Rumson-Fair Haven Regional High School

Course: *Contemporary Issues in Environmental Science*
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Board Approval: August 2025

Section I: Course Description

Contemporary Issues in Environmental Science will emphasize interrelationships in the natural world. This course will frequently require students to research current information that relates to the environment and society. Oral reports, group presentations, and hands-on activities will often be required. Students will be asked to think and form opinions based on research and well-supported factual evidence. Seven main topics will be investigated: biodiversity and species loss; population growth and sustainability; food production; pollution and its effects on ecosystems (including municipal solid waste, hazardous materials, air and water pollution, and biodiversity impacts); human health; global climate change; and energy production and consumption (including fossil fuels, renewable energy, and nuclear energy).

Section II: NJSLS: New Jersey Student Learning Standards/Learning Objectives:

1. ***2020 New Jersey Student Learning Standards – Science:***
    - "Scientific and technological advances have proliferated and now permeate most aspects of life in the 21st century. It is increasingly important that all members of our society develop an understanding of scientific and engineering concepts and processes. Learning how to construct scientific explanations and how to design evidence-based solutions provides students with tools to think critically about personal and societal issues and needs. Students can then contribute meaningfully to decision-making processes, such as discussions about climate change, new approaches to health care, and innovative solutions to local and global problems."
2. ***2023 New Jersey Student Learning Standards – Mathematics:***
    - A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society; … A high-quality mathematics education fosters a population that…leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions, persists to make sense of and model problems arising in everyday life, society, and the workplace, thinks critically and strategically to assess quantitative relationships and to solutions to complex problems, employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers' reasoning, interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well as the claims made in the private and public sectors, communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.
3. ***2023 New Jersey Student Learning Standards English Language Arts:***
    - A New Jersey education in English Language Arts builds readers, writers, and communicators prepared to meet the demands of college and career and to engage as productive American citizens with global responsibilities. ...Students will develop the necessary skills in reading, writing, speaking, and listening that are the foundations for creative and purposeful expression in language; read rich, challenging texts that build their knowledge of the world, grow their confidence and identities as readers, and develop critical thinking skills and vocabulary necessary for long-term success[; e]ngage in regular, meaningful, writing authentic tasks, exploring valued topics, writing for impact and expression, and sharing their work with others (including authentic audiences); leverage complex texts and digital media to develop comprehension, active listening, and discussion skills; ground daily writing and discussion in evidence, fostering an ability to read critically, build arguments, cite evidence, and communicate ideas to contribute meaningfully as productive citizens; evaluate the reliability, credibility, and perspective of authors and speakers across all forms of media; express ideas and knowledge through a variety of modalities and media, and serve as effective communicators who purposefully read, write, and speak across multiple disciplines [and l]earn to persist in reading complex texts, establishing lifelong habits to read voluntarily for pleasure, for further education, for information on public policy, and for advancement in the workplace.
4. ***Standard 8.1 (Computer Science) and 8.2 (Design Thinking)* of the *2020 NJSLS:***
    - "The 'Intent and Spirit of the Computer Science and Design Thinking Standards' is to focus on deep understanding of concepts that enable students to think critically and systematically about leveraging technology to solve local and global issues. Authentic learning experiences that enable students to apply content knowledge, integrate concepts across disciplines, develop computational thinking skills, acquire and incorporate varied perspectives, and communicate with diverse audiences about the use and effects of computing prepares New Jersey students for college and careers."
5. ***Standard 9.4 (Life Literacies and Key Skills)* of the *2020 NJSLS*:**
    - "This standard outlines key literacies and technical skills such as critical thinking, global and cultural awareness, and technology literacy that are critical for students to develop to live and work in an interconnected global economy."

***Climate Change:** The state of New Jersey has mandated instruction in, "Climate Change across all content areas, leveraging the passion students have shown for this critical issue and providing them opportunities to develop a deep understanding of the science behind the changes and to explore the solutions our world desperately needs."

6. ***Amistad Law: N.J.S.A. 18A 52:16A-88:***
    - The inclusion of lessons and resources/texts dealing with the African slave trade, slavery in America, the vestiges of slavery in this country and the contributions of African-Americans to our society will be implemented in English and Social Studies courses in accordance with state law: "Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students."
7. ***Holocaust Law: N.J.S.A. 18A 35-28:***
    - The inclusion of lessons and resources/texts that enable pupils to identify and analyze applicable theories concerning human nature and behavior; to understand that genocide is a consequence of prejudice and discrimination; and to understand that issues of moral dilemma and conscience have a profound impact on life will be implemented in English and Social Studies courses in accordance with state law: "Every board of education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens."
8. ***LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35:***
    - A transformative approach to the inclusion of lessons and resources/texts on the contributions and issues concerning the LGBTQ+ population and people with disabilities will be implemented across all core subjects in accordance with state law: "A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A.18A:35-4.36). A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35."
9. ****Asian American and Pacific Islanders Legislation: N.J.S.A 4021/A6100:***
    - The inclusion of lessons and resources/texts on the history and contributions of Asian Americans and Pacific Islanders, will enable New Jersey's schools to provide a curriculum that reflects the diversity of our state. In accordance with state law: "A board of education shall include instruction on the history and contributions of Asian Americans and Pacific Islanders in an appropriate place in the curriculum of students in grades kindergarten through as part of the school district's implementation of the New Jersey Student Learning Standards in Social Studies."
10. Acquisition/development/refinement of the higher-order critical thinking skills aligned with the *Revised Bloom's Taxonomy of Cognitive Objectives*

Section III: Curriculum Modifications

The *Contemporary Issues in Environmental Science* curriculum is subject to case-by-case modifications to support/advance the needs of all students, including special education students, English language learners, gifted students, and those at risk of school failure. These modifications are based on Individualized Learning Programs (IEPs), recommendations made by the district's Multilingual Learners (ML) coordinator, feedback from members of the Intervention & Referral Services Team (*I&RS*) for at-risk students, and 504 Plans.

Coursework and assessments will be modified on an individual basis for students when necessary. Modifications may include, but are not limited to those outlined on the Modifications/Accommodations for Science Courses chart.

Section IV: Preparation for Standardized Testing

Instruction in *Contemporary Issues in Environmental Science* is aligned with the requirements of state and national standardized assessments, including the *NJGPA*, *NJSLA*, the *ACT*, the *PSAT,* and the *SAT*.

Section V: Curriculum Pacing Guide

Curriculum Pacing Guide	
Course Title: *Contemporary Issues in Environmental Science*	**Grade Level:** *9-12*

Unit I: Biodiversity and Species Loss	Weeks 1-3
Unit II: Population Growth and Sustainability	Weeks 4-6
Unit III: Food Production	Weeks 7-9
Unit IV: Pollution and Its Effects on Ecosystems	Weeks 10-12
Unit V: Human Health	Weeks 13-14
Unit VI: Global Climate Change	Weeks 15-17
Unit VII: Energy Production and Consumption	Weeks 18-20

Section VI: Primary Texts and Year-Long Instructional Resources

The following texts and instructional resources are employed for all students in *Contemporary Issues in Environmental Science*:

- Google Classroom
- *Common Sense Education* (www.commonsense.org)
- Youtube
- https://phet.colorado.edu/en/
- Google Scholar
- Flinn laboratory kits
- Carolina Scientific kits
- Kimmerer, R. W. (2013). *Braiding sweetgrass: Indigenous wisdom, scientific knowledge and the teachings of plants*. Milkweed editions.

Section VII: Grading Formula and Assessment Modes

Marking period grades in *Contemporary Issues in Environmental Science* are determined via a percentage weighting model. The specific grading categories and weightings of each will be determined before the start of each academic year and will be published in the posted/distributed course syllabi.

Assessments in *Contemporary Issues in Environmental Science* vary greatly in format, scope/content/skills assessed, and alternative assessments; differentiation in assessments and choice will be incorporated as appropriate. Preliminary assessments of each format will be used as benchmarks, and summative assessments will be created/revised collaboratively each year and planned by members of the *Contemporary Issues in Environmental Science* instructional team to inform future learning and to measure student growth.

Section VIII: Unit Templates

The following unit templates have been established for the *Contemporary Issues in Environmental Science* curriculum by the *Contemporary Issues in Environmental Science* instructional team:

Unit I: Biodiversity and Species Loss
Unit Summary

In this unit, students will examine the distribution of resources in ecosystems and its influence on species interactions. They will evaluate and understand that biodiversity (including genetics, species, and habitat diversity) is critically important to the health and longevity of ecosystems. Biodiversity is a key component in sustaining life within the living world. Both natural and human disruptions have short- and long-term impacts on ecosystems. A loss of biodiversity can have a lasting and compounding effect on the world around us.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-LS2.6-7, HS-LS4.4-6, HS-ESS3.3-4, HS-ETS1-2-3
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1, A.CED.A.1-2, S.ID.A.1, S.ID.C.9, S.IC.1, S.IC.6, S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8, W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• How does the distribution of resources within an ecosystem influence the interactions among species? • Why is biodiversity fundamental to the health, stability, and longevity of ecosystems? • In what ways do both natural events and human activities cause short-term and long-term impacts on ecosystems and their biodiversity? • What are the far-reaching and compounding consequences of a loss of biodiversity on the living world? • How do the unique characteristics of different regional biomes reflect and influence the biodiversity found within them? • How does the role of individual species contribute to the overall flow of energy within an ecosystem? • *What are the significant ways in which human actions, both direct and indirect, impact regional and global biodiversity?	• The availability and distribution of resources shape the relationships and survival strategies of species within an ecosystem. • Biodiversity provides resilience, adaptability, and a wider range of ecological functions, which are critical for an ecosystem's ability to withstand disturbances, maintain productivity, and sustain life over time.. • Both natural events and human actions can significantly alter ecosystem structure and function, leading to immediate changes and long-term consequences for biodiversity and ecological balance. • A reduction in biodiversity can lead to a cascade of negative effects, including decreased ecosystem resilience, disruption of essential ecosystem services, increased vulnerability to disease, and a permanent loss of genetic potential. • The distinct abiotic factors that define regional biomes create specific environmental conditions that select for and support unique species. • Each species occupies a specific trophic level within an ecosystem, playing a critical role in the transfer and transformation of energy. • *Human activities such as habitat destruction, pollution, climate change, overexploitation, and the introduction of invasive species are major drivers of biodiversity loss.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Biodiversity Index Lab • Worm Population Lab • *Braiding Sweetgrass* written response • Nature journaling • Individual student check ins with teacher	• Aquaponics/Hydroponics Project (Benchmark) • Species Behavior Independent Study	• Unit specific lab materials and readings

Unit II: Population Growth and Stability

Unit Summary

In the last century, the global human population experienced an unprecedented explosion. In this unit, students will examine the changes that have led to this population boom. Students will also learn that, along with this growth and prosperity, there have been great demands placed on the environment. These demands have led to the exploitation of resources, loss of biodiversity, and pollution.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-LS2.1, HS-LS4.6, HS-ESS3.- 4, HS-ETS1.1, 3-4
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1, A.CED.A.1-2, S.ID.A.1, S.ID.C.9, S.IC.1, S.IC.6., S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8., W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What factors have contributed to the unprecedented explosion of the global human population in the last century? • What are the key mechanisms that drive the growth and decline of human populations? • How do complex system behaviors relate to human population dynamics, and what are the implications for our future and the future of the environment? • What factors influence population size, and what strategies have countries implemented to slow population growth? • What are the major characteristics used to describe a human population, and why are they important to understand? • How is the world's population distributed between rural and urban areas, and what factors determine the development patterns of each?	• The rapid increase in the global human population over the last century is primarily due to advancements in medicine, agriculture, and sanitation, which have significantly lowered death rates and increased life expectancy. • Human population growth and decline are driven by birth rates, death rates, and migration patterns. • Human populations behave as complex systems where interconnected factors lead to unpredictable outcomes with significant implications for future human well-being and environmental sustainability. • Population size is influenced by factors such as fertility rates, mortality rates, and migration. Various strategies, including education, access to healthcare, family planning, and economic development, have been implemented by countries to manage and slow population growth. • Key characteristics such as age structure, sex ratio, density, distribution, and growth rate are essential for understanding the current state and future trends of a human population, informing policy decisions and resource management. • The world's population is increasingly concentrated in urban areas due to factors like economic opportunity and access to services, while rural areas are shaped by agricultural practices and resource availability.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Bubble Population Lab • Global Demographic Trend and Population Pyramids • Individual student check ins with teacher	• Regional Demographic Group Presentation	• Unit specific lab materials and readings

Unit III: Food Production

Unit Summary

Soil, its components, physical and chemical properties, and its ability to support human life through agriculture will be included in this unit--including agriculture practices, soil conservation techniques, and different types of agriculture (sustainable vs. commercial). However, agricultural practices can cause environmental disruption. New agricultural strategies and practices will be discussed while addressing positive and negative results. Sustainable use of land and water resources is essential for supporting a growing human population.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-LS2.6-7, HS-LS4.4-6, HS-ESS3.3-4, HS-ETS1.2-3
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1, A.CED.A.1-2, S.ID.A.1, S.ID.C.9, S.IC.1, S.IC.6, S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8., W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• How is food grown around the world, especially in developed vs. undeveloped places? • What is a GMO? How are they produced? Benefits and drawbacks. • What does it mean for a practice or system to be "sustainable," particularly in the context of food production? • How does the concept of the "tragedy of the commons" apply to shared resources in food production and environmental management? • What are the key differences between various agricultural practices globally, and how do soil conservation techniques and energy resources factor into each? • What specific agricultural practices contribute to environmental damage, and what are the mechanisms of that damage?	• Food production methods globally are diverse, ranging from highly mechanized, input-intensive commercial agriculture in developed regions to more labor-intensive, subsistence farming in developing areas, each reflecting varying levels of technology, resource access, and economic priorities. • Genetically Modified Organisms (GMOs) are created through genetic engineering to possess specific desirable traits, offering benefits like increased yields and pest resistance, but also raising concerns about environmental impact, health implications, and economic control. • Sustainability in food production means meeting current food needs without compromising the ability of future generations to meet their own. • The "tragedy of the commons" illustrates how individual self-interest can lead to the depletion of resources in food production and environmental management unless there are effective regulations implemented. • Global agricultural practices vary significantly in scale, technology, and impact, ranging from subsistence to commercial, with each method employing distinct soil conservation techniques and requiring different energy inputs, all of which influence their sustainability and environmental footprint. • Certain agricultural practices, such as intensive monoculture, excessive use of synthetic fertilizers and pesticides, and improper irrigation, contribute to environmental damage through mechanisms like soil degradation, water pollution, biodiversity loss, and greenhouse gas emissions.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Understanding Watersheds Lab • Farm Irrigation Activity	• Understanding Food Waste Group Project	• Unit specific lab materials and readings

Unit IV: Pollution and Its Effects on Ecosystems

Unit Summary

During this unit, students will gain knowledge of pollution that happens in all areas of the environment. Determination of types, production, and disposal of municipal solid waste and hazardous waste will be discussed. Students will explore different types of water pollution. Students will discuss the need to monitor and manage pollution levels in order to maintain biodiversity. Air pollution sources and six major types of pollutants and their effects on the environment and human health will be discussed, including carbon dioxide, sulfur dioxide, nitrogen monoxide, particulate matter, chlorofluorocarbons, and methane. The burning of fossil fuels and the production of sulfur and nitrogen oxides, and their link to acid rain, will be analyzed.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-PS1.3, HS-LS2.6-7, HS-LS4.4-6, HS-ESS3.3-4, HS-ETS1.2-3
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1., A.CED.A.1-2, S.ID.A.1, S.ID.C.9, S.IC.1, S.IC.6., S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8., W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What are the different types of municipal solid waste and hazardous waste, and how are they produced and disposed of? • What are the various forms of water pollution, and how do they impact aquatic ecosystems and human health? • Why is it essential to monitor and manage pollution levels to maintain biodiversity and overall environmental health? • What are the primary sources of air pollution? • How do each of the major air pollutants affect both the environment and human health? • What is the connection between the burning of fossil fuels, the production of sulfur and nitrogen oxides, and the formation of acid rain?	• Municipal solid waste and hazardous waste are distinct categories of discarded materials, each with unique origins, compositions, and specific disposal methods required to prevent environmental contamination and protect human health. • Water pollution can stem from biological, chemical, and thermal sources and cause specific detrimental effects on aquatic ecosystems, biodiversity, and human health. • Monitoring and managing pollution levels are critical because unchecked contamination directly degrades ecosystems, harms species, and disrupts ecological balance. • Air pollution originates from both natural processes and human activities such as industrial emissions, vehicle exhaust, and energy production. • Each major air pollutant has distinct mechanisms by which it negatively impacts environmental systems and poses specific risks to human respiratory, cardiovascular, and overall health. • The burning of fossil fuels releases sulfur and nitrogen oxides into the atmosphere, which then react to form sulfuric and nitric acids, leading to acid rain with widespread environmental consequences.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Testing Vehicle Emissions Activity • Testing for Ozone Activity • Individual student check ins with teacher	• School Particulate Lab	• Unit specific lab materials and readings

Unit V: Human Health

Unit Summary

In this unit, the four major types of health hazards (cultural, biological, physical, and chemical) and the major health effects on people and organisms in the environment will be discussed. Students will identify sources of various health hazards and discuss ways to reduce the associated risks. Students will evaluate the role of environmental laws, such as the Clean Air Act, in regulating all standards for environmental and public health.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-LS2.6-7, HS-LS4.4-6, HS-ESS3.3-4, HS-ETS1.2-3
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1, A.CED.A.1-2, S.ID.A.1, S.ID.C.9., S.IC.1, S.IC.6., S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8., W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A

- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What are the four major types of health hazards, and how do they differ in their origins and characteristics? • How do each of these major health hazards impact the health of people and other organisms in the environment? • What are the primary sources of various health hazards in our environment? • What effective strategies and practices can be employed to reduce the risks associated with different health hazards? • What is the role and effectiveness of environmental laws, such as the Clean Air Act, in setting and enforcing standards for environmental and public health?	• Health hazards are broadly categorized into biological, physical, and chemical, each originating from distinct sources and posing unique risks to health. • Each type of health hazard has specific mechanisms by which it negatively affects the physiological processes, well-being, and survival of both human populations and diverse organisms within ecosystems. • Health hazards in the environment stem from a wide array of sources, including natural phenomena, industrial activities, agricultural practices, and daily human behaviors, making their identification crucial for risk mitigation. • Reducing the risks from health hazards requires a multi-faceted approach involving prevention, mitigation, and adaptation strategies, ranging from individual behavioral changes to technological innovations and regulatory measures. • Environmental laws, like the Clean Air Act, are crucial governmental tools that establish and enforce standards to limit pollution and protect public health and the environment, demonstrating the power of legislation in mitigating widespread health hazards.

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
• Understanding Vectors and Human Health Lab • Understanding the Spread of Disease Activity	• Human Disease Presentation	• Unit specific lab materials and readings

Unit VI: Global Climate Change

Unit Summary

Unit VI will focus on a central aspect of environmental science: understanding the global impact of local and regional human activities. Humans can mitigate their impact through the sustainable use of resources. Human activities can cause ozone depletion in the stratosphere and increases in greenhouse gases in the atmosphere. Increases in greenhouse gases can cause human health and environmental problems. These environmental problems include global climate change, ocean warming, and endangered species.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-PS3.1, HS-PS4.1 & 4, HS-LS2.7, HS-LS4.4-6, HS-ESS3.3-4, HS-ETS1.2-3
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1, A.CED.A.1-2, S.ID.A.1, S.ID.C.9, S.IC.1., S.IC.6, S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8., W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
● *How do local and regional human activities collectively contribute to global environmental impacts? ● In what ways can humans mitigate their global environmental impact through sustainable resource use? ● *What human activities specifically lead to ozone depletion in the stratosphere and an increase in atmospheric greenhouse gases? ● *How do increased greenhouse gas concentrations in the atmosphere cause human health and environmental problems? ● *What are the specific environmental problems, such as global climate change, ocean warming, and endangered species, linked to increased greenhouse gases? ● *What is the relationship between human actions, atmospheric changes, and the resulting global climate shifts?	● *Local and regional human activities, such as industrial emissions, deforestation, and consumption patterns, accumulate and interact to produce far-reaching global environmental impacts. ● Humans can significantly reduce their global environmental impact by adopting sustainable resource use practices, including conservation, efficiency, renewable energy adoption, and responsible consumption. ● *Specific human activities, primarily the release of chlorofluorocarbons (CFCs) and other ozone-depleting substances, cause stratospheric ozone depletion, while the burning of fossil fuels, deforestation, and industrial processes are the main drivers of increased atmospheric greenhouse gas concentrations. ● *Elevated concentrations of greenhouse gases trap more heat in the atmosphere, leading to a warming planet that directly and indirectly causes human health issues and environmental degradation. ● *Increased greenhouse gas concentrations are directly linked to critical environmental problems, including altered weather patterns, rising sea levels, coral bleaching, marine ecosystem shifts, and an acceleration in the rate of endangered species and biodiversity loss. ● *Human actions, particularly those releasing greenhouse gases, directly alter the composition of the atmosphere, leading to changes in Earth's energy balance and resulting in measurable global climate shifts with widespread environmental and societal consequences.

Evidence of Learning		
Formative & Alternative Assessments: ● Climate Interpretation Activity ● Species Survivability in a Changing Climate Activity ● Carbon Sequestering in Trees Lab	**Benchmark & Summative Assessments:** ● The Influence of Climate on Sea Level and Land Temperatures Lab ● Greenhouse Gases Lab	**Resources Needed:** ● Unit specific lab materials and readings

Unit VII: Energy Production and Consumption

Unit Summary

During this unit, students will gain valuable knowledge on the different types, functions, and uses of energy in the world. They will learn the processes that are used to unlock the energy in fossil fuels, the reactions necessary to create energy in a nuclear reactor, and the ways to capture renewable energy. They will also understand the risks, benefits, pros, and cons that each type of energy presents to the United States and the world. Students will then take their knowledge and start to apply it to discover why the United States and the world use their current energy sources. Finally, the students will be allowed to see how to capture reusable energy for everyday uses.

Standards/Core Ideas/Performance Expectations/Progress Indicators

The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in *Contemporary Issues in Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-PS3.1-2, HS-PS3.3, HS-PS4.1 & 4, HS-LS2.6-7, HS-LS4.4-6, HS-ESS3.3-4, HS-ETS1.2-3
- *2023 New Jersey Student Learning Standards: Math*
  - N.Q.A.1, A.CED.A.1-2, S.ID.A.1, S.ID.C.9, S.IC.1, S.IC.6, S.CP.6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CT.11–12.8., W.WR.11-12.5, W.SE.11–12.6, SL.PI.11-12.4, SL.PE.11–12.1.A
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2020 New Jersey Student Learning Standards: Computer Science and Design Thinking*
  - 8.2.12.ETW.3
- *2020 New Jersey Student Learning Standards: Career Readiness, Life Literacies, and Key Skills*
  - 9.4.12.CT.3, 9.4.12.GCA.1, 9.4.12.IML.2, 9.4.12.IML.5, 9.4.12.IML.7-8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What are the different types of energy available in the world, and how are they used? • What processes are involved in unlocking energy from fossil fuels, and what are their associated risks and benefits? • How is energy generated in a nuclear reactor, and what are the advantages and disadvantages of nuclear power? • What methods are used to capture various forms of renewable energy, and what are the pros and cons of each? • What are the primary risks, benefits, advantages, and disadvantages associated with each type of energy source for the United States and the world? • Why do the United States and the world primarily rely on their current energy sources? • How can renewable energy be captured and utilized for everyday uses?	• The world utilizes diverse forms of energy, broadly categorized as non-renewable and renewable, each with distinct characteristics and applications that power various aspects of human society. • Energy from fossil fuels is primarily unlocked through combustion, a process that provides significant benefits in terms of widespread availability and high energy density but carries substantial risks, including air pollution, greenhouse gas emissions, and environmental degradation. • Nuclear energy is generated through controlled nuclear fission in reactors, offering the advantage of large-scale, carbon-free electricity production but posing significant disadvantages related to radioactive waste disposal, safety concerns, and the potential for nuclear proliferation. • Renewable energy sources are captured through diverse methods, each presenting unique pros such as reduced environmental impact and sustainability, alongside cons like intermittency, land use requirements, and initial infrastructure costs. • Every energy source presents a unique balance of risks (e.g., environmental impact, safety), benefits (e.g., energy security, economic growth), advantages (e.g., reliability, scalability), and disadvantages (e.g., waste, resource depletion). • The current global reliance on specific energy sources, particularly fossil fuels, is a complex outcome of historical infrastructure development, economic factors, technological maturity, energy density, and political considerations, despite growing awareness of environmental impacts. • Renewable energy can be captured and directly utilized for everyday uses through various technologies, offering decentralized and environmentally friendlier alternatives to traditional energy consumption.

Evidence of Learning		
Formative & Alternative Assessments: • Renewable Energy Design Challenge Activity • Wind Turbine Activity • Individual student check ins with teacher	**Benchmark & Summative Assessments:** • Solar Car Project • Energy Synthesis Projects	**Resources Needed:** • Unit specific lab materials and readings

Section IX: Unit Reflection

The *Contemporary Issues in Environmental Science* instructional team must confer upon the completion of each instructional unit in the *Contemporary Issues in Environmental Science* curriculum and rate the degree to which the instructional units meet performance criteria established by the New Jersey Department of Education using the Unit Reflection Form. Completed unit reflection forms must be submitted to the Department Supervisor for approval upon completion of curriculum implementation with a complementing list of suggested modifications to the *Contemporary Issues in Environmental Science* curriculum.

Unit Reflection Form: *Contemporary Issues in Environmental Science*			
Lesson Activities:	**Strongly**	**Moderately**	**Weakly**
Foster student use of technology as a tool to develop critical thinking, creativity, and innovation skills;			
Are challenging and require higher-order thinking and problem-solving skills;			
Allow for student choice;			

Provide scaffolding for acquiring targeted knowledge/skills;			
Integrate modern, global perspectives, especially those regarding diversity, genocide, global issues, and historical ones regarding racial relations;			
Integrate 21st century skills;			
Provide opportunities for interdisciplinary connection and transfer of knowledge and skills;			
Are varied to address different student learning styles and preferences;			
Are differentiated based on student needs;			
Are student-centered, with the teacher acting as a facilitator and co-learner during the teaching and learning process;			
Provide means for students to demonstrate knowledge and skills and progress in meeting learning goals and objectives;			
Provide opportunities for student reflection and self-assessment;			
Provide data to inform and adjust instruction to better meet the varying needs of learners.			

Appendix
Writing Instruction and the RFH Community

Writing instruction should happen across the RFH Community. Writing across the curriculum is a philosophy that advances the belief that writing is a method of learning. Since all departments are committed to helping students learn, writing must be used as a methodology to advance student learning.

Each academic discipline has its own unique conventions, formats and structures. It is the responsibility of each department to agree upon domain-specific writing praxes, model them for students, and require them to utilize them on a consistent basis. Students must understand that acceptable writing in one domain may not be acceptable writing in another area. The development of domain-specific writing skills supports the overall development of the student writer because all writing is grounded in the writing situation: audience, context, purpose, subject, and writer. Representatives from the academic disciplines must share their domain-specific writing praxes with each other, identify intersections, and determine how to address perceived gaps that limit student learning.

Students must experience writing situations that help them learn how to think creatively and critically and communicate effectively in the academic disciplines. Writing instruction, regardless of the academic discipline, must always reinforce student understanding of the writing situation. When students experience writing situations, they must study examples of domain-specific writing in order to understand how writers communicate in discipline-related contexts. This does not mean information embedded in textbooks. Domain-specific writing is writing that is used to inform and influence readers as it draws them into an established circle of discourse. Students must use these non-fiction texts to develop the close reading skills that will shape their own writing. Focused engagement with domain-specific writing should not be limited to basic reading comprehension and topical understanding. It must also include the analysis of the writing situation that is represented in the text: audience, context, purpose, subject, and writer. The close reading of well-written texts—regardless of the domain—will show students the importance of writing mechanics, diction, and syntax. The development of close reading skills will also help the students grow in terms of their ability to construct and advance independent and original claims that are well-supported by evidence. Domain-specific writing is grounded in positioning of claims and the effective use of evidence.

The final written product is important; nevertheless, the learning that results in this production must not be devalued. The writing process is not limited to the basic steps of planning, drafting, revising, and editing/proofreading. It is a complex sequence of critical and creative thinking and writing that leads to the production of a text that provides evidence of learning and understanding. Students must ultimately develop the ability to self-assess the effectiveness of their writing as a representation of the writing situation. Without the use of models that evidence learning and understanding, students will not develop the ability to self-assess their own work—the true outcome of the writing process.

What types of writing situations should RFH students engage in?

RFH students should engage in writing situations across the curriculum that require them to:

- write to improve mechanical proficiency, diction usage, and syntactical sophistication
- write to narrate, describe, and reflect
- write to summarize and report
- write to classify and define
- write to explain how process leads to an outcome
- write to compare, contrast and evaluate
- write to speculate on cause and effect
- write to propose solutions and solve problems
- write to analyze

These writing situations should be positioned in a coordinated, developmental sequence that extends across the academic disciplines.

Upon Completion of Grade 12, RFH students must be ready to transition to the following writing situations:

- write to analyze
- write to persuade (argument)

The core foci of first-year college writing courses are analysis and argument. These courses orient the students to the demands and expectations of writing for the academic culture of college. At colleges/universities with carefully coordinated writing programs, students must demonstrate proficiency in analysis and argument before they transition to upper level courses that require them to engage in the following writing situation:

- write to investigate (research)