Marking Period			Unit Title		
1 and/or 2		Human Impact		20	
NJSLS - Science: TItle NJSLS - Science: Performance Expectations					
HS-LS2 Ecosystems: Interactions, Energy and Dynamics  HS-LS2-2 representative revise explain evidence a biodiversite ecosystem  HS-LS2-7 refine a so impacts of		Use mathematical tions to support and anations based on bout factors affecting y and populations in s of different scales.  Design, evaluate, and ution for reducing the human activities on the nt and biodiversity.		vities, Investigations, ections, and/or Student e NJSLS-S within Unit	
<b>HS-LS4</b> Biological Evolution: Unity and Diversity	HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.				
HS-ETS1 Engineering Design	challenge t quantitativ constraints	Analyze a major global o specify qualitative and e criteria and for solutions that r societal needs and			

HS-ESS2 Earth's Systems	HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.	
FOUNDATION Disciplinary: Core Idea	FOUNDATION Disciplinary: Statement	
LS2.A: Interdependent Relationships in Ecosystems	-Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. 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- LS2-2)	Essential Question/s:  ● How have human activities shaped local and global ecology?  Activity Description:  ● Savvas Realize Case Study- How Can a Rising Tide be Stopped?  This case study describes the impact of climate change on Southern Florida. It describes how the geography and geology of the Florida coast combine with rising seas to cause big problems for people living in affected areas. It asks students what can be done to combat the impact of sea level rise and introduces some measures that residents have taken to handle the impact of climate change in South Florida.  ● Savvas Realize Interactivity- Human Impact on Ecosystems  This digital activity provides an opportunity for students to investigate how humans can impact ecosystems through pollution, farming, hunting, building, and overfishing.  ● Savvas Realize Analyzing Data- Evidence in Ice: Case Study  Students will interpret data from a graph to evaluate how the melting rate of the polar ice caps provides evidence of global warming. They will
LS2.C: Ecosystem Dynamics, Functioning, and Resilience	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	use logical reasoning to make predictions about further environmental impact and explain the importance of further data collection.  • Savvas Realize Science Skills Activity- Biogas Farming  This digital activity provides an opportunity for students to study biogas made from the breakdown of biodegradable wastes.  • Spotlight on scientists and their accomplishments: Ruth Gates' Super Coral

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)

-Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species. (HS-LS2-7)

-Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction). (secondary to HS- LS2-7)

-Humans depend on the living world for the resources and other benefits provided by biodiversity. But human activity is also having adverse impacts on biodiversity through overpopulation, overexploitation, habitat

A marine biologist who created "super coral" that are more resistant to climate change.

#### **Interdisciplinary Connections: Content: ;NJSLS#:**

#### Connections to NISLS - English Language Arts

- **RST.9-10.8** Determine if the reasoning and evidence in a text support the author's claim or a recommendation or solving a scientific or technical problem. (HS-LS2-7)
- **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-LS2-2)
- **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-LS2-7)
- 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-LS2-7)
- WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. (HS-LS2-2)
- WHST.9-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-LS2-7)

#### Connections to NISLS - Mathematics

- **MP.2** Reason abstractly and quantitatively. (HS-LS2-2), (HS-LS2-7)
- **MP.4** Model with mathematics. (HS-LS2-2)

**LS4.D:** Biodiversity and Humans

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LS4.C: Adaptation	destruction, pollution, introduction of invasive species, and climate change. Thus sustaining biodiversity so that ecosystem functioning and productivity are maintained is essential to supporting and enhancing life on Earth. Sustaining biodiversity also aids humanity by preserving landscapes of recreational or inspirational value. (secondary to HS-LS2-7) (Note: This Disciplinary Core Idea is also addressed by HS-LS4-6).  -Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline-and sometimes the extinction-of some species. ,(HS-LS4-6)	HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (HS-LS2-2), (HS-LS2-7)      HSN-Q.A.2 Define appropriate quantities for the purpose of descriptive modeling. (HS-LS2-2), (HS-LS2-7)      HSN-Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.(HS-LS2-2), (HS-LS2-7)
ETS1.B: Developing Possible Solutions	-When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and	

	environmental impacts. (secondary to HS-LS2-7, HS-LS4-6)	
	-Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of purposes, such as running simulations to test different ways of solving a problem or to see which one is most efficient or economical; and in making a	
ETS1.A: Defining and Delimiting	persuasive presentation to a client about how a given design will meet his or her needs. (secondary to HS-LS4-6)	
Engineering Problems	-Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (HS-ETS1-1)	
	-Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed	

ESS2.D: Weather and Climate	through engineering. These global challenges also may have manifestations in local communities. (HS-ETS1-1)  -Gradual atmospheric changes were due to plants and other organisms that captured carbon dioxide and released oxygen. (HS-ESS2-6)
	-Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate. (HS-ESS2-6)
FOUNDATION Science and Engineering Practices:  Core Idea	FOUNDATION Science and Engineering Practices: Statement

computational simulations are created and used based on mathematical models of basic assumptions.

## Connections to Nature of Science: Scientific Knowledge is Open to Revision in Light of New Evidence

-Most scientific knowledge is quite durable, but is, in principle, subject to change based on new evidence and/or reinterpretation of existing evidence. (HS-LS2-2)

# **Constructing Explanations and Designing Solutions**

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 ideas, principles, and theories.

-Design, evaluate, and refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations. (HS-LS2-7)

## Asking Questions and Defining Problems

Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations.

-Analyze complex real-world problems by specifying criteria and constraints for successful solutions. (HS-ETS1-1)

Developing and Using Models Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed world(s).	-Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-ESS2-6)
FOUNDATION Crosscutting Concepts:  Core Idea	FOUNDATION Crosscutting Concepts: Statement
Scale, Proportion, and Quantity	-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)
Stability and Change	-Much of science deals with constructing explanations of how things change and how they remain stable. ,(HS- LS2-7)
Cause and Effect	-Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. (HS-LS4-6)
Connections to Engineering, Technology, and Applications of Science	-New technologies can have deep impacts on society and the environment, including some that were not anticipated. Analysis of

Influence of Science, Engineering, and Technology on Society and the Natural World	costs and benefits is a critical aspect of decisions about technology . (HS-ETS1-1)	
Social and Emotional Learning:	Social and Emotional Learning:	
Competencies	Sub-Competencies	
Self Awareness	-Recognize one's feelings and thoughts -Recognize the impact of one's feelings and thoughts on one's own behavior -Recognize one's personal traits, strengths, and limitations -Recognize the importance of self-confidence in handling daily tasks and challenges	
Self Management	-Understand and practice strategies for managing one's own emotions, thoughts, and behaviors -Recognize the skills needed to establish and achieve personal and educational goal -Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals	
Social Awareness	-Recognize and identify the thoughts, feelings, and perspectives of others -Demonstrate an awareness of the	

To show evidence of meeting th	when needed ents (Formative) e standard/s, students will successfully age within:	Assessments (Summative)  To show evidence of meeting the standard/s, students will successfully complete:
Relationship Skills	-Establish and maintain healthy relationships -Utilize positive communication and social skills to interact effectively with others -Identify ways to resist inappropriate social pressure -Demonstrate the ability to prevent and resolve interpersonal conflicts in constructive ways -Identify who, when, where, or how to seek help for oneself or others	
Responsible Decision-making	-Develop, implement, and model effective problem-solving and critical thinking skills -Identify the consequences associated with one's actions in order to make constructive choices -Evaluate personal, ethical, safety, and civic impact of decisions	
	differences among individuals, groups, and others' cultural backgrounds -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 settings	

## **Formative Assessments:**

- Savvas Realize Interactivity Assignments
- Reading and Study Guide Workbook
- Class Discussions and Questioning
- eText Notebook Responses

#### **Benchmarks:**

- District assessments
- Unit Portfolio assignment if applicable

### **Summative Assessments:**

- Chapter Tests
- Claim Evidence Reasoning Tasks
- Case Study Wrap Ups
- Lab Reports/Skills Worksheets

## 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		
<ul> <li>Authentic Reading         Materials</li> <li>Classroom Supplies</li> <li>Teacher Computer</li> <li>Internet Connectivity</li> <li>Smart Board</li> <li>Online Learning Platform</li> <li>Data Analysis Software         such as Google sheets</li> <li>Lab Equipment</li> </ul>	<ul> <li>Alternate reading materials</li> <li>Home copy of text</li> <li>Copy of Teacher notes</li> <li>USe of models</li> <li>Authentic Reading Materials</li> <li>Classroom Supplies</li> <li>Teacher Computer</li> <li>Internet Connectivity</li> <li>Smart Board</li> <li>Online Learning Platform</li> <li>Data Analysis Software such as Google sheets</li> <li>Lab Equipment</li> </ul>	<ul> <li>Translator</li> <li>English translator dictionary</li> <li>Alternate reading materials</li> <li>Copy of Teacher notes</li> <li>Use of models</li> <li>Authentic Reading Materials</li> <li>Classroom Supplies</li> <li>Teacher Computer</li> <li>Internet Connectivity</li> <li>Smart Board</li> <li>Online Learning Platform</li> <li>Data Analysis Software such as Google sheets</li> <li>Lab Equipment</li> </ul>	<ul> <li>Increased inquiry based labs</li> <li>Independent Research</li> <li>Authentic Reading Materials</li> <li>Classroom Supplies</li> <li>Teacher Computer</li> <li>Internet Connectivity</li> <li>Smart Board</li> <li>Online Learning Platform</li> <li>Data Analysis Software such as Google sheets</li> <li>Lab Equipment</li> </ul>		

## **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

Recommended Strategies & Techniques							
Core Resources Core Resources IEP/504/At-Risk/ESL		ELL Core Resources	Gifted & Talented Core				
<ul> <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>Extended time/retakes on assessments</li> <li>Modified Assessment</li> <li>Written, visual and oral directions</li> <li>multisensory during instruction</li> <li>Alternate instruction such as visual, kinetic, and auditory.</li> <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>Read aloud test</li> <li>Modified Assessments</li> <li>Written, visual and oral directions</li> <li>multisensory during instruction</li> <li>Alternate instruction such as visual, kinetic, and auditory.</li> <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>Further depth of content</li> <li>Example of realistic scenarios</li> <li>Research opportunities</li> <li>Design own experiments</li> <li>Enhanced set of introductory activities</li> <li>Extension activities</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>				

	Disciplinary Concept:					
NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS	Core Ideas:	<ul> <li>Solutions to the problems faced by a global society require the contribution of individuals with different points of view and experiences.</li> <li>Technologies such as Artificial Intelligence (AI) and blockchain can help minimize the effect of climate change.</li> </ul>				
	Performance Expectation/s:	<ul> <li>9.4.12.GCA.1: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).</li> <li>9.4.12.DC.8: Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.</li> </ul>				
	Career Readiness, Life Literacies, & Key Skills Practices					
	negative impact on other people, organiza	re of their actions and regularly make decisions that positively impact and/or mitigate ation, and the environment. They are aware of and utilize new technologies, d regulations affecting the nature of their work as it relates to the impact on the social				

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: <i>N.J.S.A. 18A:35-28</i>	X	LGBT and Disabilities Law: <i>N.J.S.A.</i> 18A:35-4.35	X	Diversity & Inclusion: N.J.S.A. 18A:35-4.36a	X	Standards in Action: Climate Change