BENWAY SCHOOL

Earth Science

Grades: 10-12

Credits: 5

Benway School	
Unit 1	
Content Area: Earth Science	
Unit Title:	
Grade Level: 9-12	
Unit Overview: In this unit students will get a true study of the cyclical changes of organisms as a natural seasonal phenomena. Students will examine the form and function of trees and wildflowers, uses and populations of these organisms. Many lessons are weather dependant and therefore assignments and topics may be adjusted as needed.	
Recommended Pacing: 70 Instructional Days	
Student Learning Objectives/Performance Expectations	**NJSLS**
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-LS2-6 AND LS2.C
Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	HS-LS2-7 AND LS2.C & LS4.D
Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources..	8.1.12.E.1
Research and evaluate the impact on Society of the unethical use of digital tools and present your research to peers	8.1.12.E.2
Evaluate the strengths and limitations of emerging Technologies and their impact on educational, career, personal and or social mean	8.1.12.F.1
Research the historical tensions between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and present the competing viewpoints to peers for review	8.2.12.B.5
New Jersey Student Learning Standards/Disciplinary Core Ideas	
S1.A: Structure and Properties of Matter ● Ecosystems have carrying capacities, which are limits to the numbers of organisms and populations they can support. These limits result from such factors as the availability of living and nonliving resources and from such challenges such as predation, competition, and disease. Organisms would have the capacity to produce populations of great size were it not for the fact that environments and resources are finite. This fundamental tension affects the abundance (number of individuals) of species in any given ecosystem. (HS-LS2-1),(HS-LS2-2) ● Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes. (HS-LS2-3) ● Plants or algae form the lowest level of the food web. At each link upward in a food web, only a small fraction of the matter consumed at the lower level is transferred upward, to produce growth and release energy in cellular respiration at the higher level. Given this inefficiency, there are generally fewer organisms at higher levels of a food web. Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded. The chemical elements that make up the molecules of organisms pass through food webs and into and out of the	

atmosphere and soil, and they are combined and recombined in different ways. At each link in an ecosystem, matter and energy are conserved. (HS-LS2-4)

- Group behavior has evolved because membership can increase the chances of survival for individuals and their genetic relatives. (HS-LS2-8)

Science and Engineering Practices	Crosscutting Concepts
Using Models Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show how relationships among variables between systems and their components in the natural and designed worlds. ● Develop a model based on evidence to illustrate the relationships between systems or components of a system. (HS-LS2-5) **Mathematics and Computational Thinking** Mathematical and computational thinking in 9-12 builds on K-8 experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions. ● Use mathematical and/or computational representations of phenomena or design solutions to support explanations. (HS-LS2-1) ● Use mathematical representations of phenomena or design solutions to support and revise explanations. (HS-LS2-2) ● Use mathematical representations of phenomena or design solutions to support claims. (HS-LS2-4)	**Cause & Effect** ● Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. (HS-LS2-8) **Energy and Matter** ● Energy cannot be created or destroyed—it only moves between one place and another place, between objects and/or fields, or between systems. (HS-LS2-4) ● Energy drives the cycling of matter within and between systems. (HS-LS2-3) **Stability and Change** ● Much of science deals with constructing explanations of how things change and how they remain stable. (HS-LS2-6),(HS-LS2-7)

Interdisciplinary Connections
English Language Arts/Literacy ● Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. (HS-LS2-6),*(HS-LS2-7),(HS-LS2-8)* ● Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. *(HS-LS2-1),(HS-LS2-2),*(HS-LS2-3),(HS-LS2-6),(HS-LS2-8) ● Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. *(HS-LS2-6),(HS-LS2-7),(HS-LS2-8)* ● Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-LS2-6),(HS-LS2-7),(HS-LS2-8) ● Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. *(HS-LS2-1),(HS-LS2-2)*,(HS-LS2-3) ● Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (HS-LS2-3) ● Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-LS2-7) *Mathematics* ● Reason abstractly and quantitatively. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-6),*(HS-LS2-7)* ● Define appropriate quantities for the purpose of descriptive modeling. *(HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-7)* ● Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),*(HS-LS2-7)* ● Represent data with plots on the real number line. *(HS-LS2-6)* ● Understand statistics as a process for making inferences about population parameters based on a random sample from that population. *(HS-LS2-6)* ● Evaluate reports based on data. (HS-LS2-6)

English Language Arts	Mathematics
● Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or	● Reason abstractly and quantitatively. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-6),*(HS-LS2-7)*

technical problem. (HS-LS2-6),*(HS-LS2-7),(HS-LS2-8)* ● Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. *(HS-LS2-1),(HS-LS2-2),*(HS-LS2-3),(HS-LS2-6),(HS-LS2-8) ● Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. *(HS-LS2-6),(HS-LS2-7),(HS-LS2-8)* ● Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-LS2-6),(HS-LS2-7),(HS-LS2-8) ● Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. *(HS-LS2-1),(HS-LS2-2),*(HS-LS2-3) ● Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (HS-LS2-3) ● Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-LS2-7)	● Define appropriate quantities for the purpose of descriptive modeling. *(HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-7)* ● Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),*(HS-LS2-7)* ● Represent data with plots on the real number line. *(HS-LS2-6)* ● Understand statistics as a process for making inferences about population parameters based on a random sample from that population. *(HS-LS2-6)* ● Evaluate reports based on data. (HS-LS2-6)
New Jersey Student Learning Standards **Technology** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**

Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources..	8.1.12.E.1
Research and evaluate the impact on Society of the unethical use of digital tools and present your research to peers	8.1.12.E.2
Evaluate the strengths and limitations of emerging Technologies and their impact on educational, career, personal and or social mean	8.1.12.F.1
Research the historical tensions between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and present the competing viewpoints to peers for review	8.2.12.B.5
New Jersey Student Learning Standards **21st Century Life and Career Skills** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	**Indicator**
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP 7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
Key Vocabulary Words	
Ablation, acid, aquatic, aquifer, aquitard, archaean, arid, atmosphere, authigenesis,Backshore, basalt, Bass, Beason, bedrock, biogenic sediment, black hole,caldera, cementation, cenozoic, channelization, chemical sediment, chlorophyll, chlorofluorocarbons Batman, clyman, compaction, compression fossil, conduction, continental shelf, continental slope, convection, equator, Crystal, Darcy's law, decomposition, deposition, desertification, disintegration, divergent boundary, dry lands, ecosystem, epicenter, equator, erosion, fissure eruption, Fjord, foliate, fossil, gemstone, geology geothermal energy, gravity , greenhouse gases, Landforms latitude, longitude, Alaba, levees, liquification, lithification, lithosphere, magma, magnitude, mantle, mesosphere, mineral, natural resources, non-foliated, nutrient, oceanic crust, Oceanic Trench, open pit mining, ore, ore deposit, outcrop, ozone layer, Pollution, pathogen, permafrost, petroleum, plate tectonics,	

precipitate precipitation, RI radiation, RI Reef, RI Reserves, RI resources, we Rift, what runoff run off, so salinization, scientific model, sediment, seismograph I know, circuit, smelting, soil, stalactites, stalagmites, stratification, subduction, suspension, thermal spring, transcontinental, Trench, viscosity, volcanic, Watershed, weathering, Zone

Evidence of Learning

Suggested Assessments:

- Reading/ Outline/Notes
- Test: Chapter Quiz/Test
- Class Discussion/ Submission of classwork
- Self-assessment via rubric/checklist
- Writing Across the Curriculum

Learning Activities:

- Collaborative group work
- Smartboards
- Small group/ large group discussion
- Hands-on lab investigations

Work individually and collaboratively to explore key concepts:

- Maintain an Environmental Journal
- Identify and define parts of a flower on a typical flower and describe modifications of specific (assigned) species
- Initial sketch and description of a sign tree
- create collection of leaves, Leaf rubbings, completed identification key
- Okay you complete diagrams and definitions related to Leaf Anatomy
- identify pigments found in leaves
- research descriptions and facts related to assign species

Instructional Materials:

Primary Text: Earth Science

- Smartboards
- Internet
- Supplemental readings

Teacher Resources:

- POGIL Assignments https://pogil.org/resources/references/earth science
- NSTA http://www.nsta.org/highschool/connections.aspx
- Vernier Lab/Activity https://www.vernier.com/earth science
- PhET https://phet.colorado.edu
- Diagnoser www.diagnoser.com
- POGIL: Process Oriented Guided Inquiry Learning- collaborative group lessons
- www.nwf.org/wildlife/wildlife-conservation/phenology.aspx

- Www. arborday.org/trees/whattree/whattree.cmf?itemid=e6a
- http://uswildlifeflowers.com/stateref.php?State=NJ

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

Gifted and Talented

(content, process, product, and learning environment)

Extension Activities:

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Conduct research and provide presentation of cultural topics
- Design surveys to generate and analyze data to be used in discussion
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Authentic listening and reading sources that provide data and support for speaking and writing prompts
- Anchor activities
- Use of higher-level questioning techniques
- Provide assessments at a higher-level of thinking

English Language Learners

Modifications:

- Modified assignments
- Native language translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

Students with Disabilities ***(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)***	**Students at Risk of School Failure**
Modifications for Classroom: ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily ● Student requires use of other assistive technology device **Modifications for Homework and Assignments:** ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication	**Modifications for Classroom:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide a copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home

Modifications for Assessments: ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments	● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily **Modifications for Homework and Assignments:** ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication **Modifications for Assessments:** ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments

Benway School
Unit 2
Content Area: Earth Science
Unit Title: Fauna
Grade Level: 9-12

Unit Overview: Students can get a true study of cyclical population changes a natural seasonal phenomena Point. Students will study the local animal populations that live around their environment a focus will be on the insects and birds species emphasis will be placed on the identification and appreciation of the species

Recommended Pacing: 15 Instructional Days

Student Learning Objectives/Performance Expectations	NJSLS
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 echo system	HS-LS2-6 AND LS2.C
design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity	HS-LS2-7 AND LS2.C & LS4.D
Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources	8.1.12.E.1
research the historical tension between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and presents the competing viewpoints to peers for review	8.2.12.B.5

New Jersey Student Learning Standards/Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.

Science and Engineering Practices	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 9–12 builds on K–8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical and empirical models. ● Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements	**Patterns** ● Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena. (HS-PS1-1), (HS-PS1-2), (HS-PS1-3),(HS-PS1-5) Systems and System Models ● When investigating, or describing a system, the boundaries and initial conditions of the system need to be defined. (HS-PS2-2)

and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly. **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student generated sources of evidence consistent with scientific ideas, principles, and theories. ● Apply scientific ideas to solve a design problem, taking into account possible unanticipated effects. (HS-PS2-3)	

Interdisciplinary Connections

English Language Arts/Literacy

- Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. (HS-LS2-6)
- Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS2-6)
- Collect relevant data across a broad spectrum of sources about the distribution of energy in a system and assess the strengths and limitations of each source.
- Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. *(HS-LS2-6)*
- Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-LS2-6)

Mathematics

- Reason abstractly and quantitatively. (HS-LS2-6)
- Represent data with plots on the real number line. *(HS-LS2-6)*
- Understand statistics as a process for making inferences about population parameters based on a random sample from that population. *(HS-LS2-6)*
- Evaluate reports based on data. (HS-LS2-6)

English Language Arts	Mathematics
Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any	Reason abstractly and quantitatively. (HS-PS3-4), (HS-ESS3-2), (HS-ETS1-3) **MP.2**

gaps or inconsistencies in the account. (HS-PS3-4), (HS-ESS3-2)**RST.11-12.1** Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. (HS-ETS1-3) **RST.11-12.7** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-ESS3-2), (HS-PS3-4), (HS-ETS1-3) **RST.11-12.8** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (HS-ETS1-3) **RST.11-12.9** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-PS3-4), (HSESS2-5) **WHST.9-12.7** Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and over reliance on any one source and following a standard format for citation. (HS-PS1-3) (HS-ETS1-3)**WHST.11-12.8** Draw evidence from informational texts to support analysis, reflection, and research. (HS-PS3-4) **WHST.9-12.9**	Model with mathematics. (HS-PS3-4), (HS-ETS1-3) **MP.4**

New Jersey Student Learning Standards **Technology** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources..	8.1.12.E.1
Research and evaluate the impact on Society of the unethical use of digital tools and present your research to peers	8.1.12.E.2
Evaluate the strengths and limitations of emerging Technologies and their impact on educational, career, personal and or social mean	8.2.12.F.1
New Jersey Student Learning Standards **21st Century Life and Career Skills** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	**Indicator**
Act as a responsible and contributing citizen and employee. Apply appropriate academic and technical skills. Attend to personal health and financial well-being. Communicate clearly and effectively and with reason. Consider the environmental, social and economic impacts of decisions. Demonstrate creativity and innovation. Employ valid and reliable research strategies. Utilize critical thinking to make sense of problems and persevere in solving them. Model integrity, ethical leadership and effective management. Use technology to enhance productivity.	CRP1 CRP2 CRP3 CRP4 CRP5 CRP6 CRP 7 CRP8 CRP9 CRP11
Key Vocabulary Words	
Ablation, acid, aquatic, aquifer, aquitard, archaean, arid, atmosphere, authigenesis,Backshore, basalt, Bass, Beason, bedrock, biogenic sediment, black hole,caldera, cementation, cenozoic, channelization, chemical sediment, chlorophyll, chlorofluorocarbons Batman, clyman, compaction, compression fossil, conduction, continental shelf, continental slope, convection, equator, Crystal, Darcy's law, decomposition, deposition, desertification, disintegration, divergent boundary, dry lands, ecosystem, epicenter, equator, erosion, fissure eruption, Fjord, foliate, fossil, gemstone, geology geothermal energy, gravity , greenhouse gases, Landforms latitude, longitude, Alaba, levees, liquification, lithification, lithosphere, magma, magnitude, mantle, mesosphere, mineral, natural resources, non-foliated, nutrient, oceanic crust, Oceanic Trench, open pit mining, ore, ore deposit, outcrop, ozone layer, Pollution, pathogen, permafrost, petroleum, plate tectonics,	
Evidence of Learning	

Suggested Assessments:

- Reading, Outline/notes
- Test: Chapter quiz/test
- Notebook Check
- Class Discussion
- Class work submission
- Writing Across the Curriculum
- PBL (Projects)

Instructional Materials:

Primary Text: Earth Science

- Smartboards
- Internet (PhET)
- Supplemental readings
- Lab simulations

Teacher Resources:

- POGIL Assignments https://pogil.org/resources/references/ Earth Science
- NSTA http://www.nsta.org/highschool/connections.aspx
- Vernier Lab/Activity https://www.vernier.com/ Earth Science/
- American Association for the Advancement of Science: http://www.aaas.org/programs
- American Association of Physics Teachers: http://www.aapt.org/resources/
- American Chemical Society: http://www.acs.org/content/acs/en/education.html
- Concord Consortium: Virtual Simulations: http://concord.org/
- International Technology and Engineering Educators Association: http://www.iteaconnect.org/
- National Earth Science Teachers Association: http://www.nestanet.org/php/index.php
- National Science Digital Library: https://nsdl.oercommons.org/
- National Science Teachers Association: http://ngss.nsta.org/Classroom-Resources.aspx
- North American Association for Environmental Education: http://www.naaee.net/
- Phet: Interactive Simulations https://phet.colorado.edu/

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

Gifted and Talented

(content, process, product, and learning environment)

Extension Activities:

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g.

English Language Learners

Modifications:

- Modified assignments
- Native language translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers

conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking	
<u>Students with Disabilities</u> ***(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)*** **Modifications for Classroom:** ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments	**<u>Students at Risk of School Failure</u>** **Modifications for Classroom:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and

- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

cultures (e.g. multiple representation and multimodal experiences).

- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide a copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
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- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily

Modifications for Homework and Assignments:

- Extended time to complete assignments

	● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication **Modifications for Assessments:** ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments

Benway School	
Unit 3	
Content Area: Earth Science	
Unit Title: Ecology in General	
Grade Level: 9-12	
Unit Overview: In this unit of study, Students will be introduced to come to the concepts related to ecology in general. There is a focus on the energy in the material transfer through ecosystems. Students will also study the habits, niches and relationships of species within certain ecosystems. After completing this unit students will be prepared to further investigate the human impacts on the echo system.	
Recommended Pacing: 40 Instructional Days	
Student Learning Objectives/Performance Expectations	**NJSLS**
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 echo system	HS-LS2-6 AND LS2.C
design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity	HS-LS2-7 AND LS2.C & LS4.D
Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources	8.1.12.E.1

research the historical tension between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and presents the competing viewpoints to peers for review	8.2.12.B.5

New Jersey Student Learning Standards/Disciplinary Core Ideas

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.
-

Science and Engineering Practices	Crosscutting Concepts
Mapping and Using Models Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds. ● Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-PS1-4), (HS-PS1-8) ● Use a model to predict the relationships between systems or between components of a system. (HS-PS1-1) **Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 9–12 builds on K–8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical and empirical models. ● Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements	**Stability and Change** ● Much of science deals with constructing explanations of how things change and how they remain stable. (HS-PS1-6) **Patterns** ● Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena. (HS-PS1-1), (HS-PS1-2),(HS-PS1-3),(HSPS1-5)

and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly. (HS-PS2-5)	

Interdisciplinary Connections

English Language Arts/Literacy

- Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem. (HS-LS2-6)
- Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS2-6)
- Collect relevant data across a broad spectrum of sources about the distribution of energy in a system and assess the strengths and limitations of each source.
- Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. *(HS-LS2-6)*
- Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-LS2-6)

Mathematics

- Reason abstractly and quantitatively. (HS-LS2-6)
- Represent data with plots on the real number line. *(HS-LS2-6)*
- Understand statistics as a process for making inferences about population parameters based on a random sample from that population. *(HS-LS2-6)*
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English Language Arts	Mathematics
Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. (HS-PS1-1) **RST.9-10.7** Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-PS1-5) **RST.11-12.1** Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia)	Reason abstractly and quantitatively. (HS-PS1-5), (HS-PS1-7),(HS-ETS1-1),(HS-ETS1-3),(HS-ETS 1-4) **MP.2** Model with mathematics. (HS-PS1-4), (HS-ETS1-1), (HS-ETS1-2),(HS-ETS1-3),(HS-ETS1-4) **MP.4** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (HS-PS1-4), (HS-PS1-5),(HS-PS1-7),(HS-PS1-8) **HSN.Q.A.1**

in order to address a question or solve a problem. (HS-ETS1-1), (HS-ETS1-3) **RST.11-12.7** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-ETS1-1), (HS-ETS1-3) **RST .11-12.8** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (HS-ETS1-1), (HS-ETS1-3) **RST .11-12.9** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-PS1-5) **WHST.9-12.2** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-PS1-6) **WHST.9-12.7** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-PS1-4) **SL.11-12.5**	

New Jersey Student Learning Standards **Technology** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
New Jersey Student Learning Standards	**Indicator**

21st Century Life and Career Skills *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Career Ready Practices	**Indicator**
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP 7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
= **Key Vocabulary Words**	
Ablation, acid, aquatic, aquifer, aquitard, archaean, arid, atmosphere, authigenesis,Backshore, basalt, Bass, Beason, bedrock, biogenic sediment, black hole,caldera, cementation, cenozoic, channelization, chemical sediment, chlorophyll, chlorofluorocarbons Batman, clyman, compaction, compression fossil, conduction, continental shelf, continental slope, convection, equator, Crystal, Darcy's law, decomposition, deposition, desertification, disintegration, divergent boundary, dry lands, ecosystem, epicenter, equator, erosion, fissure eruption, Fjord, foliate, fossil, gemstone, geology geothermal energy, gravity , greenhouse gases, Landforms latitude, longitude, Alaba, levees, liquification, lithification, lithosphere, magma, magnitude, mantle, mesosphere, mineral, natural resources, non-foliated, nutrient, oceanic crust, Oceanic Trench, open pit mining, ore, ore deposit, outcrop, ozone layer, Pollution, pathogen, permafrost, petroleum, plate tectonics, -Melting-Freezing-Deposition-Condensation-Sublimation-Phase diagram-Kinetic energy-Potential energy	
Evidence of Learning	
Suggested Assessments: ● Test: Chapter quiz/tests ● Notebook Check ● Class/ homework submission ● Writing Across the Curriculum ● PBL (Project)	
Learning Activities:	

- Collaborative group discussions/ activities
- Hands-on lab investigations
- Demonstrations
- Virtual lab investigations

Work individually and collaboratively to explore key concepts:

- What roles do certain organisms serve in their ecosystem
- What are the differences between abiotic factors and biotic factors affect an ecosystem
- How does energy flow

Instructional Materials:

Primary Text: Modern Earth Science

- Smartboard Interactive Programs
- Internet
- Notebooks
- Website

Teacher Resources:

- POGIL Assignments https://pogil.org/resources/references/ Earth Science
- NSTA http://www.nsta.org/highschool/connections.aspx
- Vernier Lab/Activity https://www.vernier.com/ Earth Science/
- American Association for the Advancement of Science: http://www.aaas.org/programs
- American Chemical Society: http://www.acs.org/content/acs/en/education.html
- Concord Consortium: Virtual Simulations: http://concord.org/
- International Technology and Engineering Educators Association: http://www.iteaconnect.org/
- National Earth Science Teachers Association: http://www.nestanet.org/php/index.php
- National Science Digital Library: https://nsdl.oercommons.org/
- National Science Teachers Association: http://ngss.nsta.org/Classroom-Resources.aspx
- North American Association for Environmental Education: http://www.naaee.net/
- Phet: Interactive Simulations https://phet.colorado.edu/
- Science NetLinks: http://www.aaas.org/program/science-netlinks

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

Gifted and Talented ***(content, process, product, and learning environment)***	**English Language Learners**
Extension Activities: ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).	**Modifications:** ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers

● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking	
<u>Students with Disabilities</u> ***(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)*** **Modifications for Classroom:** ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher	**<u>Students at Risk of School Failure</u>** **Modifications for Classroom:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage

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- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).

- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
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Benway School	
Unit 4	
Content Area: Earth Science	
Unit Title: Population Studies	
Grade Level: 9-12	
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 echo system	HS-LS2-6 AND LS2.C
design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity	HS-LS2-7 AND LS2.C & LS4.D
Produce a position statement about a real world problem by developing a systematic plan of investigation with peers and experts synthesizing information from multiple sources	8.1.12.E.1
research the historical tension between environmental and economic considerations as driven by human needs and wants in the development of a technological product, and presents the competing viewpoints to peers for review	8.2.12.B.5

New Jersey Student Learning Standards/Disciplinary Core Ideas
LS2.C: Ecosystem Dynamics, Functioning, and Resilience ● A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.

Science and Engineering Practices	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student generated sources of evidence consistent with scientific ideas, principles, and theories. ● Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-LS1-1) ● Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-LS1-6)	**Energy and Matter** ● Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system. (HS-LS1-5), (HS-LS1-6) ● Energy cannot be created or destroyed—it only moves between one place and another place, between objects and/or fields, or between systems. (HS-LS1-7)

Interdisciplinary Connections
English Language Arts/Literacy ● Make strategic use of digital media in presentations to enhance understanding of how sample census data and true census data useful

- What are the benefits of certain census techniques
- What are limiting factors
- what are the differences between density dependent and density independent factors
- how can population density be disturbed
- how do certain species die out during succession While others become the climax

Mathematics

- Develop a model based on evidence to illustrate the relationships between systems or between components of a system.

English Language Arts	**Mathematics**
Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS1-6) **RST.11-12.1** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-6) **WHST.9-12.2** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (HS-LS1-6) **WHST.9-12.5** Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-6) **WHST.9-12.9** Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. (HS-LS1-4) ,(HS-LS1-5),(HS-LS1-7) **SL.11-12.5**	Model with mathematics. (HS-LS1-4) **MP.4** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. (HS-LS1-4) **HSF-IF.C.7** Write a function that describes a relationship between two quantities. (HS-LS1-4) **HSF-BF.A.1**

New Jersey Student Learning Standards **Technology** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1

Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards **21st Century Life and Career Skills** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	**Indicator**
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP 7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12
= **Key Vocabulary Words**	
Ablation, acid, aquatic, aquifer, aquitard, archaean, arid, atmosphere, authigenesis,Backshore, basalt, Bass, Beason, bedrock, biogenic sediment, black hole,caldera, cementation, cenozoic, channelization, chemical sediment, chlorophyll, chlorofluorocarbons Batman, clyman, compaction, compression fossil, conduction, continental shelf, continental slope, convection, equator, Crystal, Darcy's law, decomposition, deposition, desertification, disintegration, divergent boundary, dry lands, ecosystem, epicenter, equator, erosion, fissure eruption, Fjord, foliate, fossil, gemstone, geology geothermal energy, gravity , greenhouse gases, Landforms latitude, longitude, Alaba, levees, liquification, lithification, lithosphere, magma, magnitude, mantle, mesosphere, mineral, natural resources, non-foliated, nutrient, oceanic crust, Oceanic Trench, open pit mining, ore, ore deposit, outcrop, ozone layer, Pollution, pathogen, permafrost, petroleum, plate tectonics,	
Evidence of Learning	

Suggested Assessments:

- Notebook Check
- Class work submission
- Test/Quiz
- Writing Across the Curriculum

Learning Activities:

- Collaborative group discussions/ activities
- computer lab-simulation activities
- Hands-on lab activities

Work individually and collaboratively to explore key concepts:

- Photosynthesis Earth Science Model: Using the chemical equation for photosynthesis and ball and stick models, students will be able to apply the law of conservation of matter by rearranging the reactants (carbon dioxide and water) of photosynthesis into the appropriate products (glucose and oxygen).
- Metabolism Earth Science Model: Students will model the chemical reactions that result in the creation and breaking down of polymers. Students will be able to explain how atoms from one type of polymer are restructured to produce a different polymer.
- Measuring Metabolism: students examine effects of temperature on metabolic rates in beetles. Focus is on cellular respiration and conservation of energy.
- Photosynthesis and Cell Respiration: inquiry-based collaborative group lesson where students will discover the complementary relationship between photosynthesis and cellular respiration. *expanded and more user-friendly version of lesson above.
- Biological Molecules: students engage in collaborative group work to discover the 4 macromolecules that are the basis for all life on Earth. Biochemical reactions that result in the polymerization of monomers are emphasized in this activity.
- Bio Earth Science Macromolecules: POGIL collaborative group activity using paper clips to simulate synthesis of monomers into polymers and explores the four major macromolecules required for life.

Instructional Materials:

Text: Modern Earth Science

Teacher Resources:

- NSTA http://www.nsta.org/highschool/connections.aspx
- Vernier Lab/Activity https://www.vernier.com/ Earth Science/
- American Association for the Advancement of Science: http://www.aaas.org/programs
- American Chemical Society: http://www.acs.org/content/acs/en/education.html
- Concord Consortium: Virtual Simulations: http://concord.org/
- International Technology and Engineering Educators Association: http://www.iteaconnect.org/
- National Earth Science Teachers Association: http://www.nestanet.org/php/index.php
- National Science Digital Library: https://nsdl.oercommons.org/
- Science NetLinks: http://www.aaas.org/program/science-netlinks

Modifications & Accommodations:

Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit	
Gifted and Talented ***(content, process, product, and learning environment)*** **Extension Activities:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking	**English Language Learners** **Modifications:** ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers
Students with Disabilities	**Students at Risk of School Failure** **Modifications for Classroom:**

(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team) **Modifications for Classroom:** ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate ● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily ● Student requires use of other assistive technology device **Modifications for Homework and Assignments:** ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication	● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community. ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide a copy of class notes ● Preferential seating to be mutually determined by the student and teacher ● Student may request to use a computer to complete assignments ● Establish expectations for correct spelling on assignments ● Extra textbooks for home ● Student may request books on tape/CD/digital media, as available and appropriate

Modifications for Assessments: ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments	● Assign a peer helper in the class setting ● Provide oral reminders and check student work during independent work time ● Assist student with long and short term planning of assignments ● Encourage student to proofread assignments and tests ● Provide regular parent/school communication ● Teachers will check/sign student agenda daily **Modifications for Homework and Assignments:** ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication **Modifications for Assessments:** ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments

Benway School
Unit 5
Content Area: Earth Science
Unit Title: Nuclear Earth Science
Grade Level: 9-12
Unit Overview: In this unit of study, energy and matter are studied further by investigating the processes of nuclear fusion and fission that govern the formation, evolution, and workings of the solar system in the universe. Some concepts studied are fundamental to science and demonstrate *scale,*

proportion, and quantity, such as understanding how the matter of the world formed during the Big Bang and within the cores of stars over the cycle of their lives.

In addition, an important aspect of Earth and space sciences involves understanding the concept *of stability and change* while making inferences about events in Earth's history based on a data record that is increasingly incomplete the farther one goes back in time. A mathematical analysis of radiometric dating is used to comprehend how absolute ages are obtained for the geologic record.

The crosscutting concepts of *energy and matter*; *scale, proportion, and quantity*; and *stability and change* are called out as organizing concepts for this unit. Students are expected to demonstrate proficiency in *developing and using models*; *constructing explanations and designing solutions; using mathematical and computational thinking; and obtaining, evaluating, and communicating information*; and they are expected to use these practices to demonstrate understanding of the core ideas.

Recommended Pacing: 10 Instructional Days

Student Learning Objectives/Performance Expectations	NJSLS
Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay.	HS-PS1-8.
Communicate scientific ideas about the way stars, over their life cycle, produce elements.	HS-ESS1-3
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-ESS1-1
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-ESS1-2
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-ESS1-6

New Jersey Student Learning Standards/Disciplinary Core Ideas

: Nuclear Processes

- Spontaneous radioactive decays follow a characteristic exponential decay law. Nuclear lifetimes allow radiometric dating to be used to determine the ages of rocks and other materials. (secondary to HS-ESS1-5), (secondary to HS-ESS1-6)

Science and Engineering Practices	Crosscutting Concepts
ging in Argument from Evidence ing in argument from evidence in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science. ● Evaluate evidence behind currently accepted explanations or solutions to	**Energy and Matter** ● Energy cannot be created or destroyed– only moved between one place and another place, between objects and/or fields, or between systems. (HS-ESS1-2) ● In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved. (HSESS1-3) **Stability and Change**

determine the merits of arguments. (HS-ESS1-5) **ning, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs. ● Communicate scientific ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically). (HS-ESS1-3)	● Much of science deals with constructing explanations of how things change and how they remain stable. (HS-ESS1-6)

Interdisciplinary Connections

English Language Arts/Literacy

- Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
- Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Mathematics

- Reason abstractly and quantitatively and model with mathematics.
- Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- Define appropriate quantities for the purpose of descriptive modeling.
- Interpret expressions that represent a quantity in terms of its context.
- Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

English Language Arts	Mathematics
Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-ESS1-1) **RST.11-12.1** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-ESS1-3), (HS-ESS1-2) **WHST.9-12.2**	Reason abstractly and quantitatively. (HS-ESS1-1), (HS-ESS1-2) ,(HS-ESS1-3) ,(HS-PS1-8) **MP.2** Model with mathematics. (HS-ESS1-1) **MP.4** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (HS-ESS1-1), (HS-ESS1-2) **HSN.Q.A.1**

Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (HS-ESS1-3) **SL.11-12.4**	Define appropriate quantities for the purpose of descriptive modeling. (HS-ESS1-1), (HS-ESS1-2) **HSN-Q.A.2** Interpret expressions that represent a quantity in terms of its context. (HS-ESS1-1) **HSA-SSE.A.1** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (HS-ESS1-1), (HS-ESS1-2) **HSA-CED.A.2** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. (HS-ESS1-1), (HS-ESS1-2) **HSA-CED.A.4**

New Jersey Student Learning Standards Technology *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards 21st Century Life and Career Skills *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	**Indicator**
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6

Employ valid and reliable research strategies. Utilize critical thinking to make sense of problems and persevere in solving them. Model integrity, ethical leadership and effective management. Plan education and career paths aligned to personal goals. Use technology to enhance productivity.	CRP 7 CRP8 CRP9 CRP10 CRP11
Work productively in teams while using cultural global competence.	CRP12

Key Vocabulary Words

Ablation, acid, aquatic, aquifer, aquitard, archaean, arid, atmosphere, authigenesis,Backshore, basalt, Bass, Beason, bedrock, biogenic sediment, black hole,caldera, cementation, cenozoic, channelization, chemical sediment, chlorophyll, chlorofluorocarbons Batman, clyman, compaction, compression fossil, conduction, continental shelf, continental slope, convection, equator, Crystal, Darcy's law, decomposition, deposition, desertification, disintegration, divergent boundary, dry lands, ecosystem, epicenter, equator, erosion, fissure eruption, Fjord, foliate, fossil, gemstone, geology geothermal energy, gravity , greenhouse gases, Landforms latitude, longitude, Alaba, levees, liquification, lithification, lithosphere, magma, magnitude, mantle, mesosphere, mineral, natural resources, non-foliated, nutrient, oceanic crust, Oceanic Trench, open pit mining, ore, ore deposit, outcrop, ozone layer, Pollution, pathogen, permafrost, petroleum, plate tectonics, capture-Positron-Half-life-Decay series-Radioactive dating-Fission-Fusion-Chain reaction-Critical mass

Evidence of Learning

Suggested Assessments:

- Test/Quiz
- Classwork
- Benchmark
- Writing Across the Curriculum
- PBL projects

Learning Activities:

- Collaborative instructional groups and activities
- Small group/ large group discussion
- hands-on activities
- computer lab simulations
- videos (NOVA, Cosmos)

Work individually and collaboratively to explore key concepts:

- Teaching the Manhattan Project (NSTA): multi-day unit lesson that addresses the science and ethical issues surrounding the development of the atomic bomb. The lessons stress civic duty and literacy.
- Nuclear Fission and Fusion: this is a collaborative guided-inquiry based lesson that requires students to compare and contrast fission and fusion reactions and their applications.
- Nuclear Reactions: a guided inquiry lesson that addresses basic nuclear reactions, fission and fusion reactions, and mechanisms of nuclear fusion.
- Fusion Reactions-How and Where are Elements Created? : In this lesson series students learn about the life cycle of stars and the origins of all elements in our universe. The Law of Conservation of Matter and Energy are addressed in this series.

- Learn Nuclear Science with Marbles: hands-on learning activity that addresses topics such as; radioactive decay, isotopes, nuclear reactions and their applications.
- The Harnessed Atom: A nuclear Earth Science unit that guides students through a series of activities and investigations that address topics such as; energy basics, atomic structure, isotopes, radiation, fission and fusion reactions, and applications of nuclear energy in a more energy conscious world. The repercussions and controversy surrounding nuclear power is also discussed.
- The Day the Mesozoic Died: this multidisciplinary lesson requires students to view a short film and then engage in discussions and activities that address topics such as; chemical composition of asteroids, calculating the quantity of iridium released from asteroid impacts, and examining chemical and physical evidence of asteroid impacts.
- Radioactive Dating Game: an interactive game that concentrates on nuclear Earth Science concepts such as; half-life, radioactivity, and carbon-dating
- Nuclear Fission: an interactive lab simulation where students control nuclear reactions by manipulating variable in a nuclear chemical reactor.
- The Green Room: The Pros and Cons of Nuclear Energy: NSTA published article that provides ideas about getting your students to critically assess the use of nuclear energy vs. other forms of energy.

Instructional Materials:

Primary Text:Earth Science

- Internet
- Supplemental readings
- Smartboard

Teacher Resources:

- POGIL Assignments https://pogil.org/resources/references/ Earth Science
- NSTA http://www.nsta.org/highschool/connections.aspx
- Vernier Lab/Activity https://www.vernier.com/ Earth Science/
- American Association for the Advancement of Science: http://www.aaas.org/programs
- American Chemical Society: http://www.acs.org/content/acs/en/education.html
- Concord Consortium: Virtual Simulations: http://concord.org/
- International Technology and Engineering Educators Association: http://www.iteaconnect.org/
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- National Science Teachers Association: http://ngss.nsta.org/Classroom-Resources.aspx
- North American Association for Environmental Education: http://www.naaee.net/
- Phet: Interactive Simulations https://phet.colorado.edu/
- Science NetLinks: http://www.aaas.org/program/science-netlinks

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

Gifted and Talented	**English Language Learners**

(content, process, product, and learning environment) **Extension Activities:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking	**Modifications:** ● Modified assignments ● Native language translation (peer, online assistive technology, translation device, bilingual dictionary) ● Extended time for assignment completion as needed ● Highlight key vocabulary ● Use graphic organizers
<u>Students with Disabilities</u> ***(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP or 504 team)*** **Modifications for Classroom:**	**<u>Students at Risk of School Failure</u>** **Modifications for Classroom:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments,
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed

aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).

- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
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• Restate, reread, and clarify directions/questions • Distribute study guide for classroom tests • Establish procedures for accommodations/modifications for assessments	• Assist student with long and short term planning of assignments • Encourage student to proofread assignments and tests • Provide regular parent/school communication • Teachers will check/sign student agenda daily **Modifications for Homework and Assignments:** • Extended time to complete assignments • Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. • Provide the student with clearly stated (written) expectations and grading criteria for assignments. • Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication **Modifications for Assessments:** • Extended time on classroom tests and quizzes • Student may take/complete tests in an alternate setting as needed • Restate, reread, and clarify directions/questions • Distribute study guide for classroom tests • Establish procedures for accommodations/modifications for assessments

Benway School
Unit 6
Content Area: Earth Science
Unit Title: Human Impact: The Earth Science of Sustainability
Grade Level: 9-12
Unit Overview: In this unit of study, students use *cause and effect* to *develop models and explanations* for the ways that feedbacks among different Earth systems control the appearance of Earth's surface. Central to this is the tension between internal systems, which are largely responsible for creating land at Earth's surface (e.g., volcanism and mountain building), and the sun-driven surface systems that tear down the land through weathering and erosion. Students begin to examine the ways that human activities cause feedbacks that create changes to other systems. Students understand the

system interactions that control weather and climate, with a major emphasis on the mechanisms and implications of climate change. Students model the flow of energy and matter between different components of the weather system and how this affects chemical cycles such as the carbon cycle. Engineering and technology figure prominently here, as students use mathematical thinking and the analysis of geoscience data to examine and construct solutions to the many challenges facing long-term human sustainability on Earth. Here students will use these geoscience data to explain climate change over a wide range of timescales, including over one to ten years: large volcanic eruption, ocean circulation; ten to hundreds of years: changes in human activity, ocean circulation, solar output; tens of thousands to hundreds of thousands of years: changes to Earth's orbit and the orientation of its axis; and tens of millions to hundreds of millions of years: long-term changes in atmospheric composition).

Recommended Pacing: 10 Instructional Days

Student Learning Objectives/Performance Expectations	NJSLS
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-ESS2-4
Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.	HS-ESS2-6
Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.	HS-ETS1-1
Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.	HS-ETS1-2
Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.	HS-ETS1-3
Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem	HS-ETS1-4

New Jersey Student Learning Standards/Disciplinary Core Ideas

A: The Universe and Its Stars

- The star called the sun is changing and will burn out over a lifespan of approximately 10 billion years. (HS-ESS1-1)
- The study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth. (HS-ESS1- 2), (HS-ESS1-3)
- Other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova stage and explode. (HS-ESS1- 2), (HS-ESS1-3)

A: Earth Materials and Systems

- Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes. (HSESS2-1),(HS-ESS2-2)
- Evidence from deep probes and seismic waves, reconstructions of historical changes in Earth's surface and its magnetic field, and an understanding of physical and chemical processes lead to a model of Earth with a hot but solid inner core, a liquid outer core, a solid mantle and crust. Motions of the mantle and its plates occur primarily through thermal convection, which involves the cycling of matter due to the outward flow of energy from Earth's interior and gravitational movement of denser materials toward the interior. (HS-ESS2-3)
- The geological record shows that changes to global and regional climate can be caused by interactions among changes in the sun's energy output or Earth's orbit, tectonic events, ocean circulation, volcanic activity, glaciers, vegetation, and human activities. These changes can occur on a variety of time scales from sudden (e.g., volcanic ash clouds) to intermediate (ice ages) to very long-term tectonic cycles. (HS-ESS2-4)

D: Weather and Climate

- The foundation for Earth's global climate systems is the electromagnetic radiation from the sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space. (HS-ESS2-2), (HS-ESS2-4)
- Gradual atmospheric changes were due to plants and other organisms that captured carbon dioxide and released oxygen. (HS-ESS2-6), (HS-ESS2-7)
- Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate. (HS-ESS2- 6), (HS-ESS2-4)

Science and Engineering Practices	Crosscutting Concepts
ɔping and Using Models ing in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed world(s). ● Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-ESS1-1) ● Develop a model based on evidence to illustrate the relationships between systems or between components of a system. (HS-ESS2-1), (HS-ESS2- 3) , (HS-ESS2-6) ● Use a model to provide mechanistic accounts of phenomena. (HS-ESS2-4) **Mathematical and Computational Thinking** Mathematical and computational thinking in 9–12 builds on K–8 experiences and progresses to using algebraic thinking and analysis, a range of linear	**Cause and Effect** Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. (HS-ESS2-4) Scale, Proportion, and Quantity The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. (HS-ESS1-1) Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth). (HS-ESS1-4) **Energy and Matter** ● Energy cannot be created or destroyed– only moved between one place and another place, between objects and/or fields, or between systems. (HS-ESS1-2) ● In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved. (HSESS1-3)

and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions. ● Use mathematical or computational representations of phenomena to describe explanations. (HS-ESS1-4)	

Interdisciplinary Connections

English Language Arts/Literacy-

- Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations describing how variations in the flow of energy into and out of Earth's systems result in changes in climate to enhance understanding of findings, reasoning, and evidence and to add interest.
- Cite specific textual evidence of the availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity.
- Use empirical evidence to write an explanation for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

Mathematics-

- Represent symbolically an explanation for how variations in the flow of energy into and out of Earth's systems result in changes in climate, and manipulate the representing symbols. Use symbols to make sense of quantities and relationships about how variations in the flow of energy into and out of Earth's systems result in changes in climate, symbolically and manipulate the representing symbols.
- Use a mathematical model to explain how variations in the flow of energy into and out of Earth's systems result in changes in climate. Identify important quantities in variations in the flow of energy into and out of Earth's systems result in changes in climate and map their relationships using tools. Analyze those relationships mathematically to draw conclusions, reflecting on the results and improving the model if it has not served its purpose.
- Use units as a way to understand problems and to guide the solution of multistep problems about how variations in the flow of energy into and out of Earth's systems result in changes in climate; choose and interpret units consistently in formulas representing how variations in the flow of energy into and out of Earth's systems result in changes in climate; choose and interpret the scale and the origin in graphs and data displays representing how variations in the flow of energy into and out of Earth's systems result in changes in climate.
- Define appropriate quantities for the purpose of descriptive modeling of how variations in the flow of energy into and out of Earth's systems result in changes in climate.

- Choose a level of accuracy appropriate to limitations on measurement when reporting quantities to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
- Represent symbolically the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere, and manipulate the representing symbols. Make sense of quantities and relationships in the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
- Use a mathematical model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. Identify important quantities in the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere and map their relationships using tools. Analyze those relationships mathematically to draw conclusions, reflecting on the results and improving the model if it has not served its purpose.
- Use units as a way to understand the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere; choose and interpret units consistently in formulas representing the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere; choose and interpret the scale and the origin in graphs and data displays representing the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
- Define appropriate quantities for the purpose of descriptive modeling of the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
- Choose a level of accuracy appropriate to limitations on measurement when reporting quantities showing the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
- Represent symbolically how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity, and manipulate the representing symbols. Make sense of quantities and relationships among availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity.
- Use units as a way to understand the relationships among availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity. Choose and interpret units consistently in formulas to determine relationships among availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity. Choose and interpret the scale and the origin in graphs and data displays representing relationships among availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity.
- Define appropriate quantities for the purpose of descriptive modeling of relationships among availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity.

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities showing relationships among availability of natural resources, occurrence of natural hazards, and changes in climate and their influence on human activity.

English Language Arts	**Mathematics**
Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia)	Reason abstractly and quantitatively. (HS-ESS1-1), (HS-ESS1-2) ,(HS-ESS1-3) ,(HS-PS1-8) **MP.2**

in order to address a question or solve a problem. (HS-ETS1-1), (HS-ETS1-3) **RST.11-12.7** Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. (HS-ETS1-1) ,(HS-ETS1-3) **RST .11-12.8** Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (HS-ETS1-1), (HS-ETS1-3) **RST .11-12.9**	Model with mathematics. (HS-ESS1-1) **MP.4** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (HS-ESS1-1), (HS-ESS1-2) **HSN.Q.A.1** Define appropriate quantities for the purpose of descriptive modeling. (HS-ESS1-1), (HS-ESS1-2) **HSN-Q.A.2** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-ESS1-1), (HS-ESS1-2**)** **HSN-Q.A.3** Interpret expressions that represent a quantity in terms of its context. (HS-ESS1-1) **HSA-SSE.A.1** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. (HS-ESS1-1), (HS-ESS1-2) **HSA-CED.A.2**

New Jersey Student Learning Standards **Technology** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.	8.1.12.A.3
Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.	8.1.12.C.1
Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.	8.1.12.F.1
Demonstrate how reusing a product affects the local and global environment.	8.2.2.B.2
Identify products or systems that are designed to meet human needs.	8.2.2.B.3
Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.	8.2.12.B.2
New Jersey Student Learning Standards **21st Century Life and Career Skills** *(Additional standards should be applied, as needed, to enrich instruction and foster student achievement.)*	**Indicator**
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Analyze how economic conditions and societal changes influence employment trends and future education.	9.2.12.C.4

Research career opportunities in the United States and abroad that require knowledge of world languages and diverse cultures.	9.2.12.C.5
Investigate entrepreneurship opportunities as options for career planning and identify the knowledge, skills, abilities, and resources required for owning and managing a business.	9.2.12.C.6
Identify transferable career skills and design alternate career plans.	9.2.12.C.3
Career Ready Practices	**Indicator**
Act as a responsible and contributing citizen and employee.	CRP1
Apply appropriate academic and technical skills.	CRP2
Attend to personal health and financial well-being.	CRP3
Communicate clearly and effectively and with reason.	CRP4
Consider the environmental, social and economic impacts of decisions.	CRP5
Demonstrate creativity and innovation.	CRP6
Employ valid and reliable research strategies.	CRP 7
Utilize critical thinking to make sense of problems and persevere in solving them.	CRP8
Model integrity, ethical leadership and effective management.	CRP9
Plan education and career paths aligned to personal goals.	CRP10
Use technology to enhance productivity.	CRP11
Work productively in teams while using cultural global competence.	CRP12

Key Vocabulary Words

Ablation, acid, aquatic, aquifer, aquitard, archaean, arid, atmosphere, authigenesis,Backshore, basalt, Bass, Beason, bedrock, biogenic sediment, black hole,caldera, cementation, cenozoic, channelization, chemical sediment, chlorophyll, chlorofluorocarbons Batman, clyman, compaction, compression fossil, conduction, continental shelf, continental slope, convection, equator, Crystal, Darcy's law, decomposition, deposition, desertification, disintegration, divergent boundary, dry lands, ecosystem, epicenter, equator, erosion, fissure eruption, Fjord, foliate, fossil, gemstone, geology geothermal energy, gravity , greenhouse gases, Landforms latitude, longitude, Alaba, levees, liquification, lithification, lithosphere, magma, magnitude, mantle, mesosphere, mineral, natural resources, non-foliated, nutrient, oceanic crust, Oceanic Trench, open pit mining, ore, ore deposit, outcrop, ozone layer, Pollution, pathogen, permafrost, petroleum, plate tectonics,

Evidence of Learning

Suggested Assessments:

- Class discussion/participation
- Classwork submission
- Writing Across the Curriculum
- PBL assignments

Learning Activities:

- collaborative group discussions/activities
- collaborative/individual group projects
- computer lab simulations.
-

Work individually and collaboratively to explore key concepts:

- What are the major levels of concerns when discussing diminishing populations

- what are some of the laws / acts are there that address the topics of habitat use and human predation
- how can I make responsible choices when making land planning decisions
- what are some species that are most affected by habitat fragmentation
- why are certain species more vulnerable to Habitat fragmentation than others
- is hunting always a bad thing why or why not
- how has poaching been regulated over the years? Or their effective methods for controlling illegal poaching
- how has technology contributed to the problem how has it helped with the issues Earth

Instructional Materials:

- Internet
- Supplemental readings
- Smartboard
- Website

Teacher Resources:

- NSTA http://www.nsta.org/highschool/connections.aspx
- Vernier Lab/Activity https://www.vernier.com/ Earth Science/
- American Association for the Advancement of Science: http://www.aaas.org/programs
- American Chemical Society: http://www.acs.org/content/acs/en/education.html
- Concord Consortium: Virtual Simulations: http://concord.org/
- International Technology and Engineering Educators Association: http://www.iteaconnect.org/
- National Earth Science Teachers Association: http://www.nestanet.org/php/index.php
- National Science Digital Library: https://nsdl.oercommons.org/
- National Science Teachers Association: http://ngss.nsta.org/Classroom-Resources.aspx
- North American Association for Environmental Education: http://www.naaee.net/
- Phet: Interactive Simulations https://phet.colorado.edu/
- Science NetLinks: http://www.aaas.org/program/science-netlinks

Modifications & Accommodations:

**Please note that the following modifications and accommodations vary from unit to unit, and may be implemented for any student who would benefit*

Gifted and Talented

(content, process, product, and learning environment)

Extension Activities:

- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).

English Language Learners

Modifications:

- Modified assignments
- Native language translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment completion as needed
- Highlight key vocabulary

● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences). ● Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings. ● Use project-based science learning to connect science with observable phenomena. ● Structure the learning around explaining or solving a social or community-based issue. ● Conduct research and provide presentation of cultural topics ● Design surveys to generate and analyze data to be used in discussion ● Collaborate with after-school programs or clubs to extend learning opportunities. ● Authentic listening and reading sources that provide data and support for speaking and writing prompts ● Anchor activities ● Use of higher-level questioning techniques ● Provide assessments at a higher-level of thinking	● Use graphic organizers
<u>Students with Disabilities</u> ***(appropriate accommodations, instructional adaptation, and/or modifications as determined by the IEP team)*** **Modifications for Classroom:** ● Pair visual prompts with verbal presentations ● Ask students to restate information, directions, and assignments, ● Repetition and practice ● Model skills/techniques to be mastered ● Extended time to complete class work ● Provide copy of class notes ● Preferential seating to be mutually determined by the student and teacher	**<u>Students at Risk of School Failure</u>** **Modifications for Classroom:** ● Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling). ● Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies). ● Provide multiple grouping opportunities for students to share their ideas and to encourage

- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication
- Teachers will check/sign student agenda daily
- Student requires use of other assistive technology device

Modifications for Homework and Assignments:

- Extended time to complete assignments
- Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases.
- Provide the student with clearly stated (written) expectations and grading criteria for assignments.
- Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication

Modifications for Assessments:

- Extended time on classroom tests and quizzes
- Student may take/complete tests in an alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations/modifications for assessments

work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).

- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments
- Repetition and practice
- Model skills/techniques to be mastered
- Extended time to complete class work
- Provide a copy of class notes
- Preferential seating to be mutually determined by the student and teacher
- Student may request to use a computer to complete assignments
- Establish expectations for correct spelling on assignments
- Extra textbooks for home
- Student may request books on tape/CD/digital media, as available and appropriate
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	Modifications for Homework and Assignments: ● Extended time to complete assignments ● Student requires more complex assignments to be broken up and explained in smaller units, with work to be submitted in phases. ● Provide the student with clearly stated (written) expectations and grading criteria for assignments. ● Implement RAFT (role, audience, format, topic) activities as they pertain to the types/modes of communication **Modifications for Assessments:** ● Extended time on classroom tests and quizzes ● Student may take/complete tests in an alternate setting as needed ● Restate, reread, and clarify directions/questions ● Distribute study guide for classroom tests ● Establish procedures for accommodations/modifications for assessments