



FREEHOLD REGIONAL HIGH SCHOOL DISTRICT
OFFICE OF CURRICULUM AND INSTRUCTION
MULTILINGUAL PROGRAM CURRICULUM

ML LAB ENVIRONMENTAL SCIENCE

Grade Level: 9-12

Credits: 5

BOARD OF EDUCATION ADOPTION DATE: August 27, 2026

FREEHOLD REGIONAL HIGH SCHOOL DISTRICT

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Course Name	ML Lab Environmental Science	
Course Description		
ML Environmental Science is a laboratory science course in the Multilingual Program, designed for multilingual learners and aligned to both the New Jersey Student Learning Standards for Science and the WIDA English Language Development Standards. Students examine the systems that sustain life on Earth and the human decisions that strain them — sustainability and ecological footprints, the dynamic Earth and its interacting spheres, biodiversity, population growth, land and water use, energy resources, and atmospheric pollution including acid rain, ozone depletion, and climate change. Through investigation, data analysis, and modeling, students evaluate real environmental problems and propose solutions, supported by sentence frames, word banks, and visual tools that make scientific argument accessible. The course connects directly to students’ own communities, equipping them to reason about environmental issues that affect their daily lives.		
Course Sequence and Pacing		
This course comprises 8 units totaling 97 instructional sessions. Suggested pacing is provided for each unit and section and may be adjusted in response to the language-proficiency needs of the students enrolled.		
Unit Title	Section Focus	Suggested Pacing
Unit 1: Introduction to Environmental Science & Sustainability	1.1 Sustainability	3 Sessions
	1.2 Tragedy of the Commons	2 Sessions
	1.3 Ecological Footprint	3 Sessions
Unit 2: Dynamic Earth	2.1 Layers of the Earth	3 Sessions
	2.4 Plate Boundaries	11 Sessions
Unit 3: Earth Systems	3.1 Spheres of the Earth	2 Sessions
	3.2 Biogeochemical Cycles	6 Sessions
	3.3 Biosphere and Biomes	1 Session
	3.4 Ecosystems	12 Sessions
Unit 4: Biodiversity	4.1 HIPPCO	8 Sessions
Unit 5: Populations	5.1 Carrying Capacity and Predator/Prey Relationships	3 Sessions
	5.2 Human Population	9 Sessions
Unit 6: Land and Water Use	6.1 Urbanization	5 Sessions
	6.2 Solid Waste	3 Sessions
	6.3 Agriculture and Soil	3 Sessions
	6.4 Water Resources	7 Sessions
Unit 7: Energy Resources	7.1 Nonrenewable Resources	2 Sessions
	7.2 Renewable Resources	4 Sessions
Unit 8: Atmospheric Pollution	8.1 Acid Rain	2 Sessions
	8.2 Ozone Depletion	1 Session
	8.3 Climate Change	7 Sessions
Total	8 units	97 Sessions
Support Resources		
Supporting resources and appendices for this curriculum are available. These include a Resource Catalog of standards-aligned activities, common formative assessment, and interdisciplinary items for performance expectations and objectives in this course.		
- ML Environmental Science Resource Catalog Appendix A: Accommodations and Modifications for Various Student Populations Appendix B: Assessment Evidence Appendix C: Interdisciplinary Connections		
This course is aligned to the NJSLS for Science (NJSLS-S), Life Science, Earth & Space Science, and Engineering Design performance expectations, and to the WIDA English Language Development Standards Framework, Standard 4: Language for Science. Performance expectations are		

presented in condensed form throughout this document; complete standard text is available from the New Jersey Department of Education and the WIDA Consortium.

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 3 Sessions Unit 1: Introduction to Environmental Science & Sustainability Section 1.1 – Sustainability
NJ Standards – NJSLS for Science Performance Expectations
HS-LS4-6* — Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.*
WIDA English Language Development Standards
ELD-SC 9-12 Explain Interpretive.1 — Interpret scientific explanations by: Defining investigable questions or problems based on observations, information, and/or data about a phenomenon
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [1.1.1] Identify safety equipment and procedures in the classroom [1.1.2] Identify and explain what "sustainable living" means and provide examples.
Language Objectives (LO) [1.1.3] Define "Safety" and give examples of safety rules [1.1.4] Pronounce and define critical vocabulary: [1.1.5] Environmental Science [1.1.6] Natural Resource [1.1.7] Sustainability [1.1.8] Ecological Footprint
Instructional Support
Critical Content Classroom Rules & Lab Safety Sustainability Why This Matters to Students Be able to safely conduct labs Adhere to classroom rules and maintain a safe learning environment Establish global stewardship Key Vocabulary sustainability, unsustainable, environmental science, natural resource, lab safety

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 2 Sessions Unit 1: Introduction to Environmental Science & Sustainability Section 1.2 – Tragedy of the Commons
NJ Standards – NJSLS for Science Performance Expectations
HS-LS4-6* — Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.*
WIDA English Language Development Standards
ELD-SC 9-12 Explain Interpretive.1 — Interpret scientific explanations by: Defining investigable questions or problems based on observations, information, and/or data about a phenomenon

Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [1.2.1] Identify what is "Tragedy of the Commons" and explain how "the Lorax" exemplifies "Tragedy of the Commons". [1.2.2] Explain unsustainable resource use in "the Lorax"
Language Objectives (LO) [1.2.3] Define and explain the word "unsustainable" [1.2.4] Verbalize how the "Tragedy of the Commons" is applicable to the real world.
Instructional Support
Critical Content Tragedy of the Commons - Lorax Why This Matters to Students Establish global stewardship Key Vocabulary tragedy of the commons, shared resource, overuse, common resource, depletion

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 3 Sessions Unit 1: Introduction to Environmental Science & Sustainability Section 1.3 – Ecological Footprint
NJ Standards – NJSLS for Science Performance Expectations
HS-LS4-6* — Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.*
WIDA English Language Development Standards
ELD-SC 9-12 Explain Interpretive.1 — Interpret scientific explanations by: Defining investigable questions or problems based on observations, information, and/or data about a phenomenon
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [1.3.1] Explain how ecological footprints compare resource demands and waste production required for an individual or a society.
Language Objectives (LO) [1.3.2] Establish proper language for calculating ecological footprint, such as "carbon footprint" and "biocapacity"
Instructional Support
Critical Content Ecological Footprint Why This Matters to Students Establish global stewardship Key Vocabulary

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 3 Sessions

Unit 2: Dynamic Earth

Section 2.1 – Layers of the Earth

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS1-5 — Evaluate the evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.

HS-ESS2-3 — Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection."

WIDA English Language Development Standards

ELD-SC 9-12 Explain Interpretive.3 — Interpret scientific explanations by: Evaluating the extent to which reasoning, theory and/or models link evidence to claims and support conclusions

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

[2.1.1] Identify and locate layers of the Earth -core, mantle, crust, lithosphere, asthenosphere

Language Objectives (LO)

[2.1.2] Explain where the layers of Earth are located using sentence starters, for example "the core is located in the center of the Earth"

Instructional Support

Critical Content

Layers of the Earth

Why This Matters to Students

Understand Earth's interior

Key Vocabulary

core, mantle, crust, lithosphere, asthenosphere, convection currents

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 11 Sessions

Unit 2: Dynamic Earth

Section 2.4 – Plate Boundaries

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS2-3 — Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection.

WIDA English Language Development Standards

ELD-SC 9-12 Explain Interpretive.3 — Interpret scientific explanations by: Evaluating the extent to which reasoning, theory and/or models link evidence to claims and support conclusions

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

- [2.4.1] Create a model of Pangea
- [2.4.2] Define convection currents and explain how they allow for movement of continents
- [2.4.3] Label convection currents
- [2.4.4] Identify and explain the mechanism that drives continental drift
- [2.4.5] Interpret seafloor spreading model
- [2.4.6] Differentiate between convergent, divergent, and transform boundaries
- [2.4.7] Identify associated landforms and real-world examples
- [2.4.8] Explain how convection currents move plate tectonics
- [2.4.9] Differentiate between convection, radiation, and conduction

Language Objectives (LO)

- [2.4.10] Explain the forces that split up Pangea and allowed for continents to move
- [2.4.11] Establish proper language related to the seafloor spreading model
- [2.4.12] Define and pronounce key vocabulary
- [2.4.13] Identify, pronounce, and define convection, conduction heat, radiation

Instructional Support**Critical Content**

Continental Drift
Seafloor Spreading
Convection Currents
Pangea
Plate Boundaries: convergent, divergent, transform, subduction

Why This Matters to Students

Explain the forces that allow for the movement of the continents
Understand the mechanism that drives continental drift
Understand the three types of plate boundaries that drive continental drift
Understand how heat and pressure from the Earth force plate movement

Key Vocabulary

continental drift, seafloor spreading, Pangea, plate boundary, convergent, divergent, transform, subduction

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 2 Sessions

Unit 3: Earth Systems

Section 3.1 – Spheres of the Earth

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS2-6 — Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
HS-ESS3-6 — Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

WIDA English Language Development Standards

ELD-SC 9-12 Explain Expressive.3 — Construct scientific explanations that: Develop reasoning to illustrate and/or predict the relationships between variables in a system or between components of a system

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO) [3.1.1] Identify, provide examples and explain the interconnections within the spheres of the Earth - geosphere, cryosphere, atmosphere, biosphere, hydrosphere
Language Objectives (LO) [3.1.2] Identify and pronounce key vocabulary
Instructional Support
Critical Content Spheres of the Earth - geosphere, cryosphere, atmosphere, biosphere, hydrosphere Why This Matters to Students Explain and understand how matter cycles through the spheres Key Vocabulary geosphere, cryosphere, atmosphere, biosphere, hydrosphere

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 6 Sessions Unit 3: Earth Systems Section 3.2 – Biogeochemical Cycles
NJ Standards – NJSLS for Science Performance Expectations
HS-ESS2-6 — Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. HS-ESS3-6 — Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
WIDA English Language Development Standards
ELD-SC 9-12 Explain Expressive.3 — Construct scientific explanations that: Develop reasoning to illustrate and/or predict the relationships between variables in a system or between components of a system
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [3.2.1] Define key vocabulary: combustion, decomposition, cellular respiration, photosynthesis, volcanism, diffusion, fossilization [3.2.2] Interpret carbon cycle diagrams and identify key components [3.2.3] Define key vocabulary: weathering, absorption, erosion, decomposition [3.2.4] Interpret phosphorus cycle diagrams and identify key components [3.2.5] Define key vocabulary: transpiration, evaporation, condensation, run-off, infiltration, precipitation [3.2.6] Interpret water cycle diagrams and identify key components [3.2.7] Define key vocabulary: decomposition, bacteria, plants, nitrates [3.2.8] Interpret nitrogen cycle diagrams and identify key components
Language Objectives (LO) [3.2.9] Identify and pronounce key vocabulary
Instructional Support
Critical Content Carbon Cycle Phosphorus Cycle

Hydrologic Cycle

Nitrogen Cycle

Why This Matters to Students

How Carbon cycles through the spheres

Human impact on carbon levels

How phosphorus cycles through the spheres

How water cycles through the spheres

How nitrogen cycles through the spheres

Key Vocabulary

carbon cycle, phosphorus cycle, hydrologic cycle, nitrogen cycle, combustion, decomposition, transpiration, evaporation, condensation, precipitation, run-off, infiltration

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 1 Session

Unit 3: Earth Systems

Section 3.3 – Biosphere and Biomes

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS2-6 — Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

HS-ESS3-6 — Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

WIDA English Language Development Standards

ELD-SC 9-12 Explain Expressive.3 — Construct scientific explanations that: Develop reasoning to illustrate and/or predict the relationships between variables in a system or between components of a system

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

[3.3.1] Identify common terrestrial biomes based on precipitation and temperature

[3.3.2] Differentiate between plant and animal life present in terrestrial biomes

Language Objectives (LO)

[3.3.3] Identify and pronounce key vocabulary

Instructional Support

Critical Content

Biomes of the Earth

Why This Matters to Students

Understand climate based on geographical locations, as well as flora and fauna present in various terrestrial biomes

Key Vocabulary

biome, biosphere, climate, precipitation, temperature, vegetation

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 12 Sessions

Unit 3: Earth Systems

Section 3.4 – Ecosystems

NJ Standards – NJSLS for Science Performance Expectations

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.

WIDA English Language Development Standards

ELD-SC 9-12 Explain Expressive.3 — Construct scientific explanations that: Develop reasoning to illustrate and/or predict the relationships between variables in a system or between components of a system

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

[3.4.1] A. Explain energy loss through trophic levels.

B. Calculate an accurate numeric answer to the energy available at a particular trophic level, using the 10% rule.

A. Analyze a diagram of a food web.

B. Describe how the food web is a model of an interlocking pattern of food chains that depicts the flow of energy and nutrients in two or more food chains.

[3.4.2] Define and identify examples of a keystone species in an ecosystem is a species whose activities have a particularly significant role in determining community structure.

[3.4.3] Differentiate between primary and secondary succession and explain how succession increases biodiversity

Language Objectives (LO)

[3.4.4] Define producer, consumer, decomposer, heterotroph, autotroph

[3.4.5] Identify key vocabulary by labeling a food web

[3.4.6] Explain how energy is transferred between different trophic levels

[3.4.7] Explain how keystone species are vital to the function of ecosystems

[3.4.8] Define primary succession, secondary succession, pioneer species, and climax community

Instructional Support

Critical Content

Energy pyramid, trophic levels

food webs and food chains

Keystone species

Ecological Succession

Why This Matters to Students

To understand how energy is lost through trophic levels

to understand the relationships between autotrophs and heterotrophs

To understand the role and importance of keystone species in ecosystems

To understand how ecosystems change over time

Key Vocabulary

ecosystem, energy pyramid, trophic level, food web, food chain, keystone species, producer, consumer, decomposer

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 8 Sessions

Unit 4: Biodiversity

Section 4.1 – HIPPCO

NJ Standards – NJSLS for Science Performance Expectations
HS-LS2-7* — Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
WIDA English Language Development Standards
ELD-SC 9-12 Explain Expressive.3 — Construct scientific explanations that: Develop reasoning to illustrate and/or predict the relationships between variables in a system or between components of a system
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [4.1.1] Explain how humans destroy ecosystems and habitats leading to decrease in biodiversity [4.1.2] Explain ways that humans introduce invasive species [4.1.3] Explain how invasive species have detrimental effects on habitats [4.1.4] Identify endangered species from different parts of the world [4.1.5] Explain the importance of protecting endangered species [4.1.6] Identify ways humans overexploit species and lead to their endangerment and/or extinction [4.1.7] Explain how extinction of a species has detrimental effects on other species in that ecosystem
Language Objectives (LO) [4.1.8] Identify and pronounce key vocabulary
Instructional Support
Critical Content Habitat Destructure, Invasive species, Populations, Pollution, Climate Change, Overexploitation Invasive Species Overexploitation Why This Matters to Students Understand how humans impact biodiversity Understand how humans introduce invasive species and the effects they have on ecosystems Importance of endangered species and human impact on endangered species Key Vocabulary biodiversity, habitat destruction, invasive species, population, pollution, climate change, overexploitation (HIPPCO)

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 3 Sessions Unit 5: Populations Section 5.1 – Carrying Capacity and Predator/Prey Relationships
NJ Standards – NJSLS for Science Performance Expectations
HS-LS2-1 — Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
WIDA English Language Development Standards
Interpret scientific explanations by: Evaluating the extent to which reasoning, theory and/or models link evidence to claims and support conclusions
Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

- [5.1.1] Identify limiting factors and their effects on population size
- [5.1.2] Differentiate between biotic and abiotic limiting factors
- [5.1.3] Differentiate between density dependent and density independent limiting factors
- [5.1.4] Analyze graphical relationships between predator/prey

Language Objectives (LO)

- [5.1.5] Identify and pronounce key vocabulary

Instructional Support

Critical Content

Population growth, carrying capacity, predator/prey relationships, limiting factors

Why This Matters to Students

Understand the reasons for the natural fluctuation in populations

Key Vocabulary

population growth, carrying capacity, predator/prey relationship, limiting factor, exponential growth, logistic growth

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 9 Sessions

Unit 5: Populations

Section 5.2 – Human Population

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS3-3 — Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

WIDA English Language Development Standards

Interpret scientific explanations by: Evaluating the extent to which reasoning, theory and/or models link evidence to claims and support conclusions

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

- [5.2.1] Differentiate between developed and developing countries
- [5.2.2] Explain how human population has changed over time
- [5.2.3] Distinguish between different population pyramids
- [5.2.4] Interpret population pyramids
- [5.2.5] Explain the difference in fertility rates and life expectancy in developing vs developed countries
- [5.2.6] Explain how a developing country can transition to a developed country (demographic transition)

Language Objectives (LO)

- [5.2.7] Identify and pronounce key vocabulary

Instructional Support

Critical Content

Demography, developed vs developing countries, population over time

Age structure diagrams

Demographic Transition

Why This Matters to Students

Understand how and why human population size has increased exponentially and the factors that influence human population growth

Key Vocabulary

demography, developed country, developing country, demographic transition, age structure, birth rate, death rate

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 5 Sessions

Unit 6: Land and Water Use

Section 6.1 – Urbanization

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS3-1 — Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

WIDA English Language Development Standards

Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

[6.1.1] Explain the different types of land use

[6.1.2] Identify and explain problems that stem from urbanization

[6.1.3] Identify and explain solutions to urbanization problems, such as green roofs and rain gardens

Language Objectives (LO)

[6.1.4] Identify and pronounce key vocabulary

Instructional Support

Critical Content

Urbanization, rural, urban, urban sprawl

Urbanization issues (noise pollution, light pollution, impervious surfaces, urban planning/open space)

Urbanization solutions

Why This Matters to Students

Understand land use and the urban-rural connection

Understand how the growth of cities affects people, resources, and the environment

Key Vocabulary

urbanization, rural, urban, urban sprawl, noise pollution, light pollution, impervious surface, urban planning, open space

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 3 Sessions

Unit 6: Land and Water Use

Section 6.2 – Solid Waste
NJ Standards – NJSLS for Science Performance Expectations
HS-ESS3-4* — Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* ETS1.B Developing Possible Solutions
WIDA English Language Development Standards
Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [6.2.1] Define solid waste and where it comes from A. Landfills, waste to energy B. Recycling C. Hazardous waste (Superfunds)
Language Objectives (LO) [6.2.2] Identify and pronounce key vocabulary [6.2.3] Explain how solid waste is generated and where it comes from [6.2.4] Write sentences that identify actions we can take to reduce land pollution
Instructional Support
Critical Content Landfills, Hazardous Waste, Waste Reduction, Waste Recovery Why This Matters to Students Understand actions we can take to reduce land pollution Key Vocabulary landfill, hazardous waste, waste reduction, waste recovery, recycling, municipal solid waste

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 3 Sessions Unit 6: Land and Water Use Section 6.3 – Agriculture and Soil
NJ Standards – NJSLS for Science Performance Expectations
HS-ESS3-4* — Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* ETS1.B Developing Possible Solutions
WIDA English Language Development Standards
Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO)

[6.3.1] Identify the goal of soil conservation is preventing soil erosion. [6.3.2] Describe sustainable agricultural and food production practices. A. Analyze data on why meat production is less efficient than agriculture. [6.3.3] Describe pesticide use and the pesticide treadmill
Language Objectives (LO) [6.3.4] Identify and pronounce key vocabulary [6.3.5] Define and explain what is a pesticide treadmill
Instructional Support
Critical Content Dust Bowl, erosion Sustainable agriculture Pesticides, pesticide treadmill Why This Matters to Students Understand how farmers can farm sustainably Identify how farmers use pesticides and the pesticide treadmill Key Vocabulary erosion, Dust Bowl, sustainable agriculture, pesticide, pesticide treadmill, soil, topsoil

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 7 Sessions Unit 6: Land and Water Use Section 6.4 – Water Resources
NJ Standards – NJSLS for Science Performance Expectations
HS-LS2-7* — Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*
WIDA English Language Development Standards
Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [6.4.1] Compare and contrast fresh water and salt water and explain water distribution A. Describe the characteristics of a watershed. B. Identify on a map and describe the physical and geological characteristics of a given watershed. [6.4.2] Identify how water is conserved on individual and large-scale levels
Language Objectives (LO) [6.4.3] Identify and pronounce key vocabulary [6.4.4] Write an explanation stating how water is distributed on Earth [6.4.5] Write an explanation stating where our drinking water comes from as it pertains to a watershed [6.4.6] Explain ways that people can conserve water
Instructional Support
Critical Content

Water use, water conservation, water pollution, groundwater, freshwater

Watersheds

Water conservation

Why This Matters to Students

Understand how water is distributed on Earth, where drinking water comes from, how water is used

Understand where drinking water comes from

Understand how to conserve water

Key Vocabulary

groundwater, freshwater, watershed, water conservation, water pollution, aquifer, water use

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 2 Sessions

Unit 7: Energy Resources

Section 7.1 – Nonrenewable Resources

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS3-1 — Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

WIDA English Language Development Standards

Interpret scientific explanations by: Evaluating the extent to which reasoning, theory and/or models link evidence to claims and support conclusions

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

[7.1.1] Identify types of nonrenewable resources and where they come from - coal, oil, natural gas, nuclear

Language Objectives (LO)

[7.1.2] Explain the importance of nonrenewable resources

Instructional Support

Critical Content

Coal, Oil, Natural Gas, Nuclear

Why This Matters to Students

Understand what are nonrenewable resources and how they are used for energy

Understand the importance of conserving nonrenewable resources

Key Vocabulary

nonrenewable resource, coal, oil, natural gas, nuclear, fossil fuel, extraction

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 4 Sessions

Unit 7: Energy Resources

Section 7.2 – Renewable Resources

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS3-1 — Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

WIDA English Language Development Standards
Interpret scientific explanations by: Evaluating the extent to which reasoning, theory and/or models link evidence to claims and support conclusions
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [7.2.1] Identify types of renewable resources and where they come from - solar, wind, hydroelectric, geothermal
Language Objectives (LO) [7.2.2] Explain the importance of renewable resources
Instructional Support
Critical Content Solar, Wind, Hydroelectric, Geothermal Why This Matters to Students Understand what are renewable resources and how they are used for energy Understand the importance of using renewable resources over nonrenewable resources Key Vocabulary renewable resource, solar, wind, hydroelectric, geothermal, biomass

ML ENVIRONMENTAL SCIENCE Suggested Pacing: 2 Sessions Unit 8: Atmospheric Pollution Section 8.1 – Acid Rain
NJ Standards – NJSLS for Science Performance Expectations
HS-ESS2-2 — Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.
WIDA English Language Development Standards
Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs
Standards-Aligned Objectives. Instruction will align to the following objectives: <i>Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.</i>
Content Objectives (CO) [8.1.1] A. Identify the pollutants the combustion of fossil fuels releases into the atmosphere: nitrogen oxides. B. Describe acid deposition.
Language Objectives (LO) [8.1.2] Write a statement that defines and describes what is acid rain and where it comes from
Instructional Support
Critical Content Acid deposition, acid rain Why This Matters to Students

Understand where acid rain comes from

Key Vocabulary

acid rain, acid, base, pH, acid deposition, sulfur dioxide, nitrogen oxide

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 1 Session

Unit 8: Atmospheric Pollution

Section 8.2 – Ozone Depletion

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS2-2 — Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.

WIDA English Language Development Standards

Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO)

[8.2.1] Describe the concept and process of how stratospheric ozone depletion is caused by humans

Language Objectives (LO)

[8.2.2] Explain what is ozone depletion and how it happens

Instructional Support

Critical Content

(stratospheric) ozone, ozone depletion

Why This Matters to Students

Understand how human activities cause an increase in the rate of ozone depletion

Key Vocabulary

ozone, stratospheric ozone, ozone depletion, CFCs, ultraviolet radiation

ML ENVIRONMENTAL SCIENCE

Suggested Pacing: 7 Sessions

Unit 8: Atmospheric Pollution

Section 8.3 – Climate Change

NJ Standards – NJSLS for Science Performance Expectations

HS-ESS2-2 — Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.

WIDA English Language Development Standards

Interpret scientific explanations by: Paraphrasing central ideas in complex evidence, concepts, processes, and information to help explain how or why a phenomenon occurs

Standards-Aligned Objectives. Instruction will align to the following objectives:

Objective IDs follow the Unit.Section.Objective convention (e.g., [2.1.3] = Unit 2, Section 1, Objective 3). Content Objectives (CO) state what students will know and do; Language Objectives (LO) state how students will use academic English to demonstrate it.

Content Objectives (CO) [8.3.1] Identify the effects of climate change including rising temperatures, melting permafrost and sea ice, rising sea levels, and displacement of coastal populations.
Language Objectives (LO) [8.3.2] Explain how climate change occurs [8.3.3] Describe ways humans have an effect on climate change
Instructional Support
Critical Content Effects of climate change: rising temperatures, melting permafrost and sea ice, rising sea levels, displacement of coastal populations. Why This Matters to Students Understand how human activities cause an increase in climate change and actions humans can take to reverse the effects Key Vocabulary climate, climate change, greenhouse gas, permafrost, sea ice, displacement, global temperature

NJSL Career Awareness, Exploration, Preparation, and Training, and Life Literacies and Key Skills	
9.4.12.CI.1	Demonstrate the ability to reflect, analyze, and use creative skills and ideas.
9.4.12.CI.3	Investigate new challenges and opportunities for personal growth, advancement, and transition.
9.4.12.CT.1	Identify problem-solving strategies used in the development of an innovative product or practice.
9.4.12.CT.2	Explain the potential benefits of collaborating to enhance critical thinking and problem solving.
9.4.12.CT.4	Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).
9.4.12.TL.1	Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task.
9.4.12.TL.4	Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem.
9.4.12.IML.2	Evaluate digital sources for timeliness, accuracy, perspective, credibility of the source, and relevance of information, in media, data, or other resources.
9.4.12.IML.3	Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions.
9.4.12.IML.4	Assess and critique the appropriateness and impact of existing data visualizations for an intended audience.
9.4.12.IML.7	Develop an argument to support a claim regarding a current workplace or societal/ethical issue such as climate change.
9.4.12.IML.9	Evaluate media sources for point of view, bias, and motivations.
9.4.12.IML.10	Analyze the decisions creators make to reveal explicit and implicit messages within information and media.