| Marking Period | Unit Title | | Recommended Instructional Days |
|---|---|---|---|
| 1 | Ecology | | 20 |

| NJSLS - Science: *TItle* | NJSLS - Science: *Performance Expectations* | Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit |
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| **HS-LS2** Ecosystems: Interactions, Energy and Dynamics | **HS-LS2-1** Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales**.**<br><br>**HS-LS2-2** Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.<br><br>**HS-LS2-6**  Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. | **Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit** |
| **HS-ESS3-1** Earth and Human Activity | **HS-ESS3-1** Construct an explanation based on evidence for | |

| FOUNDATION Disciplinary: *Core Idea* | FOUNDATION Disciplinary: *Statement* | |
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| how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. | | |
| **LS2.A:** Interdependent Relationships in Ecosystems | -Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. | **Essential Question/s:** <br> ● How do abiotic and biotic factors shape ecosystems, and contribute to changes in the populations and ecosystems? <br><br> **Activity Description**: |

| | These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, competition, and disease. Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem.  (HS-LS2-1),(HS- LS2-2) <br><br> **LS2.C:** Ecosystem Dynamics, Functioning, and Resilience | -A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability. (HS-LS2-2),(HS-LS2-6) | ● **Claim Evidence Reasoning- Population Ecology** <br> Students participate in an activity that models populations of lynxes and hares, and how density-dependent factors affect a population size. Topics included are competition, predation, exponential growth, logistic growth, carry capacity, limiting factors, growth calculations and graphs. <br> ● **Savvas Realize Interactivity- Describing Populations** <br> This digital activity provides an opportunity for students to look at various means of describing and classifying populations such as geographic range, density and distribution, growth rate, and age structure; as well as the three types of distribution (uniform, random, and clumped). <br> ● **Savvas Realize Analyzing Data- Monarchs in Decline** <br> Students analyze a line graph that shows the declining population of monarch butterflies. <br> ● **Savvas Realize PBL Science Skills Activity- Pythons in the Everglades** <br> This digital activity provides an opportunity for students to conduct an experiment to see how the introduction of a non-native species, the pythons, affects another native population, rabbits. This includes a worksheet that accompanies the digital activity. <br> ● **Savvas Realize Science Skills Activity and Worksheet- Identifying Disturbances** <br> This digital activity provides an opportunity for students to learn about disturbances by studying populations of sea birds and non-native rats on a Pacific Island. <br> ● **Savvas Realize Interactivity- Biodiversity in Ecosystems** <br> This digital activity provides an opportunity for students to learn about biodiversity and its importance by examining several wetland ecosystems. <br><br> **Interdisciplinary Connections:  Content:  ;NJSLS#:** <br> *Connections to NJSLS – English Language Arts :* <br> ● **RST.11-12.1** Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions. (HS-LS2-1), (HS-LS2-2), (HS-LS2-6) |

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| **ESS3.A** Natural Resources<br><br><br>**ESS3.B** Natural Hazards | -Resource availability has guided the development of human society. (HS-ESS3-1)<br><br>-Natural hazards and other geologic events have shaped the course of human history; (they) have significantly altered the sizes of human populations and have driven human migrations. (HS-ESS3-1) | • **RST.11-12.7** Integrate and evaluate multiple sources of information presented in diverse formats and media(e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. (HS-LS2-6),<br>• **RST.11-12.8** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-LS2-6),<br>• **WHST.9-12.5** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.<br><br>*Connections to NJSLS – Mathematics*<br>• **MP.2** Reason abstractly and quantitatively. (HS-LS2-1), (HS-LS2-2), (HS-LS2-6)<br>• **MP.4** Model with mathematics. (HS-LS2-1), (HS-LS2-2)<br>• **HSS-IC.A.1** Understand statistics as a process for making inferences about population parameters based on a random sample from that population. (HS-LS2-6)<br>• **HSS-IC.B.6** Evaluate reports based on data. (HS-LS2-6) |
| **FOUNDATION**<br>**Science and Engineering Practices:**<br>*Core Idea* | **FOUNDATION**<br>**Science and Engineering Practices:**<br>*Statement* | |
| **Using Mathematics and Computational Thinking**<br>Mathematical and computational thinking in 9-12 builds on K-8 experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools | -Use mathematical and/or computational representations of phenomena or design solutions to support explanations. (HS-LS2-1)(HS-LS2-2) | |

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| for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions. | | |
| **Engaging in Argument from Evidence**<br>Engaging in argument from evidence in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science. | -Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments. (HS-LS2-6) | |
| **Connections to Nature of Science: Scientific Knowledge is Open to Revisions in Light of New Evidence** | -Most scientific knowledge is quite durable, but is, in principle, subject to change based on ew evidence and/or reinterpretation on existing evidence. (HS-LS2-5)<br><br>-Scientific argumentation is a mode of logical discourse used to clarify the strength of relationships between ideas and evidence that may result in revision of an explanation. (HS-LS2-6) | |

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| **Constructing Explanations and Designing Solutions**<br>Constructing explanations and designing solutions in 9-12 builds on K-8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific knowledge, principles, and theories. | -Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) 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. |
| **FOUNDATION**<br>**Crosscutting Concepts:**<br>*Core Idea* | **FOUNDATION**<br>**Crosscutting Concepts:**<br>*Statement* |
| **Scale, Proportion, and Quantity** | -The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. (HS-LS2-1)<br><br>-Using the concept of orders of magnitude allows one to understand how a model at one scale relates to a model at another scale. (HS-LS2-2) |

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| **Stability and Change** | -Much of science deals with constructing explanations of how things change and how they remain stable. (HS-LS2-6) | |
| **Cause and Effect** | - Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. | |
| **Connections to Engineering, Technology, and Applications of Science:**<br>**Influence of Science, Engineering, and Technology on Society and the Natural World** | -Modern civilization depends on major technological systems. | |
| **Social and Emotional Learning:**<br>*Competencies* | **Social and Emotional Learning:**<br>*Sub-Competencies* | |
| Self Awareness | -Recognize one's feelings and thoughts<br>-Recognize the impact of one's feelings and thoughts on one's own behavior<br>-Recognize one's personal traits, strengths, and limitations<br>-Recognize the importance of self-confidence in handling daily tasks and challenges | |
| Self Management | | |

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| Social Awareness | -Understand and practice strategies for managing one's own emotions, thoughts, and behaviors<br>-Recognize the skills needed to establish and achieve personal and educational goal<br>-Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals<br><br>-Recognize and identify the thoughts, feelings, and perspectives of others<br>-Demonstrate an awareness of the differences among individuals, groups, and others' cultural backgrounds<br>-Demonstrate an understanding of the need for mutual respect when viewpoints differ<br>-Demonstrate an awareness of the expectations for social interactions in a variety of settings | |
| Responsible Decision-making | -Develop, implement, and model effective problem-solving and critical thinking skills<br>-Identify the consequences associated with one's actions in order to make constructive choices<br>-Evaluate personal, ethical, safety, and civic impact of decisions | |
| Relationship Skills | -Establish and maintain healthy relationships | |

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| -Utilize positive communication and<br>social skills to interact effectively with others<br>-Identify ways to resist inappropriate social pressure<br>-Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways<br>-Identify who, when, where, or how to seek help for oneself or others when needed | |

| Assessments (Formative)<br>*To show evidence of meeting the standard/s, students will successfully engage within:* | Assessments (Summative)<br>*To show evidence of meeting the standard/s, students will successfully complete:* |
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| **Formative Assessments:**<br>● Savvas Realize Interactivity Assignments<br>● Reading and Study Guide Workbook<br>● Class Discussions and Questioning<br>● eText Notebook Responses | **Benchmarks:**<br>● District Assessments<br>● Unit Portfolios<br><br>**Summative Assessments:**<br>● Chapter Tests<br>● Claim Evidence Reasoning Tasks<br>● Case Study Wrap Ups<br>● Lab Reports/Skills Worksheets |

**Differentiated Student Access to Content:**
**Teaching and Learning *Resources/Materials***

| Core<br>Resources | Alternate<br>Core Resources<br>*IEP/504/At-Risk/ESL* | ELL<br>Core Resources | Gifted & Talented<br>Core Resources |
|---|---|---|---|
| ● Authentic Reading Materials<br>● Classroom Supplies<br>● Teacher Computer | ● Alternate reading materials<br>● Home copy of text<br>● Copy of Teacher notes<br>● USe of models | ● Translator<br>● English translator dictionary<br>● Alternate reading materials<br>● Copy of Teacher notes | ● Increased inquiry based labs<br>● Independent Research<br>● Authentic Reading Materials<br>● Classroom Supplies |

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| ● Internet Connectivity<br>● Smart Board<br>● Online Learning Platform<br>● Data Analysis Software such as Google sheets<br>● Lab Equipment | ● Authentic Reading Materials<br>● Classroom Supplies<br>● Teacher Computer<br>● Internet Connectivity<br>● Smart Board<br>● Online Learning Platform<br>● Data Analysis Software such as Google sheets<br>● Lab Equipment | ● Use of models<br>● Authentic Reading Materials<br>● Classroom Supplies<br>● Teacher Computer<br>● Internet Connectivity<br>● Smart Board<br>● Online Learning Platform<br>● Data Analysis Software such as Google sheets<br>● Lab Equipment | ● Teacher Computer<br>● Internet Connectivity<br>● Smart Board<br>● Online Learning Platform<br>● Data Analysis Software such as Google sheets<br>● Lab Equipment |

### Supplemental Resources

**Technology:**
- Supplemental Videos
- Student Chromebooks
- Digital Platforms including Schoology and Savvas Realize

**Other:**
- Safety equipment
- Classroom models

### Differentiated Student Access to Content:
### Recommended *Strategies & Techniques*

| Core<br>Resources | Alternate<br>Core Resources<br>*IEP/504/At-Risk/ESL* | ELL Core<br>Resources | Gifted & Talented<br>Core |
|---|---|---|---|
| ● Guided experiments<br>● Inquiry experiments<br>● Class discussions<br>● CER activities<br>● Phenomenon<br>● Positive reinforcement<br>● Rubrics | ● Extended time/retakes on assessments<br>● Modified Assessment<br>● Written, visual and oral directions<br>● multisensory during instruction<br>● Alternate instruction such as visual, kinetic, and auditory. | ● Read aloud test<br>● Modified Assessments<br>● Written, visual and oral directions<br>● multisensory during instruction<br>● Alternate instruction such as visual, kinetic, and auditory.<br>● Preferential seating if needed<br>● Review activities | ● Further depth of content<br>● Example of realistic scenarios<br>● Research opportunities<br>● Design own experiments<br>● Enhanced set of introductory activities<br>● Extension activities<br>● Guided experiments<br>● Inquiry experiments |

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| | <ul><li>Preferential seating if needed</li><li>Review activities</li><li>Study guides</li><li>Break assignments into shorter tasks</li><li>Guided experiments</li><li>Inquiry experiments</li><li>Class discussions</li><li>CER activities</li><li>Phenomenon</li><li>Positive reinforcement</li><li>Rubrics</li></ul> | <ul><li>Study guides</li><li>Break assignments into shorter tasks</li><li>Guided experiments</li><li>Inquiry experiments</li><li>Class discussions</li><li>CER activities</li><li>Phenomenon</li><li>Positive reinforcement</li><li>Rubrics</li></ul> | <ul><li>Class discussions</li><li>CER activities</li><li>Phenomenon</li><li>Positive reinforcement</li><li>Rubrics</li></ul> |

| NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS | **Disciplinary Concept:** <ul><li>Technology Literacy</li></ul> | |
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| | *Core Ideas:* | <ul><li>Digital tools differ in features, capacities, and styles. Knowledge of different digital tools is helpful in selecting the best tool for a given task.</li><li>Collaborative digital tools can be used to access, record and share different viewpoints and to collect and tabulate the views of groups of people.</li></ul> |
| | *Performance Expectation/s:* | • 9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).<br> • 9.4.12.TL.2: Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data.<br>• 9.4.12.TL.3: Analyze the effectiveness of the process and quality of collaborative environments.<br>• 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem (e.g., 7.1.AL.IPERS.6). |
| | **Career Readiness, Life Literacies, & Key Skills Practices** | |

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| | **Use technology to enhance productivity, increase collaboration and communicate effectively.** Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks. |

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