

EGG HARBOR TOWNSHIP PUBLIC SCHOOLS CURRICULUM

COLLEGE PREP (CP) Environmental Science High School

Length of Course: Full Year

Elective / Required: Refer to Program of Studies

Schools: High School

Student Eligibility: Grades 10 -12

Credit Value: 5 credits

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DISTRICT MISSION STATEMENT

Our mission in the Egg Harbor Township School District is to partner with the student, family, school, and community to provide a safe learning environment that addresses rigorous and relevant 21st Century standards and best practices which will develop academic scholarship, integrity, leadership, citizenship, and the unique learning style of students, while encouraging them to develop a strong work ethic and to act responsibly in their school community and every day society.

SCIENCE – PHILOSOPHY

We believe that ALL students regardless of race, ethnicity, socio-economic status, religious background, and/or any other classification are deserving of a holistic science education. This holistic approach would include an education that will allow them to fully discover themselves, their strengths and weaknesses, and benefit from science instruction.

Scientific literacy assumes an increasingly important role in the context of globalization. The rapid pace of technological advances, access to an unprecedented wealth of information, and the pervasive impact of science and technology on day-to-day living require a depth of understanding that can be enhanced through quality science education. In the 21st century, science education focuses on the practices of science that lead to a greater understanding of the growing body of scientific knowledge that is required of citizens in an ever-changing world (NJCCCS-Science).

Science curricula are designed to reinforce 21st Century Learning, to maximize rigor, relevance, and relationships, and to engage students individually through differentiated instruction.

SCIENCE - STATEMENT OF PURPOSE

Education exists for the purpose of enabling each individual to realize and maintain her/his full potential. Scientifically literate students possess the knowledge and understanding of scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity.

Science, engineering, and technology influence and permeate every aspect of modern life. Some knowledge of science and engineering is required to engage with the major public policy issues of today as well as to make informed everyday decisions, such as selecting among alternative medical treatments or determining how to invest public funds for water supply options. In addition, understanding science and the extraordinary insights it has produced can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives. In these contexts,

learning science is important for everyone, even those who eventually choose careers in fields other than science or engineering (NJSL-Science)

All students engage in science experiences that promote the ability to ask, find, or determine answers to questions derived from natural curiosity about everyday things and occurrences. The underpinning of the revised standards lies in the premise that science is experienced as an active process in which inquiry is central to learning and in which students engage in observation, inference, and experimentation on an ongoing basis, rather than as an isolated a process. When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others in their community and around the world. They actively develop their understanding of science by identifying their assumptions, using critical and logical thinking, and considering alternative explanations (NJCCCS-Science).

Our school district provides an extensive science program, which will enable students to succeed and compete in the global marketplace using the New Jersey Student Learning Standards in Science as well as the Next Generation Science Standards.

INTRODUCTION

The most precious resource teachers have is time. Regardless of how much time a course is scheduled for, it is never enough to accomplish all that one would like. Therefore, it is imperative that teachers utilize the time they have wisely in order to maximize the potential for all students to achieve the desired learning.

High quality educational programs are characterized by clearly stated goals for student learning, teachers who are well-informed and skilled in enabling students to reach those goals, program designs that allow for continuous growth over the span of years of instruction, and ways of measuring whether students are achieving program goals.

THE EGG HARBOR TOWNSHIP SCHOOL DISTRICT CURRICULUM TEMPLATE

The Egg Harbor Township School District has embraced the backward-design model as the foundation for all curriculum development for the educational program. When reviewing curriculum documents and the Egg Harbor Township curriculum template, aspects of the backward-design model will be found in the stated enduring *understandings/essential questions, unit assessments, and instructional activities*. Familiarization with backward-design is critical to working effectively with Egg Harbor Township's curriculum guides.

GUIDING PRINCIPLES: WHAT IS BACKWARD DESIGN? WHAT IS UNDERSTANDING BY DESIGN?

“Backward design” is an increasingly common approach to planning curriculum and instruction. As its name implies, “backward design” is based on defining clear goals, providing acceptable evidence of having achieved those goals, and then working ‘backward’ to identify what actions need to be taken that will ensure that the gap between the current status and the desired status is closed.

Building on the concept of backward design, Grant Wiggins and Jay McTighe (2005) have developed a structured approach to planning programs, curriculum, and instructional units. Their model asks educators to state goals; identify deep understandings, pose essential questions, and specify clear evidence that goals, understandings, and core learning have been achieved.

Programs based on backward design use desired results to drive decisions. With this design, there are questions to consider, such as: What should students understand, know, and be able to do? What does it look like to meet those goals? What kind of program will result in the outcomes stated? How will we know students have achieved that result? What other kinds of evidence will tell us that we have a quality program? These questions apply regardless of whether they are goals in program planning or classroom instruction.

The backward design process involves three interrelated stages for developing an entire curriculum or a single unit of instruction. The relationship from planning to curriculum design, development, and implementation hinges upon the integration of the following three stages.

Stage I: Identifying Desired Results: Enduring understandings, essential questions, knowledge and skills need to be woven into curriculum publications, documents, standards, and scope and sequence materials. Enduring understandings identify the “big ideas” that students will grapple with during the course of the unit. Essential questions provide a unifying focus for the unit and students should be able to answer more deeply and fully these questions as they proceed through the unit. Knowledge and skills are the “*stuff*” upon which the understandings are built.

Stage II: Determining Acceptable Evidence: Varied types of evidence are specified to ensure that students demonstrate attainment of desired results. While discrete knowledge assessments (e.g.: multiple choice, fill-in-the-blank, short answer, etc...) will be utilized during an instructional unit, the overall unit assessment is performance-based and asks students to demonstrate that they have mastered the desired understandings. These culminating (summative) assessments are authentic tasks that students would likely encounter in the real-world after they leave school. They allow students to demonstrate all that they have learned and can do. To demonstrate their understandings students can explain, interpret, apply, provide critical and insightful points of view, show empathy and/or evidence self-knowledge. Models of student

performance and clearly defined criteria (i.e.: rubrics) are provided to all students in advance of starting work on the unit task.

Stage III: Designing Learning Activities: Instructional tasks, activities, and experiences are aligned with stages one and two so that the desired results are obtained based on the identified evidence or assessment tasks. Instructional activities and strategies are considered only once stages one and two have been clearly explicated. Therefore, congruence among all three stages can be ensured and teachers can make wise instructional choices.

At the curricular level, these three stages are best realized as a fusion of research, best practices, shared and sustained inquiry, consensus building, and initiative that involves all stakeholders. In this design, administrators are instructional leaders who enable the alignment between the curriculum and other key initiatives in their district or schools. These leaders demonstrate a clear purpose and direction for the curriculum within their school or district by providing support for implementation, opportunities for revision through sustained and consistent professional development, initiating action research activities, and collecting and evaluating materials to ensure alignment with the desired results. Intrinsic to the success of curriculum is to show how it aligns with the overarching goals of the district, how the document relates to district, state, or national standards, what a high quality educational program looks like, and what excellent teaching and learning looks like. Within education, success of the educational program is realized through this blend of commitment and organizational direction.

INTENT OF THE GUIDE

This guide is intended to provide teachers with course objectives and possible activities, as well as assist the teacher in planning and delivering instruction in accordance with the New Jersey Core Curriculum Content Standards. The guide is not intended to restrict or limit the teacher's resources or individual instruction techniques. It is expected that the teacher will reflectively adjust and modify instruction and units during the course of normal lessons depending on the varying needs of the class, provided such modified instruction attends to the objectives and essential questions outlined below.

N.J.A.C. 6A:8-3.1 Required Curriculum Components

Code Language	Evident in Curriculum YES/NO	Comments
Interdisciplinary Connections	Yes	Via lab activities. STEM units in development 1 per marking period
A pacing guide	Yes	By Unit approximately 2-4 units per marking period
A list of core instructional materials, including various levels of text at each grade level	Yes	Suggested Activities Labs
Benchmark assessments	Yes	Teacher-developed and common via pre/post and benchmark assessments
Modifications for special education students, for ELLs in accordance with N.J.A.C. 6A:15, and for gifted students. (As appropriate) – See Appendix A	Yes	As directed by student’s Individual Education Plan

Unit Name: Introduction to Environmental Science Time Frame: Two Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to familiarize the students with Environmental Science. The students will also review and revisit the scientific method and processes.

UNIT RESOURCES-Environmental Science Textbook– Ch. 1 An Introduction to Environmental Science; Student Kept Binders; Laboratory Assignments

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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.

The goal of this unit is for the students to realize that ideas in science are tested in multiple ways and also peer reviewed.

ENDURING UNDERSTANDINGS

The big idea for this unit is how scientists uncover, research and solve environmental problems.. The students will gain knowledge on the basic concept of Tragedy of the Commons. The misunderstanding coming into class may be what a true peer-reviewed article or experiment is.

ESSENTIAL QUESTIONS

1. How do scientists do science?

KNOWLEDGE AND SKILLS

Content: Vocabulary- environment, environmental science, environmentalism, natural resource, sustainable, fossil fuel, ecological footprint, hypothesis, prediction, ethics, theory, peer review, controlled study, data, dependent variable

Skills:

Model the concept of tragedy of the commons

Compare and contrast ecological footprints from around the world

Design an experiment using the scientific method

Model the importance of communication in peer reviewed communities

STAGE TWO

PERFORMANCE TASKS

Design an experiment using the steps of the scientific method
Complete a lab testing the authenticity of supposed “green” cleaners
Using written communication only to describe how to build a structure to another group

OTHER EVIDENCE

-Test on Chapter 1

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint’s and the NBC Learn videos shown to first begin their knowledge of each topic in this unit. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily “Do Now” questions as well as exit questions that will be graded, returned to the students and the correct answers explained. Students may need more time on understanding the importance of peer review.

Unit Name: Ecology

Time Frame: Nine Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to understand that life on Earth depends on interactions among organisms and between organisms and their environment.

UNIT RESOURCES- Environmental Science Textbook – Ch.4 Population Ecology, Ch.5 Evolution and Community Ecology, Ch. 6 Biomes and Aquatic Ecosystems, Ch. 7. Biodiversity and Conservation; Student Kept Binders; Laboratory Assignments

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

- HS-LS2-1** Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
- HS-LS2-2** 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-LS2-5** Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
- 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-LS2-7** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
- HS-LS2-8** Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

The goal of this unit is for the students to realize that our planet is an interconnected web that is also influenced by human activity.

ENDURING UNDERSTANDINGS

The big idea for this unit is that life on Earth depends on interactions between organisms and also between organisms and their environment. The misunderstanding coming into class is that humans are not involved in food webs or in classification of ecosystems. In actuality we can be the most damaging factor in an ecosystem but we are still a part of that ecosystem.

ESSENTIAL QUESTIONS

1. How do changes in population size relate to environmental conditions?
2. How do organisms affect one another's survival and environment?
3. How does the environment affect where and how an organism lives?
4. Why is it important to protect biodiversity?

KNOWLEDGE AND SKILLS

Content: Vocabulary- ecology, species, population, community, ecosystem, biosphere , biotic factor, abiotic factor, habitat, resource, population size, population density, age structure, survivorship curve, exponential growth, limiting factor, carrying capacity, natural selection, coevolution, herbivory, decomposer, biomass, keystone species, biome, estivation, littoral zone, biodiversity, captive breeding, extirpation

Skills:

Define biodiversity and explain how biodiversity is decreasing and how we can protect biodiversity

Identify the abiotic and biotic factors that are used to classify biomes

Explain the role the environment play in an organism's survival and reproduction

Identify how species interact in nature

Identify how communities respond to a disturbance

Name the factors that determine whether and how a population's size changes

Identify how ecologists organize life

STAGE TWO

PERFORMANCE TASKS

Draw out the levels of organization in an ecosystem

Construct an age structure diagram using Microsoft Excel

Model how population size changes in a prey population when higher numbers of predator are introduced.

Perform quadrant sampling outside

Using pond water from the WHIP garden, identify the roles of producers and consumers in an ecosystem

Using cars in the parking lot identify how variation in species affects an ecosystem. The students will be calculating the species diversity index.

Research a biome and write an essay and construct an energy pyramid for that biome

OTHER EVIDENCE

-Test on Chapter 4, 5, 6, and 7

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit.. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the correct answers explained. Students may need more time to understand the age structure diagram calculations.

Unit Name: Economics and Environmental Policy Time Frame: 5 Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to understand that we use science to understand and analyze the complex interactions between humans and their environments. The students will also gain the knowledge that we depend on the Earth to support life.

UNIT RESOURCES- Environmental Science Textbook – Ch. 2 Economics and Environmental Policy Ch. 3 Economics and Environmental Policy; Student Kept Binders; Laboratory Assignments

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

- HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere**
- HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.**
- HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.**
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.**
- 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-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.**

The goal of this unit is for the students to realize that our planet is a dynamic system that is consistently changing.

ENDURING UNDERSTANDINGS

The big idea for this unit is that there needs to be a balance between the needs of the environment and the needs of humans within the environment. The students will also need to be able to identify the complexity of politics and the environment and how they interact. The misunderstanding coming into class may be that the humans do not need the environment when in reality every aspect of our life is supported by the environment.

ESSENTIAL QUESTIONS

1. How can we best balance our own interests and needs with the health of the environment?
2. How do the nonliving parts of Earth's systems provide the basic materials to support life?

KNOWLEDGE AND SKILLS

Content: Vocabulary- economics, cost benefit analysis, environmental economics, nonmarket value, market failure, Eco labeling, Environmental Impact Statements, Cap and Trade, Command and Control, matter, molecule, feedback loop, condensation, groundwater

Skills:

Identify the properties of matter that are most important to environmental systems.

Identify what role these systems play in environmental science.

Name the characteristics of the Earth's geosphere, biosphere, atmosphere and hydrosphere

Describe how nutrients cycle in the environment

Identify how sustainability is affected by economics

Describe how environmental policies protect the environment

Identify how governments work with each other and citizens to form sound environmental policy

STAGE TWO

PERFORMANCE TASKS

Model the process of Tragedy of the Commons

Watch video on carbon credits

Make and present a PowerPoint on a law or regulation related to the environment

Role Play the movement of a water droplet through the water cycle

OTHER EVIDENCE

-Test on Chapter 2, 3

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit. The students will use all of the cycles to show the movement of matter through the environment. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the

correct answers explained. Students may need more time understand the process of how a bill becomes a law. They may also need more time to understand how important politics and ethics are in relation to the environment.

Unit Name: Human Population Time Frame: Six Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to determine how and why the human population affects the global environment more than any other species alive today.

UNIT RESOURCES- Environmental Science Textbook – Ch. 8 Human Population, Ch. 9 Environmental Health, Ch. 10 Urbanization; Student Kept Binders; Laboratory Assignments;

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND 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-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

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-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

ENDURING UNDERSTANDINGS

The big idea for this unit is that humans affect the global environment and also how humans are affected by the environment. The misunderstanding coming into class may be that students do not completely understand how disease is spread throughout the environment.

ESSENTIAL QUESTIONS

1. How does the human population affect the environment?
2. What is the relationship between environmental health and our own health?
3. How can we balance our needs for housing and jobs with the needs of the environment?

KNOWLEDGE AND SKILLS

Content: Vocabulary- infant mortality, life expectancy, growth rate, demography, total fertility rate, demographic transition, wealth gap, environmental health, hazard, pathogen, epidemiology, toxicity, dose-response relationship,

risk, pollution, carcinogen, infectious disease, emerging disease, landslide, tsunami, land cover, land use, urban area, rural area, infrastructure, smart growth, ecological restoration, sprawl, greenway, zoning

Skills:

Identify land usage

Determine the effects of urbanization

Name the characteristics of a sustainable city

Identify environmental health

Show how physical events in the environment can affect our health

Determine how chemicals in our environment can affect our health

Model how the human population's growth rate can change in the future

Identify factors that influence the impact a population has on the environment

STAGE TWO

PERFORMANCE TASKS

Use mathematical calculations to identify whether a population will shrink or grow in the future

Use census data to determine whether the population in Egg Harbor Township will grow or shrink in the future based off of our age structure diagram

Watch and analyze the movie "Contagion" and how the outbreak of disease will affect us in the future

Model the process of tracking the outbreak of a disease

Role Play as different countries and show the spread of wealth around the world as well as the usage of resources

OTHER EVIDENCE

-Test on Chapter 8,9,10

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit.. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the correct answers explained. Students may need more time to understand the process of how disease is spread.

Unit Name: Earth's Resources Time Frame: Eight Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to have the students understand that we need to use the Earth's finite resources in a sustainable way. The students will gain the knowledge of what finite resources are and how they can help reduce the usage of these resources.

UNIT RESOURCES- Environmental Science Textbook – Ch.13 Mineral Resources and Mining, Ch. 12 Soil and Agriculture, Ch. 15 The Atmosphere; Student Kept Binders; Laboratory Assignments;

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND 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-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.***
- 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-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity**

The goal of this unit is for the students to understand the importance of managing our resources sustainably.

ENDURING UNDERSTANDINGS

The big idea for this unit is that we need to use Earth's finite resources in a sustainable way. Each chapter will deal with a different resource and the importance of managing these resources. The students may have a misunderstanding of how they use resources every day in their life and how important these resources are to their life.

ESSENTIAL QUESTIONS

1. At what point do the costs of mining outweigh the benefits?
2. How can we balance our growing demand for food with our need to protect the environment?
3. How can we ensure that everyone has clean air to breathe?

KNOWLEDGE AND SKILLS

Content: Vocabulary- mineral, rock cycle, ore, strip mining, tailings, smelting, mountaintop removal, acid drainage, air pressure, troposphere, ozone layer, mesosphere, air mass, front, radiation, air pollution, fossil fuel, smog, scrubber, ozone hole, chlorofluorocarbon, soil, sand, silt, clay, weathering, intercropping, pesticide, traditional agriculture, pollinator, sustainable agriculture, feedlot, organic agriculture, biotechnology, aquaculture

Skills:

Define soil

Explain how agriculture has evolved

Describe how we could produce enough food for a rapidly growing population while sustaining our ability to produce it

Identify how erosion and soil pollution affect the productivity of soil

Name where minerals come from

Show how mineral resources are accessed

Identify how we can reduce the negative impacts of mining and manage mined resources

Identify the sources of air pollution

Describe how we can limit and prevent pollution in the atmosphere

STAGE TWO

PERFORMANCE TASKS

Build a structure to stop an oil spill

Identify minerals based on their properties

Calculate ecological footprint

Analyze soil profiles using a texture triangle

OTHER EVIDENCE

-Test on Chapter 13, 12 and 15

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the correct answers explained.

Unit Name: Towards a Sustainable Future Time Frame: Two Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to understand that the decisions of today define our future environment.

UNIT RESOURCES- Environmental Science Textbook –Ch. 16 Global Climate Change; Student Kept Binders; Laboratory Assignments;

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*

This unit will begin to introduce the concept of sustainability in terms of climate change to the students

ENDURING UNDERSTANDINGS

The big idea for this unit is that today's decisions define our future environment.

ESSENTIAL QUESTIONS

1. What are the causes and consequences of a warming Earth?

KNOWLEDGE AND SKILLS

Content: Vocabulary- greenhouse effect, greenhouse gas, topography, global climate change, climate model, proxy indicator, fossil fuel, coral bleaching, carbon footprint, carbon tax

Skills:

- Identify what factors determine Earth's climate
- Name evidence that shows that global climate change is occurring and why it is happening
- Describe how we can respond to climate change

STAGE TWO

PERFORMANCE TASKS

Watch a video on global warming and discuss in class

OTHER EVIDENCE

-Test on Chapter 16

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the correct answers explained.

Unit Name: Earth's Resources Time Frame: Four Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to have the students understand that we need to use the Earth's finite resources in a sustainable way. The students will gain the knowledge of what finite resources are and how they can help reduce the usage of these resources.

UNIT RESOURCES- Environmental Science Textbook – Ch.14 Water Resources, Ch.11 Forestry and Resource Management; Student Kept Binders; Laboratory Assignments;

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND 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-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.***
- 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-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity**

The goal of this unit is for the students to understand the importance of managing our resources sustainably.

ENDURING UNDERSTANDINGS

The big idea for this unit is that we need to use Earth's finite resources in a sustainable way. Each chapter will deal with a different resource and the importance of managing these resources. The students may have a misunderstanding of how they use resources every day in their life and how important these resources are to their life.

ESSENTIAL QUESTIONS

1. Why are we running out of water?
2. How can we use Earth's resources sustainably?

KNOWLEDGE AND SKILLS

Content: Vocabulary- runoff, watershed, recharge zone, well, aquifer, point source pollution, pathogen, red tide, septic system, reservoir, salinization, water diversion, resource management adaptive management, salvage logging, prescribed burn, salvage logging, sustainable forestry certification, selection system, deforestation

Skills:

Describe how we can manage our renewable resources for sustainable use

Identify laws regarding sustainable forestry

Identify how we can change the way we use water

Name how water pollution affects humans and ecosystems

Diagram where all of our water is located

STAGE TWO

PERFORMANCE TASKS

Identify trees outside

Make recycled Paper

Research a National forest

Complete a watershed tour

Analyze water samples

OTHER EVIDENCE

-Test on Chapter 14, 11

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the correct answers explained.

Unit Name: Towards a Sustainable Future Time Frame: Six Cycles (4 days each)

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science**

Country: **USA**

Course/Grade: **College Prep Environmental Science/ 11-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to understand that the decisions of today define our future environment.

UNIT RESOURCES- Environmental Science Textbook –Ch. 19 Waste Management, Ch. 17 Nonrenewable Energy, Ch. 18 Renewable Energy ; Student Kept Binders; Laboratory Assignments;

Internet Resource Links: SuccessNetPlus.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*

This unit will begin to introduce the concept of sustainability in terms of climate change to the students.

ENDURING UNDERSTANDINGS

The big idea for this unit is that today's decisions define our future environment.

ESSENTIAL QUESTIONS

1. Can we depend on nonrenewable energy resources for our energy needs?
2. What are the potential uses and limitations of renewable energy sources?
3. How do our choices as consumers and waste producers affect our environment?

KNOWLEDGE AND SKILLS

Content: Vocabulary- energy, kinetic energy, combustion, nonrenewable energy, oil sands, petroleum, acid drainage, nuclear energy, nuclear fusion, biofuel, biomass, hydropower, fuel cell, electrolysis, wind farm, passive solar heating, waste, sanitary landfill, incineration, biodegradable, composting, recycling, Superfund

Skills:

- Identify how our current waste disposal impacts the environment
- Name the best ways to manage solid waste
- Describe how we can best reduce the impact of hazardous waste
- Identify how we can rely on the sun and wind for power
- Name the different types of renewable energy

- Identify the problems associated with fossil fuel use
- Define energy and how it used

STAGE TWO

PERFORMANCE TASKS

Model decomposition

Research and present a form of energy

Build a wind turbine

Debate on whether a waste to energy facility would be worth building in a town

OTHER EVIDENCE

-Test on Chapter 19

- Project on Ch. 17 and Ch. 18

STAGE THREE

LEARNING PLAN

The students will use their notes given from the PowerPoint's and the NBC Learn videos shown to first begin their knowledge of each topic in this unit. Independently, the students will complete questions and vocabulary out of the book. The students will also use their weekly labs to add to their learning. The students will be monitored through the progression of this unit by daily "Do Now" questions as well as exit questions that will be graded, returned to the students and the correct answers explained.

Curriculum Resources - Differentiated Instruction

Special Education Interventions in General Education

Visual Supports

Extended time to complete tests and assignments

Graphic Organizers

Mnemonic tricks to improve memory

Study guides

Use agenda book for assignments

Provide a posted daily schedule

Use of classroom behavior management system

Use prompts and model directions

Use task analysis to break down activities and lessons into each individual step needed to complete the task

Use concrete examples to teach concepts

Have student repeat/rephrase written directions

Heterogeneous grouping

Resources:

Do to Learn:

<http://www.do2learn.com/>

Sen Teacher:

<http://www.senteacher.org/>

Intervention Central:

<http://www.interventioncentral.org/>

Learning Ally:

<https://www.learningally.org/>

English Language Learners Interventions in Regular Education

Resources:

FABRIC - Learning Paradigm for ELLs (NJDOE)

www.nj.gov/education/bilingual/pd/fabric/fabric.pdf

Guide to Teaching ELL Students

<http://www.colorincolorado.org/new-teaching-ells>

Edutopia - Supporting English Language Learners

<https://www.edutopia.org/blog/strategies-and-resources-supporting-ell-todd-finley>

Reading Rockets

<http://www.readingrockets.org/reading-topics/english-language-learners>

Gifted and Talented Interventions in Regular Education

Resources:

Who are Gifted and Talented Students

<http://www.npr.org/sections/ed/2015/09/28/443193523/who-are-the-gifted-and-talented-and-what-do-they-need>

Hoagies Gifted Education Page

<http://www.hoagiesgifted.org/programs.htm>

21st Century Learning

Resources:

Partnership for 21st Century Learning

<http://www.p21.org/>

Career Ready Practices (NJDOE)

<http://www.nj.gov/education/cte/hl/CRP.pdf>