Environmental Science/Natural Resources

Unit Title: Unit 1- Science and the Environment (8 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
9.3.12.AG-ENV.5 Use tools, equipment, machinery and technology common to tasks in environmental service systems.
9.3.12.AG-NR.1 Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.
9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Environmental Science/Natural Resources

<table>
<tr>
<td><u>Central Idea/Enduring Understanding</u>:
Human beings live within the world's ecosystems. Increasingly, humans modify ecosystems as a result of population growth, technology, and consumption. Human destruction of habitats through direct harvesting, pollution, atmospheric changes, and other factors is threatening current global stability, and if not addressed, ecosystems will be irreversibly affected.

Scientists in different disciplines ask different questions, use different methods of investigation, and accept different types of evidence to support their explanations. Many scientific investigations require the contributions of individuals from different disciplines, including engineering. New disciplines of science, such as geophysics and biochemistry often emerge at the interface of two older disciplines.

Human populations use resources in the environment in order to maintain and improve their existence. Natural resources have been and will continue to be used to maintain human populations.

Understanding basic concepts and principles of science and technology should precede active debate about the economics, policies, politics, and ethics of various science and technology related challenges. However, understanding science alone will not resolve local, national, or global challenges.</td>
<td><u>Essential/Guiding Question</u>:
How do you define the environment?

How can population pressures and consumption trends contribute to environmental problems?</td>
</tr>
<tr>
<td><u>Content</u>:

Environmental Characteristic
Understanding Environmental Problems, Issues, and Concerns
The Environment and Society</td>
<td><u>Skills(Objectives)</u>:
Define environmental science, and compare environmental science with ecology.

List the five major fields of study that contribute to environmental science.

Describe the major environmental effects of hunter-gatherers, the agricultural revolution, and the Industrial Revolution.

Distinguish between renewable and nonrenewable resources.

Classify environmental problems into three major categories.

Describe “The Tragedy of the Commons.”

Explain the law of supply and demand.

List three differences between developed and developing countries.</td>
</tr>
<tr>
<td colspan="2"><u>Interdisciplinary Connections:</u>
Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.</td>
</tr>
</table>

Environmental Science/Natural Resources

Stage 2: Assessment Evidence

Performance Task(s):	**Other Evidence:**
Define key terms Self-evaluation questions Group project EcoLog entry Golf Course Impacts project	Exit ticket Questioning and answer Student generated rubric Quiz Unit assessment

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Instruction
Demonstration
Pair-sharing
Individual activities
Cooperative learning activities
Active Reading Worksheet

Ask students to brainstorm a working definition for the term environment.

Resources:

Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston, 1996.
Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006.
Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003.
Turk, Jonathan, and Amos Turk. Environmental Science, Third Edition. New York: CBS College Publishing, .
Miller, Jr, Tyler. Environmental Science, Tenth Edition. Canada: Thomson,
Brook/Cole, 2004.
CK12.org

LGBT and Disabilities Resources:

- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth
- LGBTQ+ Books

DEI Resources:

- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities
- NJDOE Diversity, Equity & Inclusion Educational Resources
- Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student).	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions

Environmental Science/Natural Resources

● A personalized course packet with individualized enrichment materials. ● An adaptive assessment that gets harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other. ●	by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. ●	by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. ● Allow extra time on assessments ● Provide study guides ● Weekly conference to set short term goals	through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

Unit Title: Unit 1- The Organization of Life (11 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
9.3.12.AG-ENV.5 Use tools, equipment, machinery and technology common to tasks in environmental service systems.
9.3.12.AG-NR.1 Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.
9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:	**Essential/Guiding Question:**
Organisms both cooperate and compete in ecosystems.The interrelationships and interdependencies of these organisms may generate ecosystems that are stable for hundreds or thousands of years.	How do we determine the effects of biotic and abiotic factors on an ecosystem?
Content: Ecosystems: Everything is Connected; Evolution And Equilibrium	**Skills(Objectives):** Distinguish between the biotic and abiotic factors in an ecosystem.

Environmental Science/Natural Resources

The Diversity of Living Things	Describe how a population differs from a species. Explain how habitats are important for organisms. Explain the process of evolution by natural selection. Explain the concept of adaptation. Describe the steps by which a population of insects becomes resistant to a pesticide. Name the six kingdoms of organisms and identify two characteristics of each. Explain the importance of bacteria and fungi in the environment. Describe the importance of protists in the ocean environment. Describe how angiosperms and animals depend on each other. Explain why insects are such successful animals.

Interdisciplinary Connections:
Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
Define key terms Self-evaluation questions Group project EcoLog entry Golf Course Impacts project Active Reading Worksheet	Exit ticket Questioning and answer Student generated rubric Quiz Unit assessment

Stage 3: Learning Plan

Learning Opportunities/Strategies:	Resources:
Instruction, Demonstration, pair-sharing, individual activities, cooperative learning activities, Golf Course Impacts project Create a list of all the things you need for survival; Create a list of characteristics that a chameleon uses when it hunts; Students determine their own scientific classification	Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston,1996. Lee, Jasper S. Natural Resources and Environmental Technology, SecondEdition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006. Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003. Turk, Jonathan, and Amos Turk. Environmental Science, Third Edition. NewYork: CBS College Publishing, Miller, Jr, Tyler. Environmental Science, Tenth Edition. Canada: Thomson, Brook/Cole, 2004. CK12.org LGBT and Disabilities Resources: ● LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth ● LGBTQ+ Books DEI Resources: ● Learning for Justice ● GLSEN Educator Resources ● Supporting LGBTQIA Youth Resource List

Environmental Science/Natural Resources

	• Respect Ability: Fighting Stigmas, Advancing Opportunities • NJDOE Diversity, Equity & Inclusion Educational Resources • Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized enrichment materials. • An adaptive assessment that gets harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other. •	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or enrichment materials. • An adaptive assessment that gets easier or harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. •	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or enrichment materials. • An adaptive assessment that gets easier or harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other.	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

		• Allow extra time on assessments • Provide study guides • Weekly conference to set short term goals	

Environmental Science/Natural Resources

Unit Title: Unit 1- How Ecosystems Work (9 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
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9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:	Essential/Guiding Question:
Systems, order, and organization. Plant cells contain chloroplasts, the site of photosynthesis. Plants and many microorganisms use solar energy to combine molecules of carbon dioxide and water into complex, energy rich organic compounds and release oxygen to the environment.	How does the ecosystem work & change?

This process of photosynthesis provides a vital connection between the sun and the energy needs of living systems. Energy flows through ecosystems in one direction, from photosynthetic organisms to herbivores to carnivores and decomposers. As matter and energy flows through different levels of organization of living systems—cells, organs, organisms, communities—and between living systems and the physical environment, chemical elements are recombined in different ways. Each recombination results in storage and dissipation of energy into the environment as heat. Matter and energy are conserved in each change.	
Content: Energy Flow in Ecosystems The Cycling of Materials How Ecosystems Change	**Skills(Objectives):** Describe how energy is transferred from the sun to producers and then to consumers. Describe one way in which consumers depend on producers. List two types of consumers. Explain how energy transfer in a food web is more complex than energy transfer in a food chain. Explain why an energy pyramid is a representation of trophic levels. List the three stages of the carbon cycle. Describe where fossil fuels are located. Identify one way that humans are affecting the carbon cycle. List the three stages of the nitrogen cycle. Describe the role that nitrogen-fixing bacteria play in the nitrogen cycle. Explain how the excess use of fertilizer can affect the nitrogen and phosphorus cycles. List two examples of ecological succession. Explain how a pioneer species contributes to ecological succession. Explain what happens during old-field succession. Describe how lichens contribute to primary succession.
Interdisciplinary Connections: Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.	

Stage 2: Assessment Evidence

Performance Task(s): Define key terms Self-evaluation questions Group project EcoLog entry Golf Course Impacts project	**Other Evidence:** Exit ticket Questioning and answer Student generated rubric Quiz Unit assessment

Environmental Science/Natural Resources

Active Reading Worksheet Owl Pellet Dissection and research project	

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Instruction, Demonstration, pair-sharing, individual activities, cooperative learning activities

Have students write in their *EcoLog* three plants or animals and the animals that eat them;

Students examine the area around their school building to see if it is experiencing ecological succession.

Resources:

Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston,1996.
Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006.
Porter, Lynn, et. al. Environmental Science and Technology, Second Edition.
Upper Saddle River, NJ: Prentice Hall Interstate, 2003.
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CK12.org

LGBT and Disabilities Resources:

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- LGBTQ+ Books

DEI Resources:

- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities
- NJDOE Diversity, Equity & Inclusion Educational Resources
- Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized enrichment materials.	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but

Environmental Science/Natural Resources

● An adaptive assessment that gets harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other.	enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other.	remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. ● Allow extra time on assessments ● Provide study guides ● Weekly conference to set short term goals	are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

Unit Title: Unit 2- Biomes (10 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
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HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:

Species evolve over time. Evolution is the consequence of the interactions of (1) the potential for a species to increase its numbers, (2) the genetic variability of offspring due to mutation and recombination of genes, (3) a finite supply of the resources required for life, and (4)ensuing selection by the environment of those offspring better able to survive and leave offspring.

Organisms both cooperate and compete in ecosystems. The interrelationships and

Essential/Guiding Question:

How do we analyze the different levels of ecological organization in a biome?

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interdependencies of these organisms may generate ecosystems that are stable for hundreds or thousands of years. Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite. This fundamental tension has profound effects on the interactions between organisms. Organisms have behavioral responses to internal changes and to external stimuli. Responses to external stimuli can result from interactions with the organism's own species and others, as well as environmental changes; these responses either can be innate or learned. The broad patterns of behavior exhibited by animals have evolved to ensure reproductive success. Animals often live in unpredictable environments, and so their behavior must be flexible enough to deal with uncertainty and change. Plants also respond to stimuli.	
Content: What is a Biomes Forest Biomes Grassland, Desert, and Tundra Biomes	**Skills(Objectives):** Describe how plants determine the name of a biome. Explain how temperature and precipitation determine which plants grow in an area. Explain how latitude and altitude affect which plants grow in an area. List three characteristics of tropical rainforests. Name and describe the main layers of a tropical rainforest. Describe one plant in a temperate deciduous forest and an adaptation that helps the plant survive. Describe one adaptation that may help an animal survive in the taiga. Name two threats to the world's forest biomes. Describe the difference between tropical and temperate grasslands. Describe the climate in a chaparral biome. Describe two desert animals and the adaptations that help them survive. Describe one threat to the tundra biome.

Environmental Science/Natural Resources

Interdisciplinary Connections:
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Stage 2: Assessment Evidence

Performance Task(s):
Define key terms
Group project
EcoLog entry
Self-evaluation questions
Plants and Animals, ATE.

Other Evidence:
Exit ticket
Questioning and answer
Self-evaluation questions
Quiz
Unit assessment

Stage 3: Learning Plan

Learning Opportunities/Strategies:
Instruction, Demonstration, pair-sharing, individual activities, cooperative learning activities, Biome project

Students use a world map and Figure 1 to find the latitudes and biomes of certain cities. They think about how latitude might affect the type of biome that exists in each city; Explain that in the time it takes to burn a match, 97 acres of rainforest are destroyed. This equals about the size of one football field each second; list five characteristics of grasslands.

Students research two of their favorite plants or animals to find out what biome they live in. They write a paragraph about each, telling its temperature and precipitation needs, typical biome, and adaptations that help it survive. They place their writing in their Portfolio; Students taste fruits and nuts from rain forests and learn the plant and country that is the source of each food

Resources:
Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston, 1996.
Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006.
Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003.
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Differentiation
*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL

Environmental Science/Natural Resources

• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized enrichment materials. • An adaptive assessment that gets harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other. •	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or enrichment materials. • An adaptive assessment that gets easier or harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. •	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or enrichment materials. • An adaptive assessment that gets easier or harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. • Allow extra time on assessments • Provide study guides	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

		• Weekly conference to set short term goals	

Environmental Science/Natural Resources

Unit Title: Unit 2- Aquatic Ecosystems (22 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
9.3.12.AG-ENV.5 Use tools, equipment, machinery and technology common to tasks in environmental service systems.
9.3.12.AG-NR.1 Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.
9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:
Human beings live within the world's ecosystems. Increasingly, humans modify ecosystems as a result of population growth, technology, and consumption. Human destruction of habitats through direct harvesting, pollution, atmospheric changes, and other factors is threatening current global stability, and if not addressed, ecosystems will be irreversibly affected.

Natural systems have the capacity to reuse waste, but that capacity is limited. Natural systems can

Essential/Guiding Question:

What are the factors that determine where an organism lives in an aquatic ecosystem?

change to an extent that exceeds the limits of organisms to adapt naturally or humans to adapt technologically. Natural ecosystems provide an array of basic processes that affect humans. Those processes include maintenance of the quality of the atmosphere, generation of soils, control of the hydrologic cycle, disposal of wastes, and recycling of nutrients. Humans are changing many of these basic processes, and the changes may be detrimental to humans. Human activities can enhance potential for hazards. Acquisition of resources, urban growth, and waste disposal can accelerate rates of natural change. Humans have a major effect on other species. For example, the influence of humans on other organisms occurs through land use—which decreases space available to other species—and pollution—which changes the chemical composition of air, soil, and water. Marine and terrestrial environments are related, interactive, and interdependent, The ocean is an important source of food and other resources for humans Marine biology is the study of the sea's diverse inhabitants and their relationships to each other and their environments. It is important to study marine biology in order to make informed decisions about how the oceans and their resources should be used and managed How waves are created and the effect of the gravitational pull of the moon and the sun on ocean tides The exchange of energy between oceans and the atmosphere produces winds that drive ocean currents and weather patterns	
Content: Freshwater Ecosystems Marine Ecosystems Fish species of various salinity contents, habitats,prey and predators Intertidal communities, Estuaries, Coral reefs, The Open Ocean	**Skills(Objectives)** Describe the factors that determine where an organism lives in an aquatic ecosystem. Describe the littoral zone and the benthic zone that make up a lake or pond. Describe two environmental functions of wetlands. Describe one threat against river ecosystems.

Environmental Science/Natural Resources

Reading nautical charts	Explain why an estuary is a very productive ecosystem. Compare salt marshes and mangrove swamps. Describe two threats to coral reefs. Describe two threats to ocean organisms Reading nautical charts Analyze data and interpret charts to make an educated guess where a marine species may be headed utilizing a website that tracks marine species in current time.

Interdisciplinary Connections:
Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
Define key terms Group project EcoLog entry Virtual Fishing trip project Aquatic species project	Exit ticket Questioning and answer Student generated rubric Quiz Unit assessment

Stage 3: Learning Plan

Learning Opportunities/Strategies:
Instruction
Demonstration
Pair-sharing
Individual activities
Cooperative learning activities
Active Reading Worksheet

Students use a world map and Figure 1 to find the latitudes and biomes of certain cities. They think about how latitude might affect the type of biome that exists in each city; Explain that in the time it takes to burn a match, 97 acres of rainforest are destroyed. This equals about the size of one football field each second; list five characteristics of grasslands.

Resources:
Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston, 1996.
Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006.
Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003.
Turk, Jonathan, and Amos Turk. Environmental Science, Third Edition. New York: CBS College Publishing, .
Miller, Jr, Tyler. Environmental Science, Tenth Edition. Canada: Thomson,
Brook/Cole, 2004.
CK12.org

LGBT and Disabilities Resources:
- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth
- LGBTQ+ Books

DEI Resources:
- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities

Environmental Science/Natural Resources

	• NJDOE Diversity, Equity & Inclusion Educational Resources • Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized enrichment materials. • An adaptive assessment that gets harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other.	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or enrichment materials. • An adaptive assessment that gets easier or harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other.	• Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). • A personalized course packet with individualized remediation or enrichment materials. • An adaptive assessment that gets easier or harder depending on how a student is performing. • One-on-one coaching with a student, designed around his/her specific challenges. • Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. • Allow extra time on assessments	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

		• Provide study guides • Weekly conference to set short term goals	

Environmental Science/Natural Resources

Unit Title: Unit 3- Atmosphere and Climate Change (13 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
9.3.12.AG-ENV.5 Use tools, equipment, machinery and technology common to tasks in environmental service systems.
9.3.12.AG-NR.1 Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.
9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:	Essential/Guiding Question:
Weather Systems. A weather front is a transition zone between two different air masses at the Earth's surface. Each air mass has unique temperature and humidity characteristics. Often there is turbulence at a front, which is the borderline where two different air masses come together. The turbulence can cause clouds and storms.	What is the difference between weather and climate? What are the characteristics of different types of storm systems? List safety protocol for warning and watches. What is the greenhouse effect?

Environmental Science/Natural Resources

Instead of causing clouds and storms, some fronts just cause a change in temperature. However, some storm fronts start Earth's largest storms. Tropical waves are fronts that develop in the tropical Atlantic Ocean off the coast of Africa. These fronts can develop into tropical storms or hurricanes if conditions allow. Fronts move across the Earth's surface over multiple days. The direction of movement is often guided by high winds, such as Jet Streams. Landforms like mountains can also change the path of a front. There are four different types of weather fronts: cold fronts, warm fronts, stationary fronts, and occluded fronts. Heating of earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. Learning what clouds can tell us is a useful skill that will help decide if it's safe to head out for a grand day on the water or weather a storm in port. NOAA and other weather forecasts are very important, and so is a barometer, but you can also get a reliable gauge on your local weather if you think of the sky as something like the face of an emotional person whose moods are shown right on his or her face. Reliable indicators are the changing shape and color of the clouds, which are created by the same natural phenomena that cause the weather itself: temperature and humidity. Global climate is determined by energy transfer from the sun at and near the earth's surface. This energy transfer is influenced by dynamic processes, such as cloud cover and the earth's rotation, and static conditions, such as the position of mountain ranges and oceans. Natural ecosystems provide an array of basic processes that affect humans. Those processes include maintenance of the quality of the atmosphere, generation of soils, control of the hydrologic cycle, disposal of wastes, and recycling of nutrients. Humans are changing many of these basic processes, and the changes may be detrimental to humans. Materials from human societies affect both physical and chemical cycles of the earth. Natural and human-induced hazards present the need for humans to assess potential danger and risk. Many changes in the environment designed by humans bring benefits to society, as well as	What evidence is there that global warming is occurring?

cause risks. Students should understand the costs and trade-offs of various hazards—ranging from those with minor risk to a few people to major catastrophes with major risk to many people. The scale of events and the accuracy with which scientists and engineers can (and cannot) predict events are important considerations.	
Content: Weather Weather Systems Clouds Climate and Climate Change The ozone layer Global Warming	**Skills(Objectives):** Explain the difference between weather and climate. Identify and explain the different types of weather systems. How do clouds help us to predict weather? Identify four factors that determine climate. Explain why different parts of the earth have different climates. Explain what causes the seasons. Explain how the ozone layer shields the Earth from much of the sun's harmful radiation. Explain how chlorofluorocarbons damage the ozone layer. Explain the process by which the ozone hole forms. Describe the damaging effects of ultraviolet radiation. Explain why the threat to the ozone layer is still continuing today. Explain why Earth's atmosphere is like the glass in a greenhouse. Explain why carbon dioxide in the atmosphere appears to be increasing. Explain why many scientists think that the Earth's climate may be becoming increasingly warmer. Describe what a warmer Earth might be like.
Interdisciplinary Connections: Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.	

Stage 2: Assessment Evidence

Performance Task(s): Define key terms Group project EcoLog entry Weather Systems project Create your Own Island project	**Other Evidence:** Exit ticket Questioning and answer Student generated rubric Quiz Unit assessment

Stage 3: Learning Plan

Learning Opportunities/Strategies:	**Resources:**

Environmental Science/Natural Resources

Instruction, Demonstration, pair-sharing, individual activities, cooperative learning activities, Weather Systems project, Create your Own Island project Students share responses and compare the latitude of the various locations, the climates, and the possible climate influences; In their EcoLog, students list human activities that may produce gaseous emissions into the atmosphere. Ask students whether they think the seasonal temperatures have changed over the past years, and what effect this might have in the future. Students should record their responses in their EcoLog.	Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston, 1996. Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006. Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003. Turk, Jonathan, and Amos Turk. Environmental Science, Third Edition. New York: CBS College Publishing, . Miller, Jr, Tyler. Environmental Science, Tenth Edition. Canada: Thomson, Brook/Cole, 2004. CK12.org LGBT and Disabilities Resources: ● LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth ● LGBTQ+ Books DEI Resources: ● Learning for Justice ● GLSEN Educator Resources ● Supporting LGBTQIA Youth Resource List ● Respect Ability: Fighting Stigmas, Advancing Opportunities ● NJDOE Diversity, Equity & Inclusion Educational Resources ● Diversity Calendar

Differentiation

*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
● Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized enrichment materials. ● An adaptive assessment that gets harder depending on how a student is performing.	● Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials.	● Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

● One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other.	● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other.	easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. ● Allow extra time on assessments ● Provide study guides ● Weekly conference to set short term goals	

Environmental Science/Natural Resources

Unit Title: Unit 4- Nonrenewable Energy and Renewable Energy (10 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
9.3.12.AG-ENV.5 Use tools, equipment, machinery and technology common to tasks in environmental service systems.
9.3.12.AG-NR.1 Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.
9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity
HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on climate change and other natural systems.

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:	Essential/Guiding Question:
Chemical reactions may release or consume energy. Some reactions such as the burning of fossil fuels release large amounts of energy by losing heat and by emitting light. Light can initiate many chemical reactions such as photosynthesis and the evolution of urban smog.	What are the costs and benefits of humanity's demand for- and consumption of- energy from a variety of sources? What products are recycled and how can they be repurposed?

Environmental Science/Natural Resources

Human populations use resources in the environment in order to maintain and improve their existence. Natural resources have been and will continue to be used to maintain human populations. The earth does not have infinite resources; increasing human consumption places severe stress on the natural processes that renew some resources and it depletes those resources that cannot be renewed. The nuclear forces that hold the nucleus of an atom together, at nuclear distances, are usually stronger than the electric forces that would make it fly apart. Nuclear reactions convert a fraction of the mass of interacting particles into energy, and they can release much greater amounts of energy than atomic interactions. Fission is the splitting of a large nucleus into smaller pieces. Fusion is the joining of two nuclei at extremely high temperature and pressure, and is the process responsible for the energy of the sun and other stars. When we recycle, used materials are converted into new products, reducing the need to consume natural resources. If used materials are not recycled, new products are made by extracting fresh, raw material from the Earth, through mining and forestry.	
Content: Energy Resources and Fossil Fuels Nuclear Energy Renewable Energy Today Alternative Energy and Conservation Recycling and Repurposing	**Skills(Objectives):** List five factors that influence the value of a fuel. Explain how fuels are used to generate electricity in an electric power plant. Identify patterns of energy consumption and production in the world and in the United States. Explain how fossil fuels form and how they are used. Compare the advantages and disadvantages of fossil-fuel use. List three factors that influence predictions of fossil-fuel production. Describe nuclear fission.

Environmental Science/Natural Resources

	Describe how a nuclear power plant works. List three advantages and three disadvantages of nuclear energy. Explain what items are recycled and how products can be repurposed

Interdisciplinary Connections:
Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.

Stage 2: Assessment Evidence

Performance Task(s):	Other Evidence:
Define key terms Group project EcoLog entry Self-evaluation questions	Exit ticket Questioning and answer Self-evaluation questions Quiz Unit assessment

Stage 3: Learning Plan

Learning Opportunities/Strategies:
Instruction, Demonstration, pair-sharing, individual activities, cooperative learning activities,

Students look at photos showing different fuels being used for different purposes and write a reflection essay in EcoLog; Students use the visual to discuss how nuclear energy and nuclear power plants are portrayed in the media

Students research nuclear fusion and produce a report or poster describing the methods of nuclear fusion and what a fusion power plant might look like. Choose any recycled product and research ways the product can be repurposed.

Resources:
Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston, 1996.
Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006.
Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003.
Turk, Jonathan, and Amos Turk. Environmental Science, Third Edition. New York: CBS College Publishing, .
Miller, Jr, Tyler. Environmental Science, Tenth Edition. Canada: Thomson,
Brook/Cole, 2004.
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LGBT and Disabilities Resources:
- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth
- LGBTQ+ Books

DEI Resources:
- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities
- NJDOE Diversity, Equity & Inclusion Educational Resources
- Diversity Calendar

Differentiation
*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

Environmental Science/Natural Resources

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
● Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized enrichment materials. ● An adaptive assessment that gets harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other.	● Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other.	● Varying sets of reading comprehension questions to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. ● Allow extra time on assessments ● Provide study guides ● Weekly conference to set short term goals	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Environmental Science/Natural Resources

Unit Title: Unit 4- Economics, Policy, and the Future (7 days)

Stage 1: Desired Results

Standards & Indicators:

9.3.12.AG-ENV.1 Use analytical procedures and instruments to manage environmental service systems.
9.3.12.AG-ENV.2 Evaluate the impact of public policies and regulations on environmental service system operations.
9.3.12.AG-ENV.3
Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.
9.3.12.AG-ENV.4 Demonstrate the operation of environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management and energy conservation).
9.3.12.AG-ENV.5 Use tools, equipment, machinery and technology common to tasks in environmental service systems.
9.3.12.AG-NR.1 Plan and conduct natural resource management activities that apply logical, reasoned and scientifically based solutions to natural resource issues and goals.
9.3.12.AG-NR.2 Analyze the interrelationships between natural resources and humans.
9.3.12.AG-NR.3 Develop plans to ensure sustainable production and processing of natural resources.
HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
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
HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
HS-LS4-6 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12 prof.CR3a).	With a growth mindset, failure is an important part of success.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a)	Collaboration with individuals with diverse experiences can aid in the problem-solving process, particularly for global issues where diverse solutions are needed.

Central Idea/Enduring Understanding:	Essential/Guiding Question:
Learners understand that the importance and use of resources change over time and vary under different economic and technological systems. Human populations use resources in the environment in order to maintain and improve their existence. Natural resources have been and will	How does the concept of “carrying capacity” relate to both ecological and economic issues?

Environmental Science/Natural Resources

continue to be used to maintain human populations. Understanding basic concepts and principles of science and technology should precede active debate about the economics, policies, politics, and ethics of various science and technology related challenges. However, understanding science alone will not resolve local, national, or global challenges. Many factors influence environmental quality. Factors that students might investigate include population growth, resource use, population distribution, overconsumption, the capacity of technology to solve problems, poverty, the role of economic, political, and religious views, and different ways humans view the earth. Progress in science and technology can be affected by social issues and challenges. Funding priorities for specific health problems serve as examples of ways that social issues influence science and technology.	
Content: Evidence models, and explanation. Economic and Ecological issues	**Skills(Objectives):** Describe some of the challenges to achieving sustainability. Describe several major international meetings and treaties relating to the environment. Explain how economics and environmental science are related. Compare two different approaches to regulation. Give an example of a private effort to address environmental problems. Describe two major developments in U.S. environmental history. Give examples of three federal agencies that have environmental responsibilities. Explain the purpose of Environmental Impact Statements. Give an example of how citizens can affect environmental policy at each level of government—local, state, and national. Evaluate the media as a source of information about the environment

Environmental Science/Natural Resources

Interdisciplinary Connections:
Environmental science is an interdisciplinary academic field that draws on ecology, geology, meteorology, biology, chemistry, engineering, and physics to study environmental problems and human impacts on the environment. Reading and Math connections are embedded in the NGSS.

Stage 2: Assessment Evidence

Performance Task(s):
Define key terms
Group project
EcoLog entry
Self-evaluation questions
Case Study International Whaling: Conflict and Cooperation

Other Evidence:
Exit ticket
Questioning and answer
Self-evaluation questions
Quiz
Unit assessment
Student generated rubric

Stage 3: Learning Plan

Learning Opportunities/Strategies:
Instruction, Demonstration, pair-sharing, individual activities, cooperative learning activities,

From a list of environmental issues that cross borders, students choose two top priorities. Students describe in their EcoLog why enacting international agreements on these issues might be difficult; Students discuss a hypothetical expansion of a national park and its effect on local industry. Students think about what level of government should decide whether or not the park should expand.

Students read the case study and answer the Critical Thinking questions, Students think about an environmental issue that affects their lives, and the level of government most involved in decisions about the issue. Students write a letter to an appropriate official about the issue.

Resources:
Arms, Karen. Environmental Science. New York: Holt, Rinehart and Winston, 1996.
Lee, Jasper S. Natural Resources and Environmental Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2006.
Porter, Lynn, et. al. Environmental Science and Technology, Second Edition. Upper Saddle River, NJ: Prentice Hall Interstate, 2003.
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- LGBTQ-Inclusive Lesson & Resources by Garden State Equality and Make it Better for Youth
- LGBTQ+ Books

DEI Resources:
- Learning for Justice
- GLSEN Educator Resources
- Supporting LGBTQIA Youth Resource List
- Respect Ability: Fighting Stigmas, Advancing Opportunities
- NJDOE Diversity, Equity & Inclusion Educational Resources
- Diversity Calendar

Differentiation
*Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
• Varying sets of reading comprehension questions to	• Varying sets of reading comprehensi on questions	• Varying sets of reading comprehension questions to	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or

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answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized enrichment materials. ● An adaptive assessment that gets harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific for higher thinking challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can assist and challenge each other.	to answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other.	answer for a given chapter (either chosen by the teacher or student). ● A personalized course packet with individualized remediation or enrichment materials. ● An adaptive assessment that gets easier or harder depending on how a student is performing. ● One-on-one coaching with a student, designed around his/her specific challenges. ● Students grouped into small groups, which are designed around their strengths and weaknesses so that they can tutor each other. ● Allow extra time on assessments ● Provide study guides ● Weekly conference to set short term goals	IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

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Pacing Guide

Environmental Science & Natural Resources	TextBook: Natural Resources & Environmental Technology	Standards
UNIT 1: Science & the Environment Organization of Life How EcoSystems Work	**Chapters:** 1: (8 Days) 2: (11 Days) 3: (9 Days)	9.3.12.AG-ENV.1-5 9.3.12.AG-NR.1 -3 HS-LS2-1 HS-LS2-6 HS-LS4-4 HS-LS4-6 HS-LS2-7
28 Days		
UNIT 2: Biomes Aquatic Ecosystems (Part 1)	**Chapters:** 4: (10 Days) 5: (7 Days)	9.3.12.AG-ENV.1-5 9.3.12.AG-NR.1 -3 HS-LS2-1 HS-LS2-6 HS-LS4-4 HS-LS4-6 HS-LS2-7
17 Days		
UNIT 3: Aquatic Ecosystems (Part 2) Atmosphere & Climate (Part 1)	**Chapters:** 5: (15 Days) 6: (7 Days)	9.3.12.AG-ENV.1-5 9.3.12.AG-NR.1 -3 HS-LS2-1 HS-LS2-6 HS-LS4-4 HS-LS4-6 HS-LS2-7
22 Days		
UNIT 4: Atmosphere & Climate (Part 2) Non Renewable & Renewable Energy Economics, Policy, & the Future	**Chapters:** 6: (6 Days) 7: (10 Days) 8: (7 Days)	9.3.12.AG-ENV.1-5 9.3.12.AG-NR.1 -3 HS-LS2-1 HS-LS2-6 HS-LS4-4 HS-LS4-6 HS-LS2-7 HS-ESS3-4
23 Days		