Science Department
Environmental Science Curriculum

Scope and Sequence

Number of Weeks (approximate) Based upon 56 minute periods in a rotating drop schedule	Unit
3-4 weeks	The Living World: Ecosystems
3-4 weeks	The Living World: Biodiversity
3-4 weeks	Populations
4 weeks	Earth Systems and Resources
4 weeks	Land and Water Use
4 weeks	Energy Resources and Consumption
4 weeks	Atmospheric Pollution
4 weeks	Aquatic Pollution
4 weeks	Global Change
3 weeks	Capstone Project: Human Impact

Unit 1

The Living World: Ecosystems

Summary and Rationale

This unit focuses on the underlying fact that the systems of the Earth are interdependent. Students will examine ecosystem resources and how species interact to compete for resources of their environment. The ecosystems and biomes explored will be understood based upon their climate and how that climate makes each ecosystem and biome individual and dynamic; thus the importance of understanding their changes with global climate shift. Ecosystems rely on the cycle of energy for survival. The availability of and ability to cycle of this energy is dependent upon humans and our activities within the ecosystems..

Recommended Pacing

4 weeks

Standards

HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
HS-ESS2-5	Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes
HS-ESS2-6	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Ecosystems are the result of biotic and abiotic interactions Energy can be converted from one form to another.	What are the biotic and abiotic factors in an ecosystem? What is a predator-prey relationship and what are the roles within that relationship based upon who hunts who? What is symbiosis? What are the types of symbiosis? How do species compete in an ecosystem? What happens between species when resources are limited? IE - food, habitat What does it mean to partition resources? What are the benefits to ecosystems of we as human populations partition resources? What is contained in a biome? In what ways do plants and animals adapt to a biome? What are the major terrestrial biomes? What factors affect the availability of natural resources in a biome and how are those resources distributed throughout the globe? IE - water, lumber How does global climate change affect the distribution of worldwide resources? Can it shift again? In what ways? What are the major freshwater biomes? Where do humans and animals acquire drinking water? What are the major marine biomes? What is the role of algae in supplying the Earth's oxygen? What is the global distribution of nonmineral marine resources (IE - types of fish) dependent upon?.

	What is the carbon cycle? How long does carbon remain in reservoirs? How does carbon cycle between photosynthesis and cellular respiration in living things? Where did our carbon stores come from? How do we utilize this carbon? What is the phosphorus cycle? How is this stored carbon changed in our atmosphere? What are the major reservoirs of phosphorus? What makes phosphorus scare in many aquatic and terrestrial ecosystems? What does it mean to say that "phosphorus is a limiting factor in undisturbed ecosystems"? What is the hydrologic cycle? How is it powered and what phases occur within it? What is Earth's primary water reservoir? What is the difference between primary productivity, gross primary productivity and net primary productivity? In what units is it measured? How are red and blue light absorbed in aquatic ecosystems and how does it affect photosynthesis? What does it mean to say that all ecosystems are dependent upon a continuous influx of energy to survive? How does the Law of Conservation of Matter work within ecosystems? More specifically, in what ways it is applied? What is a biogeochemical cycle and how are they essential to life? How does energy flow between trophic levels in various environments and ecosystems? What is the 10% rule for energy transfer in trophic levels? How are the Laws of Thermodynamics applied in ecosystems when examining trophic levels? What is the difference between a food web and a food chain? What are the positive and negative feedback loops within a food web in terms of the outcome of adding or removing a species?
Evidence of Learning (Assessments)	
Unit I Assessment: Ecosystems Various Formative Assessments Laboratory Write Ups	

Objectives (SLO)	
Students will know: Species interactions based upon availability of resources. Global distribution and principal environmental aspects of terrestrial biomes. Global distribution and principal environmental aspects of aquatic biomes The steps and reservoir interactions in the carbon cycle, nitrogen cycle, phosphorus cycle and hydrologic cycle. Acquisition of and transference of solar energy. Energy and matter flow in trophic levels. Energy patterns in ecosystems. Food chains/food webs, and their constituent members by trophic level.	Students will be able to: Define species interactions based upon the availability of resources within a specific ecosystem. Describe global distribution and principal environmental aspects of terrestrial biomes. Describe the global distribution and principal environmental aspects of aquatic biomes Explain the steps and reservoir interactions in the carbon cycle Explain the steps and reservoir interactions in the nitrogen cycle. Explain the steps and reservoir interactions in the phosphorus cycle. Explain the steps and reservoir interactions in the hydrologic cycle. Explain how solar energy is acquired and transferred by living organisms Explain how energy flows and matter cycles through trophic levels. Determine how the energy decreases as it flows through ecosystems Describe food chains and food webs, and their constituent members by trophic level.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ✓ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 2

The Living World: Biodiversity

Summary and Rationale

Biodiversity is mandatory for the survival of the world's ecosystems. The study of biodiversity examines genetic, species and habitat diversity. Without biodiversity, sustaining life in the living world becomes essentially non-existent. Impacts of both human and natural occurrences have great impacts on biodiversity and ecosystems. Organisms must adapt to these changes in order to survive and thrive. This unit lays the foundational work for students to seek out the manner in which populations change over time in later units.

Recommended Pacing

4 weeks

Standards

HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales

HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
HS-LS4-5	Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species
HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus	
Enduring Understandings:	**Essential Questions:**
Ecosystems have structure and diversity that change over time	Biodiversity in an ecosystem includes genetic, species, and habitat diversity The more genetically diverse a population is, the better it can respond to environmental stressors. Additionally, a population bottleneck can lead to a loss of genetic diversity Ecosystems that have a larger number of species are more likely to recover from disruptions Loss of habitat leads to a loss of specialist species, followed by a loss of generalist species. It also leads to reduced numbers of species that have large territorial requirements Species richness refers to the number of different species found in an ecosystem. There are four categories of ecosystem services: provisioning, regulating, cultural, and supporting. Anthropogenic activities can disrupt ecosystem services, potentially resulting in economic and ecological consequences Island biogeography is the study of the ecological relationships and distribution of organisms on islands, and of these organisms' community structures. Islands have been colonized in the past by new species arriving from elsewhere. Many island species have evolved to be specialists versus generalists because of the limited resources, such as food and territory, on most islands. The long-term survival of specialists may be jeopardized if and when invasive species, typically generalists, are introduced and outcompete the specialists. Ecological tolerance refers to the range of conditions, such as temperature, salinity, flow rate, and sunlight that an organism can endure before injury or death results. Ecological tolerance can apply to individuals and to species Natural disruptions to ecosystems have environmental consequences that may, for a given occurrence, be as great as, or greater than, many human-made disruptions. Earth system processes operate on a range of scales in terms of time. Processes can be periodic, episodic, or random Earth's climate has changed over geological time for many reasons Sea level has varied significantly as a result of changes in the amount of glacial ice on Earth over geological time Major environmental change or upheaval commonly results in large swathes of habitat changes Wildlife engages in both short- and long-term migration for a variety of reasons, including natural disruptions.

	Organisms adapt to their environment over time, both in short- and long-term scales, via incremental changes at the genetic level. Environmental changes, either sudden or gradual, may threaten a species' survival, requiring individuals to alter behaviors, move, or perish There are two main types of ecological succession: primary and secondary succession. A keystone species in an ecosystem is a species whose activities have a particularly significant role in determining community structure. An indicator species is a plant or animal that, by its presence, abundance, scarcity, or chemical composition, demonstrates that some distinctive aspect of the character or quality of an ecosystem is present. Pioneer members of an early successional species commonly move into unoccupied habitat and over time adapt to its particular conditions, which may result in the origin of new species. Succession in a disturbed ecosystem will affect the total biomass, species richness, and net productivity over time.
Evidence of Learning (Assessments)	
Unit 2 Assessment: Biodiversity Various Formative Assessments Laboratory Write Ups	
Objectives (SLO)	
Students will know: Biodiversity is essential for sustaining life on earth. The concept of ecosystem services and the human impact related. The definition of island biogeography and the role it has played in evolution. The concept of ecological tolerance and the role it has played in the process and progression of biodiversity in ecosystems. The process of adaptation for species in their environment in response to both internal and external factors. The process of succession and how it builds ecosystems.	Students will be able to: Explain levels of biodiversity and their importance to ecosystems. Describe ecosystem services. Describe the results of human disruptions to ecosystem services Describe island biogeography Describe the role of island biogeography in evolution Describe ecological tolerance. Explain how natural disruptions, both short and long-term, impact an ecosystem. Describe how organisms adapt to their environment. Describe ecological succession. Describe the effect of ecological succession on ecosystems.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach

- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ✓ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 3

Populations

Summary and Rationale

In the natural living world, there are a number of events that shift populations. In this unit students will look at the relationship between species and habitats over time focusing on specialist and generalist species. Students will examine reproductive patterns of K and r selected species and the impact of those in populations. Populations within ecosystems change over time in response to a variety of factors. In addition to the individual species changes over time, students will examine limiting factors of population growth such as resources and space. Later in units, students will apply this knowledge to examine how populations affect all other components of the environment.

Recommended Pacing

4 weeks

Standards

HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
HS-ESS3-3	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity
HS-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Populations change over time in reaction to a variety of factors. Human populations change in reaction to a variety of factors, including social and cultural factors	What are the different types of species and how do they interact differently with their environments? What are the different reproductive strategies of the different species types? What is meant by the phrase “biotic potential”? What does it mean for a species to be invasive in an ecosystem? How do invasive species affect other species in an ecosystem? What is a survivorship curve and what data does it provide us about an ecosystem? What is carrying capacity and what happens when it is exceeded or not met in relation to the ecosystem itself? What dictates trends in population growth and what measures do we look at associated with population growth to determine what is happening within the population? What is the “Rule of 70” and how does it apply to populations and ecosystems?

Evidence of Learning (Assessments)

Unit 3 Assessment: Populations
Various Formative Assessments
Laboratory Write Ups

Objectives (SLO)	
Students will know: The various types of species in an ecosystem and how their identity determines their footprint on and interactions with an ecosystem. The mathematical representations of populations such as survivorship curves, carrying capacity, fertility and death rates, etc. The factors that affect how populations grow, stagnate or become limited.	Students will be able to: Identify differences between generalist and specialist species. Identify differences between K- and r-selected species Explain survivorship curves. Describe carrying capacity. Describe the impact of carrying capacity on ecosystems. Explain how resource availability affects population growth Explain age structure diagrams. Explain factors that affect total fertility rate in human populations. Explain how human populations experience growth and decline Define the demographic transition.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE “Take a stab at it.” Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ○ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.

✓ Work productively in teams while using cultural global competence. Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf
LINKS TO CAREERS: *Careers in Environmental Science*

Unit 4	
Earth Systems and Resources	
Summary and Rationale	
In this unit, students will explore earth's systems. Students will look specifically at how the earth was formed and the origins of the landscape that we currently see. The unit will bring together the creation of earth's resources in relation to sustaining life and understanding how the materials on earth are finite. Students will then gain full perspective in looking at the resources directly from the earth and elevating that perspective through exploration of the atmosphere, the sun, air, water and understanding the role of climate in the process.	
Recommended Pacing	
4 weeks	
Standards	
HS-ESS2-1	Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features
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
HS-ESS2-3	Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection
HS-ESS2-4	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate
HS-ESS1-5	Evaluate 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-ESS1-6	Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history
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

Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Earth's systems interact, resulting in a state of balance over time Most of the Earth's atmospheric processes are driven by input of energy from the sun.	What are the types of boundaries in the plates of the Earth and what types of landforms are created with their movement? How can maps be utilized to understand the location of boundaries and predict what events can happen based upon locations and interactions? What are the parameters of an earthquake? How are soils formed and what are the results of soil movement in natural systems? What are the different types and compositions of soils? How do their characteristics compare? What is the concept of water holding capacity and how does it vary dependent upon soil type? What are the methods we use to identify and manipulate soil? What is a soil texture triangle? What is the composition of the atmosphere based upon its layers, contents of gases and other characteristics? What is the relationship between the sun and global wind patterns? What are the factors affecting global climate?

	How does the sun's differ on the globe dependent upon factors such as earth's shape, sun angle, season and latitude? What is a watershed and what are some of the different characteristics of them? What is a rain shadow? What are el Niño and la Niña and what are their effects on the globe? Why are they considered to be a phenomenon?

Evidence of Learning (Assessments)

Unit 4 Assessment: Earth and its Resources
Various Formative Assessments
Laboratory Write Ups

Objectives (SLO)

Students will know: Soils, types of and properties of. Atmospheric composition of the Earth. Results of environmental factors on atmospheric circulation. Watersheds, characteristics and contents of. The role of the sun in the interaction with the Earth's surface. Weather and climate as dependent upon the geography of the Earth. The concept of el Niño and la Niña and how those two patterns influence weather and climate on earth.	Students will be able to: Describe the characteristics and formation of soil Describe similarities and differences between the properties of different soil types. Describe the structure and composition of the Earth's atmosphere Explain how environmental factors can result in atmospheric circulation Describe the characteristics of a watershed. Explain how the sun's energy affects the Earth's surface. Describe how the Earth's geography affects weather and climate. Describe the environmental changes and effects that result from el Niño or la Niña events (El Niño–Southern Oscillation).

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.

- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ○ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 5

Land and Water Use

Summary and Rationale

Humans are an integral part of the processes on earth, both in positive and negative ways. In this unit, students will explore the ways in which humans influence ecosystems, both land and water. In addition to establishing this human impact on land and water, students will delve into the ways in which these influences impact the environment and how those impacts can be monitored and controlled where necessary. This unit will provide the foundation for later examine impacts on the environment from a larger perspective.

Recommended Pacing

4 weeks

Standards

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

HS-ESS3-4	Evaluate or refine a technological solution that reduces impacts of human activities on natural systems
HS-ESS3-5	Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems
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
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
When humans use natural resources, they alter natural systems. Humans can mitigate their impact on land and water resources through sustainable use.	How is human selfishness harming our earth? What are the effects of clearcutting on humans and the Earth? What does The Green Revolution in agriculture aim to do? What are the focus areas of The Green Revolution in agriculture? What are the potential outcomes of The Green Revolution in agriculture, both positive and negative? What are the harmful agricultural practices that The Green Revolution aims to curb? What is the percentage of water on earth used for irrigation?

	What are the common types irrigation practices in agriculture as well as the negative impacts they have on the environment? What are common pest control measures in agriculture? What are the impacts of using pest control methods in agriculture? How has science changed crops themselves to control pests? How does the process of meat production and agriculture for meat differ? What happens in each process of meat production and what are the effects of those processes on the environment? When there are negative effects on a localized agriculture environment (IE-desertification from overgrazing), how does that affect ecosystems and other environments in the area and beyond? What is overfishing and what are the effects on an ecosystem as a result of it? How are natural resources mined? What are the impacts of each of those types of mining? What is urbanization and what effects does it have on the environment and populations? What is an ecological footprint? (carbon footprint? In what ways can we control our ecological footprint as individuals and as entire populations? How can humans inhabit earth, use its resources responsibly and not cause depletion? How can we change our environments, forestry practices, building practices, agricultural practices, pest management practices and general living practices to build sustainable practices? What is aquaculture and what impact does it have on the environment?
Evidence of Learning (Assessments)	
Unit 5 Assessment: Land and Water Use Various Formative Assessments Laboratory Write Ups	
Objectives (SLO)	
Students will know: The tragedy of the commons by examining the selfishness of the human population in relation to earth's resources. Our human practices of agriculture, forestry, pest management and building/development have impacts on the environment that are far reaching and often harmful.	Students will be able to: Explain the concept of the tragedy of the commons. Describe the effect of clearcutting on forests. Describe changes in agricultural practices. Describe agricultural practices that cause environmental damage. Describe different methods of irrigation in agriculture as well as the benefits and drawbacks associated with each.

The goal of sustainable practices is to shift processes of human life to those that allow usage of resources without depletion. Sustainable practices have many benefits but also some negative impacts. Building capacity to sustainable living means consideration of all of the impacts to the environment.	Describe methods of pest control in agriculture and the benefits and drawbacks of each. Discuss the concept of genetically modified foods for the purpose of pest control. Identify different methods of meat production and the benefits and drawbacks of each. Describe causes of and problems related to overfishing. Describe natural resource extraction through mining. Describe ecological and economic impacts of natural resource extraction through mining. Describe the effects of urbanization on the environment. Explain the variables measured in an ecological footprint Explain the concept of sustainability Describe methods for mitigating problems related to urban runoff. Describe integrated pest management. Describe the benefits and drawbacks of integrated pest management (IPM). Describe sustainable agricultural and food production practices Describe the benefits and drawbacks of aquaculture. Describe methods for mitigating human impact on forests.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.

- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ○ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.

- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 6

Energy Resources and Consumption

Summary and Rationale

In this unit, students will examine human consumption of natural and renewable resources as well as the impact that consumption has on the environment. Students will be able to relate availability and usage of resources to topics such as geologic history of the area, development of the nation, etc.

Recommended Pacing

4 weeks

Standards

HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Humans use energy from a variety of sources, resulting in positive and negative consequences.	What is the difference between renewable and nonrenewable energy resources? What are the different effects of usage of renewable versus nonrenewable energy for the planet? How does the concept of a nation being “developed” or “underdeveloped” related to its need for energy and resources? What is the mapping of energy usage throughout the globe? What patterns emerge when looking at a map of energy usage for the globe related to the individual needs of people and nations? What are the world’s natural resources, how are they used and what are the consequences, positive and negative, of using both? How are fossil fuels used to generate power? What are the specific steps or processes in the usage of fossil fuels to generate power?

	What is hydrologic fracturing and what are the positives and negatives associated with the process? What is the detailed process of using nuclear material to generate power? What is the best material to utilize for nuclear power? What are the most devastating nuclear accidents of our time? What have been the impacts of those incidents? What is biomass and how is it utilized in power generation? How are the power of the sun, water, gerothermals, hydrogen and wind utilized for energy purposes and power generation? What is the benefit of utilizing alternative power over others? In what ways can energy be conserved?
Evidence of Learning (Assessments)	
Unit 6 Assessment: Energy Resources and Consumption Various Formative Assessments Laboratory Write Ups	
Objectives (SLO)	
Students will know: The concept of renewable versus nonrenewable resources. The availability of resources based upon global location and geophysical history. The sources of both nonrenewable and renewable energy sources. Types and systems of usage for renewable resources. Ways in which to begin and continue the process of energy conservation overall.	Students will be able to: Identify differences between nonrenewable and renewable energy sources. Describe trends in energy consumption. Identify types of fuels and their uses. Identify where natural energy resources occur. Describe the use and methods of fossil fuels in power generation. Describe the effects of fossil fuels on the environment. Describe the use of nuclear energy in power generation. Describe the effects of the use of nuclear energy on the environment. Describe the effects of the use of biomass in power generation on the environment. Describe the use of solar energy in power generation Describe the effects of the use of solar energy in power generation on the environment. Describe the use of hydroelectricity in power generation Describe the effects of the use of hydroelectricity in power generation on the environment. Describe the use of geothermal energy in power generation. Describe the effects of the use of geothermal energy in power generation on the environment. Describe the use of hydrogen fuel cells in power generation. Describe the effects of the use of hydrogen fuel cells in power generation on the environment. Describe the use of wind energy in power generation.

	Describe the effects of the use of wind energy in power generation on the environment. Describe methods for conserving energy.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE “Take a stab at it.” Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ○ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 7

Atmospheric Pollution	
Summary and Rationale	
In this unit, students will explore indoor and outdoor air pollution. Students will examine the pollutants in the air, their origins and the effects on populations and environs. In addition to studying the current state of air pollution, students will also dig into actions of populations and governments to try and address associated issues.	
Recommended Pacing	
4 weeks	
Standards	
HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Human activities have physical, chemical, and biological consequences for the atmosphere	Where does air pollution come from, both indoors and outdoors? How are living organisms and environments affected when exposed to air pollution? What is thermal inversion and what is its relationship to pollution? What are the natural sources of carbon dioxide? Where do particulates come from? How can air pollution be controlled when engaging a method of control from the source? What is acid deposition and what are the effects of it on the environment? What is the difference between sound and noise? When does noise become a pollutant and what part do humans play in that pollution? What are the environmental effects of noise pollution?

Evidence of Learning (Assessments)
Unit 7 Assessment: Atmospheric Pollution Various Formative Assessments Laboratory Write Ups

Objectives (SLO)	
Students will know: The definitions for several types of pollution and the effects on living organisms and their environments. The origins of pollution. The manner in which to control pollution of different types.	Students will be able to: Identify the sources and effects of air pollutants. Explain the causes and effects of photochemical smog and methods to reduce it. Describe thermal inversion and its relationship with pollution. Describe natural sources of CO2 and particulates. Identify indoor air pollutants. Describe the effects of indoor air pollutants. Explain how air pollutants can be reduced at the source. Describe acid deposition.

	Describe the effects of acid deposition on the environment. Describe human activities that result in noise pollution and its effects.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE “Take a stab at it.” Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ✓ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 8	
Aquatic and Terrestrial Pollution	
Summary and Rationale	
In this unit, students will examine the impact of human actions as related to pollution as well as the impacts on the health and lifestyles of humans. Students will examine the inner workings and relationship between pollution in water and on land.	
Recommended Pacing	
4 weeks	
Standards	
HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning

	and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Human activities, including the use of resources, have physical, chemical, and biological consequences for ecosystems. Pollutants can have both direct and indirect impacts on the health of organisms, including humans	What is the difference between point and nonpoint sources of pollution? What effects do humans have on aquatic ecosystems based upon interactions? What are endocrine disruptors and what effects do they have on ecosystems? What are the effects of human activity on wetlands and mangroves? What are the effects on ecosystems from the use of man-made products such as detergents and fertilizers? What is biomagnification? What is bioaccumulation? What effects do biomagnification and bioaccumulation have on ecosystems? What are the various methods of waste disposal and what challenges are there with ensuring that disposal methods are appropriate? How does the water treatment process work? What is a dose response curve? In what ways is pollution harmful to humans and what overall negative health impacts do we know are a direct result of it?

Evidence of Learning (Assessments)

Unit 8 Assessment: Aquatic and Terrestrial Pollution
Various Formative Assessments
Laboratory Write Ups

Objectives (SLO)	
Students will know: The effects of human interactions in water and on land and the pollution that results from those interactions. The specific ways in which humans cause disruptions and pollutants to aquatic and terrestrial ecosystems. The process of waste accumulation and disposal. The management of waste on Earth and the challenges it poses. The process of water treatment. Health issues that have been identified as being caused by pollutants.	Students will be able to: Identify differences between point and nonpoint sources of pollution. Describe the impacts of human activities on aquatic ecosystems Describe endocrine disruptors. Describe the effects of endocrine disruptors on ecosystems. Describe the impacts of human activity on wetlands and mangroves. Explain the environmental effects of excessive use of fertilizers and detergents on aquatic ecosystems Describe the effects of thermal pollution on aquatic ecosystems Describe the effect of persistent organic pollutants (POPs) on ecosystems Describe bioaccumulation and biomagnification. Describe the effects of bioaccumulation and biomagnification Describe solid waste disposal methods. Describe the effects of solid waste disposal methods. Describe changes to current practices that could reduce the amount of generated waste and their associated benefits and drawbacks. Describe best practices in sewage treatment Evaluate dose response curves. Identify sources of human health issues that are linked to pollution Identify sources of human health issues that are linked to pollution. Explain human pathogens and their cycling through the environment.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals

- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ✓ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science

Unit 9

Global Change

Summary and Rationale

This unit is a culmination of all of the topics individually explored in this course. Students will take a broad view perspective on how we, as humans, are affecting our planet and the relationships between those actions and the outcomes we are experiencing, both positive and negative. Students will have the opportunity to examine some real life struggles and examine possible solutions as well as evaluate steps currently being taken to try and address current environmental science issues.

Recommended Pacing

4 weeks

Standards	
HS-LS2-1	Use mathematical and/or computational representations to support explanations of factors that affect the carrying capacity of ecosystems at different scales
HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales
HS-LS2-3	Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem
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-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
Interdisciplinary Connections	
NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
NJSLSA.R2	Determine the central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
RI.11-12.1 RI.9-10.1	Accurately cite strong and thorough textual evidence, (e.g., via discussion, written response, etc.), to support analysis of what the text says explicitly as well as inferentially, including determining where the text leaves matters uncertain.
NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
Integration of Technology	
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus	
Enduring Understandings:	**Essential Questions:**
Local and regional human activities can have impacts at the global level. The health of a species is closely tied to its ecosystem, and minor environmental changes can have a large impact.	Why is ozone important? Specifically in terms of the needs for survival of life on earth. What are CFC's and what alternatives have been brought forth in their place? What is the greenhouse effect and what are the gases involved in the process? What is the danger to humans and other living organisms in terms of the greenhouse effect? What are the effects of climate change on ecosystems in terms of long-term and short-term examination? What causes ocean warming and what impact is it having on aquatic ecosystems? What is ocean acidification and what impact does it have on the ocean as an ecosystem? What does it mean for a species to be invasive? What problems do invasive species cause? What can be done to control invasive species? What does it take for a species to be endangered? What steps are being taken in action of protecting endangered species? What effects do humans have on the biodiversity of our earthly ecosystem and what is being done to control the negative effects of human actions?
Evidence of Learning (Assessments)	
Unit 9 Assessment: Global Change Various Formative Assessments Laboratory Write Ups	
Objectives (SLO)	
Students will know: The role of ozone in protecting the earth. The process of global climate change and its associated outcomes such as acidification of the oceans, warming of the oceans, decreased biodiversity, etc. The proposed and managed solutions for negative human impacts on Earth.	Students will be able to: Explain the importance of stratospheric ozone to life on Earth. Describe chemicals used to substitute for chlorofluorocarbons (CFCs). Identify the greenhouse gases. Identify the sources and potency of the greenhouse gases. Identify the threats to human health and the environment posed by an increase in greenhouse gases. Explain how changes in climate, both short- and long-term, impact ecosystems. Explain the causes and effects of ocean warming. Explain the causes and effects of ocean acidification.

	Explain the environmental problems associated with invasive species and strategies to control them Explain how species become endangered and strategies to combat the problem Explain how human activities affect biodiversity and strategies to combat the problem.

Suggested Resources/Technology Tools

AP/IB Resources and Activities Environmental Science
AP College Board Manual
State of Wisconsin Environmental Resources and Activities
TedEd
EPA Resources
National Science Foundation Resources
https://www.worldof7billion.org/teacher-resources/high-school-activities/
NSTA Free Teacher Resource
https://www.teachengineering.org/

Modifications

General Modifications for students struggling to learn:

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

ELL

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow ELL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE “Take a stab at it.” Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

G/T

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

21ST CENTURY LIFE AND CAREER STANDARDS

Please select all standards that apply to this unit of study:

- ✓ Act as a responsible and contributing citizen and employee.
- ✓ Apply appropriate academic and technical skills.
- ✓ Attend to personal health and financial well being.
- ✓ Communicate clearly and effectively and with reason.
- ✓ Consider the environmental social and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Employ valid and reliable research strategies.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ✓ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity.
- ✓ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Careers in Environmental Science