Grade 8
Module D Dimensions
Diversity of Living Things

New Jersey State Learning Standards

Established	2016-2017
Revised	2017-2018
Revised	2018-2019
Revised	2019-2020
Revised	2020-2021
Revised	2022-2023

Marking Period	Unit Title	Recommended Instructional Days
1 (and beginning of MP2)	**Diversity of Living Things (Module D)**	**55 Days (Includes Lab Safety Skills and Procedures)**

NJSLS - Science: *Title*	NJSLS - Science: *Performance Expectations*	Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit
MS-ESS1:Earth's Place in the Universe **MS-LS3: Heredity: Inheritance and Variation of Traits** **MS-LS4: Biological Evolution : Unity and Diversity**	**MS-ESS1-4.** Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. **MS-LS3-1.** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism **MS-LS4-1.** Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction,	**Essential Question/s:** 1. What is the geological timescale? 2. What are fossils and how are they created? 3. How can rock strata be used to determine the relative age of a fossil? 4. How do patterns in the fossil record indicate how living things have changed throughout history? 5. What is evolution and what factors influence change over time? 6. How can comparative anatomy and embryology be indicators of biological evolution? 7. How does genetic variation among organisms in a species affect survival and reproduction? 8. Why are some genetic mutations harmful and some helpful? 9. Why is DNA replication necessary? 10. What effect does human activity have on the endangerment and extinction of species? 11. How can environmental and genetic evidence be used to support the theory of natural selection?

	and change of life forms throughout **MS-LS4-2**. 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. **MS-LS4-3.** 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. **MS-LS4-4.** Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. **MS-LS4-5.** Gather and synthesize information about the	12. How can artificial selection and genetic engineering alter evolutionary outcomes? **<u>Activity Description:</u>** ❖ Hands-on Lab: Model Fossil Formation ❖ Hands-on Lab: Model Analysis of the Fossil Record ❖ Hands-on Lab: Make Inferences from Evidence ❖ Hands-on Lab: Model Natural Selection in a Population ❖ Take It Further: Mutations and Phenotypes ❖ Hands-on Lab: Analyze Speciation of Salamanders ❖ Hands-on Lab: Model Protein Folding ❖ Take It Further: Evolution of Drug-Resistant Bacteria ❖ Hands-on Lab: Analyze Selected Traits in Vegetables ❖ Hands-on Lab: Model the Modification of Bacteria ❖ Virtual Lab: Similarities in Animals ❖ Virtual Lab: Natural Selection **Lab and engineering activities will incorporate these skills:** ● Planning and Organization ● Critical Thinking ● Communication in a group ● Decision Making ● Reflection on activity and participation

MS-ETS1: Engineering Design	technologies that have changed the way humans influence the inheritance of desired traits in organisms. **MS-LS4-6.** Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. **MS-ETS1-1.** 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-ETS1-2.** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-3.** Analyze data from tests to determine similarities and	**Spotlight on scientists and their accomplishments** Ex. Ben Barres - Neurobiologist Dr. Margaret S. Collins- Entomologist Human Impacts on Earth Discuss the impact of climate change on organisms in different environments ❏ HMH: Book D Unit 3 Exploration 3 Case Study: Artificial Selection of Corals ❏ HMH: Book D Unit 2 Lesson 3- Speciation and Extinction **<u>Interdisciplinary Connection: Content: (NJSLS#)</u>** **<u>Connections to Math</u>** ● Model with mathematics **(MP.4)** ● 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 any number in a specified set. **(6.EE.B.6)** ● Work with ratios and proportional relationships, use concepts of probability, and use order of magnitude thinking ● Use concepts of probability ● Model with mathematics **(MP.4)**

	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-ETS1-4.** 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.	• Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. **(6.RP.A.1)** • Recognize and represent proportional relationships between quantities. **(7.RP.A.2)** • Summarize numerical data sets in relation to their context. **(6.SP.B.5)** • Use probability language and concepts when explaining how variation in traits among a population leads to an increase in some traits in the population and a decrease in others. **(6-8.SP)** • Use ratios and proportional relationships and use order of magnitude thinking. **<u>Connections to English Language Arts</u>** • Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.(**RST.6-8.1)** • Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually)e.g., in a flowchart, diagram, model, graph, or table). **(RST.6-8.7)** • Compare and contrast the information gained from experiments, simulations, video, or multimedia

FOUNDATION Disciplinary: *Core Idea*	FOUNDATION Disciplinary: *Statement*	
LS4.A: Evidence of Common Ancestry and Diversity	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 chang 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	sources with that gained from reading a text on the same topic. **(RST.6-8.9)** (MS-LS4-3), (MS-LS4-4) ● Engage effectively in a range of collaborative discussions with diverse partners on grade 8 topics, texts and issues, building on others' ideas and expressing their own clearly. **(SL.8.1)** ● Present claims and findings, emphasizing points with evidence, valid reasoning, and details; use appropriate eye contact, volume and pronunciation. **(SL.8.4)** Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points **(SL.8.5)** ● Write informative/explanatory tests to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. **(WHST.6-8.2)** ● Gather relevant information from multiple print and digital sources; assess the credibility of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and providing basic bibliographic information for sources.**(WHST.6-8.8)** ● Draw evidence from informational texts to support analysis, reflection and research **(WHST.6-8.9)**

	relationships not evident in the fully-formed anatomy.	
LS4. B: Natural Selection	Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4) In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed onto offspring. (MS-LS4-5)	
LS4.C: Adaptation	Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes. (MS-LS4-6)	

ETS1.B: Developing Possible Solutions	A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4) There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) Models of all kinds are important for testing solutions. (MS-ETS1-4)	
FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	
Analyzing and Interpreting Data	Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to	

	investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.	
Using Mathematics and Computational Thinking	Mathematical and computational thinking in 6–8 builds on K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments.	
Constructing Explanations and Design Solutions	Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.	
Obtaining, Evaluating, and Communicating Information	Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.	

FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***	
Patterns	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)	
Cause and Effect	Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS4-4), (MS-LS4-5), (MS-LS4-6)	
Connections to Engineering, Technology, and Applications of Science **Interdependence of Science, Engineering, and Technology**	Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered	

Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence**	systems. (MS-LS4-5) Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-LS4-1)	
Scientific Knowledge Assumes an Order and Consistency in Natural Systems	Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. (MS-LS4-1), (MS-LS4-2)	
Science Addresses Questions About the Natural and Material World	Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-LS4-5)	
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***	
Responsible Decision Making	● Develop, implement, and model effective problem-solving and critical thinking skills	

Relationship Skills **Self Management** **Social Awareness** **Self Awareness**	• Utilize positive communication and social skills to interact effectively with others • Recognize the skills needed to establish and and achieve personal and educational goals • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Recognize the importance of self-confidence in handling daily tasks and challenges.	
Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***		**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
Formative Assessments: • Diagnostic tests used to modify teaching and learning activities to improve student attainment		**Benchmarks:** • District Assessment **Summative Assessments:** • End of unit/chapter tests/lesson quizzes

Differentiated Student Access to Content: Teaching and Learning *Resources/Materials*			
Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
• **Interactive Worktext** • **Equipment Kits** • **Online Simulations** • **BrainPop Science** • **Evidence Notebook** • **Lab Safety Handbook** • **CK 12** • **IXL Science**	• Multilingual Glossary • Sciencesaurus • Online Science Tools (Scientific Calculator, Graphing) • BrainPopEspanol	• Multilingual Glossary • Sciencesaurus • Online Science Tools (Scientific Calculator, Graphing) • Brain Pop ELL	• Online Simulations • CK 12 • Virtual Labs • Webquests • PHET • Video-Based Projects • Take It Further • You Solve It ! • Unit Performance Tasks • Unit Projects • Online Science Tools (Scientific Calculator, Graphing) • Brain Pop Science • IXL Science
Supplemental Resources			
Technology: • **8.1.8.A.1, 8.1.8.A. 2, 8.1.8.A.3, 8.1.8.A. 4, 8.1.8.A. 5**			

Other:

- CRP4 Communicate clearly and effectively and with reason.
- CRP6 Demonstrate creativity and innovation
- CRP7 Employ valid and reliable research strategies
- CRP11 Use technology to enhance productivity

Differentiated Student Access to Content:
Recommended Strategies & Techniques

Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
• **Large group instruction** • **Small group instruction** • **Think Pair Share** • **Peer editing** • **Cooperative group work** • **Multimedia presentations** • **Choice Boards/Learning Menus** • **Manipulatives**	• Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break	• Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	• Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related talent development opportunities.

	assignments into segments of		

NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	**Disciplinary Concept: 1.Career Awareness and Planning, 2.Creativity and Innovation, 3.Critical Thinking and Problem Solving, 4.Global and Cultural Awareness 5. Digital Citizenship 6. Information and Media Literacy 7. Technology Literacy**	
	Core Ideas:	**1. There are a variety of resources available to help navigate the career planning process.** **2. Gathering and evaluating knowledge and information from a variety of sources, including global perspectives, fosters creativity and innovative thinking.** **3. Multiple solutions often exist to solve a problem.** **4. Awareness of and appreciation for cultural differences is critical to avoid barriers to productive and positive interaction.** **5. Detailed examples exist to illustrate crediting others when incorporating their digital artifacts in one's own work.** **6. Digital tools make it possible to analyze and interpret data, including text, images, and sound. These tools allow for broad concepts and data to be more effectively communicated.** **7. Some digital tools are appropriate for gathering, organizing, analyzing, and presenting information, while other types of digital tools are appropriate for creating text, visualizations, models, and communicating with others**
	Performance Expectation/s:	**1. 9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.** **2. 9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., cross cultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5,**

		7.1.NH.IPERS.6, 8.2.8.ETW.4). 3. 9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2). 4. 9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. 5. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 5. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 6. 9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. 7. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4). 7. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
	Career Readiness, Life Literacies, & Key Skills Practices	
	• Act as a responsible and contributing community member and employee. • Demonstrate creativity and innovation. • Utilize critical thinking to make sense of problems and persevere in solving them. • Consider the environmental, social and economic impacts of decisions. • Use technology to enhance productivity, increase collaboration and communicate effectively. • Work productively in teams while using cultural/global competence.	

New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
X	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*	X	LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	X	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*	X	Standards in Action: *Climate Change*