

Lower Cape May Regional School District

Life Science

7th Grade

Interdisciplinary Connections

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

RL.7.1. Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

Integration of Technology

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., MSLS4-5, 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.

21st Century Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, 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 (e.g., 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.

Career Education

- 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.5: Develop a personal plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.
- 9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.
- 9.2.8.CAP.7: Devise a strategy to minimize costs of postsecondary education.
- 9.2.8.CAP.8: Compare education and training requirements, income potential, and primary duties of at least two jobs of interest.
- 9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts postsecondary options.
- 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
- 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.
- 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances.
- 9.2.8.CAP.14: Evaluate sources of income and alternative resources to accurately compare employment options.
- 9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
- 9.2.8.CAP.16: Research different ways workers/ employees improve their earning power through education and the acquisition of new knowledge and skills.
- 9.2.8.CAP.17: Prepare a sample resume and cover letter as part of an application process.
- 9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.
- 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
- 9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

| Lower Cape May Regional School District (Life Science) Curriculum | |
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| Content Area: Science | |
| Course Title: Life Science | Grade level: 7th |
| Unit 1: Introduction to Life Science and the Nature of Science | Dates for Units: 30 days (revisited 10 days throughout the year) |
| Unit 2: Characteristics of Living Things | Dates for Units: 20 days (revisited 10 days throughout the year) |
| Unit 3: Selection and Adaptation | Dates for Units: 20 days |
| Unit 4: Cell Structure and Function | Dates for Units: 20 days |
| Unit 5: Inheritance and Variation in Traits | Dates for Units: 20 days |
| Unit 6: Body Systems | Dates for Units: 20 days |
| Unit 7: Ecology and Interdependent Relationships in Ecosystems | Dates for Unit: 20 days |

| Lower Cape May Regional School District (7th grade Science) Curriculum Unit 1 Overview |
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| Content Area: Life Science |
| Unit Title: Introduction to Life Science |
| Target Course/Grade Level: Life Science 7th |
| Unit Summary: Topics to be studied during this unit include Careers in Life Science, Safety in the lab, Skills of a Scientist, Scientific Method and Inquiry, and Metrics. Students will work to: Identify |

skills scientists use to learn about the world; Explain what Scientific Inquiry involves; Describe how to develop a hypothesis; Examine how to make observations and inferences; Practice reading and using Scientific tools properly; Practice safe lab procedures; Measure accurately using science tools; Explain how Technology is used by a scientist; Explain the main concepts of Life Science; Explain the Careers of Life Science; Explain what a model is in Science and why models are important in Life Science; Describe the goal of technology; Explain how technology differs from Science; Describe how technology affects society; Explain why preparation is important when carrying out Scientific Investigations in the lab and in the field and the prevention of accidents; Discuss all safety in the lab rules as well as proper use of safety equipment provided in all science labs; Explain that scientists use the scientific method and inquiry skills to study the natural world.

Student Learning Objectives

MS-LS-1-1

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

Science and Engineering Practices:

Developing and Using Models:

Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems.

- **Develop and use a model to describe phenomena. (MS-LS1-2)**
- **Develop a model to describe unobservable mechanisms. (MS-LS1-7)**

Planning and Carrying Out Investigations

Planning and carrying out investigations in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.

- **Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1)**

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)**

Crosscutting Concepts:

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)**

Connections to Engineering, Technology, and Applications of Science

- **Interdependence of Science, Engineering, and Technology Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS1-1)**

Connections to Nature of Science

Science is a Human Endeavor

- **Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (MS-LS1-3)**

Scientific Knowledge is Based on Empirical Evidence

- **Science knowledge is based upon logical connections between evidence and explanations. (MS-LS1-6)**

Unit Enduring Questions:

- What is Science? What are the skills and attitudes that a scientist uses to learn about the world around them? What are the main concepts and Big Ideas with Life Science? What are the branches/careers of Life Science? How do you make observations about objects, organisms, and the environment? How do you use simple measuring tools to gather data and extend the senses? How do you use observed patterns to make predictions? How do you use standard measuring tools to collect data and nonstandard measures to make comparisons? How can physical properties be used to order and sort objects and organisms? How do you locate relevant science information in printed resources? How do graphs represent information?

Unit Enduring Understandings:

- Scientific inquiry is a thoughtful and coordinated attempt, through a continuous process of questioning, data collection, analysis and interpretation, to describe, explain, and predict natural phenomena. Scientific inquiry progresses through a continuous process of questioning, data collection, analysis and interpretation. Scientific inquiry requires the sharing of findings and ideas for critical review by colleagues and other scientists. Scientific literacy includes speaking, listening, presenting, interpreting, reading and writing about science. Scientific literacy includes also the ability to search for and assess the relevance and credibility of scientific information found in various print and electronic media. Scientific numeracy includes the ability to use mathematical operations and procedures to calculate, analyze and present scientific data and ideas.

Unit Objectives:

Students will know....

- The steps of Inquiry

Unit Objectives:

Students will be able to.....

- Explain the steps of Inquiry

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| <ul style="list-style-type: none"> • How to apply inquiry skills • The careers/branches of Life Science • The importance of models • How to implement technology | <ul style="list-style-type: none"> • Apply the steps inquiry field work • Identify various careers in Life Sciences • Create Models • Read, understand, and make conclusions from models • Apply proper safety procedures • Explain how to respond to laboratory safety situations |
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| Lower Cape May Regional School District (7th grade Science) Curriculum Unit 2 Overview | |
| Content Area: Science | |
| Unit Title: Characteristics of Living Things | |
| Target Course/Grade Level: Life Science 7th | |
| Unit Summary: Students demonstrate age appropriate abilities to plan and carry out investigations to compare and contrast living (biotic) and non-living (abiotic) things. Students gather evidence to support explanations of what makes something living. They are able to communicate and understanding of the characteristics of living things. Students are expected to demonstrate proficiency in engaging in argument from evidence and obtaining, evaluating and communicating information. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas. | |
| Student Learning Objectives | |
| 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. |
| Science and Engineering Practices | |
| Planning and Carrying Out Investigations <ul style="list-style-type: none"> • Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1) | |
| Disciplinary Core Ideas | |
| LS1.A: Structure and Function <ul style="list-style-type: none"> • 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) | |

Crosscutting Concepts

Scale, Proportion, and Quantity

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

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS1-1)

Unit Enduring Questions:

- What does it mean to be living?
- What characteristics do all living things have in common?

Unit Enduring Understandings:

- All Living Things reproduce either sexually or asexually
- All living things respond to stimuli
- All living things are organized by cells
- All living things have adaptations that help them survive in their environments
- All living things develop and grow
- All living things have basic need; water, oxygen and energy

Unit Objectives:

Students will know....

- The 6 Characteristics of Life
- Different types of Adaptations
- Cells are the smallest unit of life that can be said to be alive

Unit Objectives:

Students will be able to.....

- Identify the characteristics shared by all living things
- Distinguish between living (biotic) and non-living (abiotic) things based on the characteristics of life

Lower Cape May Regional School District (7th grade Science) Curriculum Unit 3 Overview

Content Area: Science

Unit Title: Selection and Adaptation

Target Course/Grade Level: Life Science 7th

Unit Summary:

Students construct explanations based on evidence to support fundamental understandings of natural selection and evolution. They will use ideas of genetic variation in a population to

make sense of how organisms survive and reproduce, thus passing on the traits of the species. The crosscutting concepts of patterns and structure and function are called out as organizing concepts that students use to describe biological evolution. Students use the practices of construction explanations, obtaining, evaluating and communicating information, and using mathematical and computational thinking. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Student Learning Objectives

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| MS-LS4-4 | Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. |
| MS-LS4-5 | Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. |
| MS-LS4-6 | Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. |

Science and Engineering Practices

Constructing Explanations and Designing Solutions

Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena. (MS-LS4-4)

Obtaining, Evaluating, and Communicating Information

Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS4-5)

Using Mathematics and Computational Thinking

Use mathematical representations to support scientific conclusions and design solutions. (MS-LS4-6)

Disciplinary Core Ideas

LS4.B: Natural Selection

- **Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4)**
- **In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring. (MS-LS4-5)**

LS4.C: Adaptation

- **Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common: those that do not become less common. Thus, the distribution of traits in a population changes. (MS-LS4-6)**

Crosscutting Concepts

Cause and Effect

- **Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS4-4), (MS-LS4-5), (MS-LS4-6)**

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- **Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS4-5)**

Connections to Nature of Science

Science Addresses Questions About the Natural and Material World

- **Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS4-5)**

Unit Enduring Questions:

- How can changes to the genetic code increase or decrease an individual's chances of survival?
- How can the environment affect natural selection?
- How does natural selection lead to adaptations over generations?

Unit Enduring Understandings:

- Genetic variations of traits in a population increase or decrease some individuals probability of surviving and reproducing in a specific environment.
- Natural selection leads to the predominance of certain traits in a population and suppression of others
- Natural selection may have more than one cause, and some cause and effect relationships with natural selection can only be described using probability
- Natural selection, which over generations leads to adaptations, is one important process through which species change over time in response to changes in environmental conditions.
- The distribution of traits in a population changes
- Traits that support successful survival and reproduction in the new environment become

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| | more common; those that do not become less common |
| Unit Objectives: <i>Students will know....</i> <ul style="list-style-type: none"> • Living things are able to adapt to their environments over time. This is a characteristic that defines something as Living • Genetic variations of traits in a population increase or decrease some individuals probability of surviving and reproducing in a specific environment. • Evolution is a long process | Unit Objectives: <i>Students will be able to.....</i> <ul style="list-style-type: none"> • Explain the benefits of specific anatomical (structural), behavioral or physiological adaptations or traits for species' survival. • Correlate certain animal's adaptive traits with the survival or extinction of its group in a mass extinction event. • Explain why evolution is a long processes |

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| Lower Cape May Regional School District (7th grade Science) Curriculum Unit 4 Overview | |
| Content Area: Science | |
| Unit Title: Cell Structure and Function | |
| Target Course/Grade Level: Life Science 7th | |
| Unit Summary: Students demonstrate age appropriate abilities to plan and carry out investigations to develop evidence that living organisms are made of cells. Students gather information to support explanations of the relationship between structure and function in cells. They are able to communicate and understanding of cell theory and understand that all organisms are made of cells. Students understand that special structures are responsible for particular functions organisms. They then are able to use their understanding of cell theory to develop and use physical and conceptual models of cells. The crosscutting concepts of scale, proportion, and quantity and structure and function provide a framework for understanding and the disciplinary core ideas. Students are expected to demonstrate proficiency in planning and carrying out investigations, analyzing and interpreting data, and developing and using models. Students are also expected to use these science and engineering practices to demonstrate understanding of the core ideas. | |
| Student Learning Objectives | |
| 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 |
| MS-LS1-2 | Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. |

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| MS-LS1-4 | Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. |
| MS-LS1-6 | Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms |

Science and Engineering Practices

Developing and Using Models

- **Develop and use a model to describe phenomena. (MS-LS1-2)**
- **Develop a model to describe unobservable mechanisms. (MS-LS1-7)**

Planning and Carrying Out Investigations

- **Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1)**

Obtaining, Evaluating, and Communicating Information

- **Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS1-8)**

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.B: Growth and Development of Organisms

- **Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4)**
- **Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (MS-LS1-4)**
- **Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5)**

Crosscutting Concepts

Scale, Proportion, and Quantity

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

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)**

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology

- **Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS1-1)**

Connections to Nature of Science

Scientific Knowledge is Based on Empirical Evidence

- **Science knowledge is based upon logical connections between evidence and explanations. (MS-LS1-6)**

Unit Enduring Questions:

- How did technology affect the discovery of cells?
- If cells were never discovered, how would our understanding of life be different today?
- How can there be so many similarities among organisms yet so many different kinds of plants, animals and microorganisms?
- What evidence shows that different species are related?
- How does genetic variation among organisms affect survival and reproduction?
- How does the environment influence populations of organisms over multiple generations?

Unit Enduring Understandings:

- All organisms are composed of one or more cells; each cell carries on life-sustaining functions. Multicellular organisms need specialized structures and systems to perform basic life functions.
- Successful reproduction of animals and plants may have more than one cause, and some cause-and-effect relationships in systems can only be described using probability.
- Kingdoms of Life have specialized behaviors, reproductive parts, adaptations, and strategies that help them to successfully reproduce.
- Animal survival instincts include herding, flocking, or schooling.
- Favorable conditions for reproduction include food, water, shelter, space, and mates.
- Animals attract a mate by having colorful plumage, vocalizing, and making nests.
- Animals keep young alive by choosing a safe nesting site

Unit Objectives:

Unit Objectives:

Students will know....

- Living things have characteristics that distinguish them from nonliving things. Living things use energy, respond to their environment, grow and develop, produce waste and reproduce.
- Organisms are made of tiny cells that perform the basic life functions and keep the organism alive.
- Many organisms (e.g., yeast, algae) are singlecelled and many organisms (e.g., plants, fungi and animals) are made of millions of cells that work in coordination.
- All cells come from other cells and they hold the genetic information needed for cell division and growth. This cell division process is called mitosis.
- Cells are organized by levels; level 1 - the cell, level 2- tissues, level 3- organs, level 4- organ systems, level 5- organism
- Recognize how classification schemes have changed from Aristotle to Linnaeus
 - List the levels of classification
 - Explain how scientific names are created through the use of Binomial Nomenclature
 - Describe use of Dichotomous key
 - Identify Characteristics of Kingdoms/Domains

Students will be able to.....

- Compare and contrast single-celled organisms with multicellular organisms
- Explain the difference between prokaryotic and eukaryotic cells.
- Identify and explain the different structures, relationships and functions of a eukaryote cell.
- Compare the structure and functions of a cell to a real-world model
- Illustrate the structural differences and function of various cell types found in multicellular organisms (muscle, bone)
- Explain how the structure and function of multicellular organisms is dependent on the interaction of cells, tissues, organs and systems.

**Lower Cape May Regional School District (7th grade Science) Curriculum
Unit 5 Overview**

Content Area: Science

Unit Title: Inheritance and Variation in Traits

Target Course/Grade Level: Life Science 7th

Unit Summary:

Students develop and use models to describe how gene mutations and sexual reproduction contribute to genetic variation. Students understand how genetic factors determine the growth of an individual organism. They also demonstrate understanding of the genetic implications of

sexual and asexual reproduction. The crosscutting concepts of cause and effect and structure and function provide a framework for understanding how gene structure determines differences in the functioning of organisms. Students are expected to demonstrate proficiency in developing and using models. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

Student Learning Objectives

MS-LS3-1

Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.

MS-LS3-2

Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

Science and Engineering Practices

Developing and Using Models

- **Develop and use a model to describe phenomena. (MS-LS3-1), (MS-LS3-2)**

Disciplinary Core Ideas

LS1.B: Growth and Development of Organisms

- **Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MSLS3-2)**

LS3.A: Inheritance of Traits

- **Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. (MS-LS3-1)**
- **Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (MS-LS3-2)**

LS3.B: Variation of Traits

- **In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. (MS-LS3-2)**
- **In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism. (MS-LS3-1)**

Crosscutting Concepts

Cause and Effect

- **Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3-2)**

Structure and Function

- **Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS3-1)**

Unit Enduring Questions:

- How do living organisms pass traits from one generation to the next?
- How do species adapt to changing environments?
- What processes enable plants to survive and reproduce?
- How do living things interact with and depend on the other parts of an ecosystem?
- How does the growth of organisms depends on inherited characteristics and the quality of the environment?
- In what ways could mutations impact our lives?
- How do we use genetic knowledge?
- What are ethical, social, and legal issues surrounding the use of genetic information?

Unit Enduring Understandings:

- Complex and microscopic structures and systems, such as genes located on chromosomes, can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among the parts of the system; therefore, complex natural structures/systems can be analyzed to determine how they function.
- Genes, comprised of DNA, are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes.
- All life is based on the genetic code contained in DNA, and variation in the genetic code leads to diversity of life.
- In addition to variations that arise from sexual reproduction, genetic information can be altered due to mutations.
- Some changes to genetic material are beneficial, others are harmful, and some are neutral to the organism.
- Organisms reproduce either sexually or asexually and transfer their genetic information to their offspring.
- Asexual reproduction results in offspring with identical genetic information.
- Sexual reproduction results in offspring with genetic variation.
- Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.
- In sexually reproducing organisms, each parent contributes half of the genes acquired (at

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| | <p>random) by the offspring.</p> <ul style="list-style-type: none"> ● Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. ● Punnett squares, diagrams, and simulations can be used to describe the cause-and-effect relationship of gene transmission from parent (s) to offspring and resulting genetic variation. |
| <p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● Patterns of Inheritance ● Functions of Sex Chromosomes ● Relationships with Genes/Environment ● How phenotypes and genotypes are related ● Difference between gene expression of a homozygous and heterozygous dominant genotype ● Mitosis vs Meiosis ● Events that lead to DNA ● Basic DNA Structure ● Relationship between DNA, genes, and proteins | <p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Explain the relationship between traits and heredity ● Describe the results of Mendel’s experiments. ● Identify what controls the inheritance of traits in organisms. ● Define Probability and utilize Punnett Squares. ● Explain what is meant by genotype and phenotype. ● Describe the role of chromosomes. Explain what forms the genetic code. ● Describe Proteins and mutations and how they affect an organism. ● Identify some patterns of inheritance in humans. ● Describe the functions of sex chromosomes. ● Identify major causes of genetic disorders and how they are traced, diagnosed and treated. ● Portray the advances in Genetics via the goal of the Human Genome Project. ● Interpret a Pedigree |

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| <p>Lower Cape May Regional School District (7th grade Science) Curriculum Unit 6 Overview</p> |
| <p>Content Area: Science</p> |
| <p>Unit Title: Body Systems</p> |
| <p>Target Course/Grade Level: Life Science 7th</p> |
| <p>Unit Summary: In this unit students develop a basic understanding of the role of cells in body systems and how</p> |

those systems work to support the life functions of the organism. Students will construct explanations for the interactions of systems in cells and organisms. Students understand that special structures are responsible for particular functions in organisms, and that for many organisms, the body is a system of multiple interaction subsystems that form a hierarchy, from cells to the body. Students construct explanations for the interactions of systems in cells and organisms and for how organisms gather and use information from the environment. The crosscutting concepts of systems and system models and cause and effect provide a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in engaging in argument from evidence and obtaining, evaluating, and communicating information. Students use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.

Student Learning Objectives

MS-LS1-3

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

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.

Science and Engineering Practices

Engaging in Argument from Evidence

- Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3)
- Use an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-LS1-4)

Obtaining, Evaluating, and Communicating Information

- Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS1-8)

Disciplinary Core Ideas

LS1.A: Structure and Function

- 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.C: Organization for Matter and Energy Flow in Organisms

- Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy. (MS-LS1-7)

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)

Crosscutting Concepts

Systems and System Models

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

Cause and Effect

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

Unit Enduring Questions:

- How are cells organized to form organs and organ systems?
- How do organ systems interact within an organism to allow the organism to function properly?
- How do organ systems interact within an organism to transport materials throughout the body? What materials are transported?
- What nutrients are necessary for the body to function?
- Which body system is responsible for different processes within the body?
- What is the purpose of the circulatory system?
- How do the skeletal and muscle systems work together to allow the body to move?
- What is a neuron?
- How do neurons transmit messages to the brain?
- What is the relationship between sensory neurons, interneurons, and motor neurons?

Unit Enduring Understandings:

- In multicellular organisms, the body is a system of multiple, interacting subsystems.
- Subsystems are groups of cells that work together to form tissues
- Organs are groups of tissues that work together to form a particular body function.
- Tissues and organs are specialized for particular body functions.
- Systems may interact with other systems.
- Systems may have subsystems and be part of larger complex systems.
- Interactions are limited to the circulatory, excretory, digestive, respiratory, muscular and nervous system.
- The body needs important nutrients to carry out its processes
- The body's systems process foods into materials it can use.
- Body systems interact to transport materials throughout the body.
- The circulatory system uses blood vessels to interact with other systems.
- The skeletal system is composed of bones.
- The respiratory system interacts with other systems to exchange gases.
- Other body systems interact with the excretory system to remove wastes.
- Sense receptors respond to different inputs and transmit responses as signals that travel along nerve cells to the brain
- Signals are then processed in the brain
- Brain processing results in immediate

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| | behaviors (responses) or memories <ul style="list-style-type: none"> ● Cause and effect relationships may be used to predict response to stimuli in natural systems |
| <p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● The levels of organization ● The various factors that help an organisms maintain homeostasis ● How food is processed ● How blood vessels work to deliver oxygen to the body and eliminate carbon dioxide from the body ● Blood is composed of Red Blood Cells, White Blood Cells, Plasma and Platelets ● Red Blood Cells carry oxygen throughout the body ● White blood cells fight infections ● Plasma is the liquid part of blood and platelets allow blood to clot ● The organs associate with the various body systems and the functions of those organs | <p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● List the levels of organization within the body ● Elaborate on how humans carry out life processes including movement, respiration, digestion and circulation ● Explain how body systems interact to maintain homeostasis ● Identify the path food takes through the body ● Compare and contrast mechanical and chemical digestion ● Sequence the path blood flows through the body. ● Describe the structure and function of blood vessels. ● Construct a model of human blood; explain its components and the function of each component ● Identify and explain the products and reactants of cellular respiration. ● Build a model of a body system and explain the parts along with their corresponding functions ● Distinguish between voluntary and involuntary movements. ● Compare and contrast the three types of muscles ● Provide examples that show how sensory information is processed by the brain as memories and behavior ● Gather and process information that sensory receptors respond to stimuli by sending messages to the brain. |

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| <p>Lower Cape May Regional School District (7th grade Science) Curriculum Unit 7 Overview</p> |
| <p>Content Area: Science</p> |
| <p>Unit Title: Ecology and Interdependent Relationships in Ecosystems</p> |

Target Course/Grade Level: Life Science 7th**Unit Summary:**

Students analyze and interpret data, develop models, construct arguments, and demonstrate a deeper understanding of the cycling of matter, the flow of energy, and resources in ecosystems. They are able to study patterns of interactions among organisms within an ecosystem. They consider biotic and abiotic factors in an ecosystem and the effects these factors have on populations. They also understand that the limits of resources influence the growth of organisms and populations, which may result in competition for those limited resources. The cross cutting concepts of matter and energy, systems and system models, patterns and cause and effect provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in analyzing and interpreting data, developing models, and constructing arguments. Students are also expected to use these practices to demonstrate an understanding of the core ideas.

Student Learning Objectives

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| MS-LS2-1 | Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. |
| MS-LS2-2 | Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. |
| MS-LS2-3 | Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. |
| MS-LS2-4 | Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. |
| MS-LS2-5 | Evaluate competing design solutions for maintaining biodiversity and ecosystem services. |

Science and Engineering Practices**Analyzing and Interpreting Data**

- Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1)

Constructing Explanations and Designing Solutions

- Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2)

Developing and Using Models

- Develop a model to describe phenomena. (MS-LS2-3)

Disciplinary Core Ideas

LS2.A: Interdependent Relationships in Ecosystems

- **Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)**
- **In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2-1)**
- **Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)**
- **Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)**

LS2.B: Cycle of Matter and Energy Transfer in Ecosystems

- **Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3)**

Crosscutting Concepts

Patterns

- **Patterns can be used to identify cause and effect relationships. (MS-LS2-2)**

Cause and Effect

- **Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1)**

Energy and Matter

- **The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3)**

Connections to Nature of Science

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

- **Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS2-3)**

Unit Enduring Questions:

- **What are biotic and abiotic factors in an environment?**
- **How is an environment organized?**

Unit Enduring Understandings:

- **Living and Nonliving factors encompass an environment**
- **Describe the levels of organization within an**

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| <ul style="list-style-type: none"> ● How are populations influenced by limiting factors? ● How do adaptations impact survival? ● How do food chains/webs relate to energy flow in an ecosystem? ● How does migration or hibernation influence populations? ● How do humans impact the diversity and stability of ecosystems? ● How can change in one part of an ecosystem affect change in other parts? | <p>ecosystem.</p> <ul style="list-style-type: none"> ● Describe and analyze populations and limiting factors. ● Explain how adaptations are related to survival. ● Describe interactions among ecosystems. Identify symbiotic relationships. ● Describe the differences between primary and secondary succession. ● Describe biogeography, name the six major biomes found on Earth. ● Explain energy roles in an ecosystem. ● Describe how energy moves and is available through an ecosystem. ● Explain why and how populations hibernate and migrate |
| <p>Unit Objectives: <i>Students will know....</i></p> <ul style="list-style-type: none"> ● Abiotic vs Biotic Factors ● Characteristics of Life ● Consumers vs Producers ● Food Chain vs Food Web | <p>Unit Objectives: <i>Students will be able to.....</i></p> <ul style="list-style-type: none"> ● Identify needs of an organism ● Identify biotic and abiotic factors ● Compare/Contrast Consumers vs Producers ● Investigate impact of catastrophic events on NJ Environment and beyond |

Assessments

Summative Assessment

- **End of Unit Exams**
- **Unit Projects**

Benchmark Assessments

- **Quarterly Quizzes**

Formative Assessments

- **Warm-up activities**
- **Classwork/Homework**
- **Laboratory investigations**
- **Cool Down/Exit Tickets**

Alternative Assessments

- **Create collages/posters/brochures for various topics**

- **Create a board game**
- **Create a comic strip**
- **Create crossword puzzles for vocabulary terms**

Modifications for ELL's

- **Strategy groups**
- **Teacher conferences**
- **Graphic Organizers**
- **Modification Plan**
- **NJDOE resources**

Modifications for Gifted and Talented Students:

- Teacher tutoring
- Peer tutoring
- Cooperative Learning Groups
- Provide advance reading level books
- Provide opportunities for Project-based learning
- Extended learning opportunities when classroom assignments are finished early

Modifications for Special Education

- Modified Assignments - reduce length of assignment for different mode of delivery
- Differentiated Instruction
- Response to Intervention (www.help4teachers.com)
- Follow all IEP and 504 modifications and accommodations
- Prioritize tasks
- Break down into smaller increments

Modifications for 504

- Follow all 504 modifications (Example: multiple attempts, word bank, modified reading level, preferential seating)

Gifted And Talented

- Provide advance reading level books
- Provide opportunities for Project-based learning
- Extended learning opportunities when classroom assignments are finished early

Modifications for Students at Risk of Failure

- Opportunities to retake exams
- Opportunities for making up missed work
- Parent/Teacher/Student Log

Project-based Learning Tasks:

- A multimedia presentation on a current science topic

Vocabulary:

- In-text vocabulary should be incorporated into every unit. Word journals, vocabulary walls, and/or various other activities should be utilized by the instructor to teach vocabulary.

The Research Process:

- The research process must be integrated within each course curriculum. Students will be provided with opportunities to investigate issues from thematic units of study. As the NJSLS indicate, students will develop proficiency with MLA or APA format as applicable.

Technology:

- Students must engage in technology applications integrated throughout the curriculum. Applicable technology utilized in this curricula are included below:
 - Books online
 - Laptops/Chromebooks
 - Ipads/Ipods as per IEP
 - Mimio/Smartboard
 - Internet

Curriculum development Resources/Supplemental Instructional Materials:

- You Tube, BrainPop
- Text-support materials (tests, quizzes ...)
- Gizmos
- Lab materials
- Teacher Generated Materials (worksheets, tests, projects, activities (independent & group, internet research, note taking, and scavenger hunts).

Board of Education Approved Text(s)/ Core Material

Life Science Pearson