

CCPS Science Unit Plan

Grade	7th grade	Subject	Science	Unit #	One
Unit Name	Cells and the Human Body: The BioVerse: Exploring the Microcosm of Cells & the Human Form		Timeline	Eight weeks	
How to use the Framework	<p>This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding of all abbreviations used with this framework.</p>				
Unit Overview	<p>This unit will lead students through investigations of organisms' organization from basic to complex. Students will investigate processes associated with systems that function in: acquisition and utilization of energy e.g. digestion and respiration, and excretion. They will examine these processes which will ultimately lead them to the understanding that all living organisms are made of cells (including humans) and all participate in these processes in order to maintain life.</p> <ol style="list-style-type: none"> 1. Cell Structures & Their Functions 2. Levels of Organization of Living Things 3. Body Systems <p>By the end of this unit, students understand how the human body is similar to a machine with each system playing a part in maintaining the efficiency and functionality of the human body.</p>				
Lesson Plan guidance document and template	<p>CCPS Lesson Plan Template Day View Lesson Plan Template Week View Department of Science Guidance Document</p>				
3Dimensional Instruction	<u>GSE</u>		<u>Science and Engineering Practices</u>		<u>Crosscutting Concepts</u>
	<p>S7L2: Obtain, evaluate, and communicate information to describe how cell structures, cells, tissue, organs, and organ systems interact to maintain the basic needs of organisms. a: Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste. <i>(Clarification statement: The intent is for students to demonstrate how the component structures of the cell interact and work together to allow the</i></p>		<p>Asking questions (for science) and defining problems (for engineering) Developing and using models Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Engaging in argument from evidence Obtaining, evaluating, and communicating information</p>		<p>Cause and Effect Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8)</p> <p>Scale, Proportion, and Quantity Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)</p> <p>Systems and System Models</p>

	<p><i>cell as a whole to carry out various processes. Additional structures, beyond those listed, will be addressed in high school Biology.)</i></p> <p>b: Develop and use a conceptual model of how cells are organized into tissues, tissues into organs, organs into organ systems, and organ systems into organisms.</p> <p>c: Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes. <i>(Clarification statement: The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)</i></p>		<p>Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3)</p> <p>Structure and Function</p> <p>Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)</p>
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NGSS Alignment

NGSS Alignment to Disciplinary Core Ideas
LS1.A: Structure and Function

All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1)

Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2)

In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3)

LS1.D: Information Processing

Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (MS-LS1-8)

Week 1

GSE:

Focused Concept: Science is a process and a body of knowledge. Science is a mandated curiosity that is

NGSS standards:

MS-ETS1-1 Engineering Design

Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

continually refining and expanding our knowledge of the universe, and as it does, it leads to new questions for future investigation.

SEP: Asking questions (for science) and defining problems (for engineering)
 Developing and using models
 Planning and carrying out investigations
 Analyzing and interpreting data
 Using mathematics and computational thinking
 Constructing explanations (for science) and designing solutions (for engineering)
 Engaging in argument from evidence
 Obtaining, evaluating, and communicating information

CCC:
 Cause and effect
 Patterns
 Scale proportion and quantity
 Systems and system models
 Structure and function




Phenomenon:

Mystery Cube activity

■ [MysteryCubesScientificMethodandScientificInquiryITSAWESOME.pdf](#)

DQ: How can we use scientific evidence and reasoning to support or question ideas in science? or How can understanding different ways of thinking help us solve problems, support ideas, and question concepts?

Learning Target:	Day 1	Day 2	Day 3	Day 4	Day 5
The students will be able to (SWBAT)	SWBAT identify appropriate protocol for the science classroom.	SWBAT identify appropriate protocol for the science classroom.	SWBAT revise predictions or explanations on the basis of discovering new evidence, learning new information, or using	SWBAT revise predictions or explanations on the basis of discovering new evidence, learning new information, or using	SWBAT revise predictions or explanations on the basis of discovering new evidence, learning new information, or using

			models.	models.	models.
Opening	<p>Organization is an important skill 7th grade students struggle with. Students will be introduced to interactive notebooks. Interactive notebooks are a combination of traditional notes and hands-on activities. They require students to interact with, manipulate, and think about new skills as they complete each activity. These notebooks are an active learning strategy that requires kids to think deeply about new concepts. This leads to a deeper understanding</p>	<p>The teacher will generate a word cloud defining science-based on student input and participation of the opening question: What does science mean to you? The teacher will then facilitate a short (less than six-minute) lesson on the scientific method and inquiry</p>	<p>What is Science? The teacher will start with a "Mystery Box" activity where a common scientific tool or object is hidden inside a box. Students will ask yes-or-no questions to guess what's inside, leading to a discussion on scientific inquiry and hypothesis testing.</p>	<p>The teacher will review the lesson material from the previous day and finish any presentation notes. The teacher will explain the class agenda of the day and expectations for the critical thinking activity.</p>	<p>The complex practice of argumentation helps people articulate their individual reasoning, explore the ideas and perspectives of others, and refine a shared understanding of scientific ideas.</p> <p>This review process is important because it helps to ensure that a new idea is not based on flawed reasoning and the evidence used to support a new idea is valid. Scientific argumentation also helps scientists improve their arguments.</p> <p>Students will engage in a short lesson on the parts of an argument and arguments are developed.</p>
Guided Practice/Transition	<p>Students and the teacher will complete a classroom discussion over interactive notebooks. Students will set up their interactive notebooks for science class.</p> <p>The teacher will use the Interactive notebook website for ideas or the embedded sample interactive notebook presentation: https://sadlerscience.com/in-teractive-notebooks-science/ (Website)  Interactive notebook...</p>	<p>Students will begin work on the nature of science and the mystery cube activity. This activity introduces basic procedures involved in inquiry and concepts describing the nature of science. In the first portion of the activity the teacher uses a numbered cube to involve students in asking a question—what is on the bottom?— and the students propose an explanation based on their observations. Then the teacher presents the students with a second</p>	<p>Introduction to Science: students will participate in a class discussion/ note-taking activity covering an introduction to science. Students will define the terms independent variable, dependent variable, control, theory, and law and apply their knowledge of the terms.</p> <p>The teacher will present the information via Google Slides and the students will take notes based on the lesson material.</p>	<p>The teacher will review the lesson material from the previous day and finish any presentation notes. (If time, students will complete a mini lesson focused on observations and inferences).</p>	<p>The teacher will facilitate a claim evidence reasoning/justification activity using the discussion question: Is a hot dog a sandwich?</p> <p>The lesson material is located here: https://docs.google.com/presentation/d/10SXQUPuOORP4xEVdh_T_Di4iluukDoqz68w89LZVtUU/edit?usp=sharin</p>

	<p>Students will complete an “All about me” one pager activity. The teacher will use the instructions below to facilitate the activity. (note: the instructions are located on the last slide of the embedded interactive notebook presentation)</p> <p>A one-pager is a way to visually share key ideas and information from what you have learned. When you create a one pager, you are trying to use both visual symbols and important words to clearly and concisely share your most important takeaways from something you’ve learned with someone else. For this assignment, you are creating a one-pager about YOU. This is a great chance for you to think about the story of your life and share part of it with us. To make it easier to get started, I’ve provided you with a template.</p> <p>Here’s what it MUST INCLUDE:</p> <ul style="list-style-type: none">Your full nameFive adjectives you’d use to describe yourselfA story, drawing, or description that shares something about your familyThree important moments in your life, told in words or pictures or bothA symbol that somehow	<p>cube and asks them to use the available evidence to propose an explanation for what is on the bottom of this cube.</p>	<p>Introduction to Science Lesson Presentation</p>		
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	<p>represents you</p> <p>The year and place you were born</p> <p>The name of your favorite song, and maybe some lyrics and an illustration of it</p> <p>The title of your favorite book or a quotation from it.</p> <p>The way you think one of your best friends would describe you.</p> <p>Symbols, words, or illustrations to reveal three things, places, or people you love.</p> <p>A few words about what you might like to do someday as a career.</p> <p>Your favorite teacher you've ever had and what you liked about them.</p>				
<p>Independent Practice</p>	<p>Students will set up the science interactive notebook, using the instructions given by the teacher.</p>	<p>Students will begin work on the nature of science and the mystery cube activity. This activity introduces basic procedures involved in inquiry and concepts describing the nature of science.</p> <p>In the first portion of the activity the teacher uses a numbered cube to involve students in asking a question—what is on the bottom?— and the students propose an explanation based on their observations. Then the teacher presents the students with a second cube and asks them to use the available evidence to propose an explanation for what is on the bottom of</p>	<p>Students will complete the Nature of Science review worksheet.</p> <p>The teacher will give the following instructions to the students: For extended response questions, answers must be written in full sentences and the question must be restated. For multiple choice questions, first choose the right answer and then using complete sentences explain why you chose the answer you did.</p>	<p>Working together, students must rescue Fred, turn his boat right side up, and put on his life preserver – all without hurting Fred or dropping him into the “lake.”</p> <p>This activity helps children develop teamwork, problem solving, communication, and creativity.</p> <p>Save Fred Worksheet Lesson and Instructions</p> <p>To do this activity, each group will need the following materials: 1 gummy worm (Fred) 1 gummy life saver candy (life preserver) – it must be</p>	<p>Students complete a claim/evidence/reasoning chart addressing whether or not to classify a buttered roll or taco as a sandwich.</p> <p>The claim/evidence/reasoning chart is something that we will be using often during class. Because this is the first time we use it, and because it is being used as an exit slip, this form is a bit more guided than we will be using in the future.</p> <p>Students will choose either taco or buttered roll and circle the claim with which they agree. Students will then write three reasons</p>

		this cube		the gummy kind, not the hard kind 1 small, clear plastic cup (boat) 4 paper clips (rescue materials) Optional: Small tray (lake)	why the food they chose is or is not a sandwich. Finally, students will state their reasoning which should state why the evidence proves the claim to be true. Claim, Evidence, Reasoning/Justification Lesson Material and activity. https://docs.google.com/presentation/d/10SXQUPuO0RP4xEVdh_T_Di4iluukDo0z68w89LZVtUU/edit?usp=sharing
Assessment/ Summary	Students will complete the exit ticket: 3-2-1. Three things they learned about interactive notebooks, two uses of interactive notebooks, and one question they still have.	What is science? Students will complete an exit ticket on their ideas of what science is and is not.	Students and the teacher will complete the closing activities: review the learning target and teacher will informally assess class's journey toward standard mastery.	Introduction to Science Lesson Quiz (Teacher can use the lesson quiz to assess student's knowledge and understanding)	Students and the teacher will complete the closing activities: review the learning target and teacher will informally assess class's journey toward standard mastery.
Small Group Tasks (TBA)					

Week 2	
GSE: S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.	Focused Concept: All living things (organisms) share a set of characteristics. Those characteristics are: <ol style="list-style-type: none"> 1. Living things grow and develop 2. Living things contain one or more cells 3. Living things contain DNA 4. Living things reproduce 5. Living things respond to their environment and maintain homeostasis

- 6. Living things use energy
- 7. Living things use evolve

SEP: Asking questions (for science) and defining problems (for engineering)
 Analyzing and interpreting data
 Constructing explanations (for science) and designing solutions (for engineering)
 Obtaining, evaluating, and communicating information
 Planning and carrying out investigations

CCC: Structure and function, and systems and system models

Phenomenon: [Vampyrella amoeba eating & digesting an algae cell](#) or What's for lunch? (available as a Module Opener via Inspire Textbook page 3 of teacher's edition)

DQ: 1. What are the characteristics of living things?
 2. How do the characteristics of living organisms contribute to their survival and reproduction in diverse environments?

Learning Targets	Day 6	Day 7	Day 8	Day 9	Day 10
The students will be able to (SWBAT)	SWBAT determine what characteristics are necessary for life to exist.	SWBAT determine what characteristics are necessary for life to exist.	SWBAT determine what characteristics are necessary for life to exist.	SWBAT demonstrate proper microscope techniques	SWBAT determine what characteristics are necessary for life to exist.
Opening	The teacher will show a video available here Frank Gregorio has a set of short videos that serve as an excellent resource for introducing various science topics. The characteristics of living things video gives a backdrop of the various things that make living things living.	What are living things assessment probe? The teacher will have students complete the probe located on page 10 of the student textbook. Have students watch the video "Is it Alive?" as they fill out their chart. The video is part of the teacher resources from the textbook series.	Students will complete a characteristics of living things review quiz . The teacher will show a six minute video, "Untamed Science". Students will be introduced to manatees and will answer the following discussion questions: <i>What were a few of the life forms that the video showed living in and around swamps? What do they have in common?</i>	Bellwork: What does the term "compound" mean? A compound light microscope is one of biologists most important tools. Students will connect the word compound (which is used in social studies and language arts) to a science concept. Teacher will then review learning targets and progress towards meeting standard S7L2 and answer any questions regarding the learning target and/or bellwork question.	The teacher will show the six minute video, " The Wacky History of Cell Theory " and the following discussion question: <i>How did the microscope change our view of living things?</i> will be used to jump start the class lesson on cellular theory.
Guided Practice/ Transition	Use the following question to guide students to driving question 1: How can you tell whether or not this	All living things have characteristics in common. Classification involves organizing living and nonliving things into	All living things have certain items needed for survival. Students will complete a guided note-taking activity: What Do Living Things Need	The teacher will lead a microscope orientation class discussion. Students will identify various parts of the microscope and take	Students will complete a guided note taking activity. KEY CONCEPT Cells are the basic unit of life.

	<p>campfire is alive? The Teacher will show students a video of a campfire and use the Encounter the Phenomenon worksheet located within the textbook teaching resources to guide student understanding of the characteristics of living things.</p>	<p>different categories to understand the relationships between them. Students should understand that classification organizes organisms into identifiable groups. Students will explore the following lesson question, “What are the characteristics of living things?” through a lesson presentation by the instructor.</p>	<p>to Survive? Students will take notes covering the needs of living things.</p>	<p>notes on proper microscope usage.</p> <p>The following resources are available for the teacher to use for the microscope orientation:</p> <p>Microscope orientation with the letter “E”</p> <ul style="list-style-type: none"> ■ microscopes_letter_... ■ Microscope Orienta... 	<p>The invention of the microscope in the late 1500s revealed to early scientists a whole new world of tiny cells. Most cells are so small that they cannot be seen without a microscope. The discoveries of scientists from the 1600s through the 1800s led to the cell theory, which is a unifying concept of biology. The cell theory has three major principles:</p> <ul style="list-style-type: none"> • All organisms are made of cells. • All existing cells are produced by other living cells. • The cell is the most basic unit of life.
<p>Independent Practice</p>	<p>Characteristics of Living Things Review Learning Task: Students characteristics of living things review learning task:</p> <ol style="list-style-type: none"> 1. Read the characteristics of life that all living organisms have. 2. Match the examples to the characteristic, and write the letter of the example in the table. 3. Match the picture to the characteristic, and write the letter of the picture in the table. 	<p>Characteristics of Living Things Station activity: Students will complete review characteristics of living things through a station activity. Students will visit a series of eight stations to review the characteristics of living things. Each of the characteristics of living things are addressed through the five 7th grade science content standards.</p>	<p>Using the Needs of Living Things Lesson and Video, Students will complete the scenario investigation “Mom’s car must be alive”. Students apply their knowledge of the characteristics of living things as a science answer person at a fictional radio station.</p> <p>Discussion Prompt:</p>	<p>Students will practice using the microscope using a teacher prepared wet mount slide of the letter “e”. Students will explore the low powered and high powered magnifications and illustrate what they observed under teacher guidance. Some questions that will be used to guide student learning include: How is the image of an object seen through the high powered objective different from the image seen through the low power objective? How does the letter “e” differ as</p>	<p>Students will complete a review worksheet covering the day’s lesson.</p> <ol style="list-style-type: none"> 1. All living things are made of one or more cells. 2. The cell is the basic unit of life. 3. All cells come from preexisting cells.

				seen through the microscope? Microscope E Lab activity	
Assessment Summary	Have students answer the following question as an exit ticket: What makes something living?	Teacher will give the following instructions: Do you think viruses are alive? Use information from today's lesson to support your claim. Use the CER model to complete this activity.	Have students read their answers to the lesson probe as the science answer person. Students will complete an oral review of the day's activities.	The student will complete the virtual microscope game available at the following website for review: Virtual Labs: Using the Microscope - GameUp - BrainPOP.	5-3-1 Dialogue Technique 5: Students will each write 5 words or phrases that are essential to the topic. With elbow partners, students will identify, discuss, and come to a consensus regarding 3: 3 words or phrases that are essential to the topic. 1: In groups of four, students will come to a consensus on 1 appropriate word or phrase that they believe is most essential to the topic. Each group will share their word or phrase and explain why it was chosen. Lesson Assessment: Students will summarize the information shared from dialogue generated by the 5-3-1 strategy and enter it in their science notebooks.
Small Group Tasks (TBA)					

Week 3

GSE: S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.

Focused Concept:

- All organisms are composed of cells- the fundamental unit of life.
- Organisms can be unicellular or multicellular.
- Cells have various functions. Cell shape is related to its specific function.
- Cells grow and divide which produces new cells.

a: Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste.
(Clarification statement: The intent is for students to demonstrate how the component structures of the cell interact and work together to allow the cell as a whole to carry out various processes. Additional structures, beyond those listed, will be addressed in high school Biology.)

•Cells take in nutrients, which they use to provide energy for the work that cells do, and to make the materials that a cell or organism needs.

SEP:Planning and carrying out investigations
 Analyzing and interpreting data
 Using mathematics and computational thinking
 Constructing explanations (for science) and designing solutions (for engineering)
 Obtaining, evaluating, and communicating information

CCC: Scale, Proportion, and Quantity
 Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)

Systems and System Models
 Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3)

Structure and Function
 Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)

Phenomenon: Killer T Cell - The Cancer Assassin
 Description: Researchers at the University of Cambridge captured this dramatic footage of killer (cytotoxic) T cells capturing and destroying cancer cells. These white blood cells identify chemicals on the surface of virally-infected or cancerous cells. They then inject chemicals which lead to the death of the infected or cancerous cell.

<https://www.cam.ac.uk/research/news/bodys-serial-killers-captured-on-film-destroying-cancer-cells>

DQ: How do all cells perform the essential functions for life?
 How do the organelles of cells carry out the essential functions of life?

Learning Targets	Day 11	Day 12	Day 13	Day 14	Day 15
The students will be able to (SWBAT)	SWBAT <ul style="list-style-type: none"> identify the organelles in an animal cell. 	SWBAT <ul style="list-style-type: none"> identify the organelles in an animal cell. 	SWBAT <ul style="list-style-type: none"> identify the organelles in an animal cell. 	SWBAT <ul style="list-style-type: none"> demonstrate proper microscope 	SWBAT <ul style="list-style-type: none"> develop and use a model to describe the

	<ul style="list-style-type: none"> • identify the organelles in a plant cell. 	<ul style="list-style-type: none"> • identify the organelles in a plant cell. 	<ul style="list-style-type: none"> • identify the organelles in a plant cell. 	<p>techniques and identify various organelles located within an eukaryotic cell.</p> <ul style="list-style-type: none"> • examine evidence and identify cell organelles based on my knowledge of prokaryotic and eukaryotic cells. 	<p>function of a cell as a whole and ways the parts of cells contribute to the function.</p>
Opening	<p>Science Probe: The Basic Unit of Life Have students look at the photo of the hyena trying to eat the ostrich egg (page 30 of the student textbook) or show the video Eggcellent Science available within the teacher textbook resources. Students will complete the encounter with the phenomenon worksheet located on pages 31-32 of the student textbook.</p>	<p>Show students an image of an animal cell and a plant cell and ask them to identify the organelles they recognize. Discuss with students what they already know about cells and organelles.</p>	<p>Reintroduce the cell as the basic unit of life and conduct of review of cell organelles. Students will review cell organelles to ensure there are no gaps in knowledge.</p>	<p>Inner Life of the Cell: The “Inner Life of the Cell” depicts what goes on inside one white blood cell, and how the blood cell senses and responds to its surroundings and external stimuli.</p>	<p>Show the Cell as City video to get students excited for the day’s lesson. ■ yt5s.com-Cell City b...</p>
Guided Practice/Transition	<p>Show students the Amoeba Sisters video Introduction to cells: Students will view the short Amoeba Sisters video entitled “Introduction to Cells”. The video serves as a great review of cell theory and preview of cell organelles. Students will complete a guided note-taking activity focuses on the following key concepts:</p>	<p>Students will complete a close reading a Discovery Education Article titled: “Cells - The Structure of Life.” (You can use any passage that details cells and cell organelles or the textbook pages 35; 38-41)</p>	<p>Pass out the Student Exploration sheets and ask students to complete the Prior Knowledge Questions. Discuss student answers as a class. Complete the Gizmo warmup questions together as a class.</p>	<p>Review the student exploration activities from the previous day. Students and teacher can complete the five question assessment as a review (if not used the previous day as an assessment)</p>	<p>Cell City Worksheet: Students and teachers will complete the Cell City worksheet. Clarify any misconceptions along the way. You can have students complete the 13 questions that follow the table by themselves or with a partner.</p>

	<ul style="list-style-type: none"> •All organisms are composed of cells- the fundamental unit of life. •Organisms can be unicellular or multicellular. •Cells have various functions. Cell shape is related to its specific function. 				
Independent Practice	<p>Divide students into groups and provide them with worksheets containing labeled cell diagrams. Ask them to identify and describe the functions of each organelle.</p>	<p>Close reread with a partner a chunk at a time. Students should re- read just a short section, or page at a time. Partners agree before beginning where the “breaks” for chunks will be. When partners finish reading a chunk, they are to discuss the chunk with each other and take notes. Partners continue until all chunks are read and discussed.</p> <p>After close re-reading and note taking with partners is complete, students will check their notes on cells by comparing them to the teacher notes (Power Point) and refining their individual notes as needed.</p>	<p>Students will complete the Explore Learning activity “Cell Structure”. The Cell Structure Gizmo™ will allow students to explore various cells on the microscopic and macroscopic levels.</p> <p>Students should complete Activity A – Students identify the organelles in an animal cell.</p> <ul style="list-style-type: none"> • Activity B – Students identify the organelles in a plant cell and determine how a plant cell differs from an animal cell. • Activity C – Students identify the organelles in a bacterial cell and determine how bacterial cells differ from animal and plant cells. 	<p>Cell Argumentation Activity:</p> <p>Aaliyah and Jeremiah are arguing about the cell structures in living things. Jeremiah says all cells have the same structures, while Aaliyah says that some cells have different structures. They each want to prove they are right. Alfonso was tired of listening to them argue over Zoom and told them they needed to “prove it”. Use the Gizmos and the student exploration sheets completed the previous day to support either Aaliyah or Jeremiah.</p> <p>After collecting evidence, do you agree with Aaliyah or Jeremiah? Why? Share your evidence to support your reasoning.</p> <p><i>Names can be changed to fit the students in your class.</i></p>	<p>Students and teachers will complete the Cell City worksheet. Clarify any misconceptions along the way. You can have students complete the 13 questions that follow the table by themselves or with a partner.</p>
Assessment/Summary	<p>Students will complete a short assessment covering cells, cell types, and cell theory. The assessment is five questions.</p>	<p>Students will complete a 3-2-1 activity covering the day’s lesson.</p>	<p>Students and the teacher will complete the closing activity: The teacher will discuss the prior knowledge questions and give out correct answers and review the learning target and the teacher will informally</p>	<p>Students will share if they are Team Aaliyah or Team Jeremiah and give supporting evidence.</p>	<p>Students and the teacher will complete the closing activities: review the lab analysis questions and review the learning target and teacher will informally assess class’s journey toward standard mastery.</p>

			assess the class's journey toward standard mastery.		
Small Group Tasks (TBA)					

Week 4

GSE: S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.
 a: Develop a model and construct an explanation of how cell structures (specifically the nucleus, cytoplasm, cell membrane, cell wall, chloroplasts, lysosome, and mitochondria) contribute to the function of the cell as a system in obtaining nutrients in order to grow, reproduce, make needed materials, and process waste.

Focused Concept: Cells are the structural and functional unit of all living organisms. Some organisms, such as bacteria, are unicellular, consisting of a single cell. Other organisms, such as humans, are multicellular, or have many cells—an estimated 100,000,000,000,000 cells! Each cell can take in nutrients, convert these nutrients into energy, carry out specialized functions, and reproduce as necessary. Each cell also stores its own set of instructions for carrying out each of these activities.


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Scale, Proportion, and Quantity
 Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)
Systems and System Models
 Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3)
Structure and Function
 Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)

Phenomenon: Available in the opening activities

DQ: Does the type of cell affect the way the cell obtains energy, reproduces, or gets rid of waste?

Learning Target:	Day 16	Day 17	Day 18	Day 19	Day 20
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<p>The students will be able to (SWBAT)</p>	<p>SWBAT compare animal and plant cells. SWBAT demonstrate proper microscope techniques.</p>	<p>SWBAT compare animal and plant cells.</p>	<p>SWBAT identify chloroplasts, cell walls, and the cytoplasm of a plant cell. SWBAT demonstrate proper microscope techniques.</p>	<p>SWBAT compare cellular respiration and photosynthesis.</p>	<p>SWBAT compare animal and plant cells.</p>
<p>Opening</p>	<p>Explain the day's lesson focus and activity.</p>	<p>Review yesterday's lab activity and answer questions students may have.</p>	<p>Guiding Questions: What organelles are present in plant cells that can be observed in Elodea? Can photosynthesis be visualized in Elodea?</p>	<p>The teacher will show the following picture:</p> 	<p>The teacher should review the lesson questions: How do the mitochondria and chloroplasts provide energy for a plant and animal cell? Does the type of cell affect the way the cell obtains energy, reproduces, or gets rid of waste? Where are we in the learning journey?</p>
<p>Guided Practice/Transition</p>	<p>Microscope tool talk</p>	<p>Students will complete the cell organelle worksheet. Cell Organelle review</p>	<p>Student will be given the following instructions:</p> <p>Prepare a wet mount of Elodea. Select a leaf from an Elodea plant. Place the leaf on a microscope slide. Place a drop of water on the leaf and place a coverslip over the specimen. Push the coverslip down and use a paper towel to remove excess water. Focus on the Elodea under scanning objective. Switch objectives to the low section near the edge attempting to find a section where the cells are a single layer thick. Switch to a higher objective and</p>	<p>Mystery Scenario: Teacher will present a mystery scenario along with a picture: "Imagine waking up one day to find that all the plants in the world have disappeared. What consequences do you think this would have on the Earth and all living creatures?" The teacher will allow students to brainstorm and share their thoughts.</p>	<p>Flex Day for curriculum catch up.</p>

			<p>refocus with the fine adjustment knob. Turn on the light source of the compound microscope to full intensity. This will allow the chloroplast to begin to undergo photosynthesis. Leave the wet mount of Elodea under the light for 10-15 minutes. During this time, you can sketch and label your elodea leaf model. After 15 minutes, reduce the light so that you may visualize the Elodea cells. You should see the chloroplasts moving in a circular pattern around the cell. This process is known as cytoplasmic streaming.</p>	 <p>Students will engage in short discussion of the previous day's lab activity with the teacher linking it to today's lesson. This will help them understand the relationship between photosynthesis and oxygen production.</p>	
<p>Independent Practice</p>	<p><u>Comparing Animal and Plant Cells Microscope Activity</u> or the Lab activity located on page 42 of the student's textbook.</p> <p>Using compound light microscopes and assorted slides, students will view, classify, and illustrate various cell slides.</p> <p>Materials needed: Microscopes, assorted plant and animal cells.</p>	<p>To help cement student understanding of the cell and its organelles, students will color and label an animal and plant cell.</p> <p>☰ Shrinking Cell Temp...</p> <p>Alternate activity: 📄 Felt Cell: Creating...</p>	<p>Students (working in learning pairs) will work with the aquatic plant, elodea, also known as anacharis. This plant can commonly be found in lake habitats. The purpose for using this plant is to study the internal structure of a leaf cell, more specifically the cell membrane, cell wall, and chloroplasts. Students will prepare a wet mount slide of Elodea and investigate the structure of a plant cell. Students will view and sketch the cell structure, focusing on the chloroplasts and cell wall</p>	<p>Teacher will facilitate a class discussion to explain the key concepts of cellular respiration and photosynthesis. Teacher should cover topics such as:</p> <p>Definition and purpose of cellular respiration and photosynthesis. Chemical equations for both processes. Role of mitochondria and chloroplasts. Energy transformation.</p> <p>The teacher can use the Photosynthesis and <u>Cell Respiration Worksheet</u> as a practice assignment.</p>	

				The teacher will conduct a closing discussion where students share what they learned and what questions they still have.	
Assessment/Summary	Students and the teacher will complete the closing activities: review the lab analysis questions and review the learning target and teacher will informally assess class's journey toward standard mastery.	Students and the teacher will complete the closing activities: review the learning target and teacher will informally assess class's journey toward standard mastery.	Students and the teacher will complete the closing activities: review the lab analysis questions and review the learning target and teacher will informally assess class's journey toward standard mastery.	Conclusion: Wrap up the lesson by summarizing the key takeaways and connecting them to the initial mystery scenario. Encourage students to see the interconnectedness of cellular respiration and photosynthesis in maintaining life on Earth.	
Small Group Tasks (TBA)					

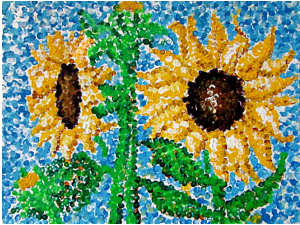
Week 5



GSE:
b. Develop and use a conceptual model of how cells are organized into tissues, tissues into organs, organs into systems, and systems into organisms.
c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes.
(Clarification statement: The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)

Focused Concept: Cells are organized into tissues, tissues into organs, organs into organ systems, and organ systems into organisms. This organization allows the human body to be an efficient machine. Like a real machine, the human body also consists of many parts that work together to perform certain functions, which in the case of the human body include keeping the organism alive.

SEP: Asking questions (for science) and defining problems (for engineering)
 Developing and using models
 Analyzing and interpreting data

CCC: Systems and System Models

Using mathematics and computational thinking Constructing explanations (for science) and designing solutions (for engineering) Obtaining, evaluating, and communicating information		Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3) Structure and Function Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)			
Phenomenon: Available during the opening activities		DQ:How can a single cell be either an entire organism or just part of a larger one? How does the organization of cells support life functions in multicellular organisms?			
Learning Target:	Day 21	Day 22	Day 23	Day 24	Day 25
The students will be able to (SWBAT)	SWBAT <ul style="list-style-type: none"> Explore and model how the body is a system of interacting subsystems composed of cells. 	SWBAT <ul style="list-style-type: none"> Explore and model how the body is a system of interacting subsystems composed of cells. 	SWBAT <ul style="list-style-type: none"> Explore the levels of organization of cells, tissues, organs, and organ systems and how they work together. 	SWBAT <ul style="list-style-type: none"> Develop a model of the levels of organization of cells, tissues, organs, and organ systems and how they work together. 	SWBAT <ul style="list-style-type: none"> Identify the different ways that cells work in the body.
Opening	<p>The teacher will have students study the picture located on page 55 of the student textbook. The teacher will ask the students the “encounter the phenomenon” question: How do body systems in this glass frog work together to perform life functions?</p> <p>Alternate opening activity: Students can complete the Basic Unit of Function Science probe located on page 57 of the student</p>	 <p>The teacher will use an example of pointillism art (like the picture above) to review the previous day’s lesson and set the stage for learning.</p>	<p>The teacher will use the interactive presentation: How are cells organized in the body? as an opening for the day’s lesson. The teacher will introduce the lesson question: How are cells organized in the body?- Student ideas will be written down on chart paper to serve as a visual for the lesson activity.</p>	<p>The teacher will review the characteristics of living things with students. As students recite the characteristics, the teacher will write the characteristics of living things on chart paper, or the Interwrite/Mimo board. The teacher will then pose this question: is the cell the smallest unit and function of life? Provide evidence to support your claim. The teacher will give students 5 minutes to formulate their thoughts. The teacher will</p>	<p>The teacher will have students complete the Sam’s Puppy assessment probe (the probe and a Google slide is available below:</p> <ul style="list-style-type: none"> Sam's Puppy Assess... Sam's Puppy Assess...

	textbook.			<p>show students a short video of an amoeba eating and ask students would they consider the amoeba to be a living thing? Use the video available here:</p> <p> Amoeba eats param...</p>	
<p>Guided Practice/Transition</p>	<p>As a class, students and the teacher will watch the Glass Frog video (available via textbook resources). The teacher should have students develop a list of questions to investigate to find out more about how the glass frog’s body systems work together to perform life functions. Students can complete this activity as learning pairs or groups. The teacher will record questions on the board or chart paper. The chart paper will serve as a reference item as students move through the week’s lessons.</p> <p>The teacher will then direct students to turn to page 58 of their student textbook and study the photo of the light micrograph of the stomach lining cells. The teacher will project the interactive video “Pointillism” and complete a short discussion on how the painting technique is similar to cellular organization.</p>	<p>The teacher will have students review their responses to the Explore the Phenomenon (page 59). The teacher will then review the CER process and explain the day’s activity. Students will complete the investigation on page 62 of the student textbook. The investigation will provide evidence for the CER activity on pages 59-60.</p>	<p>The teacher will ask “What is the benefit of similar cells being grouped together?”</p> <p>Teacher will use the following analogy to assess student understanding and provide context for the day’s lesson activities:</p> <p>Sports Team Organization: Use the structure of a sports team as an analogy. Individual players (cells) come together to form units or positions (tissues), which are organized into the whole team (organism). This can lead to discussions about teamwork, roles, and responsibilities.</p>	<p>The teacher will engage students in a short lesson covering the organization of living things. The reading activity “Level of Organization” is a good review on content and will provide all learners with the background knowledge to complete the independent learning activities of the day.</p> <p>The reading essentials: Levels of Organization (available within the teacher resources of the textbook) will provide an overview of the organization of living things.</p>	<p>Prior to the day’s lesson, visit the CommonLit.org website to set up a free teacher account: https://support.commonlit.org/hc/en-us/articles/360001723733-Quick-Start-Guide-For-Teachers</p> <p>After setting up your teacher account, you will be able to assign the reading activity for the day’s lesson. You will have students set up their CommonLit account and review how to navigate the website. Students will complete “Let’s see What you are made of” via the CommonLit website. Alternatively, you can have students complete this activity via hardcopy. A copy of the reading passage is located below.</p> <p> Let’s See What Yo...</p> <p>Teaching Tips: This is a great reinforcement text if you are teaching about life science and organisms. It is also great for teaching how to identify the main idea and key details.</p>

<p>Independent Practice</p>	<p>Students will complete the Encounter the Phenomenon activity on page 59 of the student textbook.</p> <p>Materials needed: Markers or colored pencils.</p>	<p>Students will complete the CER activity located on pages 59-60 of the student textbook. The investigation information located on pages 61-62 will provide students with evidence needed to revise their earlier claim and finish the CER.</p>	<p>Students will complete two activities: the Making Bodies Investigation and the Body Functions Investigation.</p>	<p>Students will complete the lab activity “Organism Organization” located on page 68-69 of the student textbook.</p> <p>Materials needed: Cardboard shapes Permanent markers Tape Glue and Macaroni</p> <p>Teacher note: This activity works best with student groups of two to three. Make sure to address lab safety and the rules of food in the lab prior to starting the activity.</p>	<p>Students will complete the CommonLit activity, “Let’s See What you are made of”.</p>
<p>Assessment/Summary</p>	<p>Have students complete the Basic Unit of Function Science Probe to assess the student's understanding of the lesson. This probe will also be for the identification of student’s misconceptions.</p>	<p>Remind students to return the Claim/Evidence/Reasoning graphic organizer to record additional information (evidence) about how organs are grouped together in an organism.</p>	<p>Remind students to return the Claim/Evidence/Reasoning graphic organizer to record additional information (evidence) about how organs are grouped together in an organism.</p>	<p>Remind students to return to the Claim/Evidence/Reasoning graphic organizer to record additional information (evidence) about how organs are grouped together in an organism.</p>	<p>Have students review the BrainPop video located here: ▶ CELLS BRAINPOP Have students complete the What, So What, Now What Chart ☰ What, So What, No...</p>
<p>Small Group Tasks (TBA)</p>					

Week 6

GSE:S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.
 c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact

Focused Concept: Focused Concept: Cells are organized into tissues, tissues into organs, organs into organ systems, and organ systems into organisms. This organization allows the human body to be an efficient machine. Like a real machine, the human body also consists of many parts that work together to perform certain functions, which in the case of the human body include keeping the organism alive.

with one another to carry out life processes.
 (Clarification statement: The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)

SEP: Asking questions (for science) and defining problems (for engineering)
 Developing and using models
 Planning and carrying out investigations
 Analyzing and interpreting data
 Using mathematics and computational thinking
 Constructing explanations (for science) and designing solutions (for engineering)
 Engaging in argument from evidence
 Obtaining, evaluating, and communicating information

CCC:
Systems and System Models

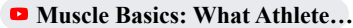
Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3)

Structure and Function

Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)

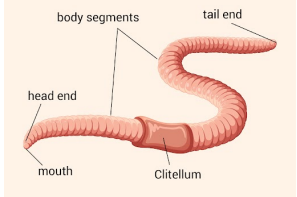
Phenomenon: Available during the opening activities

DQ: How are structure and support provided in multicellular organisms?

Learning Target:	Day 26	Day 27	Day 28	Day 29	Day 30
The students will be able to (SWBAT)	SWBAT explain how the body is organized from cells to organ systems and how these parts work together to keep the human body alive.	SWBAT explore how different systems interact to enable structural and supportive functions.	SWBAT explore how different systems interact to enable structural and supportive functions.	SWBAT differentiate between voluntary and involuntary muscle control, identifying the parts of the nervous system responsible for each. They will also classify the types of muscles (cardiac, smooth, skeletal) under each control system.	Engineering Standard: MS-ENGR-II-5 Invent and/or innovate a technological product or system that addresses a societal need using the Engineering Design Process. SWBAT apply their knowledge of the skeletal and muscular system in the engineering design process.
Opening	The teacher will begin with a True or False activity to activate prior knowledge about cells and their functions. Display the following statements	Is muscle alive probe? The teacher will have students complete the probe located on page 75 of the student textbook.	The teacher will review the lab activity from the previous day. What misconceptions do students have? Show the video below as a review of muscles and bones. 	The teacher will initiate the lesson with a True or False activity to activate prior knowledge and set the stage for the lesson.	The teacher will kick off the lesson with a hands-on activity where students simulate joint movements using simple materials like rubber bands and straws to

	<p>one at a time:</p> <ol style="list-style-type: none"> 1. All cells in the human body are identical. 2. Cells are the smallest unit of life. 3. Different types of cells have different functions. 4. Cells can work independently without interacting with other cells. <p>Give students a few minutes to decide whether each statement is true or false. Ask several students to share their reasoning. This activity will prime students for the lesson by activating their existing knowledge about cells, which is a prerequisite for understanding the organization of the human body.</p>			<p>The teacher display the following statements, one at a time, and ask students to decide if each is true or false:</p> <ul style="list-style-type: none"> <input type="checkbox"/> "Our heart beats voluntarily." <input type="checkbox"/> "We can control the contraction and relaxation of our stomach muscles." <input type="checkbox"/> "The muscles that help us lift objects are under our voluntary control." <input type="checkbox"/> "The muscles in our blood vessels work without our conscious control." <p>The teacher will solicit different strategies for thinking about the statements and different assumptions. The statements build on each other to draw attention to their structure. This activity will help students recall their existing knowledge about voluntary and involuntary muscle control, preparing them for the lesson ahead.</p>	<p>represent muscles and bones. This visual and tactile experience can help them understand how muscles and bones work together to facilitate movement.</p> <p>Alternate opening: The teacher will show the short video detailing Cooper Kupp and his football injury.</p> <p>▶ Inside Cooper Kupp'...</p> <p>or Chris Goodwin</p> <p>▶ How an NFL Player ...</p> <p>Ask students what ideas do they have for protecting athletes from injury?</p>
<p>Guided Practice/Transition</p>	<p>The teacher will introduce the topic by explaining the</p>	<p>Have students study the photo of the girl</p>	<p>Students will complete Make no Bones About it on page 82 of the</p>	<p>Students will complete the Types of Muscles lab</p>	<p>The teacher will introduce a problem-based learning</p>

	<p>hierarchical organization of the human body: cells form tissues, tissues form organs, and organs form organ systems. Use a diagram on the board to illustrate this.</p> <p>Explain that cells are the smallest unit of life and that they are specialized to perform specific functions. For example, red blood cells carry oxygen, while nerve cells transmit signals. Next, discuss tissues. Explain that a tissue is a group of similar cells working together. Use the example of epithelial tissue, which lines the inside of the mouth and protects it from wear and tear.</p> <p>Move on to organs. Explain that an organ is a structure composed of different types of tissues working together. Use the lungs as an example, highlighting how they contain several tissue types that allow them to expand and contract. Finally, discuss organ systems. Explain that an organ system is a group of organs working together to carry out complex functions. Use the respiratory system as an example, explaining how it allows us to breathe. Reiterate the hierarchical</p>	<p>doing a handstand on page 76 of the student textbook. The teacher will ask students How is this girl able to do a handstand? (<i>The muscular and skeletal systems provide the essential motion, support, and structure required to balance, working together to enable the person to do a handstand</i>). Students will complete the Encounter the Phenomenon activity on page 77 of the student textbook. After the activity, have students watch the video Dance Moves (via the Mimio board) to see the phenomenon in action.</p>	<p>student textbook. Students will work in learning pairs. Materials needed: bubble wrap, plastic bags, plastic jar.</p> <p>Remind students that they are building a model and the limitations of models.</p> <p>After students complete the lab activity, discuss as a class how the lab successfully, or unsuccessfully modeled the skeletal system.</p>	<p>located on page 87. Before beginning the lab activity, the teacher will review microscope basics (including focusing, and slide placement). Each group will receive a compound light microscope, a prepared slide of smooth muscle, a prepared slide of cardiac muscle, and a prepared slide of skeletal muscle.</p>	<p>scenario where students must design a protective gear for athletes, focusing on how it can support and protect specific muscles and bones during sports activities. This allows them to apply their knowledge of the human body in a real-world context and encourages teamwork and creative thinking.</p> <p>Assign each student pair or group a sport and have the group focus on a common injury of that sport. Once the common injury for the sport is found, students will design a protective gear for athletes that play that sport.</p> <p>Example of sports that can be used:</p> <p>Football: Knee injuries in football are the most common, especially those to the anterior or posterior cruciate ligament (ACL/PCL) and to the menisci (cartilage of the knee). These knee injuries can adversely affect a player's long term involvement in the sport.</p> <p>Basketball: Ankle sprains are easily the most common injury in basketball. Ankle sprains occur most often when you land on another player's foot. In most cases, the ankle turns inward, stretching the ankle</p>
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	<p>organization by comparing it to Russian nesting dolls: cells are the smallest doll, tissues are the next size up, followed by organs and organ systems.</p> <p>Below are teaching notes that can be used to facilitate a guided discussion. The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.</p> <p>☐ Human Body Systeme...</p>				<p>ligaments.</p> <p>Baseball</p> <p>Soccer</p> <p>Volleyball</p> <p>Track and Field</p>
<p>Independent Practice</p>	<p>Group Discussion: Divide students into groups of four. Assign each group a specific organ system (e.g., digestive, respiratory, circulatory, etc.). Instruct groups to identify the organs in their system, the tissues that make up those organs, and the cells that make up those tissues. Each group should also discuss how their organ system interacts with other systems.</p> <p>Argumentation Session: Using their group discussion findings, students should construct an argument supported by evidence to explain how their assigned organ system is a system of interacting subsystems</p>	<p>How are muscles controlled in their body? activity</p> <p>The teacher will discuss the terms voluntary and involuntary as a class. Voluntary muscles can be controlled by our conscious thought, e.g. the muscles in our hands as we catch a ball. Involuntary muscles, like those that control the beating of the heart, do not require conscious thought to make them move even though their action is still controlled by the nervous system.</p> <p>Students will be placed</p>	<p>Students complete the Exploring Earthworm Movement lab activity located on page 84 of the student textbook. (The lab is also available as an interactive presentation via the teacher resources). The purpose of this activity is to have students observe how an earthworm moves. If earthworms are not available, show the video available here and hand each student pair a labeled diagram of an earthworm.</p> <p>Video of Earthworm moving</p> <p>Diagram of an earthworm</p> 	<p>Types of Muscles Lab Students will examine how the characteristics and the arrangement of different muscle cells support the special function of different types of muscle tissues.</p>	<p>Students will complete a review of the week's lessons using the material on pages 94-95 of the student textbook.</p>

	<p>composed of groups of cells. They should present their arguments to the class.</p> <p>Modeling Activity: Provide each group with modeling clay of different colors. Instruct them to create a 3D model of their organ system, showing the different organs, tissues, and cells. This hands-on activity will help students visualize the hierarchical organization of the human body.</p> <p>Reflection: After all groups have presented, lead a class discussion on the interconnectedness of the human body's subsystems. Ask students to reflect on how the body's organization helps it function effectively.</p>	<p>in student pairs and complete the Muscle Lab activity.</p> <p>Muscle Labs.pdf</p> <p>Material needed: Meter sticks Timers</p>			
<p>Assessment/Summary</p>	<p>For the last 5 minutes of class, have students write a short paragraph summarizing what they learned about the organization of the human body and the importance of interacting subsystems. Collect these as they leave for formative assessment.</p>	<p>Closing activity: On a piece of paper, quickly sketch a diagram showing how two systems (e.g., skeletal and muscular) interact to support a function, like movement or protection. Label the main parts and their interactions. Write one sentence below your diagram explaining how these interactions help the body function.</p>	<p>The teacher will show the video located below to review how earthworms move.</p> <p>Exploring Invertebrates - ...</p> <p>Discuss with students how the movement of earthworms benefits their habitat.</p>	<p>The teacher will pose a scenario: "Imagine you are a doctor explaining to a patient why they can't control their heartbeat or digestion. How would you explain this based on what you've learned about muscles?"</p> <p>Allow students to brainstorm and share their explanations.</p>	<p>5-3-1 Dialogue Technique 5: Students will each write 5 words or phrases that are essential to the topic. With elbow partners, students will identify, discuss, and come to a consensus regarding</p> <p>3: 3 words or phrases that are essential to the topic.</p> <p>1: In groups of four, students will come to a consensus on 1 appropriate word or phrase that they believe is most essential to the topic. Each group will share their</p>

					word or phrase and explain why it was chosen. Lesson Assessment: Students will summarize the information shared from dialogue generated by the 5-3-1 strategy and enter it in their science notebooks.
Small Group Tasks (TBA)					

Week 7

GSE:S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.

c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes.
(Clarification statement: The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)

Focused Concept: Cells are organized into tissues, tissues into organs, organs into organ systems, and organ systems into organisms. This organization allows the human body to be an efficient machine. The organs of the digestive system act in a sequence, breaking food down into smaller and smaller pieces until it is small enough to be absorbed into the bloodstream. Cells use these food pieces for energy and to build the structures of the body. Cellular waste is disposed of via the excretory system.

SEP:Asking questions (for science) and defining problems (for engineering)
Developing and using models
Planning and carrying out investigations
Analyzing and interpreting data
Using mathematics and computational thinking
Constructing explanations (for science) and designing solutions (for engineering)
Engaging in argument from evidence
Obtaining, evaluating, and communicating information

CCC:
Cause and Effect
Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8)

Scale, Proportion, and Quantity
Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)

Systems and System Models
Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3)

Structure and Function

Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)

Phenomenon: Available during opening activities

DQ: How do organisms obtain energy and remove waste?

Learning Target:	Day 31	Day 32	Day 33	Day 34	Day 35
The students will be able to (SWBAT)	SWBAT describe how organisms obtain energy.	SWBAT describe the nutrients found in certain foods and the role the nutrients play in the human body.	SWBAT explore how digestion occurs in the human body.	SWBAT model digestion in the human body.	SWBAT model how waste is filtered in the human body.
Opening	Science Probe: Digestion and Food Have students complete the science probe located on page 97 of the student textbook. Students will complete the encounter with the phenomenon worksheet located on page 99 of the student textbook.	The teacher will show students an image of a food label and ask students what they think it means certain items mean. The teacher will explain how the nutrients listed on food labels provide information about the food's nutritional content and its potential effects on the body, including the digestive and excretory systems.	The wavelike muscular contractions that push food through the digestive system are called peristalsis. To demonstrate peristalsis, the teacher will have students take turns squeezing toothpaste from a tube. By compressing the tube from bottom to top, toothpaste is squeezed through the tube just as food is squeezed through the digestive system.	The teacher will show the video located here, https://www.youtube.com/watch?v=T_vmcLyTzI In this 3D animation, students will explore the fascinating world of the digestive system. From the moment food enters our mouths to its transformation into vital nutrients, the video breaks down each stage with stunning visuals and clear explanations.	The teacher will begin the lesson by asking students what they know about waste removal in the human body. The teacher will discuss the importance of removing waste products to maintain a healthy body. The teacher will introduce the excretory system as the bodily system responsible for eliminating waste products.
Guided Practice/Transition	Show students the Insect Lunch video (available within the teacher resources): Students will see the phenomenon in action. The teacher will then have students turn to page 100 of the student	The teacher will briefly review the key nutrients typically listed on food labels, such as carbohydrates, proteins, fats, fiber, vitamins, and minerals. The teacher will discuss the	The teacher will pass out the Student Exploration sheets (or assign the Google documents via Canvas) and ask students to complete the Prior Knowledge Questions. Discuss student answers as a class. Complete the Gizmo	Review the student exploration activities from the previous day. Students and teacher can complete the five question assessment as a review (if not used the previous day as an assessment)	The teacher will ask "Why must waste be eliminated from the body?" The teacher will explain the functions of each organ in waste elimination and maintaining fluid balance in the body.

	<p>textbook. Students complete the Explain the Phenomenon activity. Students should read the Explain the Phenomenon paragraph then complete the claim portion of the activity. Through the day’s lessons, students will collect evidence to support and/or revise their claims. The teacher will complete the Learning S’more about Science located on page 102. The purpose of the activity is to illustrate the energy content in food. The teacher will follow the directions located on 102 of the teacher’s edition. (Teacher note: this activity is teacher driven and can be done without students present for safety. Teachers can record themselves completing the activity).</p>	<p>role of each nutrient in the body and its importance for overall health, particularly in relation to digestion and excretion. The teacher will divide students into groups of two to four and assign each group a different nutrient. The teacher will review the requirements of the activity, You are what you eat on page 104.</p> <p>The materials needed for the activity are food labels, empty food containers, and ChromeBook computers.</p>	<p>warmup questions together as a class.</p>		<p>The teacher should encourage questions and clarifications from students throughout the discussion. The teacher will review lab safety and the lab activity. Materials needed from the activity are plastic cups, fine gravel, sand, water, wire screen, filter paper, funnel, sponges, and coffee filters. The complete lab and directions are located on page 108 of the teacher and student textbooks.</p>
<p>Independent Practice</p>	<p>Students will complete the Using Energy investigation located on page 103. Students will work in learning pairs to come up with activities and the energy required. After completing the investigation, students would create a collage of their activities and write a caption beside each explaining how different systems are involved.</p>	<p>Students will complete the You are what you eat investigation activity located on page 104.</p>	<p>Students will complete the Explore Learning activity “Digestive System”. The Digestive System Gizmo™ will allow students to explore the digestive system.</p> <p>Students should complete the Student Exploration sheet containing four activities: Activity A – Students design their own digestive systems and measure the results. Activity B – Students explore mechanical and chemical digestion. Activity C – Students determine how different nutrients are absorbed. Activity D – Students apply their learning to the human digestive system</p>	<p>Students will complete the task card activity that is based on the previous day’s activity.</p> <p>The Task: Design a digestive system with ONLY 4 organs (including the mouth) that can digest the most calories from a cheeseburger</p>	<p>Students will complete the Filtering Waste Lab activity located on page 106 of the student textbook.</p>

Assessment/Summary	Students will complete a 3-2-1 activity covering the day's lesson.	The teacher will conclude the activity by asking students to reflect on what they learned from analyzing food labels. Prompt them to consider how they can apply this knowledge to make healthier dietary choices and support the optimal functioning of their digestive and excretory systems. Encourage students to share any insights or questions they gained from the activity.	Students and the teacher will complete the closing activity: The teacher will discuss the prior knowledge questions and give out correct answers and review the learning target and the teacher will informally assess the class's journey toward standard mastery.	Students will complete a 3-2-1 activity covering the day's lesson.	Students and the teacher will complete the closing activities: review the lab analysis questions and review the learning target and teacher will informally assess class's journey toward standard mastery.
Small Group Tasks (TBA)					

Week 8

GSE:S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.

`c. Construct an argument that systems of the body (Cardiovascular, Excretory, Digestive, Respiratory, Muscular, Nervous, and Immune) interact with one another to carry out life processes.
(Clarification statement: The emphasis is not on learning individual structures and functions associated with each system, but on how systems interact to support life processes.)

Focused Concept: Cells are organized into tissues, tissues into organs, organs into organ systems, and organ systems into organisms. This organization allows the human body to be an efficient machine. The subsystems within the human body work together to move materials throughout the body.

SEP:

**CCC:
Cause and Effect**

Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8)

Scale, Proportion, and Quantity

Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1)

Systems and System Models



Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3)

Structure and Function

Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)

Phenomenon: Available during opening activities

DQ: How are materials transported in multicellular organisms?

	Day 36	Day 37	Day 38	Day 39	Day 40
The students will be able to (SWBAT)	SWBAT explore how materials are transported throughout multicellular organisms.	SWBAT model how blood travels through the circulatory system and learn how the immune system interacts with the circulatory system.	SWBAT model osmosis and diffusion.	SWBAT construct an argument that body systems interact with each other to carry out life processes.	SWBAT demonstrate how materials move across cell membranes.
Opening	The teacher will show a picture of celery stalks in dyed water and ask students what they think happened.	The teacher will show a video of red blood cells traveling through the body.  Blood Flow The teacher will ask students: What do you notice? What do you wonder?	Teacher will show a short video of the emptying of the Georgia Dome (after a football game) to link diffusion to the real world. Students will complete Procedure Step 2 of the Egg Osmosis Lab	The teacher will ask “If one system was not working as it should, would it affect other systems? Why do you think those systems work together?”	The teacher will show the following video  Red blood cells und... The teacher will ask students: What do you notice? What do you wonder?



Guided Practice/Transition

Students will complete the Encounter the Phenomenon activity located on page 117 of the student textbook. (Teacher note: the instructions for the activity are located on 117 of the teacher textbook). Students will complete the Explain the Phenomenon activity located on page 118. Students should read the Explain the Phenomenon paragraph then complete the claim portion of the activity. Through the day's lessons, students will collect evidence to support and/or revise their claims. Teacher will introduce the vocabulary terms: osmosis, diffusion, passive transport, and active transport. Students will take notes covering cell transport and participate in a class discussion over cell transport.

Unit one: Osmosis, ...

Teacher will complete a short discussion of the circulatory system and its role in helping the body maintain homeostasis. Students will also be asked to add additional evidence to their Explain the Phenomenon activity from the previous day.

Students will complete the guided worksheet activity:

Exploring the Ci...

Students will complete the Osmosis GIZMO via the Explore Learning website: Prior to using the Gizmo (10 – 15 minutes) Before students are at the computers, the teacher will pass out the Student Exploration sheets and ask students to complete the Prior Knowledge Questions. Teacher will discuss student answers as a class, but will not provide correct answers at this point (this will be part of the closing activity for the lesson)

Teacher and students will watch The Generation Genius Multicellular Organisms Video From the video, students will learn that the human body and other living things are made up of many different systems. They also know that all organisms are organized in the same way: groups of specialized cells that work together form tissue, different tissues work together to form organs, and organs work together to create systems. Students were also introduced to some examples of systems working together. For example, the circulatory system and the excretory system work together to rid the body of things it doesn't need.




<https://www.generationgenius.com/definition/multicellular-definition/>

Teachers can sign up for a free 30 day trial account to

Students will complete the data table calculations and the lab analysis questions for the Egg Osmosis lab activity with teacher guidance and feedback.

Analysis Questions
What liquids caused the egg to swell? Cite evidence from your data table.
What liquids caused the egg to shrink? Cite evidence from your data table.

What process caused the egg to swell or shrink? Illustrate this process below.

				access all lesson material from Generation Genius or watch the videos without signing up for free.	
Independent Practice	<p>Students will complete the first step of the egg osmosis lab activity using the following procedures</p> <p>Procedure Step 1: Soaking egg in vinegar Label your container with your class period and group number. In the data table, make a drawing and observation of the eggs in the appropriate space To Measure Your Eggs, use a flexible tape measure, measure the circumference of the egg (along the “equator”). Record circumference to closest millimeter Mass the eggs in grams. Record mass Pour 300 ml of vinegar into the container. Carefully place eggs into the container and allow it to soak for 2 days. Loosely place the lid on top; if placed too tight it may break!</p> <p>Teacher note: review lab safety and procedure before allowing students to receive their eggs. Groups should be divided into learning pairs or thirds, if possible.</p> <p> Egg Osmosis Lab</p>	<p>Students will complete the Modeling Blood Cells activity located on page 129 of the student textbook. Students will model how blood travels through the circulatory system.</p> <p>Reflection: Reflect on what you have learned about the circulatory and immune systems. Write a short paragraph about the importance of these systems working together to maintain overall health.</p>	<p>Gizmo activities (15 – 20 minutes per activity) Students will complete Activity A and B of the Osmosis Gizmo. Students can work individually or in small groups. Students will work through the activities in the Student Exploration using the Gizmo.</p>	<p>Students will complete the constructed response activity using the following instructions:</p> <p>Suppose you decide to enter a bicycle race. How would the organs and systems of the body interact with each other? In your response be sure to:</p> <p>Identify the names of two or more systems that will interact (Claim). Explain how your heart and lungs will work together to meet the needs of your muscle cells as you ride, so that you can successfully compete in the race (Evidence and Reasoning).</p> <p>Your response will be scored for completeness, synthesis of information, and accurate use of terms. Your response must be at least five sentences for full credit.</p> <p> S7L2c: Construct a...</p> <p>Students will complete the Unit one review guide in preparation for a unit test or assessment.</p> <p> Unit 1 Cells and th...</p>	<p>Students will complete the investigation, Just Breathe, located on page 131 of the student textbook. Students will work in learning pairs to complete activities. Chromebooks will be necessary to complete the activity.</p>

Assessment/Summary	Students and the teacher will complete the closing activity: The teacher will discuss the prior knowledge questions and give out correct answers and review the learning target and the teacher will informally assess the class's journey toward standard mastery.	Students will complete the quick check questions: Quick Check: Describe the path blood takes through the circulatory system. What are the main functions of white blood cells in the immune system?	Students and the teacher will complete the closing activities: review the learning target and teacher will informally assess class's journey toward standard mastery.	Students will share their answers to the constructed response learning prompt to receive feedback prior to turning in the activity. Teacher and students will review the learning target and teacher will informally assess class's journey toward standard mastery.	Students and the teacher will complete the closing activities: review the lab analysis questions and review the learning target and teacher will informally assess class's journey toward standard mastery. How does the Egg Osmosis lab relate to the human body and cells?
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep Presentation.

Unit One Assessment Prep

Provide the following guidance:

Ask the students to use what they know about the tasks completed to answer the provided assessment prep question.

- What is the question asking you?
- What do you know about the vocabulary or concept in the question?
- Is this question similar to any investigations or tasks we've completed?
- How can what you've done help you answer this question?
- Just view the assessment question: What is the question asking you?

Guide students to think about how their experience connects to the question.

Using the answer choices provided, ask the students the following:

- Identify a wrong answer: How do I know this answer is incorrect?
- Identify the right answer: How do we know this answer is correct?

Allow the students time to discuss in collaborative groups.

TEACHER NOTE: If students struggle with the question, review it the next day. Do not rush to the next question; instructional time is the only time they have to prepare for the end-of-year assessment.

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Labs / Investigations

Mandatory Labs	Explore Learning Gizmo	Pivot Interactives/Phet
ADI Lab: What type of cell is on the unknown slide? Microscope Lab	Cell Structure Cell Types Human Homeostasis Digestive System Osmosis	Characteristics of Living Things Intro to Cells Cell Size and Diffusion

Additional Resources/Tasks

Supplemental Resources	
	<u>Introduction to Characteristics of Living Things Lesson</u> <u>Needs of Living things lesson material and video</u> <u>Characteristics of Living Things quiz</u> <u>Cell Theory Review Worksheet</u> <u>ADI Life Science Resource Book</u> <u>Amoeba Sisters Youtube Playlist</u> <u>Photosynthesis and Cellular Respiration Worksheet</u> <u>CommonLit</u>