

Unit #3: Life Science 8: Human Systems Interactions

Content Area: **Science**
 Course(s): **Science 8**
 Time Period: **Third Marking Period**
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Unit Overview

Science is central to the lives of all Americans. Our science education program must prepare our students to be informed citizens and knowledgeable consumers. If the nation is to compete and lead in the global economy and if American students are to be able to pursue expanding employment opportunities in science-related fields, all students in Linden must have a solid K–12 science education that prepares them for college and careers.

The latest standards are based on learning progressions that provide students with opportunities to investigate core ideas in science in increasingly complex ways over time. The target goals for the curriculum are to help students know and use scientific explanations of the natural world and the designed world; to understand the nature and development of scientific knowledge and technological capabilities; and to participate productively in scientific and engineering practices.

Goals: The focus of the module is life as a complex series of interactions and how the basis of the human body is the cell. Students explore how organ systems interact to support each cell in the body. The questions in the unit will inspire students to find out more about the body systems and the environmental factors that affect them.

STAGE 1- DESIRED RESULTS

2020 New Jersey Student Learning Standards- Science

Life Science

SCI.MS-LS1-1

Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

SCI.MS-LS1-7

Develop a model to describe how food is rearranged through chemical reactions forming

new molecules that support growth and/or release energy as this matter moves through an organism.

SCI.MS-LS1-8

Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

SCI.MS-LS1-3

Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Science and Engineering Practices

- Analyzing and Interpreting Data
- Asking Questions and Defining Problems
- Constructing Explanations and Designing Solutions
- Developing and Using Models
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information
- Planning and Carrying Out Information
- Using Mathematics and Computational Thinking

Cross Cutting Concepts

- Cause and Effect
- Energy and Matter
- Influence of Engineering, Technology, and Science on Society and the Natural World
- Interdependence of Science, Engineering, and Technology
- Patterns
- Scale, Proportion, and Quantity
- Stability and Change
- Structure and Functions
- Systems and System Models

Disciplinary Core Ideas

Physical Sciences

- PS3D: Energy in Chemical Processes and Everyday Life

Life Sciences

- LS1A: Structure and Functions
- LS1C: Organization for Matter and Energy Flow in Organisms
- LS1D: Information Processing

Essential Questions

Investigation 1: Systems Connections

Part 1: What is a human body made of?

Part 2: How do human organ systems interact?

Investigation 2: Supporting Cells

Part 1: How do cells in the human body get the resources they need?

Part 2: How does the energy in food become energy that cells can use?

Investigation 3: The Nervous Systems

Part 1: How does the sense of touch work in humans?

Part 2: How do messages travel to and from the brain?

Part 3: How are the senses alike and how are they different?

Part 4: How do humans learn and form memories?

Enduring Understanding

The focus of the module is life as a complex series of interactions and how the basis of the human body is the cell. Students explore how organ systems interact to support each cell in the body. The questions in the unit will inspire students to find out more about the body systems and the environmental factors that affect them.

Students will know...

Investigation 1: Systems Connections

Atom, cell, cell structure, circulatory system, diabetes, diagnosis, digestive system, endocrine system, excretory system, hormone, molecule, muscular system, nervous system, organ, organ system, respiratory system, skeletal system, symptom, tissue

Investigation 2: Supporting Cells

aerobic cellular respiration, alveolus, calorie, capillary, glucose

Investigation 3: The Nervous System

cerebral cortex, chemoreceptor, learning. Mechanoreceptor, memory, metacognition, nerve, neuron

neurotransmitter, photoreceptor, reaction time, receptive field, response, sensory receptor, smell, stimulus

synapse, touch, vision

Science Resource Vocabulary

Investigation 1: Systems Connections

Abnormal, alveoli, artery, autonomic nervous system, bone marrow, capillary, cardiac muscle, cartilage

Cell, central nervous system, circulatory system, digestive system, endocrine system, enzyme, epiglottis

excretory system, fatigue, gland, heart, homeostasis, hormone, interneuron, joint, metabolism, motor neuron

muscular system, nervous system, neuron, osteoblast, pain, peripheral nervous system, peristalsis, plasma

platelet, receptor, red blood cell, respiratory system, saliva, sensory neuron, sensory receptor, skeletal muscle

skeletal system, smooth muscle, spinal cord, stimulus, symptom, tendon, vein, white blood cell

Investigation 2: Supporting Cells

aerobic cellular respiration, glucose, photosynthesis

Investigation 3: The Nervous System

Amygdala, axon, cell body, cerebral cortex, chemoreceptor, cone, dendrite, electromagnetic, hippocampus

Interneuron, mechanoreceptor, motor neuron, neuron, neurotransmitter, photoreceptor, pressure, reaction time

Rod, sense of hearing, sense of sight, sense of smell, sense of taste, sense of touch, sensory neuron, sensory receptor, stimulus, synapse, temporal lobe

Misconceptions

- The different systems in the human body are not connected to each other.
- Muscles are not found all over the body
- Cells make up the tissues, the tissues make up the organs and the organs make up the organ systems. (Ribbon of Life)
- Blood does not carry oxygen to the cells of the body.
- Capillaries are found only in internal organs.
- Air is distributed through the bodies in air tubes.

- The only gas we breathe out is carbon dioxide.
- Simple sugars have to be broken down into smaller molecules before they can enter the cells of the body.
- Fatty acids have to be broken down into smaller molecules before they can enter the cells of the body.
- We only have five senses (hear, touch, smell, see, taste).

Students will be able to...

- Obtain, evaluate, and communicate information regarding a single human organ system.
- Diagnose a disease affecting a patient by evaluating research information and evidence.
- Engaging in argument from evidence to defend conclusions.
- Develop models to describe how food molecules are rearranged by chemical reactions forming new molecules to provide usable energy for cells.
- Construct explanation about organ system interactions at different scales.
- Develop a model for the action of a neural pathway.
- Gather and interpret data on sensory stimuli and responses.
- Experience and describe learning and memory formation.

STAGE 2- EVIDENCE OF LEARNING

Formative Assessment

- 3- Minute Pause
- A-B-C Summaries
- Analogy Prompt
- Choral Response
- Debriefing
- Exit Card / Ticket
- Hand Signals
- Idea Spinner
- Index Card Summaries
- Inside-Outside Circle Discussion (Fishbowl)
- Journal Entry
- Misconception Check

- Observation
- One Minute Essay
- One Word Summary
- Portfolio Check
- Questions & Answers
- Quiz
- Self-Assessment
- Student Conference
- Think-Pair-Share
- Web or Concept Map

Authentic Assessments

- follow lab procedures
- complete assignments
- develop and utilize models
- cooperate in groups and with partners
- complete a written science journal
- maintain class notes and vocabulary in MacBook Airs
- complete data tables
- complete and interpret graphs

Benchmark Assessments

- Final module exam.
- End of investigation assessments.

STAGE 3- LEARNING PLAN

Instructional Map

Investigation 1: Systems Connections – 5 sessions

Students are presented with a patient who has symptoms that could lead to a number of diagnoses. They determine a course of learning that begins with confirming the levels of complexity in a multicellular

organism.

Students continue their research to determine a diagnosis by focusing on how one organ system interacts with other organ systems in the body to support life processes. They pool their learning with the rest of the class. They conclude by making a tentative diagnosis of the patient, arguing their case to the other students. They learn additional information that allows them to make a conclusive diagnosis.

Investigation 2: Supporting Cells- 5 sessions

Students participate in an exercise activity to think about how the cells in the human body get oxygen and energy (food). They watch video clips and manipulate an online activity to add detail to their ideas. They construct a model to illustrate the pathways that oxygen and energy (food) take the external environment to a muscle cell in the leg.

Students model the substances and step in aerobic cellular respiration. They summarize the entire process, demonstrating how substances get to the cells, what happens at the cells, and how substances depart from the cells to be removed from the body.

Investigation 3: The Nervous System- 11 sessions

Students think about how humans sense the environment around them and then turn their attention to the sense of touch. They compare touch sensitivity between fingertips and knuckles to learn about pressure receptors and receptive fields.

Students consider the stimulus/response phenomenon. They develop a model to explain how messages are transmitted along neurons and across synapses, to and from the brain. Students explore the sense of smell by identifying scents, and the sense of sight by testing reaction time. They read about chemical receptors and consider how their eyes are designed to interpret electromagnetic information. Students use mirror drawing to explore connection between hand-eye coordination, learning, and memory. They use various combinations of sensory input to memorize lists of objects. They look for patterns to determine strategies for improving short-term memory.

Modification/Differentiation of Instruction

Differentiation Strategies for Special Education Students

- Remove unnecessary material, words, etc., that can distract from the content
- Use of off-grade level materials
- Provide appropriate scaffolding
- Limit the number of steps required for completion

- Time allowed
- Level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in “chunks”
- Varied texts and supplementary materials
- Use technology, if available and appropriate
- Varied homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language.
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Ability to work at their own pace
- Present ideas using auditory, visual, kinesthetic, & tactile means
- Provide graphic organizers and/or highlighted materials
- Strategy and flexible groups based on formative assessment
- Differentiated checklists and rubrics, if available and appropriate

Differentiation Strategies for Gifted and Talented Students

- Increase the level of complexity
- Decrease scaffolding
- Variety of finished products
- Allow for greater independence
- Learning stations, interest groups
- Varied texts and supplementary materials
- Use of technology
- Flexibility in assignments
- Varied questioning strategies
- Encourage research
- Strategy and flexible groups based on formative assessment or student choice
- Acceleration within a unit of study
- Exposure to more advanced or complex concepts, abstractions, and materials
- Encourage students to move through content areas at their own pace
- After mastery of a unit, provide students with more advanced learning activities, not more of the same activity
- Present information using a thematic, broad-based, and integrative content, rather than just single-subject areas

Differentiated Strategies for ELL Students

- Remove unnecessary materials, words, etc., that can distract from the content
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Gradually increase the level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in “chunks”
- Varied texts and supplementary materials, including visuals
- Use technology, if available and appropriate
- Differentiate homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language.
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary
- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Allow students to work at their own pace
- Presenting ideas through auditory, visual, kinesthetic, & tactile means
- Role play
- Provide graphic organizers, highlighted materials
- Strategy and flexible groups based on formative assessment

Differentiation Strategies for At Risk Students

- Remove unnecessary materials, words, etc., that can distract from the content
- Provide appropriate scaffolding
- Limit the number of steps required for completion
- Gradually increase the level of independence required
- Tiered centers, assignments, lessons, or products
- Provide appropriate leveled reading materials
- Deliver the content in “chunks”
- Varied texts and supplementary materials
- Use technology, if available and appropriate
- Differentiate homework and products
- Varied questioning strategies
- Provide background knowledge
- Define key vocabulary, multiple-meaning words, and figurative language
- Use audio and visual supports, if available and appropriate
- Provide multiple learning opportunities to reinforce key concepts and vocabulary

- Meet with small groups to reteach idea/skill
- Provide cross-content application of concepts
- Presenting ideas through auditory, visual, kinesthetic, & tactile means
- Provide graphic organizers and/or highlighted materials
- Strategy and flexible groups based on formative assessment

504 Plans

Students can qualify for 504 plans if they have physical or mental impairments that affect or limit any of their abilities to:

- walk, breathe, eat, or sleep
- communicate, see, hear, or speak
- read, concentrate, think, or learn
- stand, bend, lift, or work

Examples of accommodations in 504 plans include:

- preferential seating
- extended time on tests and assignments
- reduced homework or classwork
- verbal, visual, or technology aids
- modified textbooks or audio-video materials
- behavior management support
- adjusted class schedules or grading
- verbal testing
- excused lateness, absence, or missed classwork
- pre-approved nurse's office visits and accompaniment to visits
- occupational or physical therapy

Modification Strategies

- Cooperative Grouping
- Extended Time
- Frequent Breaks
- Highlighted Text

- Interactive Notebook
- Modified Test
- Oral Directions
- Peer Tutoring
- Preferential Seating
- Re-direct
- Repeated Drill and Practice
- Shortened Assignment
- Teacher Notes
- Tutorials
- Use of Additional Reference Materials
- Use of Audio Resources

Differentiation Strategies

High Preparation

- Alternative Assessments
- Choice Boards
- Games and Tournaments
- Group Investigations
- Guided Reading
- Independent Research / Project
- Interest Groups
- Learning Contracts
- Leveled Rubrics
- Literature Circles
- Multiple Intelligence Options
- Multiple Texts
- Personal Agendas
- Project Based Learning (PBL)
- Stations / Centers
- Think-Tac-Toe
- Tiered Activities / Assignments
- Varying Graphic Organizers

Low Preparation

- Choice of Book / Activity
- Cubing Activities
- Exploration by Interest (using interest inventories)
- Flexible Grouping
- Goal Setting With Student
- Homework Options
- Jigsaw
- Mini Workshops to Re-teach or Extend Skills
- Open-ended Activities
- Think-Pair-Share by Readiness, Interest, or Learning Style
- Use of Collaboration
- Use of Reading Buddies
- Varied Journal Prompts
- Varied Product Choice
- Varied Supplemental Materials
- Work Alone / Together

Horizontal Intergration- Interdisciplinary Connections

Student Learning Standards for Mathematics

Grade 8

8.EE.B. Understand the connections between proportional relationships.

8.EE.C. Solve real world problems and mathematical problems.

8.F.A. Define, evaluate, and compare functions.

8.F.B Use functions to model relationships between quantities.

Reading Science and Technical Subjects

RST.6-8.1. Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

RST.6-8.3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

RST.6-8.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

RST.6-8.5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

RST.6-8.6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

RST.6-8.7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

RST.6-8.8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

RST.6-8.9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

RST.6-8.10. By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

Writing History, Science and Technical Subjects

WHST.6-8.1. Write arguments focused on *discipline-specific content*.

A. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

B. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.

C. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.

D. Establish and maintain a formal/academic style, approach, and form.

E. Provide a concluding statement or section that follows from and supports the argument presented.

WHST.6-8.2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

A. Introduce a topic and organize ideas, concepts, and information using text structures (e.g. definition, classification, comparison/contrast, cause/effect, etc.) and text features (e.g. headings, graphics, and multimedia) when useful to aiding comprehension.

B. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

C. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

E. Establish and maintain a formal/academic style, approach, and form.

F. Provide a concluding statement or section that follows from and supports the information or explanation presented

WHST.6-8.3(See note; not applicable as a separate requirement)

WHST.6-8.4. Produce clear and coherent writing in which the development, organization, voice, and style are appropriate to task, purpose, and audience.

WHST.6-8.5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

WHST.6-8.6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

WHST.6-8.7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

WHST.6-8.8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

WHST.6-8.9. Draw evidence from informational texts to support analysis, reflection, and research.

WHST.6-8.10. Write routinely over extended time frames (time for research, reflection, metacognition/self-correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

2020 New Jersey Student Learning Standards- Computer Science and Design Thinking

Computer Science and Design Thinking Practices

CSDT.K-12.CSDTP1	Fostering an Inclusive Computing and Design Culture
CSDT.K-12.CSDTP2	Collaborating Around Computing and Design
CSDT.K-12.CSDTP3	Recognizing and Defining Computational Problems
CSDT.K-12.CSDTP4	Developing and Using Abstractions
CSDT.K-12.CSDTP5	Creating Computational Artifacts
CSDT.K-12.CSDTP6	Testing and Refining Computational Artifacts
CSDT.K-12.CSDTP7	Communicating About Computing and Design

8.2 Design Thinking

<p>8.2.8.ED.1: Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.</p> <p>8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.</p> <p>8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).</p> <p>8.2.8.ED.4: Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.</p> <p>8.2.8.ED.5: Explain the need for optimization in a design process.</p> <p>8.2.8.ED.6: Analyze how trade-offs can impact the design of a product.</p> <p>8.2.8.ED.7: Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).</p>
<p>8.2.8.ITH.1: Explain how the development and use of technology influences economic, political, social, and cultural issues.</p> <p>8.2.8.ITH.2: Compare how technologies have influenced society over time.</p> <p>8.2.8.ITH.3: Evaluate the impact of sustainability on the development of a designed product or system.</p> <p>8.2.8.ITH.4: Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact.</p> <p>8.2.8.ITH.5: Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another.</p>
<p>8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.</p> <p>8.2.8.NT.2: Analyze an existing technological product that has been repurposed for a different function.</p> <p>8.2.8.NT.3: Examine a system, consider how each part relates to other parts, and redesign it for another purpose.</p> <p>8.2.8.NT.4: Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product.</p>
<p>8.2.8.ETW.1: Illustrate how a product is upcycled into a new product and analyze the short- and long-term benefits and costs.</p> <p>8.2.8.ETW.2: Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital).</p> <p>8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact.</p> <p>8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address</p>

climate change issues and use data to justify which choice is best.

8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.

8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.

2020 New Jersey Student Learning Standards- Career Readiness, Life Literacies, and Key Skills

Career Readiness, Life Literacies, and Key Skills Practices

CRP.K-12.CRP1	Act as responsible and contributing community members and employee.
CRP.K-12.CRP2	Attend to financial well-being.
CRP.K-12.CRP3	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP4	Demonstrate creativity and innovation.
CRP.K-12.CRP5	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP6	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP7	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP8	Use technology to enhance productivity, increase collaboration and communicate effectively.
CRP.K-12.CRP9	Work productively in teams while using cultural/global competence.

9.2 Career Awareness and Planning

9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.

9.2.8.CAP.2: Develop a plan that includes information about career areas of interest.

9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.

9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.

9.2.8.CAP.11: Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.

9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.

9.4 Life Literacies and Key Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).

9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).

9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).

9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries.

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (MS-ETS1-2).

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.

9.4.8.DC.1: Analyze the resource citations in online materials for proper use.

9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).

9.4.8.DC.3: Describe tradeoffs between allowing information to be public (e.g., within online games) versus keeping information private and secure.

9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences.

9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure.

9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation.

9.4.8.DC.7: Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.

9.4.8.DC.8: Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities).

9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a).

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.

9.4.8.IML.1: Critically curate multiple resources to assess the credibility of sources when searching for information.

9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.

9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).

9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations.

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

9.4.8.IML.6: Identify subtle and overt messages based on the method of communication.

9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose (e.g., 1.2.8.C2a, 1.4.8.CR2a, 2.1.8.CHSS/IV.8.AI.1, W.5.8, 6.1.8.GeoSV.3.a, 6.1.8.CivicsDP.4.b, 7.1.NH. IPRET.8).

9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change (e.g., 1.1.8.C1b).

9.4.8.IML.9: Distinguish between ethical and unethical uses of information and media (e.g., 1.5.8.CR3b, 8.2.8.EC.2).

9.4.8.IML.10: Examine the consequences of the uses of media (e.g., RI.8.7).

9.4.8.IML.11: Predict the personal and community impact of online and social media activities.

9.4.8.IML.12: Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.

9.4.8.IML.13: Identify the impact of the creator on the content, production, and delivery of information (e.g., 8.2.8.ED.1).

9.4.8.IML.14: Analyze the role of media in delivering cultural, political, and other societal messages.

9.4.8.IML.15: Explain ways that individuals may experience the same media message differently.

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).

9.4.8.TL.3: Select appropriate tools to organize and present information digitally.

9.4.8.TL.4: Synthesize and publish information about a local or global issue or event (e.g., MS-LS4-5, 6.1.8.CivicsPI.3).

9.4.8.TL.5: Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.

9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

Vertical Integration- Discipline Mapping

Grade 5: Living Systems

Grade 6: Diversity of Life

Grade 7: Populations and Ecosystems

Preparation for High School Science Curriculum.

Additional Materials

Word wall

Video on digestive and excretory systems, Doctor Interview 1 & 2, How Memory Works

FOSS Website Online Activities

Studyjam videos (various topics)

student guide and resource book

colored pencils for recording

safety procedure poster

materials poster

argumentation bulletin board

student notebook