MOUNT HOLLY TOWNSHIP SCHOOL DISTRICT
7th GRADE SCIENCE CURRICULUM

Revised to meet the June 2020 Science NJSLS-S
Board Approval: August 2022

Board Approved: August 17, 2022

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Board Approved: August 17, 2022

2020 New Jersey Student Learning Standards for Science (K-5)

2020 New Jersey Student Learning Standards for Science (6-8)

Intent and Spirit

The New Jersey Student Learning Standards for Science (NJSLS-S) describe the expectations for what students should know and be able to do as well as promote three-dimensional science instruction across the three science domains (i.e., physical sciences, life science, Earth and space sciences). From the earliest grades, the expectation is that students will engage in learning experiences that enable them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and discuss those arguments (in appropriate ways relative to their grade level).

The foundation of the NJSLS-S reflects three dimensions — science and engineering practices, disciplinary core ideas, and crosscutting concepts. The performance expectations are derived from the interplay of these three dimensions. It is essential that these three components are integrated into all learning experiences. Within each standard document, the three dimensions are intentionally presented as integrated components to foster sensemaking and designing solutions to problems. Because the NJSLS-S is built on the notions of coherence and contextuality, each of the science and engineering practices and crosscutting concepts appear multiple times across topics and at every grade level. Additionally, the three dimensions should be an integral part of every curriculum unit and should not be taught in isolation.

Mission

All students will possess an understanding of scientific concepts and processes required for personal decision-making, participation in civic life, and preparation for careers in STEM fields (for those that chose).

Vision

Prepare students to become scientifically literate individuals who can effectively:

- Apply scientific thinking, skills, and understanding to real-world phenomena and problems;

- Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;
- Conduct investigations, solve problems, and engage in discussions;
- Discuss open-ended questions that focus on the strength of the evidence used to generate claims;
- Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well-reasoned claims; and
- Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.

Three Dimensions of NJSLS-S

The performance expectations reflect the three dimensions and describe what students should know and be able to do. In layman's terms, they are "the standards." They are written as statements that can be used to guide assessment and allow for flexibility in the way that students are able to demonstrate proficiency.

The example below is provided to illustrate the interconnected nature of the NJSLS-S components.

Disciplinary Core Ideas and Performance Expectations

Disciplinary Core Idea	Performance Expectation
Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models.	Develop and use a model of the Earth-sun moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

Science and Engineering Practices

Developing and Using Models	Develop and use a model to describe phenomena

Crosscutting Concepts

Scale, Proportion, and Quantity	Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

Becoming familiar with the science practices and crosscutting concepts is a critically important first step in designing learning experiences reflective of the three dimensions. A description of each of the science and engineering practices and the cross-cutting concepts can be found in the next sections.

Further, for students to develop proficiency of the NJSLS-S, they will need to engage in learning experiences that are meaningful, cumulative, and progressive. Learning experiences designed to be meaningful, go beyond reading about science concepts and provide opportunities for students to be active learners and make sense of ideas. Cumulative learning experiences provide opportunities for students to use and build on ideas that they have learned in previous units. Progressive learning experiences provide multiple occasions for students to engage in ways that enable them to improve their construction of explanations and solutions over time by iteratively assessing them, elaborating on them, and holding them up to critique and evidence.

Scientific and Engineering Practices

Asking Questions and Defining Problems

A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested. Engineering questions clarify problems to determine criteria for successful solutions and identify constraints to solve problems about the designed world. Both scientists and engineers also ask questions to clarify the ideas of others.

Planning and Carrying Out Investigations

Scientists and engineers plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables or parameters. Engineering investigations identify the effectiveness, efficiency, and durability of designs under different conditions.

Analyzing and Interpreting Data

Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data. Scientists identify sources of error in the investigations and calculate the degree of certainty in the results. Modern technology makes the collection of large data sets much easier, providing secondary sources for analysis. Engineering investigations include analysis of data collected in the tests of designs. This allows comparison of different solutions and determines how well each meets specific design criteria—that is, which design best solves the problem within given constraints. Like scientists, engineers require a range of tools to identify patterns within data and interpret the results. Advances in science make analysis of proposed solutions more efficient and effective.

Developing and Using Models

A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations. Modeling tools are used to develop questions, predictions and explanations; analyze and identify flaws in systems; and communicate ideas. Models are used to build and revise scientific explanations and proposed engineered systems. Measurements and observations are used to revise models and designs.

Constructing Explanations and Designing Solutions

The products of science are explanations and the products of engineering are solutions. The goal of science is the construction of theories that provide explanatory accounts of the world. A theory becomes accepted when it has multiple lines of empirical evidence and greater explanatory power of phenomena than previous theories. The goal of engineering design is to find a systematic solution to problems that is based on scientific knowledge and models of the material world. Each proposed solution results from a process of balancing competing criteria of desired functions, technical feasibility, cost, safety, aesthetics, and compliance with legal requirements. The optimal choice depends on how well the proposed solutions meet criteria and constraints.

Engaging in Argument from Evidence

Argumentation is the process by which explanations and solutions are reached. In science and engineering, reasoning and argument based on evidence are essential to identifying the best explanation for a natural phenomenon or the best solution to a design problem. Scientists and engineers use argumentation to listen to, compare, and evaluate competing ideas and methods based on merits.

Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to identify strengths and weaknesses of claims.

Using Mathematics and Computational Thinking
In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; statistically analyzing data; and recognizing, expressing, and applying quantitative relationships. Mathematical and computational approaches enable scientists and engineers to predict the behavior of systems and test the validity of such predictions. Statistical methods are frequently used to identify significant patterns and establish correlational relationships.

Obtaining, Evaluating, and Communicating Information
Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations as well as orally, in writing, and through extended discussions. Scientists and engineers employ multiple sources to acquire information that is used to evaluate the merit and validity of claims, methods, and design.

{NJDOE NJSLS-S January 2022}

New Jersey Technology Standards
2020 New Jersery Student Learning Standards: Computer Science and Design Thinking

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

New Jersey Climate Change Standards
2020 New Jersey Student Learning Standards: Climate Change

Pacing Guide

Topic	Unit #	Unit Length
Introduction to Life Science	1	20 days
Cells	2	25 days
Body Systems	3	20 days
Reproduction	4	15 days
Genetics	5	30 days
Evolution	6	20 days
Ecology	7	25 days

Board Approved: August 17, 2022

Science Unit {1} **Grade 7**	
Unit Title	Introduction to Life Science
Recommended Pacing	20 days
Unit Summary	In this unit students will… ● Apply the steps of the scientific method to an experiment ● Be able to list and describe the characteristics of living things ● Understand and use the taxonomy classification system to sort living things
Career Readiness, Life Literacies, and Key Skills Standards	• 9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential
Computer Science and Design Thinking (Technology)	**8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.** **8.1.8.DA.3: Identify the appropriate tool to access data based on its file format.**
Diversity, Equity, and Inclusion	● **Unit 1- Lesson 1- Scientific method** ○ Students will work in diverse groups as a team to solve a problem ● **Unit 1- Lesson 2- What does it mean to be alive?** ○ Students will create a list of characteristics all living things have in common ○ Create a sense of self, we are all living things ● **Unit 1- Lesson 3- Taxonomy** ○ In this unit students will be looking at organisms from a variety of countries around the world
Climate Change	Addressed in Unit 7

Supplemental Class Resources	• Brainpop (username: holbein password: mtholly) • Teachers pay teachers • Nearpod • Actively learn • IXL • Youtube

Disciplinary Core Idea	**Performance Expectation**
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)	• Apply the steps of the scientific method to complete an experiment • List and describe the characteristics of life • Identify living, non living, and once living things • Use the taxonomy classification system to sort living things

Science & Engineering Practices	Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1)
Articulation of DCI's Across Grade-Levels	HS.LS1.A (MS.LS1-1)
Crosscutting Concepts	Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1) 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)

Math Student Learning Objectives Covered in this Unit

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1)

ELA Student Learning Objectives Covered in this Unit

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. (MS-LS1-1)

Modifications

SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper

ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences;

504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest

At-Risk Students: Reduce the number of problems given; Give extra time

Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons;

Additional Modification Option:
https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit One: **Introduction to Life Science**	
NJ Student Learning Standards: Science Grade * ***List Standards here:*** 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. MS-ETS1-1. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ETS1-2. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-3. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. MS-ETS1-4. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of	**Length: 20 days** **NJDOE Science Curricular Framework** NJ Science Frameworks **21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills** **highlight appropriate indicators for unit/domain** Information Literacy Media Literacy ICT (Information, Communicationcs and Technology Literacy) **Life and Career Skills** **highlight appropriate indicators for unit/domain**

cells. *[Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.]* (MS-LS1-1)	Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams

Unit Focus and Targets:

Essential Questions:

- How do scientists answer scientific questions?
- What does it mean to be 'living'?
- How can scientists classify all living things?

Learning Goals:

- Students will be able to apply the steps of the scientific method to an experiment
- Students will be able to identify the characteristics all living things have in common
- Students will be able explain how taxonomy helps scientists classify living things

NJSLS Lessons:

Unit 1 Lesson 1: Scientific Method

Materials: Simple lab materials (look at gummy bear example)

Engage: Ask students how they would go about solving a problem? What steps would they take?

Explore: NA

Explain: Review the steps of the scientific method and review relevant vocabulary
Hypothesis, data, scientific question, communication, experiment, independent variable, dependent variable, control

Elaborate: Have students review practice problems to identify variables and parts of an experiment.

Evaluate: Have students complete a simple lab (Gummy bear lab example) and Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 1 Lesson 2: Characteristics of Living Things

Materials: Chromebook, materials for living or not living lab (raw chicken, water, paper, seeds, picture of fire, plant, frog from dissection)

Engage: Show students an image of a dog and a tree. Have students write a list of all the things they have in common? (grow, reproduce, need energy, need water, etc)

Explore: Is it living? Non living? Or once living lab (attached)

Explain: Review the characteristics of living things

- **Exchange gases**
- **Need energy**
- **Excrete waste**
- **Are made of one or more cells**
- **Reproduce**
- **Need water**
- **Grow and develop**
- **etc**

Elaborate: **What's going on with Quinn?**- in this activity students will read about a boy named quinn who may have turned into a zombie, they will evaluate evidence and determine if quinn meets the criteria of what it means to be alive.

Evaluate: Quiz

Differentiation:

General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 1 Lesson 3: Classifying Living Things

Materials:

Engage: Show students a variety of 10 living things and ask them to sort them into 3 categories then name each category based on how the animals were sorted (ex: pets, not pets, lives in ocean, walks on 4 legs, etc)

Explore: Challenge students to organize the 10 living things in another way. Then discuss with students how they think scientists classify all the living things on earth. What characteristics are important?

Explain: Explain the taxonomy system and have students look up the taxonomic classification of each level. Show students the brainpop video about taxonomy for more information.

Elaborate: Classifying aliens activity

Evaluate: Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:

Formative: Gummy bear lab, scientific method quiz, living things quiz, taxonomy quiz

Summative: Unit 1 Assessment

Science Unit {2}

Grade 7	
Unit Title	Cells
Recommended Pacing	25 days
Unit Summary	In this unit students will… ● Be able to use a microscope to look at samples ● Explain the difference between unicellular and multicellular organisms ● List and describe the role of the major organelles in a plant and animal cell ● Explain the process of photosynthesis and it's role in the ecosystem
Career Readiness, Life Literacies, and Key Skills Standards	9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential
Computer Science and Design Thinking (Technology)	**NA**
Diversity, Equity, and Inclusion	● **Unit 2- Lesson 1- students will learn about the various scientists that played a role in developing the microscope**
Climate Change	Addressed in Unit 7
Supplemental Class Resources	- Brainpop - Legends of Learning - Actively Learn - Nearpod - Teachers pay Teachers - IXL

Disciplinary Core Idea	Performance Expectation
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) Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. (MS-LS1-6) The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. (secondary to MS-LS1-6) Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials. (secondary to MS-LS1- 7) Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to	● Use a microscope to identify microscopic organisms ● Differentiate between unicellular and multicellular organisms ● Explain how unicellular and multicellular organisms carry out life functions differently ● Create a model of a cell ● Create a cell city by using analogies ● Write an explanation of how multiple organelles work together to make a cell carry out life functions ● Identify the following parts of a cell and their roles ○ Nucleus ○ Cell membrane ○ Chloroplast ○ Cell wall ○ mitochondria ● Draw a diagram to show the process of photosynthesis ● Explain how photosynthesis is a chemical process that creates energy and waste products

form new molecules, to support growth, or to release energy. (MS-LS1-7)	

Science & Engineering Practices	Develop and use a model to describe phenomena. (MS-LS1-2) Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1) Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3) Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-6) Develop a model to describe unobservable mechanisms. (MS-LS1-7)
Articulation of DCI's Across Grade-Levels	4.LS1.A (MS-LS1-2) HS.LS1.A (MS-LS1-1), (MS-LS1-2), (MS-LS1-3) 5.PS3.D (MS-LS1-6), (MS-LS1-7) 5.LS1.C (MS-LS1-6), (MS-LS1-7) 5.LS2.A (MS-LS1-6) 5.LS2.B (MS-LS1-6), (MS-LS1-7) HS.PS1.B (MS-LS1-6), (MS-LS1-7) HS.LS2.B (MS-LS1-6), (MS-LS1-7) HS.ESS2.D (MS-LS1-6)
Crosscutting Concepts	Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1) Systems may interact with other systems; they may have subsystems and be a part of larger complex systems. (MS-LS1-3) 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) 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) 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) Matter is conserved because atoms are conserved in physical and chemical processes. (MS-LS1-7) Within a natural system, the transfer of energy drives the motion and/or cycling of matter. (MS-LS1-6) Science knowledge is based upon logical connections between evidence and explanations. (MS-LS1-6)

Math Student Learning Objectives Covered in this Unit
Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1), (MS-LS1-2), (MS-LS1-3), (MS-LS1-6)

ELA Student Learning Objectives Covered in this Unit
RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. (MS-LS1-3) (MS-LS1-6)

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. (MS-LS1-6)
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. (MS-LS1-1)
WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS1-6)
WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research.(MS-LS1-6)
SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-2) (MS-LS1-7)

Modifications

SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper

ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences;

504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest

At-Risk Students: Reduce the number of problems given; Give extra time

Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons;

Additional Modification Option:
https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit Two: **Cells**	
NJ Student Learning Standards: Science Grade * ***List Standards here:*** **Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.** [Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.] (MS-LS1-1) **Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function.** [Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.] [*Assessment Boundary: Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical function of cells or cell parts.*](MS-LS1-2) **Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.** [Clarification Statement: Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal	**Length: 25 days** **NJDOE Science Curricular Framework** NJ Science Frameworks **21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills** **highlight appropriate indicators for unit/domain** Information Literacy Media Literacy ICT (Information, Communications and Technology Literacy) **Life and Career Skills** **highlight appropriate indicators for unit/domain**

functioning of those systems.] [*Assessment Boundary: Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.*] (MS-LS1-3) 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. [Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.] (MS-LS1-6) 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. [Clarification Statement: Emphasis is on describing that molecules are broken apart and put back together and that in this process, energy is released.] [Assessment Boundary: Assessment does not include details of the chemical reactions for photosynthesis or respiration.](MS-LS1-7)	Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams

Unit Focus and Targets:

Essential Questions:

- What tools are needed to study the microscopic world?
- What makes up living things?
- How do single and multicellular organisms carry out life functions? (compare and contrast)
- How do plant and animals carry out life functions? What organelles play a vital role in this process?
- What role does photosynthesis play in keeping organisms alive?

Learning Goals:

- Students will be able to use a microscope to identify single and multicellular organisms

- Students will be able to explain how single and multicellular organisms carry out life functions
- Students will be able to explain how the main organelles in a cell work together to carry out life functions
- Students will be able to create a model that shows the role of photosynthesis in an ecosystem

NJSLS Lessons:

Unit 2 Lesson 1: Microscopes

Materials: microscopes, prepared slides

Engage: Show students an image of a telescope and microscope and ask them to describe what each of them does. Discuss as a class.

Explore: Give groups of students a microscope, allow them to explore the functions

Explain: Show students the following youtube video to discuss how microscopes were invented and some of the discoveries it lead too. Show students the parts of a microscope and how it works.

Elaborate:Allow students to use prepared slides and attempt to focus them on their own using the microscope.

Evaluate: Microscope quiz

Differentiation:
General Accomodations/Modifications:
- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 2 Lesson 2: Unicellular Vs. Multicellular

Materials: microscopes, celery, pond water, slides

Engage: Show students the following video and have them guess what is happening. Exp;lain to students that the amoeba is a single celled organism that is 'eating' in the video. Discuss how amoebas are living things made out of one cell so they must carry out all life functions differently than multicellular organisms.

Explore: Have students work in groups to observe single celled orgaisms from a pond under a microscope vs. celery (multicelled). Students should draw and write their observations (sample assignment)

Explain: Review the different ways single and multicelled organisms carry out life functions using the attached notes.

Elaborate: Give students scenarios and have them work in small groups to decide which type of living thing would survive best under different circumstances and why.
Examples:

1. The population of the organism is low and will go extinct if they cannot grow their population quickly. Which population will be able to reproduce quickly and save their species!
2. Within a month the Earth enters a **new** Ice Age, organisms must adapt or they will not survive. Which organism will be able to adapt to this new environment? And why?
3. Earth had a harsh atmosphere in its early development, it was covered in a hot soup of water. Which organism can survive in this environment?

Evaluate: Quiz

Differentiation:

General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 2 Lesson 3: Organelles of a plant and animal cell

Materials: Chromebooks, stations, poster board, markers, crayons, etc

Engage: Show students a picture of a plant and an animal and ask them to compare and contrast. Students should recognize that the organisms obtain energy differently among other things. Use this to inform students that because plants and animals are different the smaller parts that make them up are also different. These are called organelles and they each play an important role in a cell.

Explore: Students will work in pairs walking around the room to different stations, each station will have a picture of an organelle and a clue. Students will guess what each organelle does based on the clue.
Analogies (print as stations, one copy is enough)
Stations
Station answer sheet
Answer Key

Explain: Review each organelle from the stations and provide students with the actual role it plays in a cell. Show following video to further understanding of each organelle.

Elaborate: Have students create a cell city (poster, slideshow, etc)

Evaluate: Organelle assessment

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 2 Lesson 4: Photosynthesis

Materials:

Engage: List the characteristics of living things. (specifically focus on 'exchange gases" and discuss what this means)

Explore: Have students compare and contrast plant and animals cells and explain how they are different. Students should discover plants need cO2 and release O and animals are the opposite. Students should also realize that plants get their energy from the sun while animals eat.

Explain: Discuss the process of photosynthesis through reading the attached document and completing a diagram as a class.

Elaborate: Students will create their own cut and paste model of photosynthesis.

Evaluate: Photosynthesis Quiz

Differentiation:

General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:

Formative: Microscope quiz, Uni vs. multicellular quiz, organelle quiz, photosynthesis quiz, cell city project, photosynthesis diagram

Summative: Unit 2 Assessment

Science Unit {3} Grade 7	
Unit Title	Body Systems
Recommended Pacing	20 days

Unit Summary	In this students will… ● Be able to list and describe the different body systems that help them carry out life functions ● Act as doctors to analyze patient data about the circulatory and respiratory system ● Demonstrate that the nervous system is a network of nerve cells that send messages to and from the brain for immediate behaviors. ● Participate in a frog dissection to identify the different organs and body systems
Career Readiness, Life Literacies, and Key Skills Standards	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.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential. 9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
Computer Science and Design Thinking (Technology)	**8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.**
Diversity, Equity, and Inclusion	**Unit 3 Lesson 2: Compare and contrast health statitstics by race, gender, etc**
Climate Change	Addressed in Unit 7
Supplemental Class Resources	- Brainpop - Legends of Learning - Actively Learn - Nearpod

	- Teachers pay Teachers

Disciplinary Core Idea	Performance Expectation
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) 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)	● Write how multiple body systems work together to help carry out life functions ● Analyze patient data to determine risk of heart disease ● Test nervous system under normal and distracted conditions ● Perform an experiment in groups ● Identify organs and complete a frog dissection

Science & Engineering Practices	Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3) 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)
Articulation of DCI's Across Grade-Levels	HS.LS1.A (MS-LS1-3), (MS-LS1-8)
Crosscutting Concepts	Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8) Systems may interact with other systems; they may have subsystems and be a part of larger complex systems. (MS-LS1-3) 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)

Math Student Learning Objectives Covered in this Unit

6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-3)

ELA Student Learning Objectives Covered in this Unit

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-3)
RI.6.8 Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. (MS-LS1-3)
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. (MS-LS1-8)

Modifications

SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper

ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences;

504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest

At-Risk Students: Reduce the number of problems given; Give extra time

Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons;

Additional Modification Option:

https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit three: **Body systems**	
NJ Student Learning Standards: Science Grade * ***List Standards here:*** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. [Clarification Statement: Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.] [Assessment Boundary: Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.] (MS-LS1-3) Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. [Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.] (MS-LS1-8)	**Length: 20 days** **NJDOE Science Curricular Framework** NJ Science Frameworks **21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills**

	highlight appropriate indicators for unit/domain Information Literacy Media Literacy ICT (Information, Communicationcs and Technology Literacy) **Life and Career Skills** **highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams
Unit Focus and Targets:	
Essential Questions: How do body systems work together to carry out life functions? How does our nervous system send and deliver signals? How can I assess my risk of heart disease? Learning Goals: Students will be able to list and describe the body systems that carry out life functions Students will be able to describe how multiple body systems work together to do everyday things like walk, talk, etc Students will be able to assess patient risk for heart disease Students will be able to describe how the nervous system works to send and receive signals Students will be able to complete a frog dissection and identify at least 5 organs.	
NJSLS Lessons:	
Unit 3 Lesson 1: Body Systems	

Materials: Chromebooks

Engage: Ask students to list the top 3 most important parts of their body when it comes to survival (students will say things like brain, heart, lungs, stomach). Share responses and discuss how all of these organs are part of systems that work together to help us survive.

Explore: Have students research 5 body systems and what they do have students share as a class

Explain: Review each of the body systems with the students using guided notes and relevant brainpop videos.

Elaborate: Have students complete one of the following assignments allowing them to use their knowledge of body systems.
Crime scene body systems
Escape room

Evaluate: Body Systems Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 3 Lesson 2: Reflexes (nervous/muscular/skeletal systems)

Materials: Chromebooks, rulers, timers (use chromebook)

Engage: Ask students which body system they think is the most important and why (lead students to discussing the nervous system because it is in charge of all the other systems)

Explore: Students will research the importance of the nervous system and the different parts that make it up (brain, nerves, etc)

Explain: Review the different parts of the nervous system using guided notes and the brainpop video for the nervous system.

Elaborate: Nervous system lab

Evaluate: Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 3 Lesson 3: Heart disease (circulatory/respiratory systems)

Materials: Chromebooks

Engage: Ask students to describe what the heart does and what they think happens during a heart attack.

Explore: Have students research the function of the circulatory and respiratory system. Then have students find their resting heart rate and active heart rate. Have students write about why they think their heart rate increases when they are active.

Explain: Review using guided notes how the circulatory and respiratory system work together. Also review heart rate and blood pressure to prepare students for the heart disease lab. Also show relevant brainpop videos and this video of the heart.

Elaborate: Heart disease lab (students review patient data and assess risk for heart disease then develop a plan to minimize risk) As an extension have students review statistical information

Evaluate: Heart disease quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 3 Lesson 4: Frog Dissection

Materials: Dissection tools, goggles, gloves, dissection frogs (3 per group)

Engage: Ask students to complete a venn diagram of humans vs frogs (any facts)

Explore: Have students research the different body systems found in a frog. Then have students compare and contrast the systems of a frog to a human.

Explain: Review frog dissection preparation

Elaborate: Frog dissection - have students identify the organs and organ systems in the frog
Virtual Dissection
Dissection papers
Parent permission slip

Evaluate: Frog Dissection Reflection

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:

Formative: Body Systems Quiz, Nervous system lab, Heart Disease lab, exit tickets, Frog Dissection reflection and lab

Summative: Unit 3 Assessment

Science Unit {4} Grade 7	
Unit Title	Reproduction
Recommended Pacing	15 days
Unit Summary	In this unit students will.. ● Compare and contrast asexual and sexual reproduction ● List pros and cons of asexual and sexual reproduction ● Explain how/why asexual reproduction leads to clones and sexual reproduction leads to a unique offspring
Career Readiness, Life Literacies, and Key Skills Standards	9.1.8.FP.1: Describe the impact of personal values on various financial scenarios. 9.1.8.FP.2: Evaluate the role of emotions, attitudes, and behavior (rational and irrational) in making financial decisions.
Computer Science and Design Thinking (Technology)	**NA**
Diversity, Equity, and Inclusion	**Unit 4 Lesson 4- Students will discuss different animal parenting styles from species around the world**
Climate Change	Addressed in Unit 7
Supplemental Class Resources	- Brainpop - Legends of Learning - Actively Learn

	- Nearpod - Teachers pay Teachers - IXL

Disciplinary Core Idea	**Performance Expectation**
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) Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MSLS3-2) 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) 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)	● Evaluate animal and plant 'parenting' styles ● Differentiate between asexual and sexual reproduction ● Create a diagram to depict the three main types of asexual reproduction (binary fission, fragmentation, budding) ● Explain how asexual reproduction leads to clones ● Explain how sexual reproduction leads to unique offspring ● Explain pros and cons of asexual reproduction as it relates to the survival of the species ● Explain pros and cons of sexual reproduction as it relates to the survival of the species

Science & Engineering Practices	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) Develop and use a model to describe phenomena. (MS-LS3-1), (MS-LS3-2)

Articulation of DCI's Across Grade-Levels	3.LS1.B (MS-LS1-4) HS.LS2.A (MS-LS1-4), HS.LS2.D (MS-LS1-4) 3.LS3.A (MS-LS3-2) 3.LS3.B (MS-LS3-2) HS.LS1.B (MS-LS3-2) HS.LS3.A (MS-LS3-2) HS.LS3-B (MS-LS3-2)
Crosscutting Concepts	Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-4) Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3-2)

Math Student Learning Objectives Covered in this Unit
MP.4 Model with mathematics. (MS-LS3-2) 6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS3-2)

ELA Student Learning Objectives Covered in this Unit
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. (MS-LS3-1), (MS-LS3-2) 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). (MS-LS3-1), (MS-LS3-2) SL.8.5 Integrate multimedia and visual displays into presentations to clarify

Modifications
SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences; 504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest At-Risk Students: Reduce the number of problems given; Give extra time Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons; Additional Modification Option: https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit Four: **Reproduction**	
NJ Student Learning Standards: Science Grade * *** ***List Standards here:***	**Length: 15 days** **NJDOE Science Curricular Framework** NJ Science Frameworks

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. [Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.] (MS-LS1-4) **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.** [Clarification Statement: Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation. (MS-LS3-2)	**21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills** **highlight appropriate indicators for unit/domain** Information Literacy Media Literacy ICT (Information, Communicationcs and Technology Literacy) **Life and Career Skills** **highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams

Unit Focus and Targets:

Essential Questions:
How does parenting style impact survival of an offspring?
How do different organisms reproduce?

Learning Goals:
Students will be able to compare and contrast asexual and sexual reproduction
Students will be able to explain the pros and cons of asexual and sexual reproduction
Students will be able to describe how gender is determined in humans/mammals
Students will be able to evaluate parenting styles to determine chances of offspring survival

NJSLS Lessons:

Unit 4 Lesson 1: Asexual Vs. Sexual Reproduction Overview

Materials: Chromebook

Engage: Show students a video of bacteria dividing and ask them to describe what is happening. Discuss how different living things are able to reproduce in different ways. Discuss the importance of reproduction in regards to survival of the species.

Explore: Have students complete the attached investigation to determine the pros and cons of asexual and sexual reproduction.
Student worksheet
Explain: Use guided notes to compare and contrast asexual and sexual reproduction. Review the pros and cons for each type of reproduction.

Elaborate: Have students create an information brochure summarazing their findings.

Evaluate: Reproduction Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 4 Lesson 2: Asexual Reproduction/ Bacteria Growth Lab

Materials: Chromebook, agar dishes, q tips, incubator

Engage: Ask students, "where can bacteria be found?" Discuss with students that bacteria can be found everywhere. Review how bacteria reproduce asexually and explore what that means as review.

Explore: Have students read and answer questions about the different types of asexual reproduction.

Explain: Use guided notes to explain the three types of asexual reproduction (budding, fragmentation, and binary fission)

Elaborate: Bacteria growth lab

Evaluate: Asexual reproduction quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate

- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 4 Lesson 3: Sexual Reproduction

Materials: Chromebook

Engage: Show students the following video of a sperm fertilizing and egg and ask students to describe what they think is happening. Discuss how this process creates a unique offspring. As an extension you can discuss how identical vs. fraternal twins are created.

Explore: NA

Explain: Review sexual reproduction definition and pros/cons

Elaborate: Students will complete both of the following…

- **Plant sexual reproduction**
- **Gender determination lab**

Evaluate: Sexual reproduction quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 4 Lesson 4: Animal Behaviors (parenting styles)

Materials: Chromebook

Engage: How do animals take care of their offspring?

Explore: Have students research 3 animals and list 1 way they care for their offspring.

Explain: Discuss with students how different species either have many offspring and are not involved parents or have very few offspring and are more involved in the offsprings upbringing.

Elaborate: Students will evaluate different animal parenting styles using the attached stations.

Evaluate: Animal parenting quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:

Formative: Reproduction quiz, types of asexual reproduction quiz, sexual reproduction quiz, animal parenting styles quiz, exit tickets, classwork, gender determination lab, bacteria growth lab, plant reproduction lab, brochure **Summative: Unit 4 assessment**

Science Unit {5} **Grade 7th**	
Unit Title	Genetics
Recommended Pacing	30 Days
Unit Summary	In this unit students will… ● Understand that Genes make up DNA and DNA makes up chromosomes ● Create a model of DNA ● How gender is determined in different spcies ● Differentiate between inherited and acquired traits ● Use a punnett square to determine the percent chance of an offspring inheriting a specific trait based on the parents genotype and phenotype ● Identify types of single gene mutations ● Understand that there are various types of mutations that can be beneficial, neutral, or harmful ● Be able to explain how humans can influence genetic traits in other species

Career Readiness, Life Literacies, and Key Skills Standards	9.1.8.CR.2: Compare various ways to give back through strengths, passions, goals, and other personal factors. 9.1.8.EG.7: Explain the effect of the economy (e.g., inflation, unemployment) on personal income, individual and family security, and consumer decisions 9.1.8.PB.1: Predict future expenses or opportunities that should be included in the budget planning process. 9.1.8.PB.2: Explain how different circumstances can affect one's personal budget.
Computer Science and Design Thinking (Technology)	**8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies.**
Diversity, Equity, and Inclusion	**Unit 5- Lesson 1- Students will discuss how biological gender is determined in different species across the world** **Unit 5- Lesson 2- Students will discuss the difference between inherited and acquired traits. Students will learn that some inherited traits are more common in certain races (such as hair color, eye color, and genetic disorders)** **Unit 5- Lesson 3- Students will learn how to use a punnett square to determine the percent chance of an offspring inheriting a certain trait from their parents, this ties in to how we are all unique and diverse** **Unit 5- Lesson 4- Students will discuss certain genetic disorders that are more prevalent in certain races. For example, sickle cell anemia is a genetic disorder that is more common in African Americans than any other race.**
Climate Change	Addressed in Unit 7
Supplemental Class Resources	- Brainpop

	- Legends of Learning - Actively Learn - Nearpod - Teachers pay Teachers - IXL

Disciplinary Core Idea	**Performance Expectation**
Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5) Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MSLS3-2) 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) 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)	● Create a model of DNA and use it to show the different types of genetic mutations ● Create a diagram to show the levels of organization between DNA, genes, and chromosomes ● Explain how genetics impact growth of plants ● Model how sexual reproduction leads to a unique offspring ● Use punnett squares to determine percent chance of an inherited trait being passed down from parent to offspring ● Demonstrate understanding of genotype and phenotype ● Explain how sexual reproduction leads to variation in a species and model this concept with punnett squares ● Form an opinion using evidence on genetic engineering and other practices humans use to manipulate genes in other species ● Differentiate between inherited and acquired traits ● Identify inherited and acquired traits in different species ● Research a genetic disorder and create an informational presentation ● Explain how DNA codes for physical appearances and genetic disorders

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)	

Science & Engineering Practices	Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-5) Develop and use a model to describe phenomena. (MS-LS3-1), (MS-LS3-2) 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) 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) 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) 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) Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS4-5)
Articulation of DCI's Across Grade-Levels	3.LS1.B (MS-LS1-4), (MS-LS1-5)

	3.LS3.A (MS-LS1-5) 3.LS3.A (MS-LS3-1), (MS-LS3-2) 3.LS3.B (MS-LS3-1), (MS-LS3-2) HS.LS1.A (MS-LS3-1) HS.LS1.B (MS-LS3-1), (MS-LS3-2) HS.LS3.A (MS-LS3-1), (MS-LS3-2) HS.LS3-B (MS-LS3-1), (MS-LS3-2) HS.LS3.B (MS-LS4-4), (MS-LS4-5), (MS-LS4-6) HS.LS4.C (MS-LS4-4), (MS-LS4-5), (MS-LS4-6)
Crosscutting Concepts	Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-5) Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3-2) 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)

Math Student Learning Objectives Covered in this Unit
6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MS-LS1-5) 6.SP.B.4 Summarize numerical data sets in relation to their context. (MS-LS1-5) MP.4 Model with mathematics. (MS-LS3-2) 6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS3-2)

ELA Student Learning Objectives Covered in this Unit
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-5) 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. (MS-LS1-5) WHST.6-8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS1-5) WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS1-5) • 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. (MS-LS3-1), (MS-LS3-2) 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). (MS-LS3-1), (MS-LS3-2) SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS3-1), (MS-LS3-2) RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions(MS-LS4-5) 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. (MS-LS4-5)

Modifications
SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper

ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences;

504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest

At-Risk Students: Reduce the number of problems given; Give extra time

Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons;

Additional Modification Option:
https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit Five: **Genetics**	
NJ Student Learning Standards: Science Grade * ***List Standards here:*** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. ***[Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting*** *growth of organisms.*	**Length: 30 days** **NJDOE Science Curricular Framework** NJ Science Frameworks **21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively

Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.] [Assessment Boundary: Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.] (MS-LS1-5) 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. ***[Clarification Statement: Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.] [Assessment Boundary: Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.]***(MS-LS3-1) 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. *[Clarification Statement: Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.]* (MS-LS3-2)	Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills** **highlight appropriate indicators for unit/domain** Information Literacy Media Literacy ICT (Information, Communicationcs and Technology Literacy) **Life and Career Skills** **highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams

Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. [Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, gene therapy); and, on the impacts these technologies have on society as well as the technologies leading to these scientific discoveries.] (MS-LS4-5)	

Unit Focus and Targets:

Essential Questions:
Where do our inherited and acquired traits come from?
How is gender determined through DNA?
How can we predict what inherited traits an offspring will have?
What happens if DNA makes a mistake?
How do genetic disorders occur? Can they be cured?
How can humans manipulate genes for their own benefit?
Learning Goals:
Students will be able to model the levels of organization between genes, DNA, and chromosomes
Students will be able to differentiate between inherited and acquired traits amongst different species
Students will be able to use a punnett square to determine the percent chance of an offspring inheriting a specific trait from their parents
Students will be able to create a model of DNA then use it to demonstrate how genetic mutations occur
Students will be able to research and present on a genetic disorder
Students will be able to explain how humans influence genetic information in other species

NJSLS Lessons:

Unit 5 Lesson 1: Genes, DNA, and chromosomes

Materials: Chromebook

Engage: Ask students to write what they think DNA is, why is it important?

Explore: Have students watch the following videos then use the attached guided notes in the 'explain' section to review the information.

Amoeba sisters video

Why do ferns have more chromosomes than you?

How is gender determined?

Explain: Guided notes

Elaborate: Have students create a chromosome catalogue of different species and the number of chromosomes they have.

Evaluate: Quiz/Exit ticket

Differentiation:

General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 5 Lesson 2: Inherited Vs. Acquired traits

Materials:Chromebook

Engage: Have students take a traits survey (hair color, eye color, widows peak, etc)

Explore: Have students research if the traits in the survey were inherited or acquired

Explain: Review definitions and examples of inherited and acquired traits using the attached assignment.

Elaborate: Give students examples of traits and have students identify if they are inherited or acquired. Sample assignment is attached.

Evaluate:Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 5 Lesson 3:

Materials:Chromebook

Engage: Ask students to brainstorm reasons why a mom with blond hair and a dad with brown hair may have children that all have brown hair? What could cause this to happen?

Explore: Review the following vocabulary with students: dominant, recessive, phenotype, genotype
Then have students explore how traits are passed down by completing the following assignment.

Explain: Teach students how to use a punnett square to determine the percent chance an offspring will inherit a specific trait from their parents. Sample guided notes are attached. Also show the following video: how to complete a punnett square?

Elaborate: Have students complete the following assignment to practice using a punnett square to determine percent chance of an inherited trait being passed down.

Evaluate: Punnett square quiz or self check assignment

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 5 Lesson 4: Genetic Mutations

Materials: Chromebook, 4 different colored marshmallows, Twizzlers, Toothpicks

Engage: Ask students to draw a model of DNA

Explore: Have students look at images of DNA, students should determine that there are certain chemical bases that match together.

Explain: Review with students the structure of DNA and how mistakes in DNA can occur if a chemical base is added, removed, or substituted.

Elaborate: Have students create a model of DNA using marshmallows, toothpicks, and twizzlers. Then have students use their model to show how mutations can occur in DNA. Use the following assignment for the hands on activity. Use this assignment for a virtual version.

Evaluate: Mutations Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 5 Lesson 5: Genetic Disorders

Materials: Chromebook

Engage: Have students make a list of all the things that can be inherited from parent to offspring. Eventually discuss how things like color blindness, certain types of cancer, and other genetic disorders can be inherited.

Explore: Have students read about different genetic disorders and how it impacts individuals lives (life according to Sam is a good documentary to show here)

Explain: Review different types of genetic disorders (single gene mutations, x chromosome, etc) and how they are inherited using guided notes.

Elaborate: Have students research and create a presentation in groups about a specific genetic disorder. Sample instructions are attached.

Evaluate: Genetic Disorders Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 5 Lesson 6: Genetic Engineering

Materials: Chromebook

Engage: Have students draw a picture and describe their favorite type of apple (this assignment can also be done with favorite type of dogs) discuss how all of the pictures are of the same item "apples/dogs" but they have differences. Discuss how that's possible.

Explore: Have students watch the following video about the different types of apples and discuss how humans are able to accomplish this. You can also relate this to why there are many different dog breeds that are all considered the same species.

Explain: Use guided notes to explain that humans use different strategies like genotyping to determine what parents should be bred together for a certain purpose.

Elaborate: Have students complete the attached assignment to show how selective breeding in flowers can alter the frequency of petal color.

Evaluate: Genetic Engineering quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:
Formative: Genes, DNA, and chromosome quiz, inherited vs acquired traits quiz, punnett square quiz, mutations quiz, genetic disorder quiz, genetic engineering quiz, classwork, exit tickets, DNA model lab, Genetic smiley assignment, Genetic Disorder presentation

Summative: Unit 5 Test

Science Unit {6} Grade 7	
Unit Title	Evolution
Recommended Pacing	20 days

Unit Summary	In this unit students will… ● Create a diagram to show how life has changed over time ● Explain how Earth's climate and other factors influence evolution ● Use comparative anatomy to prove evolutionary relationships ● Use comparative embryology to prove evolutionary relationships ● Explain how natural selection changes the frequency of traits in a population ● Explain how organisms have certain adaptations to help them survive in their environments
Career Readiness, Life Literacies, and Key Skills Standards	9.1.8.CR.1: Compare and contrast the role of philanthropy, volunteer service, and charities in community development and the quality of life in a variety of cultures.
Computer Science and Design Thinking (Technology)	**8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis**
Diversity, Equity, and Inclusion	**Unit 6-Students will discuss the theory of evolution and how other religious beliefs may differ from this theory.** **Unit 6- Lesson 4- Students will discuss the galapagos island finches from South America**
Climate Change	Addressed in Unit 7
Supplemental Class Resources	- Brainpop - Legends of Learning - Actively Learn - Nearpod - Teachers pay Teachers - IXL

Disciplinary Core Idea	Performance Expectation
The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth. (MS-LS4-1) Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. (MS-LS4-2) Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy. (MS-LS4-3) Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4) 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)	● Create a timeline of Earth's major events ● Analyze a timeline of Earth's major events and how life became more diverse throughout time ● Use comparative anatomy to determine evolutionary relationships ● Identify homologous, analogous, and vestigial structures ● Use comparative embryology to determine evolutionary relationships ● Explain how natural selection favors beneficial traits for a specific environment (thicker fur for colder climates, etc) ● Model natural selection with 'bird beaks'

Science & Engineering Practices	Analyze displays of data to identify linear and nonlinear relationships. (MS-LS4-3) Analyze and interpret data to determine similarities and differences in findings. (MS-LS4-1) Use mathematical representations to support scientific conclusions and design solutions. (MS-LS4-6) Apply scientific ideas to construct an explanation for real-world phenomena, examples, or

	events. (MS-LS4-2) Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena. (MS-LS4-4)
Articulation of DCI's Across Grade-Levels	4.PS3.A (MS-PS4-1) 3.LS3.B (MS-LS4-4) 3.LS4.A (MS-LS4-1), (MS-LS4-2) 3. LS4.B (MS-LS4-4) 3.LS4.C (MS-LS4-6) HS.LS2.A (MS-LS4-4), (MS-LS4-6) HS.LS2.C (MS-LS4-6) HS.LS3.B (MS-LS4-4), (MS-LS4-5), (MS-LS4-6) HS.LS4.A (MS-LS4-1), (MS-LS4-2), (MS-LS4-3) HS.LS4.B (MS-LS4-4), (MS-LS4-6) HS.LS4.C (MS-LS4-4), (MS-LS4-5), (MS-LS4-6) HS.ESS1.C (MS-LS4-1),(MS-LS4-2) HS.ESS2.D (MS-PS4-2)
Crosscutting Concepts	Patterns can be used to identify cause and effect relationships. (MS-LS4-2) Graphs, charts, and images can be used to identify patterns in data. (MS-LS4-1), (MS-LS4-3) 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) Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-LS4-1) Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS4-1), (MS-LS4-2)

Math Student Learning Objectives Covered in this Unit

MP.4 Model with mathematics. (MS-LS4-6)

6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-LS4-4), (MS-LS4-6)

6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS4-4), (MS-LS4-6)

6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-LS4-1), (MS-LS4-2)

7.RP.A.2 Recognize and represent proportional relationships between quantities. (MS-LS4-4), (MS-LS4-6)

ELA Student Learning Objectives Covered in this Unit

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (MS-LS4-1), (MS-LS4-2), (MS-LS4-3), (MS-LS4-4), (MS-LS4-5)

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). (MS-LS4-1), (MS-LS4-3) • 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. (MS-LS4-3), (MS-LS4-4)

WHST.6-8.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (MS-LS4-2), (MS-LS4-4)

WHST.6-8.9 Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS4-2), (MS-LS4-4)

SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, teacher led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. (MS-LS4-2), (MS-LS4-4)

SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (MS-LS4-2), (MS-LS4-4)

Modifications

SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper

ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences;

504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest

At-Risk Students: Reduce the number of problems given; Give extra time

Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons;

Additional Modification Option:
https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit Six: **Evolution**	
NJ Student Learning Standards: Science Grade *** ***List Standards here:*** Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. [Clarification Statement: Emphasis is on finding patterns of changes in the level of	**Length: 20 days** **NJDOE Science Curricular Framework** NJ Science Frameworks **21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain**

complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers.] [Assessment Boundary: Assessment does not include the names of individual species or geological eras in the fossil record.] (MS-LS4-1) Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. [Clarification Statement: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures.] (MS-LS4-2) Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. [Clarification Statement: Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.] [Assessment Boundary: Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.] (MS-LS4-3) 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. [Clarification Statement: Emphasis is on using simple probability	Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills** **highlight appropriate indicators for unit/domain** Information Literacy Media Literacy ICT (Information, Communicationcs and Technology Literacy) **Life and Career Skills** **highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams

statements and proportional reasoning to construct explanations.] (MS-LS4-4) Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability statements, and proportional reasoning to support explanations of trends in changes to populations over time.] [Assessment Boundary: Assessment does not include Hardy Weinberg calculations.] (MS-LS4-6)	

Unit Focus and Targets:

Essential Questions:
How has life changed over time?
What causes a species to change?
How can we prove common ancestry amongst different species?
How does studying embryology help us determine evolutionary relationships?
How do adaptations help a species survive?
Learning Goals:
Students will be able to explain how life has changed on earth over time and the driving forces behind these changes.
Students will be able to identify homologous, analogous, and vestigial structures and explain how they support/don't support the theory of evolution
Students will be able to explain the theory of evolution and natural selections role in the process
Students will be able to compare embryological features

NJSLS Lessons:

Unit 6 Lesson 1: Life Throughout Earth's History

Materials: Chromebooks, scissors, glue/tape, geologic timescale cut out

Engage: Start with the following prompt to get students thinking about how video games have changed over time and how 'evolution' is involved in this process.

1. What do all the video games above have in common?

2. What is the difference between the video games in the Xbox section and the video games in the Nintendo section?

3. How do I know that the Magnavox Odyssey (console at very bottom) ever existed if no one plays it anymore?

Explore: Have students review the geologic timescale and look up living things that were around during those times (when did dinosaurs exist, when did the first mammals appear, etc)

Explain: Complete the attached close reading as a review/overview of Earth's history.

Elaborate: Have students create a model of the geologic timescale with important events labeled. Sample assignment attached.

Evaluate: Complete a quiz using the timeline made in previous section.

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 6 Lesson 2: Comparative Anatomy

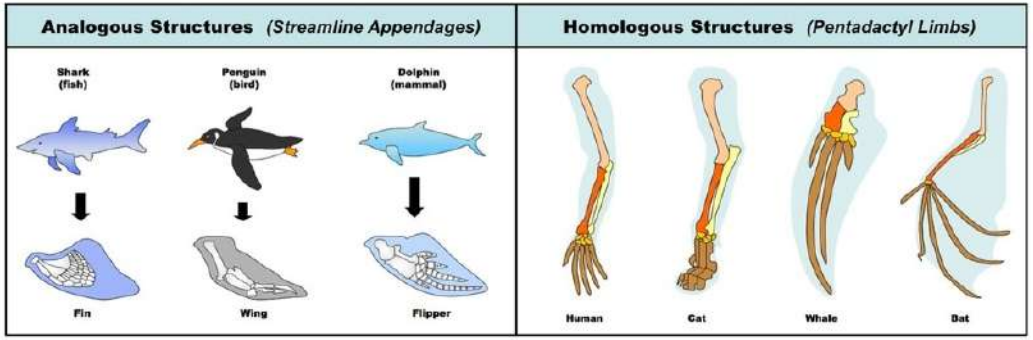
Materials: Chromebook

Engage: Have students answer the following prompt, then show the following video.

Start With Phenomena

When you look at this skeleton fossil of a woolly mammoth, what modern animal do you think it might be related to? _____ What structures do you see that makes you think that? _____

Explore: Provide students with the following image and ask them to determine the similarities and differences between the body parts. Students should start to realize some body parts are similar in appearance but different in function. While others are similar in function but appearance is very different.



Explain: Complete guided notes explaining the theory of evolution and how comparative anatomy (homologous, analogous, and vestigial structures) are proof to support this theory.

Elaborate: Students will complete the attached vestigial structure stations.

Evaluate: Comparative anatomy quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 6 Lesson 3: Comparative Embryology

Materials: Chromebook

Engage: Students will look at various species as embryos and try to guess what animal it will grow up to be (review answers after they guess)

Explore: Show students the following video and have them make observations. The video shows a salamander growing from a single cell to breaking through it's egg. Discuss with students how features change over time. Also discuss how eventually the salamander will walk on land and grow other body parts that we were not able to see when it was still an embryo.

Explain: Define embryology and how it is evidence to support the theory of evolution

Elaborate: Embryology Activity- show students Haeckles drawings and have them sort which animal is which. Then provide students with the answers. Then have students compare embryology of a specific animal to it's adult version. Ask them what is missing? What is added? (example: humans have tails as embryos). After the activity show the following video and discuss.

Evaluate: Embryology Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 6 Lesson 4:

Materials: Chromebook, rice, clay, straws, containers, water, beads, rubberbands, seeds, tongs, straws, tweezers, clothespins, slotted spoons, chopsticks (tools and 'foods' can be replaced as needed)

Engage: Show students pictures of birds and ask them to compare and contrast their beaks. Why are the beaks different? What food is it used for?

Explore: Bird beak stations - students will use different 'bird beaks' to try and pick up various types of 'food' students will time themselves using each tool for each food to see which works the best.

Explain: Review guided notes to explain how natural selection is the driving force behind evolution and how desired adaptations can lead to changes in a population.

Elaborate: Provide students with a scenario that mimics the galapagos island finches (one bird population arrives at an island and is separated, they survive on different food sources) then have students predict how the food the birds eat may change the way their beaks look over time. Sample assignment attached.

Evaluate:Natural selection Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:

Formative: Earth's timeline quiz, Geologic Timescale project, Comparative anatomy quiz, Embryology quiz, natural selection quiz, class work, exit tickets, bird beak challenge

Summative: Unit 6 Assessment

Science Unit {7} **Grade 7**	
Unit Title	Ecology
Recommended Pacing	25 days
Unit Summary	In this unit students will… ● Understand how resource availability influences populations of species

	● Identify patterns in ecological relationships across different biomes ● Model how biotic and abiotic factors cycle through an ecosystem ● Model food chains and webs ● Explain how changes to an ecosystem can impact a specific species ● Evaluate design solutions for maintaining biodiversity
Career Readiness, Life Literacies, and Key Skills Standards	9.1.8.EG.5: Interpret how changing economic and societal needs influence employment trends and future education
Computer Science and Design Thinking (Technology)	**8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.**
Diversity, Equity, and Inclusion	**Unit 7- Lessons 1-3- Students will discuss species from different countries around the world** **Unit 7- Lesson 4- Students will discuss invasive species and how they are able to travel from one country to another. Students will discuss how one culture/country may find the invasive species beneficial while others find it detrimental to their ecosystems.**
Climate Change	● **MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.** ○ 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-LS2-4: Construct an argument supported by empirical evidence that**

	changes to physical or biological components of an ecosystem affect populations. ○ Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. ● **MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.** ○ Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. ○ Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. ○ There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem
Supplemental Class Resources	- Brainpop - Legends of Learning - Actively Learn - Nearpod - Teachers pay Teachers - IXL

Disciplinary Core Idea	**Performance Expectation**

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) 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) Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)	● Analyze data to see how changes in living and non living things in an ecosystem can impact a species ● Explain how carrying capacity is determined in a species ● Identify limiting factors for a species ● Differentiate between abiotic and biotic factors ● Identify symbiotic relationships (mutualism, commensalism, parasitism, competition, and predation) ● Show the flower of energy through an ecosystem ● Identify cause and effect patterns of invasive species entering an ecosystem

Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems.The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5) Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2-5) There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)	

Science & Engineering Practices	Develop a model to describe phenomena. (MS-LS2-3) Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1) Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2) Construct 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-LS2-4) Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-LS2-5)
Articulation of DCI's Across Grade-Levels	1.LS1.B (MS-LS2-2) 3.LS2.C (MS-LS2-1), (MS-LS2-4) 3.LS4.D (MS-LS2-1), (MS-LS2-4) 5.LS2.A (MS-LS2-1), (MS-LS2-3) 5.LS2.B (MS-LS2-3)

	HS.PS3.B (MS-LS2-3) HS.LS1.C (MS-LS2-3) HS.LS2.A (MS-LS2-1), (MS-LS2-2), (MS-LS2-5) HS.LS2.B (MS-LS2-2), (MS-LS2-3) HS.LS2.C (MS-LS2-4), (MS-LS2-5) HS.LS2.D (MS-LS2-2) HS.LS4.C (MS-LS2-1), (MS-LS2-4) HS.LS4.D (MS-LS2-1), (MS-LS2-4), (MS-LS2-5) HS.ESS2.A (MS-LS2-3) HS.ESS2.E (MS-LS2-4) HS.ESS3.A (MS-LS2-1), (MS-LS2-5) HS.ESS3.B (MS-LS2-4) HS.ESS3.C (MS-LS2-4), (MS-LS2-5) HS.ESS3.D (MS-LS2-5)
Crosscutting Concepts	Patterns can be used to identify cause and effect relationships. (MS-LS2-2) Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1) The transfer of energy can be tracked as energy flows through a natural system. (MS-LS2-3) Small changes in one part of a system might cause large changes in another part. (MS-LS2-4), (MS-LS2-5) The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from region to region and over time. (MS-LS2-5) Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS2-3)

	Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS2-5) Science disciplines share common rules of obtaining and evaluating empirical evidence. (MS-LS2-4)

Math Student Learning Objectives Covered in this Unit
MP.4 Model with mathematics. (MS-LS2-5) 6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-LS2-5) 6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation. (MS-LS2-3) 6.SP.B.5 Summarize numerical data sets in relation to their context. (MS-LS2-2)

ELA Student Learning Objectives Covered in this Unit
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS2-1), (MS-LS2-2), (MS-LS2-4) 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). (MS-LS2-1) RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. (MS-LS2-5) RI.8.8 Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. (MS-LS-4), (MS-LS2-5) WHST.6-8.1 Write arguments focused on discipline-specific content. (MS-LS2-4)

WHST.6-8.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (MS-LS2-2)

WHST.6-8.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (MS-LS2-2), (MS-LS2-4)

SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. (MS-LS2-2)

SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (MS-LS2-2)

SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS2-3)

Modifications

SPED: Provide visuals for students throughout the lesson on promethean board and the focus wall; allow extra time for activities to be completed; dictated responses in lieu of written work; hands on activities instead of pencil and paper

ESL/ELL: Describing pictures or classroom objects; Providing information in graphic organizers; Identifying real life objects based on descriptive oral phrases or short sentences;

504 Students: Provide a checklist of the steps needed to complete the problem; Provide lots of white-space to make it less busy; If still struggling, reteach and retest

At-Risk Students: Reduce the number of problems given; Give extra time

Gifted and Talented: Added detail to written work; find connecting stories from classroom library and compare to the lessons;

Additional Modification Option:
https://www.nextgenscience.org/sites/default/files/Appendix%20D%20Diversity%20and%20Equity%206-14-13.pdf

Unit Seven: **Ecology**	
NJ Student Learning Standards: Science Grade *** ***List Standards here:*** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.] (MS-LS2-1) Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.] (MS-LS2-2) Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary:	**Length: 25 days** **NJDOE Science Curricular Framework** NJ Science Frameworks **21st Century Student Outcomes** http://www.battelleforkids.org/networks/p21 **Learning and Innovation Skills** **highlight appropriate indicators for unit/domain** Think Creatively Work Creatively with Others Implement Innovations Reason effectively Use Systems Thinking Make Judgments and Decisions Solve Problems Communicate Clearly Collaborate with Others **Information, Media and Technology Skills** **highlight appropriate indicators for unit/domain** Information Literacy Media Literacy ICT (Information, Communicationcs and Technology Literacy)

Assessment does not include the use of chemical reactions to describe the processes.] (MS-LS2-3) Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.] (MS-LS2-4) Evaluate competing design solutions for maintaining biodiversity and ecosystem services. [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.] (MS-LS2-1)	**Life and Career Skills** **highlight appropriate indicators for unit/domain** Adapt to Change Be Flexible Manage Goals and Time Work Independently Be Self-directed Learners Interact Effectively with Others Work Effectively in Diverse Teams
Unit Focus and Targets:	
Essential Questions: How do living and nonliving things impact a species in an ecosystem? How does energy flow through an ecosystem? How do invasive species impact native species? What are the different ways species interact with one another in an ecosystem? Learning Goals: Students will be able to graph species populations over time Students will be able to explain how different factors influence a population Students will be able to identify ecological relationships Students will be able to create and analyze food chains and food webs in different biomes	

Students will be able to analyze the negative impacts an invasive species has on native species

NJSLS Lessons:

Unit 7 Lesson 1: Limiting Factors and Carrying Capactiy

Materials: Chromebook

Engage: Have students make a list of reasons why the squirrel population in mount holly doesn't grow out of control. (cars, food supply, weather, space, etc)

Explore: Have students choose a species to research. Students should make a specific list of limiting factors for their species. (for example: limiting factor for polar bear would be climate, food availability, etc)

Explain: Complete guided notes with students explaining how limiting factors impact the carrying capacity of a population.

Elaborate: Have students research the kaibab deer population from the kaibab plateau. Students should graph their population overtime as President Roosevelt removed limiting factors of the deer (like predators). Sample assignment attached.

Evaluate: Limiting factors and carrying capacity quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 7 Lesson 2: Symbiotic Relationships

Materials: Chromebooks

Engage: Show students a picture of a crocodile and plover bird and ask them to predict what they think is happening.

Explore: Give students a list of organisms and have them research how the two interact with one another

Explain: Review definition and examples of mutualism, commensalism, parasitism, competition, and predation.

Elaborate: Have students choose a biome and find an example of each type of symbiotic relationship

Evaluate: Symbiotic relationship quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 7 Lesson 3: Energy in an Ecosystem

Materials: Chromebook, poster board, animal cut outs for biomes, glue, markers, crayons, colored pencils

Engage: Show students a food web and a food chain. Have them compare and contrast.

Explore: Ask students what would happen to all the other living things if one animal was removed from the food web and one from the food chain. Which one is impacted more?

Explain: Differentiate between food webs and food chains with students. Identify the roles of producers, consumers (herbivore, omnivore, and carnivores), and decomposers.

Elaborate: Give students a specific biome to research. Have students create a poster showing an example of a food web that can be found in the biome.

Evaluate: Food web Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit 7 Lesson 4: Invasive Species

Materials: Chromebooks

Engage: Ask students to define the word invasive. Use is in a sentence? What is invasive?

Explore: Have students read and explore different invasive species that can be found in New Jersey (ex: spotted lantern fly)

Explain: Use guided notes to explain to students what an invasive species is, how do they travel from one place to another, how can we combat the negative impacts, how does it impact native species, and how does it impact humans economy.

Elaborate: Have students create a "Wanted" poster for a specific invasive species. Posters can be digital or physical depending on supplies.

Evaluate: Invasive Species Quiz

Differentiation:
General Accomodations/Modifications:

- Extended time for assignments
- Alternative forms of assessment if appropriate
- Visuals for vocabulary
- Pre-teach new vocabulary when appropriate
- Reduce auditory and visual distractions
- Small group instruction as needed

Unit Assessments:

Formative: Carrying capacity quiz, kaibab deer lab, symbiotic relationships quiz, food web quiz, food web project, invasive species quiz, wanted poster

Summative: Unit 7 Assessment