
Generalization Connection(s):	<p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p>
Teacher Resources:	<p>http://www.diffen.com/difference/Eukaryotic_Cell_vs_Prokaryotic_Cell (Comparison/contrast chart of characteristics of prokaryotic and eukaryotic cells)</p> <p>http://etap.org/demo/biology1/instruction3tutor.html (Can be used to provide students with disabilities the notes on topics discussed in this learning experience)</p>
Student Resources:	<p>http://www.diffen.com/difference/Eukaryotic_Cell_vs_Prokaryotic_Cell(Comparison/contrast chart of characteristics of prokaryotic and eukaryotic cells)</p> <p>http://dsc.discovery.com/tv-shows/other-shows/videos/assignment-discovery-shorts-eukaryote-prokaryotes.htm (Video that discusses both prokaryotes and eukaryotes)</p> <p>www.shellysscience.com (Multiple resources on cell types, structure, and function)</p>
Assessment:	<p>The students will design a cell model/diagram, explain what characteristics of this cell designate it as prokaryotic or eukaryotic, and describe how the structure and function of each cell type supports the life of the cell/organism and/or</p> <p>Complete a graphic organizer comparing and contrasting pro- and eukaryotic cells.</p> <p>http://www.eisd.net/cms/lib04/TX01001208/Centricity/Domain/599/DoubleBubbleMap.pdf (Thinking map for comparing and contrasting)</p>

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Differentiation:	Access (Resources and/or Process)	Expression (Products and/or Performance)
<p>(Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>The teacher may provide skeleton notes The teacher may provide a word bank for test/quiz The teacher may provide guided questions for lab The teacher may provide reading material at lower reading levels The teacher may pre-teach vocabulary The teacher may provide a “sound-it-out guide” for new vocabulary (syllabication of new vocabulary)</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning.)</p>	<p>The student may use provided pictures and a word bank to cut out and arrange organelles into a diagram</p>
Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>The teacher may allow students to research antibiotic-resistant bacteria The teacher may allow students to brainstorm importance of prokaryotic life to ecosystems www.shellyssciencepot.com (Science spot around bacteria)</p> <p>http://prezi.com/ (Prezi site-sign in required, but free) The student may explore antibiotic-resistant bacteria, and its impact on animal life and present their findings (orally, written, etc.)</p>	<p>The student may create theories (written report, Prezi, etc) as to what could happen if prokaryotic life did not exist</p>
Critical Content:	<ul style="list-style-type: none"> • Cells can be classified as Prokaryotic or Eukaryotic • Eukaryotic cells can be classified as Plant, Animal, Protist or Fungi • Prokaryotic cells have genetic material not surrounded by a membrane, whereas Eukaryotic cells have a membrane bound nucleus and organelles. • Prokaryotic cells are simple, single-celled bacteria that have symbiotic relationships with Eukaryotic organisms. 	
Key Skills:	<ul style="list-style-type: none"> • Explain characteristics of a cell • Describe the structure and function of a cell and its parts • Design a model of a cell 	
Critical Language:	<p>Cell, cell membrane, prokaryotic, eukaryotic, structure, function, genetic material, organelles, design, describe, explain</p>	

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Learning Experience # 4		
The teacher may provide various opportunities for the investigation of plant and animal cells so that the students can analyze the relationship between the structure and function of these eukaryotic cells.		
Generalization Connection(s):	<p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p>	
Teacher Resources:	<p>http://www.diffen.com/difference/Animal_Cell_vs_Plant_Cell (Plant versus animal cells)</p> <p>http://www.biologycorner.com/lesson-plans/cells/ (Lesson plans for cells)</p> <p>http://www.shellyssciencepot.com/Curriculum.htm#CellO (Power Points, diagrams, lesson plans, etc.)</p> <p>http://serendip.brynmawr.edu/sci_edu/waldron/ (Hands-on activities around cells and cell organelles)</p> <p>http://www.youtube.com/watch?v=1Z9pqST72is (A Tour of the Cell –upper level)</p>	
Student Resources:	<p>http://quizlet.com/410483/cell-organelles-and-their-functions-flash-cards/ (Online flash cards for organelles)</p> <p>http://www.cellsalive.com/ (Student practice for identifying organelles)</p> <p>http://www.biologycorner.com/worksheets/cellsalive.html#.UnPca3C-2uI (Cell comparison lab)</p>	
Assessment:	<p>The students will design and construct a complete cell model/diagram, explain what characteristics of this cell designate it as prokaryotic, eukaryotic (plant or animal), and describe how the structure and function of each organelle supports the life of the cell/organism.</p>	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>The teacher may provide skeleton notes</p> <p>The teacher may provide a word bank</p> <p>The teacher may provide guided questions</p> <p>The teacher may provide reading material at lower reading levels</p> <p>The teacher may pre-teach vocabulary</p> <p>The teacher may provide a “sound-it-out guide” for new vocabulary (syllabication of new vocabulary)</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning.)</p> <p>The teacher may have students role play the parts of a cell</p> <p>http://www.readwritethink.org/files/resources/interactives/venn_diagrams/ (Template for Venn diagrams)</p>	<p>The student may use provided pictures and a word bank to cut out and arrange organelles into a diagram</p> <p>The student may arrange provided key concepts/phrases in a Venn Diagram</p> <p>The student may role play the parts of the cell</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may provide 3 circle Venn Diagram structures The teacher may provide opportunities for students to come up with analogies for cell components http://www.readwritethink.org/files/resources/interactives/venn_diagrams/ (Template for Venn diagrams)	The student may create a picture book with cell analogies The student may create a 3 circle Venn Diagram comparing and contrasting Plant, Animal, Prokaryotic and Eukaryotic cells
Critical Content:	<ul style="list-style-type: none"> • Cells are made up of organelles (structure) that serve specific roles (function) • Cells can be classified as Prokaryotic or Eukaryotic • Eukaryotic cells can be classified as Plant, Animal, Protist or Fungi 	
Key Skills:	<ul style="list-style-type: none"> • Identify cell organelles from a diagram or model • Analyze the structure and function of each organelle (cell analogies) • Compare and Contrast Prokaryotic and Eukaryotic Cells • Compare and Contrast Plant and Animal Cells 	
Critical Language:	Cell, cell membrane, cell wall, cytoplasm, cytoskeleton, organelles, nucleus, chloroplast, mitochondria, endoplasmic reticulum, golgi apparatus, vacuoles, prokaryotic, eukaryotic, plant cell, animal cell, structure, function, chlorophyll, genetic material, nuclear envelope, analogy, organism, nucleolus, compare, contrast, analyze, identify	

Learning Experience # 5
Instructional Timeframe: Week 4

Learning Experience # 5	
The teacher may introduce the concepts of active and passive transport so that the students can analyze how materials pass through a membrane (endocytosis, exocytosis, diffusion, osmosis and facilitated diffusion).	
Teacher Notes:	Teachers may use egg shell osmosis, Gummy Bear diffusion, etc.
Generalization Connection(s):	Cells operate independently and interdependently to perform the necessary functions of life The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function
Teacher Resources:	http://rmpbs.pbslearningmedia.org/asset/tdc02_int_membraneweb/?utm_source=teachersdomain_redirect/asset/tdc02_int_membraneweb/utm_medium=teachersdomain/asset/tdc02_int_membraneweb/utm_campaign=td_redirects (Visual representation of cell transport with various substances.) http://www.wiley.com/legacy/college/boyer/0470003790/animations/membrane_transport/membrane_transport.htm (Cellular transport presentation) http://www.apsarchive.org/resource.cfm?submissionID=3688 (You Can't Touch This: A Lesson in Diffusion- Egg Osmosis) http://www.polymerambassadors.org/diffusionwater.pdf (Gummy Bear Diffusion Lab Resource)

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Student Resources:	http://rmpbs.pbslearningmedia.org/asset/tdc02_int_membraneweb/?utm_source=teachersdomain_redirect/asset/tdc02_int_membraneweb/utm_medium=teachersdomain/asset/tdc02_int_membraneweb/utm_campaign=td_redirects (Visual representation of cell transport with various substances)	
Assessment:	The students will analyze lab results and create diagrams that demonstrate endocytosis, exocytosis, diffusion, osmosis and facilitated diffusion in order to infer how materials move in and out of cells.	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may pre teach vocabulary The teacher may provide skeleton notes The teacher may provide guided questions for lab write up The teacher may provide formulas The teacher may allow for the use of a calculator http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)	The student may match diagrams to descriptions and/ or vocabulary
Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may guide student thought processes to brainstorm real life applications The teacher may provide time for internet research The teacher may allow students to research careers and/or real life situations where knowledge of active and passive transport are necessary (e.g., food preservation, water purification, water salinity, ecology)	The student may create a model or demonstration to show classmates how the size of a cell can affect the rate of transport (e.g., traffic in and out of big city versus a small city) The student may present research findings around active and passive transport
Critical Content:	<ul style="list-style-type: none"> • Materials must move in/out of cells for cell survival (nutrients, wastes etc.) • Diffusion • Osmosis • Active transport • Passive transport • Endocytosis • Exocytosis • Facilitated diffusion 	
Key Skills:	<ul style="list-style-type: none"> • Create diagrams that demonstrate endocytosis, exocytosis, diffusion, osmosis and facilitated diffusion. • Analyze how water diffuses through a membrane 	
Critical Language:	Osmosis, diffusion, active, passive, endocytosis, exocytosis, facilitated diffusion, transport proteins, ratio, volume, surface area, equilibrium, calculate, length, width, height, concentration, vesicles, create, analyze, diagram, identify	

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Learning Experience # 6
Instructional Timeframe: Week 4

Learning Experience # 6		
The teacher may provide information on cellular organization so that the students can understand and illustrate the connection of cells to tissue to organs to organ systems to organism (e.g., flow charts, specimens, diagrams).		
Generalization Connection(s):	<p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p>	
Teacher Resources:	http://www.vusd.org/webpages/rnordell/files/chp%2028.1%20-%20levels%20of%20organization1.pptx (Power Point for levels of organization)	
Student Resources:	http://www.youtube.com/watch?v=QD3bF_Vy3w8 (You tube video on the levels of organization) http://peer.tamu.edu/curriculum_modules/Cell_Biology/Module_1/index.htm (Levels of organization activities) http://quizlet.com/4220017/levels-of-structural-organization-organ-systems-flash-cards/ (Levels of structural organization flashcards with voice) http://www.lakesc.lake.k12.ca.us/resources/Structural_Organization_of_Living_Things.pdf (Charts of structural organization)	
Assessment:	<p>Students will generate, through class inquiry, a flow chart that displays a hierarchy of cellular organization to demonstrate the interconnectedness from cells to tissues to organs to organ systems to organisms.</p> <p>http://www.eisd.net/cms/lib04/TX01001208/Centricity/Domain/599/FlowMap.pdf (Flow chart thinking map)</p>	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>The teacher may allow framed note taking</p> <p>The teacher may provide a manipulative flow chart</p> <p>The teacher may review and pre-teach key vocabulary</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>The student may place manipulatives in the correct order within the flow chart</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may allow students to investigate levels of organization with other organisms (e.g., plants, various non-human animals, etc.)	The student may create a visual presentation (Power Point, video, etc.) around different organisms and their levels of organization to demonstrate that all organisms have similar levels of organization
Critical Content:	<ul style="list-style-type: none"> • Levels of organization • Body Systems • Cell theory • Cells • Tissues • Organs • Organ Systems • Organisms 	
Key Skills:	<ul style="list-style-type: none"> • Making connections between key concepts • Completing a flow chart 	
Critical Language:	Cells, tissues, organs, organ systems, organisms, cell theory, illustrate, demonstrate	

Learning Experiences # 7 – 19
Instructional Timeframe: Weeks 5-9

Learning Experience # 7	
The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the skeletal system so that students can relate the structure and function <i>within</i> the system.	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>
Teacher Resources:	<p>http://www.gobookee.org/get_book.php?u=aHR0cDovL2FhbGVhY2hwaHlzaWNhbGVkdWNhdGlvb3Z3ZWVibHkuY29tL3VwbG9hZHVMy82LzMyMC8zNjMwNjYyZ3luN19za2VsZXRhbnF9hc3NpZ25tZW50LnBkZgpTS0VMRVRBTCBTWVNURU0gLyBNVVNDTEUgUVVJWjBOYW1lOiBQbGFjZSB0aGUgLi4u (Skeletal System- Bone Memorization)</p> <p>http://www.sciencebob.com/experiments/rubberbone.php (Skeletal System - Rubber Chicken Bone in Vinegar)</p> <p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body</p>

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	<p>Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHT4 (Sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the skeletal system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary...etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label bones on their own body or mannequin/science model using stickers</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the skeletal system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the skeletal system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the skeletal system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human skeletal system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the skeletal system (cell type, organs, etc.) • Skeletal system (major bones, joints, ligaments, cartilage, marrow, blood production, osteocytes, etc) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	<p>Support, movement, compact bone, spongy bone, ball and socket, hinge, pivot, ligaments, cartilage, marrow, periosteum, arthritis, osteoporosis, osteocytes, observe, dissect, diagram, gather, analyze</p>	

Learning Experience # 8		
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the muscular system so that students can relate the structure and function <i>within</i> the system.</p>		
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>	
Teacher Resources:	<p>http://www.morganparkcps.org/ourpages/auto/2011/12/4/51167223/Muscle%20Fatigue%20Lab.pdf (Muscular System - Muscle Fatigue Lab)</p> <p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources)</p>	

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	<p>http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources)</p> <p>http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources)</p> <p>http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources)</p> <p>http://answers.yahoo.com/question/index?qid=20120127125646AA9EHT4 (Sprained ankle effect on all organ systems)</p>	
Student Resources:	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources)</p> <p>http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources)</p> <p>http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources)</p> <p>http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources)</p> <p>http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
Assessment:	<p>Students will gather, analyze, and evaluate information related to structure and function for the muscular system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p>	<p>Expression (Products and/or Performance)</p>
	<p>The teacher may allow for framed note taking</p> <p>The teacher may use fill-in-the-blank lab write-ups</p> <p>The teacher may provide data templates</p> <p>The teacher may preview/review vocabulary</p> <p>The teacher may use visual diagrams</p> <p>The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.)</p> <p>The teacher may provide Latin/Greek roots definition resource (website, dictionary...etc.)</p> <p>The teacher may allow students to complete modified assignments/assessments (e.g. fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks)</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank</p> <p>The students may complete exams orally</p> <p>The student may relate diagrams to reality, may label the muscles on their own body or mannequin/science model using stickers</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about organ systems (anatomy in general) for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the muscular system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the muscular system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human muscular system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the muscular systems (cell type, organs, etc.) • Muscular system (types of muscles (skeletal, smooth, cardiac), involuntary and voluntary muscles, movement, tendons, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	<p>Support, movement, skeletal muscle, smooth muscle, cardiac muscle, involuntary muscle, voluntary muscle, tendons, gather, analyze, evaluate, dissect, diagram, observe, dissect, diagram, analyze, gather</p>	

Learning Experience # 9	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the integumentary system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>
Teacher Resources:	<p>http://www.flinnsci.com/Documents/demoPDFs/Biology/BF10228.pdf (Integumentary System - Human Epidermal Cells)</p> <p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources)</p>

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	<p>http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources)</p> <p>http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources)</p> <p>http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources)</p> <p>http://answers.yahoo.com/question/index?qid=20120127125646AA9EHT4 (sprained ankle effect on all organ systems)</p>	
Student Resources:	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources)</p> <p>http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources)</p> <p>http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources)</p> <p>http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources)</p> <p>http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
Assessment:	<p>Students will gather, analyze, and evaluate information related to structure and function for the integumentary system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p>	<p>Expression (Products and/or Performance)</p>
	<p>The teacher may allow for framed note taking</p> <p>The teacher may use fill-in-the-blank lab write-ups</p> <p>The teacher may provide data templates</p> <p>The teacher may preview/review vocabulary</p> <p>The teacher may use visual diagrams</p> <p>The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.)</p> <p>The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.)</p> <p>The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks)</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank</p> <p>The student may complete exams orally</p> <p>The student may relate diagrams to reality, may label the integumentary system on their own body or mannequin/science model using stickers</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the integumentary system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the integumentary system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the integumentary system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human integumentary system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the integumentary system (cell type, organs, etc.) • Integumentary system (layers of skin (epidermis, dermis, fatty layer), melanin, keratin, temperature regulation, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	Support, epidermis, dermis, fatty layer, melanin, keratin, temperature regulation, skin cancer, analyze, gather, dissect, observe, diagram	

Learning Experience # 10	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the circulatory system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHt4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnct.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the circulatory system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label the circulatory system on their own body or mannequin/science model using stickers</p>

Colorado Teacher-Authored Sample Instructional Unit

Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the circulatory system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the circulatory system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system’s function</p> <p>The student may create a fictional creature and describe the structure and function of the circulatory system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human circulatory system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the circulatory system (cell type, organs, etc.) • Circulatory system (arteries, veins, capillaries, heart, types of circulation (systemic, coronary, pulmonary), blood clotting etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	<p>Arteries, veins, capillaries, heart, types of circulation (systemic, coronary, pulmonary), atherosclerosis, heart failure, blood clots, platelets, red blood cells, white blood cell, plasma, ABO system, Rh factor, hemophilia, sickle cell, anemia, leukemia, observe, analyze, gather, dissect, diagram</p>	

Learning Experience # 11	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the respiratory system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

Colorado Teacher-Authored Sample Instructional Unit

<p>Teacher Resources:</p>	<p>http://www.morganparkcps.org/ourpages/auto/2011/12/4/51167223/Muscle%20Fatigue%20Lab.pdf (Respiratory System - Lung Capacity Lab Activity)</p> <p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources)</p> <p>http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources)</p> <p>http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources)</p> <p>http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources)</p> <p>http://answers.yahoo.com/question/index?qid=20120127125646AA9Eht4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources)</p> <p>http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources)</p> <p>http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources)</p> <p>http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources)</p> <p>http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the respiratory system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking</p> <p>The teacher may use fill-in-the-blank lab write-ups</p> <p>The teacher may provide data templates</p> <p>The teacher may preview/review vocabulary</p> <p>The teacher may use visual diagrams</p> <p>The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.)</p> <p>The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.)</p> <p>The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks)</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank</p> <p>The student may complete exams orally</p> <p>The student may relate diagrams to reality, may label the respiratory system on their own body or mannequin/science model using stickers</p>

Colorado Teacher-Authored Sample Instructional Unit

Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the respiratory system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the respiratory system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the respiratory system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human respiratory system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the respiratory system (cell type, organs, etc.) • Respiratory system (breathing, cellular respiration, gas exchange, pharynx, larynx, bronchi, bronchioles, trachea, alveoli, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	<p>Emphysema, asthma, diaphragm, breathing, cellular respiration, oxygen, carbon dioxide, pharynx, larynx, bronchi, bronchioles, trachea, alveoli, lungs, mouth, esophagus,</p>	

Learning Experience # 12	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the digestive system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>http://www.apsarchive.org/resource.cfm?submissionID=384&BEN=1 (Digestive System - Junkyard Digestion)</p> <p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources)</p> <p>http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources)</p> <p>http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources)</p> <p>http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources)</p> <p>http://answers.yahoo.com/question/index?qid=20120127125646AA9EHt4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources)</p> <p>http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources)</p> <p>http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources)</p> <p>http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources)</p> <p>http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the digestive system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking</p> <p>The teacher may use fill-in-the-blank lab write-ups</p> <p>The teacher may provide data templates</p> <p>The teacher may preview/review vocabulary</p> <p>The teacher may use visual diagrams</p> <p>The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.)</p> <p>The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.)</p> <p>The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks)</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank</p> <p>The student may complete exams orally</p> <p>The student may relate diagrams to reality, may label the digestive system on their own body or mannequin/science model using stickers</p>

Colorado Teacher-Authored Sample Instructional Unit

Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the integumentary system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the digestive system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the digestive system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human digestive system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the digestive system (cell type, organs, etc.) • Digestive system (mouth, esophagus, enzymes, types of digestion (mechanical and chemical), intestines, nutrient absorption, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	<p>Movement, mouth, esophagus, enzymes, mechanical digestion, epiglottis, ileum, chemical digestion, stomach, gall bladder, small intestines, large intestine, colon, observe, gather, analyze, diagram, dissect</p>	

Learning Experience # 13	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the excretory system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHt4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnct.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for each body system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label the excretory system on their own body or mannequin/science model using stickers</p>

Colorado Teacher-Authored Sample Instructional Unit

Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the excretory system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the excretory system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the excretory system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human excretory system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the excretory system (cell type, organs, etc.) • Excretory system (removal of waste (digestive, urinary, respiratory, integumentary), etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	Bladder, kidney, nephron, ureter, urethra, nutrient absorption, filter, gather, analyze, dissect, diagram, observe	

Learning Experience # 14	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the lymphatic system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHt4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the lymphatic system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label the lymphatic system on their own body or mannequin/science model using stickers</p>

Colorado Teacher-Authored Sample Instructional Unit

Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the lymphatic system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the lymphatic system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the lymphatic system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human lymphatic system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the lymphatic system (cell type, organs, etc.) • Lymphatic system (filter, lymph nodes, spleen, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	Lymph, lymph nodes, spleen, gather, analyze, dissect, diagram, observe	

Learning Experience # 15	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the nervous system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>http://faculty.washington.edu/chudler/chtouch.html (Nervous System - Two Point Discrimination Activity) http://rhoyle.cusd.claremont.edu/mm/Course%20Assets/Biology/Labs/pdf%20-%20Nervous%20System%20Lab.pdf (Nervous System – Reaction Time) https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHt4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the nervous system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label the nervous system on their own body or mannequin/science model using stickers</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the nervous system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the nervous system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the nervous system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human nervous system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the nervous system (cell type, organs, etc.) • Nervous system (neurons, nerves, brain, spinal cord, response to stimuli, involuntary and voluntary, etc) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	Neurons, nerves, brain, spinal cord, pathogens, antigens, antibodies, T cells, B cells, gather, analyze, dissect, diagram, observe	

Learning Experience # 16	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the immune system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHt4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the immune system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label the immune system on their own body or mannequin/science model using stickers</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the immune system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the immune system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the immune system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human immune system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the immune system (cell type, organs, etc.) • Immune system (lymphocytes, pathogens, parts of immune system (skin, respiratory, digestive), antigens and antibodies, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	Pathogens, antigens, antibodies, T cells, B cells	

Learning Experience # 17	
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the reproductive system so that students can relate the structure and function <i>within</i> the system.</p>	
Generalization Connection(s):	<p>Models allow scientists to investigate and explain the various structures within an organism across a range of scales and organizational levels from the atomic to the whole-organism level</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p> <p>Cells operate independently and interdependently to perform the necessary functions of life</p> <p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p>

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<p>Teacher Resources:</p>	<p>https://sites.google.com/a/jeffcoschools.us/mr-volk-s-science-website/science-content/circulatory-and-respiratory-systems (Body Systems Resources) http://msp.ehe.osu.edu/wiki/index.php/MSP:MiddleSchoolPortal/Organ_Systems:_Function_Diversity_and_Uniformity (Body Systems Resources) http://www.lessonplansinc.com/biology_lesson_plans_human_body_systems.php (Body Systems Resources) http://www.bozemanscience.com/anatomy-and-physiology/ (Body Systems Resources) http://answers.yahoo.com/question/index?qid=20120127125646AA9EHT4 (sprained ankle effect on all organ systems)</p>	
<p>Student Resources:</p>	<p>http://www.factmonster.com/ipka/A0774536.html (Body Systems Resources) http://kidshealth.org/teen/your_body/#cat20116 (Body Systems Resources) http://kids.discovery.com/tell-me/science/body-systems (Body Systems Resources) http://www.kidskonnnect.com/subjectindex/31-educational/health/337-human-body.html (Body Systems Resources) http://www.fda.gov/downloads/drugs/resourcesforyou/consumers/buyingusingmedicinesafely/understandingover-the-countermedicines/ucm205286.pdf (Caffeine’s effects on all human body systems)</p>	
<p>Assessment:</p>	<p>Students will gather, analyze, and evaluate information related to structure and function for the reproductive system through a variety of assessments (e.g., lab reports, dissection labeling, creative writing, qualitative data, projects).</p>	
<p>Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)</p>	<p>Access (Resources and/or Process)</p> <p>The teacher may allow for framed note taking The teacher may use fill-in-the-blank lab write-ups The teacher may provide data templates The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may allow testing accommodations including chunking matching, reduced distractors on multiple choice tasks, word banks, etc.) The teacher may provide Latin/Greek roots definition resource (website, dictionary, etc.) The teacher may allow students to complete modified assignments/assessments (e.g., fill-in-the-blank lab write-ups, data templates, framed paragraphs, diagrams with word banks) http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning)</p>	<p>Expression (Products and/or Performance)</p> <p>The student may complete labeling quizzes with either the first letter already filled in, or with a word bank The student may complete exams orally The student may relate diagrams to reality, may label the reproductive system on their own body or mannequin/science model using stickers</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>www.kidsbiology.com (Site for children that describes and illustrates the different body systems)</p> <p>The teacher may provide reading material about the reproductive system for other animals so students may learn about similarities and differences between themselves and other species</p> <p>The teacher may have students read <i>The Blood Hungry Spleen</i> by Allan Wolf</p>	<p>The student may use a variety of sources to learn about the reproductive system and create a 3D model showing the structure. Then create a story or analogy that speaks to the system's function</p> <p>The student may create a fictional creature and describe the structure and function of the reproductive system for that creature in a written report, and then classify that creature as mammal, reptile, etc. or a combination of several</p> <p>The student may create their own collection of poetry modeled after <i>The Blood Hungry Spleen</i> representing the human reproductive system</p>
Critical Content:	<ul style="list-style-type: none"> • Structure and function of and within the reproductive system (cell type, organs, etc.) • Reproductive system (sperm, egg, ovulation, fertilization, basic anatomy, menstrual cycle, etc.) • Diseases and injuries 	
Key Skills:	<ul style="list-style-type: none"> • Observations of organ specimens • Dissect organ specimens • Diagramming • Creative writing • Gather and analyze data 	
Critical Language:	Movement, sperm, egg, ovulation, fertilization, basic anatomy, menstrual cycle, observe, analyze, gather, diagram, dissect	

Learning Experience # 18	
The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around human organ systems so that students can investigate and analyze the interconnectedness <i>between</i> each system.	
Generalization Connection(s):	<p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p>
Teacher Resources:	<p>http://faculty.washington.edu/chudler/organ.html (Nervous system connections)</p> <p>www.coe.unt.edu/sites/all/files/xtreem/8science/8_6ABodySystems.ppt (Body System Power Point)</p> <p>http://quizlet.com/7407511/organ-system-relationships-flash-cards/ (Body system interconnectedness)</p> <p>http://svms.rocklinusd.org/Library/Assignments/Human-Body-Systems-Project/</p> <p>http://dese.mo.gov/divimprove/curriculum/hp/documents/cur-health-middle-body-systems-2011.pdf (Effects of Personal Lifestyle Choices)</p>

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Student Resources:	http://at.glenview34.org/webresources/science/bodysystems.htm (Links to many student sites) http://www.kidinfo.com/health/human_body.html (Links to many student sites)	
Assessment:	Students will generate a Structure and Function Matrix to ascertain how each organ system in the human body depends on the other organ systems to keep the organism alive. https://www.google.com/search?q=%22structure+and+function%22+%2B+graphic+organizer&espv=210&es_sm=93&tbm=isch&tbo=u&source=univ&sa=X&ei=LZYGU6LCLu--2AWQnYDAAw&ved=0CDAQsAQ&biw=1092&bih=533 (Structure and function graphic organizers)	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may allow for framed note taking The teacher may provide fill-in-the-blank lab write-ups The teacher may allow students to use a data template The teacher may preview/review vocabulary The teacher may use visual diagrams The teacher may use modified testing http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning.) http://edhelper.com/teachers/graphic_organizers.htm (Graphic organizer templates) http://jacksonmiddle.wikispaces.com/FRAME+Note+Taking (Framed note taking templates)	The student may cut and paste various organs into a framed note-taking template The student may complete a graphic organizer to demonstrate knowledge of the relationships between organ systems
Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may allow students to research how the excretory, the nervous, and the integumentary systems work together and identify possible issues that may arise when one does not work efficiently http://www.classtools.net/FB/home-page (Fake Book page)	The student may present their findings of their research to the class The student may create a “Fake Book” page for the excretory, nervous, and integumentary systems that describe their friend lists as well as their status updates
Critical Content:	<ul style="list-style-type: none"> • Organ Systems within an organism are interconnected. • Structures in various organ systems work together with other organ systems to keep the organism alive. 	
Key Skills:	<ul style="list-style-type: none"> • Diagram multiple organ systems together to show relationships • Observe/dissect/diagram multiple organ systems to illustrate/conceptualize interconnectedness. • Investigate and justify an organism’s need for multiple organ systems working together. 	
Critical Language:	Structure, function, organs, organ systems, analyze, relationships, interconnectedness, synthesize	

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Learning Experience # 19		
<p>The teacher may lead a variety of activities (e.g., microscope work, labs, dissections) around the human organ systems so students can apply and synthesize their understanding of the relationship within and interconnectedness between organ systems to maintain homeostasis within an organism.</p>		
Generalization Connection(s):	<p>The pattern of similarities and differences among structures in living things reflects the strong relationship between structure and their function</p> <p>The structures within the human body (cells, tissues, organs, organ systems) interact with one another to perform a wide variety of functions that support the whole organism</p>	
Teacher Resources:	<p>https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved=0CCsQFjAA&url=http%3A%2F%2Fstpeter.pbworks.com%2F%2Forgan%2520systems%2520and%2520homeostasis%2520ch%252013-1.ppt&ei=ld9zUtgSglrXyAGt-IHgBQ&usg=AFQjCNF6u7mGymC4Y8r1Q1eGwDCwdimXkw&bvm=bv.55819444,d.aWc (Homeostasis and the body systems power point)</p> <p>http://www.vusd.org/webpages/rnordell/files/chp%2028.2%20-%20mechanisms%20of%20homeostasis1.pptx (Homeostasis and the systems power point)</p>	
Student Resources:	<p>http://www.classzone.com/cz/books/bio_07/resources/htmls/animated_biology/unit9/bio_ch28_0867_ab_running.html (Interactive maintaining homeostasis for a runner)</p>	
Assessment:	<p>Students will synthesize, in written form, their understanding of homeostasis in regards to organs and organ systems working together to keep organisms alive.(e.g., case scenarios, paragraph writing, and summative assessment)</p> <p>http://teachers.colonelby.com/arbogastn/eng%201D/Writing/How%20to%20Write%20an%20Expository.htm (Expository paragraph)</p>	
Differentiation: (Multiple means for students to access content and multiple modes for student to express understanding.)	Access (Resources and/or Process)	Expression (Products and/or Performance)
	<p>The teacher may allow for framed note taking</p> <p>The teacher may provide fill-in-the-blank lab write-ups</p> <p>The teacher may allow students to use a data template</p> <p>The teacher may preview/review vocabulary</p> <p>The teacher may use visual diagrams</p> <p>The teacher may use modified testing</p> <p>http://www.wordsift.com/ (Quickly identifies important words; provides pictures and resources to reinforce meaning.)</p> <p>https://voicethread.com/ (Voicethread- must sign up but is free)</p>	<p>The student may role-play their understanding of how systems work together to keep the organism alive</p> <p>The student may use <i>Voicethread</i> to create a video of how organs work together within systems to keep an organism alive</p>

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Extensions for depth and complexity:	Access (Resources and/or Process)	Expression (Products and/or Performance)
	The teacher may allow student to research diseases, infections, and/or injuries (broken ankle, respiratory infection, etc.) and their impacts on various organs to ascertain their total impact on the organism	The student may create case files describing symptoms, organ systems affected, and possible diagnosis The student may produce a creative writing story around the cases researched
Critical Content:	<ul style="list-style-type: none"> • The human body uses multiple organ systems to respond to stimuli in the environment • Multiple systems work together to help the body to maintain homeostasis. 	
Key Skills:	<ul style="list-style-type: none"> • Students will draw conclusions as to how the body responds to a variety of stimuli. • Students will apply and adapt information to real-life medical situations. 	
Critical Language:	Homeostasis, structure, function, organs, organ systems, organism, respond, stimulus, draw, apply, adapt, create	