EGG HARBOR TOWNSHIP PUBLIC SCHOOLS
CURRICULUM

GENERAL CORE 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 (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: Scientific Method **Time Frame: Two Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to develop an understanding of the five areas of study in science. The students will also use and identify the steps of the scientific method. The last purpose of this unit is how scientists communicate in with each other.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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.**

This unit will begin the students' knowledge of the different types of sciences and process of the scientific method

ENDURING UNDERSTANDINGS

The big idea for this unit is that using the scientific method, scientists can attempt to explain and study the world around them. The students should be able to identify the steps of the scientific method convert different units of measurements used in scientific experiments. They students should also be able to identify the different types of sciences. The students may come into class with the flawed knowledge that scientists use the English type of measurement and not the Standard Units of measurements.

ESSENTIAL QUESTIONS

1. How do scientists "do" science?

KNOWLEDGE AND SKILLS

Content: Vocabulary- Scientific Method, Standard Units of Measurement, Hypothesis, Scientific Notation, Scientific Theory

Skills:

- Convert units
- Put amounts into scientific notation

- Label the steps of the scientific method

STAGE TWO

PERFORMANCE TASKS

- Design an experiment using the steps of the scientific method
- Conversions

OTHER EVIDENCE

- Quiz on scientific method

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 complete worksheets on conversions and scientific notation to show understanding. They will complete an experiment to use the steps of the scientific method. There will also be a study guide provided for the test and the quiz. 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. The students have in the past struggled with converting measurements from higher units into smaller units so this will be paid special attention to.

Unit Name: Astronomy **Time Frame: Seven Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to explore the dynamic system beyond Earth and the effects that celestial bodies have on the Earth. The topics that will be covered are the Sun-Moon-Earth system, the Solar System, Stars, Galaxies and how space is studied. At the end of this unit the students will identify that the Earth is one sole body in a complex and dynamic universe.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

HS-ESS1-1 **Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.**

HS-ESS1-2 **Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.**

HS-ESS1-3 **Communicate scientific ideas about the way stars, over their life cycle, produce elements.**

HS-ESS1-4 **Use mathematical or computational representations to predict the motion of orbiting objects in the solar system.**

This unit will begin the students' knowledge of the earth and the universe and how it is all interconnected.

ENDURING UNDERSTANDINGS

The big idea for this unit is that using the laws of motion and gravitation, astronomers can understand the orbits and the properties of the planets and other objects in the solar system. The students should be able to explain how the solar system is formed, compare and contrast the characteristics of the inner and outer planets, and distinguish between planets and other objects in the universe. They will also develop an understanding of the ways in which space is studied. The students may come into class with a preconceived notion of the size of space and may believe that

the Milky Way Galaxy is the only galaxy in the universe. They may also not understand what a star is and how it is formed.

ESSENTIAL QUESTIONS

1. How does the interaction of the sun, moon and earth affect our planet?
2. What are the biggest differences between the inner planets and the outer planets?
3. How are other objects in our universe formed?
4. How do astronomers study space?

KNOWLEDGE AND SKILLS

Content: Vocabulary- Nebula, Black Hole, Supernova, Luminosity, Constellation, Solstice, Equinox, Ellipse, Fusion, SunSpots, Terrestrial Planets, Gas Planets, Meteor, Meteorite, Astronomical Unit, Umbra, Penumbra, Waxing, Waning, Solstice, Equinox

Skills:

-Draw out a picture of a solar eclipse and a lunar eclipse. Include where the umbra and penumbra would be.

-Write the changes in dates for our seasons and what causes seasons on our planet.

-Name and describe all 8 planets. (ex. Which is the hottest, which one has rings etc.) and put the planets in order starting with the one closest to the sun.

-Name all of the famous astronomers learned about and their contribution to astronomy

-Name what ancient astronomers thought the universe revolved around and how they benefited from studying space.

-Name all of the phases of the moon

-Name the layers of the suns atmosphere and their characteristics.

-Name the life cycle of a star.

-Describe moon theory and the Big Bang Theory

-Identify the number of tides and on Earth and how they are affected by space

STAGE TWO

PERFORMANCE TASKS

-Compare the diameter of the Earth to the diameter of the Sun using hands on models

-Completely draw the phases of the moon

-Use the Star Lab to identify constellations and what the constellations represent

-Complete a poem using vocabulary terms from this section

-Make a cosmic timeline the length of the classroom

-Determine the validity of astrological readings based on the zodiac sign

-Use pictures to determine how we have made in improvements in studying space.

-Make a foldable on the life cycle of a star and in the computer lab research a star.

-Design and launch a bottle rocket

OTHER EVIDENCE

- Quiz on moon phases
- Test on whole astronomy unit
- Grading of research done in the computer lab

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 unit will broken down into the four sub categories- sun, moon and earth interactions, inner and outer planets, stars and galaxies and the study of space. The subcategories will be presented in the order above. The students making their own drawings for the phases of the moon, layers of the suns atmosphere, life cycle of a star and the cosmic timeline will be hands on and will help the students on the quiz and the test. The research projects will ask the students to think outside the box in terms of developing new ideas of the scope of space and this will help the students on the assessments. There will also be a study guide provided for the test and the quiz. 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. The students have in the past struggled with the differences of the different objects in space so special attention will be paid to this and the students will be shown many different models so they accurately understand the information. The end project of the rocket launch will further help students to understand the physics behind astronomy.

Unit Name: Matter and Energy **Time Frame: Two Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to develop an understanding of what all matter is made up of and how it is held together. The second purpose is to determine the types of states of matter.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

HS-PS1-1 **Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.**

HS-PS1-2 **Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.**

HS-PS1-5 **Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.**

This unit will determine that the variety of substances on earth and in space results from the way that atoms are arranged and combined.

ENDURING UNDERSTANDINGS

The big idea for this unit is that matter on earth is combined in different ways which is determined by the way that atoms are combined. The students should be able to describe atom and its components and the energy levels of electrons in the atom. The students should also be able to describe the states of matter on earth and explain the reason that matter exists in these states. The students may have a misunderstanding of all matter being made up of a certain number of elements just in different combinations.

ESSENTIAL QUESTIONS

1. What are all livings and nonliving things made up of?

KNOWLEDGE AND SKILLS

Content: Vocabulary- matter, element, nucleus, proton, neutron, electron, atomic number, mass number, plasma, evaporation, condensation, sublimation

Skills:

- Define thermodynamics
- Describe the structure and placement of valence electrons.
- Define the Kinetic Theory of Matter
- Identify the levels of electron placement
- Name the properties of a solid, a liquid and a gas.
- Describe the placement of the subatomic particles and what charges each particle has.
- Find the number of protons, electrons and neutrons in an atom using the atomic number and atomic mass

STAGE TWO

PERFORMANCE TASKS

- Make elemental trading cards from the periodic table
- Draw out elemental configurations
- Make a model of elemental configurations

OTHER EVIDENCE

- Test on matter and energy

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 build elemental models and will complete labs on elements to show understanding of the structure of atoms. They will complete experiments on elements. There will also be a study guide provided for the test. 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. The students have in the past struggled with understanding the size of atoms and elements so they will be shown multiple models to help them with these misunderstandings.

Unit Name: Geology **Time Frame: Five Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to determine the differences among the different types of rocks on Earth as well as the uses for rocks and minerals. The second purpose will be to determine how the Earth's surface changes through different processes and what soil is composed of.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

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-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-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-ESS2-3 **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 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 are 4 types of rocks that are composed of different types of minerals and that our planet is dynamic. The students should be able to list and identify different

types of rocks and at least ten types of minerals. The students should be able to identify soil layers in a soil sample. The students should also be able to determine the processes that shape the Earth including tectonic movement. The students may not know that soil is a complex object with many components within it. They also may not know the differences between rock types and how mountains are formed.

ESSENTIAL QUESTIONS

1. How are rocks studied?
2. How is soil studied?
3. What are the characteristics of volcanoes and earthquakes?
4. How does the movement of tectonic plates affect our planet?

KNOWLEDGE AND SKILLS

Content: Vocabulary- hardness, luster, mineral, streak, igneous rock, lava, extrusive rock, intrusive rock, magma, sedimentary, metamorphic, lithification, cementation, compaction, clastic, foliated, rock cycle, weathering, erosion, soil, soil horizon, soil profile, continental drift, tectonic plate, caldera, composite cone, cinder cone, crater, hot spot, shield volcano, fault, focus, seismic wave, seismometer, Richter scale, modified Mercalli scale

Skills:

- Name the seven properties of minerals, define them and use the properties to identify rocks
- Use Mohs scale to identify rocks
- Identify types of rocks and how they are formed
- Identify soil samples by layer and composition
- Determine the differences amongst types of volcanoes and how they are formed
- Determine how earthquakes are formed and the result of earthquakes
- Identify movement of tectonic plates and effect on the Earth's surface

STAGE TWO

PERFORMANCE TASKS

- Identify rocks using mineral characteristics

- Draw out the rock cycle

- Model the rock cycle

- Draw out soil layers

- Use a soil profile triangle

- Identify composition of a soil sample

- Build the three types of volcanoes and a model of tectonic plate

OTHER EVIDENCE

- Make an evacuation plan for an earthquake
- Quiz on rock cycle
- Test on Geology

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 build models of soil layers and rock cycles and will complete labs to identify types of rocks. They will also identify the movement of tectonic plates. There will also be a study guide provided for the test and a quiz. 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. The students have in the past struggled with using mineral characteristics to identify types of rocks.

Unit Name: Hydrology **Time Frame: One Cycle (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to identify the stages of the water cycle and how water is circulated through our planet.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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-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 water is continually being cycled in our environment. Also our fresh water supply is limited and is threatened by pollution. The students may not know the impact pollution has on the global and local water supply.

ESSENTIAL QUESTIONS

1. How do we study the water cycle?
2. How do organisms survive in an area where the water supply is limited

KNOWLEDGE AND SKILLS

Content: Vocabulary- spring, marsh, geyser, precipitation, evaporation, condensation, transpiration, wetlands, zone of aeration, zone of saturation, lakes, groundwater, freshwater

Skills:

- Name all six stages of the water cycle, what are the causes of the stages
- Identify what affects the freshwater supply
- Define where the water in EHT comes from

STAGE TWO

PERFORMANCE TASKS

Draw a diagram of the water cycle

Model the water cycle

Debate a case study of water pollution

Watch a video on Emperor Penguins

OTHER EVIDENCE

- Quiz on water cycle

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 build models of the water cycle and will complete labs on the water cycle. They will also debate an issue involving development and water pollution. There will also be a study guide provided for a quiz. 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: Meteorology **Time Frame: Three Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to identify what causes climate locally and globally. The students will also look at the effect of storms. They will also identify the layers of the atmosphere and how the sun affects life on earth.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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 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 climate is a result of the interaction of a number of factors. The atmosphere is one of the most influential factors. Energy in the atmosphere can result in damaging storms. The misunderstanding coming into class may be that weather is only a result of local factors and not of global factors.

ESSENTIAL QUESTIONS

1. How is weather studied and analyzed?
2. How do the layers of the atmosphere affect the Earth's surface

KNOWLEDGE AND SKILLS

Content: Vocabulary- Troposphere, Stratosphere, Mesosphere, Thermosphere, exosphere, dew point, Air pressure, Humidity, Fronts, Radiation, Anemometer, Barometer, Flood, Cumulus, Stratus, Cirrus, weather, climate, thermometer, barometer, Thunderstorm, Tornado

Skills:

- Name the six layers of the atmosphere and determine how the temperature varies in each layer
- Identify greenhouses gases and how this could affect the climate of the Earth
- Compare and contrast cold and warm air
- Name the properties of the four types of clouds and how clouds are formed
- Name properties of cold fronts and properties of warm fronts.
- Identify how major storms affect an area

STAGE TWO

PERFORMANCE TASKS

Draw out layers of the atmosphere and complete lab on temperature change in the atmosphere

Read and analyze a weather map

Complete computer based weather predictions based off of current weather patterns

Build a model on a hurricane and identify the path of a tornado

OTHER EVIDENCE

-Test on meteorology

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 computer and paper based models to analyze weather patterns. There will also be a study guide provided for a quiz. 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 global weather patterns.

Unit Name: Oceanography **Time Frame: Six Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to have the students gain knowledge of the structure of the ocean floor as well as properties of the oceans. The students will also spend time gaining knowledge of marine animals and how they adapt to their environment.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

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-ESS2-4 **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-ESS2-5 **Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.**

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 studying the oceans help scientists learn about global climate change and the earth's history as well as understanding that the marine environment is geologically diverse and contains a wealth of natural resources. The students will gain the understanding of how the seafloor is formed and what type of marine organisms live in the variety

of ecosystems in the oceans. The students may have the misunderstanding that the ocean is not affected by climate and vice versa but this will be explained in this unit.

ESSENTIAL QUESTIONS

1. How tools are used to study the oceans?
2. What are the key features of the oceans topography?
3. How do the ocean currents affect climate?
4. How do organisms adapt to living in marine environments?

KNOWLEDGE AND SKILLS

Content: Vocabulary- Oceanography, Deep Sea drilling, Sonar, Submersibles, Biogenous Sediments, Salinity, Surface Current, Ocean waves, Crest, Trough, Wavelength, Wave height, Thermocline, Deep ocean, Surface layer ,Density current, Warm and cold currents, Continental shelf, Continental Slope, Trench, Plain, Seamount, Guyot, Mid-ocean ridge, Beaches, Terrigenous Sediments, Hydrogenous Sediments, Hydrothermal vents-

Skills

- Describe what would raise and what would lower the salinity of the ocean
- Determine which is denser warm or cold water
- Determine how the ocean affects climate
- What causes a wave to break? Describe the process
- Draw a diagram of a wave :label crest, trough, wavelength and wave height
- Name the size of each ocean and how deep each ocean is
- Name at least 5 facts about a specific marine animal and be able to list where marine organisms live
- Draw a diagram of the sea floor and be able to label each part of the sea floor.

STAGE TWO

PERFORMANCE TASKS

Build a model of the ocean floor

Design and build a boat that will float in both salt and fresh water

Design a poem and a stamp for a marine organism

Complete a lab on identifying marine specimens

Complete a lab on identifying shells of marine organisms

Build a marine animal

OTHER EVIDENCE

- Quiz on oceanography

-Test on oceanography

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 marine specimens to supplement the knowledge in power points. They will also use models of the ocean floors as well as models of ocean waves to help better understand the properties of the ocean. There will also be a study guide provided for a quiz. 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: Paleontology **Time Frame: Three Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to have the students understand that over time change has occurred in the continents, the oceans and life itself. The students will gain the knowledge of how the Earth is studied from the beginning of time and what scientists use to put together a geologic time scale.

UNIT RESOURCES- Earth Science Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Glencoe.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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.**

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

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 scientists sue several methods to learn about Earth's long history. The students will also then focus on the major time periods on the geologic time scale and what unique characteristics each era has that has led to present day life on earth. The students may have the misunderstanding that evolution of life over time has no evidence. They also may misunderstand that evolution is just a theory but a theory that withstood over time.

ESSENTIAL QUESTIONS

1. How do we study past and extinct life forms?
2. How old is Planet Earth and has it ever changed?

KNOWLEDGE AND SKILLS

Content: Vocabulary- Extinction, continental drift, mass extinction, amino acids

Skills

- Define what fossil are, where they are found and how they are dated.
- Identify the composition of the Earths early atmosphere
- Name theories on mass extinctions on Earth
- Name the main characteristics of each era.
- Identify major occurrences on the Geologic Time Scale

STAGE TWO

PERFORMANCE TASKS

Identify animals from the fossil record

Complete web quest on the Geologic Time Scale

Participate in a Dinosaur Dig

Build a dinosaur model

OTHER EVIDENCE

-Test on paleontology

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 fossil from the fossil record to supplement their knowledge. They will also use a dinosaur dig to get a clear idea of how paleontologists perform their jobs. There will also be a study guide provided for a quiz. 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. The students will have a clear misunderstanding of the theory of evolution and will need time spent in class clearing up any misconceptions that they might have.

Unit Name: Animal Behavior **Time Frame: Two Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to determine how animals interact with each other and interact with their environment. The importance of communication in all animals will be discussed.

UNIT RESOURCES- Biology Foundation Edition Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Pearson.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

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 understand that animals are influenced by each other and their environment.

ENDURING UNDERSTANDINGS

The big idea for this unit is that animals communicate with each other using signals. These signals can be visual, verbal, and chemical. Animals have two types of behaviors- learned and innate. Environmental changes also affect the behavior of animals. Social behavior is also a behavior of most animals. The students may not know the unique ways that different animals communicate.

ESSENTIAL QUESTIONS

1. How do animals behave?
2. How do animals communicate with each other in their environments?

KNOWLEDGE AND SKILLS

Content: Vocabulary- behavior, innate behavior, learning, habituation, classical conditioning, operant conditioning, insight learning, imprinting, circadian rhythm, migration, territory, aggression, courtship, society, communication

Skills:

- Identify how an inherited behavior can spread through a population
- Identify the four major types of learning and an example of each.

- Give an example of innate behavior
- Name social behaviors and how they influence a population.
- Name the types of signals that cause animals to communicate including language

STAGE TWO

PERFORMANCE TASKS

- Complete a lab on trial and error learning

- Use a multiple intelligence test to determine how individual students learn

- Analyze the behavior of animals in the classroom

OTHER EVIDENCE

- Test on animal behavior

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 real life examples such as the animals in the classroom as well as their own learning styles to apply the knowledge of how animals behave. There will also be a study guide provided for the test and a quiz. 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. The students have in the past struggled with the knowledge that all animals communicate in some way and this will be shown through specific examples in this unit.

Unit Name: Anatomy **Time Frame: Seven Cycles (4 days each)**

Author: Egg Harbor Township High School Science Department

UNIT

Subject: **Science** Country: **USA**

Course/Grade: **General Core Science/ 10-12** State/Group: **NJ**

School: **Egg Harbor Township High School**

UNIT SUMMARY- The purpose of this unit is to identify the structure and function of the human body as well as how the body maintains homeostasis. This unit will focus on the complex nature of the human body and how each system interacts with the other systems in the body.

UNIT RESOURCES- Biology Foundation Edition Textbook, Student Kept Binders, Laboratory Assignments, Media Center

Internet Resource Links: Pearson.com, NBCLearn videos

STAGE ONE

GOALS AND STANDARDS-

HS-LS1-3 **Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.**

The goal of this unit is for the students to understand that the human body is complex and has a specific structure and function and that the body needs to maintain homeostasis in order to function correctly.

ENDURING UNDERSTANDINGS

The big idea for this unit is that the human body is characterized by a specific organization and maintains homeostasis. The systems of the body that will be focused on in this unit are the digestive, excretory, nervous, skeletal, muscular, circulatory, and respiratory and immune systems. Each organ in each system will be discussed and the function will be analyzed. The students may not know each organ in the human body and where it is located.

ESSENTIAL QUESTIONS

1. What are the anatomical and physiological properties of the human body?

KNOWLEDGE AND SKILLS

Content: Vocabulary- tissue, homeostasis, calorie, enzyme, senses, esophagus, mouth, stomach, small intestine, gallbladder, large intestine, liver, trachea, neurons, brain, spinal cord, axon, dendrite, muscle, bones, heart, vein, aorta, blood, antigens, antibodies, allergy

Skills:

- Draw and label organs of the following systems: digestive, circulatory, respiratory, immune, skeletal, and nervous

- Identify the four levels of organization in the human body
- Identify the nutritional value of different types of food
- Label a neuron and how information is transmitted through the body
- Identify how our senses work
- Explain how movement can occur in the human body
- Identify how the human body protects itself from disease
- Explain how oxygen is moved through the body
- Identify the four major blood types and who can donate to whom

STAGE TWO

PERFORMANCE TASKS

- Use a food label to identify the nutritional value of a particular food

- Draw and label a foldable for the digestive system

- Use synthesized chemicals to show how food is digested in the body

- Complete a coloring of the different organs of the brain

- Draw and label all of the sense organs in the body

- Complete a lab on optical illusions

- Dissect an owl pellet and show comparisons between the human anatomy

- Label the bones in the human body

- Investigate a crime scene using evidence

- Identify which blood types cannot be mixed using a lab demonstration

- Watch and analyze the movie contagion and how the disease can be spread throughout the human population

- Complete case study on our immune system

OTHER EVIDENCE

- Quiz on digestive system
- Test on the nervous system
- Quiz on the skeletal system
- Quiz on circulatory system
- Quiz on immune system

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 real life examples and

synthesized chemicals to help show how the human body maintains its homeostasis. There will also be a study guide provided for the test and a quiz. 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. The students have in the past struggled with the amount of vocabulary in this unit so it will be broken down into smaller blocks so that it can be more easily retained.

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