EGG HARBOR TOWNSHIP PUBLIC SCHOOLS
CURRICULUM

Honors (HN) Oceanography
High School

Length of Course:	Full Year
Elective / Required:	Refer to Program of Studies
Schools:	High School
Student Eligibility:	Grades 11-12
Credit Value:	5 credits
Date Submitted:	September 2013
Date Approved:	

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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 (NJSLS-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: Geological Oceanography- Part 1 **Time Frame:** Five Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to identify how the earth and the oceans formed, and how they are still moving and changing today. The students will identify the layers of the earth, and how features are created and destroyed on earth through plate tectonics.

UNIT RESOURCES-

- Oceanography Textbook-
  - Ch. 1: The Origin of the Ocean
  - Ch. 2: A History of Marine Science
  - Ch. 3: Earth Structures and Plate Tectonics

- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

Internet Resource Links:

- Richard Stockton College Online Library for Dual Credit Students www.Stockton.edu
- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search

STAGE ONE

GOALS AND STANDARDS

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-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.**

The goal of this unit is to understand how plate tectonics shapes our earth's surface.

ENDURING UNDERSTANDINGS

- The earth is made of layers of materials with different composition and properties.
- The earth's crust is made of tectonic plates that are always moving.
- Tectonic plates interact to create earthquakes, volcanoes, mountains, trenches, and mid-ocean ridges.

ESSENTIAL QUESTIONS

1. What does the inside of the earth look like, and how do we know?
2. How do plate tectonics shape the earth?

KNOWLEDGE AND SKILLS

- Label the layers of the earth by chemical composition and physical properties. Compare the composition and function of each layer.
- Identify tectonic plates on a map.
- Analyze interactions between plate boundaries. Compare how constructive, destructive, and transform boundaries have different outcomes on the crust.
- Analyze how type of plate material (oceanic or continental) and type of boundary will result in a specific feature on earth.
- Recognize plate boundaries on maps based on features present.
- Analyze how boundaries create earthquakes and volcanoes.

STAGE TWO

PERFORMANCE TASKS

- Creating a foldable for the layers of the earth for both chemical composition and physical properties
- Creating diagrams for each type of plate boundary
- Analyzing maps to identify plate boundaries
- Look at earthquake data to support plate movement and the layers of the earth
- Analyze volcanic position and types of eruption based on plate boundaries.
- Design a new planet. Recreate tectonic features based on plate boundaries. Indicate plate types, direction of movement, etc.
- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups

- Inquiry based activities with reflective discussion
- Online models, simulators, and videos
- Class review and discussion

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.
This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all honors students.

Unit Name: Geological Oceanography- Part 2 **Time Frame: 4** Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to look at the bathymetry of the sea floor and marine sediments. Students will examine the location of bathymetric features, as well as their origin and how they are changes by earth processes. The resulting sediments will be classified by origin and location.

UNIT RESOURCES-

- Oceanography Textbook-
  - Ch. 4: Ocean Basins
  - Ch. 5: Ocean Sediments
- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

Internet Resource Links:

- Richard Stockton College Online Library for Dual Credit Students www.Stockton.edu
- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search

STAGE ONE

GOALS AND 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-ESS2-5.	**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**
HS-ESS2-7.	**Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.**

ENDURING UNDERSTANDINGS

- Bathymetric features on the ocean floor come from interactions at plate boundaries, hot spots, and weathering.
- The type of plate boundary will determine the features seen in that part of the ocean.
- Marine sediments are weathered and recycled materials from all over the earth.

ESSENTIAL QUESTIONS

1. What features are found on the sea floor, and how do they get there?
2. Where do marine sediments come from, and how to they affect the marine environment?

KNOWLEDGE AND SKILLS

- Label the features found on mid-oceans ridges, subduction zones, and coastal boundaries.
- Identify features on satellite images and bathymetric maps.
- Identify hydrothermal vents and deeps sea life for how they use the bathymetry of the sea floor.
- Identify the four origins of marine sediments
- Analyze how sediments are changed, weathered, and recycled through the oceans.

STAGE TWO

PERFORMANCE TASKS

- Create diagrams for bathymetric features for mid-ocean ridges, subduction zones, and coastal boundaries.
- Create a bathymetric map for an island volcano using contour lines.
- Take sounding data for unknown locations to create a map. Create contour lines on the map. Analyze the lines to discover what feature was sounded.
- Build a model for bathymetric features from data about passive vs active margin and age of a plate.
- Analyze sediment samples for origin.
- Dissect and analyze sediment profiles. Interpret history and location of the profiles.

- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models, simulators, and videos
- Class review and discussion

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.
This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all honors students.

Unit Name: Chemical and Physical Oceanography- Part 1 **Time Frame: 6** Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to look at the composition of seawater, and analyze how dissolved salts will affect the properties of water. The chemical and physical interactions between the atmosphere and the ocean will also be analyzed. Lastly, large ocean water movement due to air movement and earth's rotation will be studied.

UNIT RESOURCES-

- Oceanography Textbook-
  - Ch. 6: Ocean Water Structure
  - Ch. 7: Ocean Chemistry
  - Ch. 8: Circulation of the Atmosphere
  - Ch. 9: Circulation of the Ocean
- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

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STAGE ONE

GOALS AND STANDARDS

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.**
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-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-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.** **The goal of this unit is to understand how the atmosphere and the ocean interact with each other.**

ENDURING UNDERSTANDINGS

- The ocean has dissolved minerals within it that change the properties of the water.
- The oceans and the atmosphere affect each other through climate, weather patterns, and ocean currents.
- The movement of the earth affects the movement of the oceans and atmosphere.

ESSENTIAL QUESTIONS

1. How does the composition of the ocean water affect its properties?
2. How does the atmosphere affect the oceans?
3. How does the movement of the earth affect the oceans?

KNOWLEDGE AND SKILLS

- Identify the major ions in seawater.
- Identify how temperature, pressure, and salinity change with depth and climate.
- Label wind belts and circulation cells in the atmosphere.
- Analyze how wind will affect ocean currents
- Label and analyze gyres and ocean currents.
- Analyze how the Coriolis Force will affect the atmosphere and oceans.

STAGE TWO

PERFORMANCE TASKS

- Create diagrams showing the major ions in seawater's composition and amounts.
- Creating diagrams for changes in pressure, temperature, and salinity with depth
- Analyzing maps to identify wind belts and circulations cells.
- Create a map to show current names, directions, speed, and temperature.
- Based on titration data, determine the salinity of an unknown seawater sample.
- Predict weather and climate patterns based on location from ocean data.
- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models, simulators, and videos
- Class review and discussion

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.
This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all honors students.

Unit Name: Chemical and Physical Oceanography- Part 2 **Time Frame: 4** Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to look at the bathymetry of the sea floor and marine sediments. Students will examine the location of bathymetric features, as well as their origin and how they are changes by earth processes. The resulting sediments will be classified by origin and location.

UNIT RESOURCES-

- Oceanography Textbook-
  - Ch. 10: Waves
  - Ch. 11: Tides

- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

Internet Resource Links:

- Richard Stockton College Online Library for Dual Credit Students www.Stockton.edu
- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search

STAGE ONE

GOALS AND STANDARDS

HS-PS4-1	**Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.**
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-ESS2-5.	**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.**
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-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.**

The goal of this unit is to understand how the earth interacts with the atmosphere and

the solar system to create waves and tides.

ENDURING UNDERSTANDINGS

- The wind direction, speed, and duration will affect the waves.
- Waves will interact with a coastline to shape shoreline processes.
- Tidal forces are affected by both the sun and moon.
- Tidal forces are long period waves affecting the entire earth.

ESSENTIAL QUESTIONS

1. What creates and shapes waves in the ocean?
2. What creates and shapes the tides on earth?

KNOWLEDGE AND SKILLS

- Identify wave anatomy and patterns
- Identify how waves are shaped and bent by coastlines
- Identify and analyze how tides are created and effected by the sun and moon
- Identify tidal cycles throughout the globe
- Analyze how tidal patterns change through the year.

STAGE TWO

PERFORMANCE TASKS

- Label wave anatomy and shape patterns
- Create diagrams and maps to show wave reflection, refraction, and diffraction
- Create model to show the effects of the sun and moon on the tides.
- Analyze tidal data to types of tidal cycles and effects of lunar cycles.
- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models, simulators, and videos

- Class review and discussion

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.
This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all honors students.

Unit Name: Coastal Processes and Oceans **Time Frame: 6** Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to examine the coastlines of continents, looking at both the anatomy of a coastline and how they are move and shape by human activities. Additionally, the laws that govern the coastal areas will be discussed.

UNIT RESOURCES-

- Oceanography Textbook-
  - Ch. 12: Coasts
  - Ch. 17: Marine Resources
  - Ch. 18: The Ocean Environment

- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

Internet Resource Links:

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- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search

STAGE ONE

GOALS AND 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-ESS2-5.
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.

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.

The goal of this unit is to analyze the anatomy and changes to a coastline over time, both by nature and human activities.

ENDURING UNDERSTANDINGS

- Coastlines will be shaped by the type of tectonic boundaries they are near.
- Coastlines can be greatly impacted by human activities.
- There are laws that govern coastlines and the activities humans can do within those areas.

ESSENTIAL QUESTIONS

1. How is a coastline defined, and how can it be changed?
2. Why are coastlines important to us?
3. What laws exist to protect coastlines and the resources they hold?

KNOWLEDGE AND SKILLS

- Label the anatomy of a coastline.
- Differentiate between erosional and depositional coastlines.
- Analyze different types of estuaries, and the importance they play to coastlines.
- Analyze how humans have effected and changed coastlines.
- Analyze how marine laws were created and how they affect human activities in coastal zones.

STAGE TWO

PERFORMANCE TASKS

- Create diagrams showing features for erosional and depositional coastlines.
- Create models for the anatomy of barrier islands
- Create models for hard stabilization of sand on coastlines.
- Propose hard stabilization techniques for local beaches. Defend why they are needed.
- Analyze the shapes and functions of different estuaries.
- Analyze the importance of marine laws that govern the coastal areas.
- Propose new laws needed to protect the marine coasts. Defend why they are needed.
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models, simulators, and videos
- Class review and discussion

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.
This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all honors students.

Unit Name: Biological Oceanography- Part 1 **Time Frame: 4** Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to study how organisms are classified using taxonomy, and how this applies to marine environment. Different marine ecosystems will be compared and analyzed. Finally, the productivity's effect on the ecosystem will be studied.

UNIT RESOURCES-

- Essentials of Oceanography Textbook-
  - Ch. 13: Life in the Oceans
  - Ch. 14: Plankton, Algae, and Plants

- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

Internet Resource Links:

- Richard Stockton College Online Library for Dual Credit Students www.Stockton.edu
- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search

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.**
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.**
HS-LS4-2.	**Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.**
HS-LS4-4.	**Construct an explanation based on evidence for how natural selection leads to adaptation of populations.**

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.** **The goal of this unit is to analyze how living things are organized, and to apply that to ocean organisms. The effect of available energy sources in the oceans will be applied to the diversity of marine life.**

ENDURING UNDERSTANDINGS

- Living things are classified using common characteristics and traits.
- Marine organisms have developed adaptations to survive.
- All living things need energy to survive. In the oceans the energy base will be photosynthetic phytoplankton and macroalgae.
- The availability of light and nutrients will determine the amount of productivity of living things for each ocean region.
- Our changing climate will affect productivity in the oceans.

ESSENTIAL QUESTIONS

1. How are living things classified and organized? How does marine life fit into this classification?
2. How are marine organisms adapted for their environment?
3. How is life in the oceans supported? How does that change across the globe?
4. What effect will climate change have on the oceans?

KNOWLEDGE AND SKILLS

- Classify and organize marine organisms using taxonomy
- Identify adaptations of marine organisms
- Identify marine food webs and ecosystems
- Analyze how productivity varies around the globe
- Analyze how productivity will affect the marine organisms for each region.

STAGE TWO

PERFORMANCE TASKS

- Create food webs for different marine ecosystems
- Compare and contrast marine ecosystems. Note similarities in producers and consumers.
- Create a foldable for taxonomy classification
- Classify marine organisms using a dichotomous key
- Construct food pyramids for different marine ecosystems.
- Create maps for different marine climate zones, focusing on productivity trends for each.
- Compare maps for current climate zones with projected future zones. Analyze the potential impact to productivity.
- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips

- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

- Common assessment quiz
- Common assessment chapter test
- Review Activity

STAGE THREE

LEARNING PLAN

- Power point presentations
- Lecture with note taking or guided notes
- Whole and small group discussions
- Laboratory groups
- Inquiry based activities with reflective discussion
- Online models, simulators, and videos
- Class review and discussion

Student progress will be measured by formative and summative assessments. To maximize student understanding current and cumulative topics will be assessed weekly.
This unit is sequenced to begin with an informal assessment of prior knowledge of topics within the unit and determine any misconceptions. Students will then build small concrete blocks of information pertinent to mastery of this unit. Finally, students will be asked to use this information to evaluate higher level problems. This unit will end with a formal assessment common to all honors students.

Unit Name: Biological Oceanography- Part 2 **Time Frame: 5** Cycles (4 Days each)
Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**
Course/Grade: **Honors Oceanography/ 11-12** State/Group: **NJ**
School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to compare animals in the pelagic environment and benthic environment. Each needs different adaptations to survive. Organisms for each environment will be studied in more depth.

UNIT RESOURCES-

- Essentials of Oceanography Textbook-
  - Ch. 15: Marine Animals
  - Ch. 16: Marine Communities

- Student Guided Notes and Binders
- Laboratory Assignments
- Media Center

Internet Resource Links:

- Richard Stockton College Online Library for Dual Credit Students www.Stockton.edu
- Discovery: www.unitedstreaming.com
- NBC Learn Videos: www.nbclearn.com
- eLibrary science: http://science.bigchalk.com/sciweb/science/do/search

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.**
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.**
HS-LS4-2.	**Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.**
HS-LS4-4.	**Construct an explanation based on evidence for how natural selection leads to adaptation of populations.**
HS-LS4-	**Evaluate the evidence supporting claims that changes in environmental**

5. **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.**

The goal of this unit is to analyze how marine organisms of the pelagic environments and benthic environments compare to each other, and the specific adaptations and needs of each environment will affect the organisms that survive there.

ENDURING UNDERSTANDINGS

- The pelagic environment is vast. Organisms need to adapt for mobility and flotation.
- The pelagic environment is divided into four zones. Each zone will deal with various amounts of light and pressure. Each zone contains different organisms with different adaptations.
- The benthic zone is divided by distance from a coastline. Each zone will deal with various amounts of light and pressure. Each zone will contain different organisms with different adaptations.

ESSENTIAL QUESTIONS

1. What marine organisms are found in the pelagic environment? How are they adapted to live there?
2. What marine organisms are found in the benthic environment? How are they adapted to live there?

KNOWLEDGE AND SKILLS

- Label the zones of the pelagic environments. Note the characteristics of each one.
- Label the zones of the benthic environments. Note the characteristics of each one.
- Identify where an organism would be found based on their adaptations.
- Identify marine organism's characteristics in taxonomy groups.

STAGE TWO

PERFORMANCE TASKS

- Create a diagram of the ocean showing pelagic and benthic zones. Compare amount of light and pressure for each zone.
- Research a specific marine organism. Identify all adaptations for the marine zone where it lives.
- Identify species of marine reptiles, birds, fish, and mammals. Analyze how they are adapted to pelagic or benthic life.
- Identify species of mollusks, arthropods, cnidarians, sponges, echinoderms, and marine worms. Analyze how they are adapted to pelagic or benthic life.
- Laboratory investigations within small groups
- Constructed response
- Graphic organizers or models
- Do nows and/or exit slips
- Individual, small, and large group work
- Homework
- Guided practice

OTHER EVIDENCE

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- Common assessment chapter test
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STAGE THREE

LEARNING PLAN

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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