Rumson-Fair Haven Regional High School

Course: *AP Environmental Science*
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Board Approval: August 2025

Section I: Course Description

Advanced Placement (AP) Environmental Science is a year-long elective designed to provide students with a comprehensive understanding of the scientific principles, concepts, and methodologies necessary to explore the interconnected relationships within the natural world. Through this course, students will develop the skills to identify and analyze both natural and anthropogenic environmental problems, evaluate potential solutions, and assess preventative strategies. Emphasizing an interdisciplinary approach, this course integrates environmental science with real-world applications and technological solutions. Core themes include environmental history, activism, biodiversity, natural capital, sustainability, pollution and waste reduction, population dynamics, energy use and efficiency, ecological relationships, and individual responsibility in environmental stewardship. Daily instruction is enriched with hands-on lab activities, field investigations, and data analysis to offer students meaningful opportunities to apply their knowledge and develop practical skills. Students enrolled are expected to take the *AP Environmental Science* exam in May to demonstrate proficiency.

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. ***2020 New Jersey State Learning Standards-Social Studies:***
    - Today's challenges are complex, have global implications, and are connected to people, places, and events of the past. The study of social studies focuses on deep understanding of concepts that enable students to think critically and systematically about local, regional, national, and global issues. Authentic learning experiences that enable students to apply content knowledge, develop social studies skills, and collaborate with students from around the world prepare New Jersey students for college, careers, and civic life. The natural integration of technology in social studies education allows students to overcome geographic borders, apply scientific and mathematical analysis to historical questions and contemporary issues, appreciate cultural diversity, and experience events through the examination of primary sources. The 2020 New Jersey Student Learning Standards – Social Studies (NJSLS-2020) are informed by national and state standards and other documents such as the College, Career, and Civic Life (C3) Framework for Social Studies State Standards, as well as those published by the National Center for History Education, National Council for Social Studies, National Council for Geographic Education, Center for Civic Education, National Council on Economic Education, National Assessment of Educational Progress, and the Partnership for 21st Century Skills. Social studies instruction occurs throughout the K-12 spectrum, building in sophistication of learning about history, economics, geography, and civics at all ages.
4. ***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 engage 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 learn 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.

5. ***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."
6. ***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."
7. ****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."
8. ****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."
9. ****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."
10. ****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."
11. 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 *AP 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 *AP 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: *AP Environmental Science*	**Grade Level:** 11-12
Unit I: The Living World: Ecosystems	Weeks 1-3
Unit II: The Living World: Biodiversity	Weeks 4-7
Unit III: Populations	Weeks 8-11
Unit IV: Earth Systems and Resources	Weeks 12-15
Unit V: Land and Water Use	Weeks 16-19
Unit VI: Energy Resource and Consumption	Weeks 20-24
Unit VII: Atmospheric Pollution	Weeks 25-27
Unit VIII: Aquatic and Terrestrial Pollution	Weeks 28-31
Unit IX: Global Change	Weeks 32-34
Unit X: Practices in Environmental Stewardship	Weeks 35-40

Section VI: Primary Texts and Year-Long Instructional Resources

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

- Google Classroom
- *Common Sense Education* (www.commonsense.org)
- Youtube
- https://phet.colorado.edu/en/
- Google Scholar-Various peer-reviewed publications
- Flinn laboratory kits
- *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)
- 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 *AP 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 *AP 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 *AP 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 *AP Environmental Science* curriculum by the *AP Environmental Science* instructional team:

<table>
<tr><th colspan="2">Unit I: The Living World: Ecosystems</th></tr>
<tr><td colspan="2">Unit Summary</td></tr>
<tr><td colspan="2">In this unit, students will examine the distribution of resources in ecosystems and their influences on species interactions. There is a global distribution of terrestrial and aquatic biomes—regional ecosystems—that each have specific environmental features based on their shared climate. This distribution is dynamic, and it has changed due to global climate change. Each ecosystem relies on biogeochemical cycles for survival. These cycles facilitate the acquisition and transfer of energy into usable forms, and they can be altered by human activities.</td></tr>
<tr><th colspan="2">Standards/Core Ideas/Performance Expectations/Progress Indicators</th></tr>
<tr><td colspan="2">The state standards outlined below, and established by the New Jersey Department of Education, will guide instruction throughout this unit in AP Environmental Science:
2020 New Jersey Student Learning Standards: Science
HS-LS2-2, HS-LS2-6, HS-LS2-7, HS-LS4-5, HS-LS4-6, HS-ESS2-6, HS-ESS2-7, HS-ESS3-3, HS-ESS3-4, HS-ESS3-6
2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12
RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
2020 New Jersey Student Learning Standards: Social Studies
6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
2023 New Jersey Student Learning Standards: Mathematics
N.Q.A.1, A.CED.1
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, 9.4.12.IML.8, 9.4.12.TL.2</td></tr>
<tr><th>Unit Essential Questions</th><th>Unit Enduring Understandings</th></tr>
<tr><td>How does the distribution and availability of resources within an ecosystem influence the interactions among species?
What are the defining environmental features and global distribution patterns of major terrestrial biomes?</td><td>The distribution and availability of resources fundamentally shape the types and intensity of interactions (e.g., competition, predation, symbiosis) among species within an ecosystem, determining population dynamics and community structure.
Major terrestrial biomes are characterized by distinct climate patterns (temperature and precipitation), which dictate the dominant plant and animal life, leading to predictable global distribution patterns.
Major aquatic biomes are defined by factors such as salinity, depth,</td></tr>
</table>

• What are the defining environmental features and global distribution patterns of major aquatic biomes? • How has global climate change impacted the dynamic distribution of terrestrial and aquatic biomes? • What are the key steps and reservoir interactions within the carbon cycle, and how are they affected by human activities? • What are the key steps and reservoir interactions within the nitrogen cycle, and how are they affected by human activities? • What are the key steps and reservoir interactions within the phosphorus cycle, and how are they affected by human activities? • What are the key steps and reservoir interactions within the hydrologic (water) cycle, and how are they affected by human activities? • How is solar energy acquired by living organisms and subsequently transferred through ecosystems? • How does energy flow and matter cycle through different trophic levels within an ecosystem? • Why does the amount of available energy decrease as it flows from one trophic level to the next in an ecosystem? • How do food chains and food webs illustrate the feeding relationships and energy flow among constituent members at various trophic levels?	light penetration, and water flow, which determine the types of organisms present and result in predictable global distribution patterns. • Global climate change is altering temperature and precipitation patterns, causing shifts in the geographic distribution of terrestrial and aquatic biomes as species and ecosystems respond to changing environmental conditions. • The carbon cycle involves the continuous movement of carbon through major reservoirs (atmosphere, oceans, land, living organisms) via processes like photosynthesis, respiration, and decomposition, but human activities, particularly the burning of fossil fuels and deforestation, significantly alter this balance, leading to increased atmospheric carbon dioxide. • The nitrogen cycle involves the transformation and movement of nitrogen through various forms (e.g., atmospheric N2, ammonia, nitrates) via processes like nitrogen fixation, nitrification, and denitrification, which are critically impacted by human activities such as fertilizer use and combustion, leading to environmental imbalances. • The phosphorus cycle is a slow geological process involving the movement of phosphorus through rocks, soil, water, and living organisms, and human activities like mining and fertilizer application significantly accelerate its release and movement, often leading to nutrient pollution in aquatic systems. • The hydrologic cycle involves the continuous movement of water through evaporation, condensation, precipitation, and runoff, and human activities such as damming rivers, deforestation, and groundwater depletion can significantly alter its natural flow and availability. • Solar energy is primarily acquired by producers through photosynthesis and then transferred through ecosystems via consumption, with energy being lost as heat at each trophic transfer, following the laws of thermodynamics. • Energy flows unidirectionally through trophic levels, decreasing at each transfer, while matter (nutrients) cycles continuously within an ecosystem, being reused and transformed by organisms and the environment. • The amount of available energy decreases significantly at each successive trophic level because organisms use a large portion of acquired energy for their own metabolic processes (e.g., respiration, growth, reproduction), and much is lost as heat, allowing only a fraction to be transferred to the next level. • Food chains and more complex food webs graphically represent the feeding relationships within an ecosystem, illustrating the pathways of energy flow from producers through various consumers at different trophic levels, highlighting the interdependence of species.

Evidence of Learning

Formative & Alternative Assessments:	**Benchmark & Summative Assessments:**	**Resources Needed:**
• Cycling of Matter Project • Reproductive Strategies Presentation • Food Web Activity • Scientific writing/response • Carbon Sequestering Activity • Apex Predator/Mesopredator Bioload Activity • AP Classroom progress check • Individual student check ins with teacher	• Ecosystems Assessment (Benchmark)	• *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 1-3

Unit II: The Living World: Biodiversity

Unit Summary

In this unit, students will evaluate and understand that biodiversity, which includes genetic, species, and habitat diversity, is critically important to ecosystems. Biodiversity in ecosystems is a key component to sustaining life within the living world. Natural and human disruptions have short- and long-term impacts on ecosystems. Ecological succession can occur in terrestrial and aquatic ecosystems in both developed and developing areas. Organisms within ecosystems must adapt to the changes created by these disruptions.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-LS2-2, HS-LS2-6, HS-LS2-7, HS-LS4-5, HS-LS4-6, HS-ESS2-6, HS-ESS2-7, HS-ESS3-3, HS-ESS3-4, HS-ESS3-6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What are the different levels of biodiversity (genetic, species, and habitat), and why is each level critically important to the health and functioning of ecosystems? • What are ecosystem services, and how do they contribute to sustaining life within the living world? • How do human disruptions impact ecosystem services, and what are the consequences of these impacts? • How does the theory of island biogeography explain the patterns of species diversity on islands? • What role does island biogeography play in understanding evolutionary processes and species adaptation? • How do natural disruptions, both short-term and long-term, impact the structure and function of an ecosystem? • In what ways do organisms adapt to changes in their environment, particularly those created by disruptions? • What is ecological succession, and how does it occur in both terrestrial and aquatic ecosystems? • What are the effects of ecological succession on the structure, species composition, and overall health of ecosystems?	• Biodiversity encompasses genetic, species, and habitat diversity, and each level is critically important because it provides the raw material for adaptation, enhances ecosystem stability and productivity, and offers a wider range of ecological functions, all vital for the health and long-term functioning of ecosystems. • Ecosystem services are the essential benefits that nature provides to humanity (e.g., clean air and water, pollination, nutrient cycling), directly contributing to sustaining life by supporting human well-being and maintaining the conditions necessary for all organisms to thrive. • Human disruptions, such as pollution, habitat destruction, and climate change, degrade or eliminate ecosystem services, leading to severe consequences, including reduced resource availability, increased vulnerability to natural disasters, economic losses, and a decline in overall environmental and human health. • The theory of island biogeography explains that the number of species on an island is determined by a dynamic equilibrium between immigration rates of new species and extinction rates of existing species, influenced by the island's size and its distance from the mainland. • Island biogeography provides a powerful framework for understanding evolutionary processes and species adaptation by illustrating how isolation, limited resources, and unique selective pressures on islands can lead to rapid speciation, adaptive radiation, and increased vulnerability to extinction. • Natural disruptions, whether short-term (e.g., wildfires, floods) or long-term (e.g., climate shifts, glaciations), fundamentally alter the structure (e.g., species composition, physical landscape) and function (e.g., nutrient cycling, energy flow) of ecosystems, initiating processes of recovery and adaptation. • Organisms adapt to environmental changes, including those caused by disruptions, through evolutionary processes that result in heritable traits enhancing survival and reproduction in the new conditions, or through behavioral and physiological adjustments.

	● Ecological succession is the predictable process of change in the species structure of an ecological community over time, occurring in both terrestrial (e.g., primary succession on bare rock, secondary succession after a disturbance) and aquatic ecosystems as communities colonize and modify their environment. ● Ecological succession leads to progressive changes in an ecosystem's structure (e.g., biomass, complexity), species composition (e.g., pioneer to climax species), and overall health, often resulting in increased biodiversity and stability over time, unless disrupted.

Evidence of Learning		
Formative & Alternative Assessments: ● Species Data Collection and Statistics Activity ● Scientific reading/writing ● Biodiversity Index Collection ● Climate Graph Presentations ● AP Classroom progress check ● Individual student check ins with teacher	**Benchmark & Summative Assessments:** ● Biome Speed Dating ● Biodiversity Assessment	**Resources Needed:** ● *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 3-6

Unit III: Populations
Unit Summary
In this unit, students will explain how populations within ecosystems change over time in response to a variety of factors. This unit examines the relationship between the type of species and the changes in a habitat over time. Specialist species are advantaged by habitats that remain constant, while generalist species tend to be advantaged by habitats that are changing. Different reproductive patterns, including those exhibited by K- and r-selected species, also impact changes to population. Population growth is limited by environmental factors, especially by the availability of resources and space.
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 *AP Environmental Science:* ● *2020 New Jersey Student Learning Standards: Science* ○ HS-LS2-1, HS-LS2-2, HS-LS2-6, HS-LS2-8, HS-LS4-2, HS-LS4-3, HS-LS4-4, HS-LS4-5, HS-ESS3-1, HS-ESS3-3 ● *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12* ○ RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5 ● *2020 New Jersey Student Learning Standards: Social Studies* ○ 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a ● *2023 New Jersey Student Learning Standards: Mathematics* ○ N.Q.A.1, A.CED.1 ● *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
● How do populations within ecosystems change over time in response to various environmental factors? ● What are the key differences between generalist and specialist species, and how do these traits provide advantages in stable versus changing habitats? ● How do the reproductive patterns of K-selected and r-selected species impact population changes over time?	● Populations within ecosystems are dynamic, constantly changing in size, density, and distribution over time due to the interplay of birth rates, death rates, immigration, emigration, and interactions with environmental factors such as resource availability, predation, and disease. ● Generalist species, with broad niches and adaptable traits, are advantaged in changing or unpredictable habitats, while specialist species, with narrow niches and specific requirements, thrive in stable environments but are more vulnerable to habitat alterations. ● The distinct reproductive strategies of K-selected species (few, large offspring; long parental care) and r-selected species (many, small offspring; little parental care) significantly impact their population growth rates, carrying capacity interactions, and responses to

● How do survivorship curves illustrate the patterns of survival for different species within a population? ● What is carrying capacity, and how does it impact the growth and stability of populations within ecosystems? ● How does the availability of resources and space limit population growth in an ecosystem? ● How do age structure diagrams provide insights into the past, present, and future growth trends of a population? ● What factors influence the total fertility rate in human populations, and how do these factors affect population growth? ● How do human populations experience periods of growth and decline, and what are the underlying causes of these changes? ● What is the demographic transition, and how does it explain changes in human population growth rates over time?	environmental fluctuations. ● Survivorship curves graphically represent the proportion of individuals surviving at each age in a population, illustrating distinct patterns (Type I, II, III) that reflect the species' life history strategy, parental care, and environmental pressures. ● Carrying capacity is the maximum population size that a particular environment can sustain indefinitely, and it acts as a limiting factor that regulates population growth, leading to fluctuations around this level and influencing the long-term stability of populations within ecosystems. ● The availability of essential resources (e.g., food, water, nutrients) and physical space directly limits population growth in an ecosystem, as scarcity increases competition and mortality rates, preventing populations from exceeding the environment's carrying capacity. ● Age structure diagrams graphically display the proportion of individuals in different age groups within a population, providing crucial insights into past demographic events, current population dynamics, and predicting future growth or decline trends. ● The total fertility rate in human populations is influenced by a complex array of socioeconomic factors (e.g., education, economic development, access to family planning, cultural norms), which collectively determine the birth rate and significantly impact overall population growth or decline. ● Human populations experience periods of growth and decline driven by the interplay of birth rates, death rates, and migration, with underlying causes rooted in advancements in healthcare, agriculture, sanitation, economic development, social policies, and environmental factors. ● The demographic transition is a multi-stage model that explains the historical shift in human population growth rates from high birth and death rates to low birth and death rates as societies undergo economic and social development, resulting in periods of rapid population growth followed by stabilization or decline.

Evidence of Learning

Formative & Alternative Assessments:	**Benchmark & Summative Assessments:**	**Resources Needed:**
● Population Labs ● Demographic Transitioning Project ● FRQ Response Practice ● Invasive Species Influence Presentations ● AP Classroom progress check ● Individual student check ins with teacher	● Population Assessment ● Summative Assessment #1	● *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 6-7, 11, & 20

Unit IV: Earth Systems and Resources

Unit Summary

In this unit, students will explore Earth systems and its resources that support life. Geological changes that occur to Earth systems at convergent and divergent boundaries can result in the creation of mountains, island arcs, earthquakes, volcanoes, and seafloor spreading. Soils are a resource, formed when parent material is weathered, transported, and deposited. The atmosphere is another resource, composed of certain percentages of major gases. Climate is influenced by the sun's energy, Earth's geography, and the movement of air and water.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-ESS2-1, HS-ESS2-2, HS-ESS2-3, HS-ESS2-4, HS-ESS2-5, HS-ESS2-6, HS-ESS2-7, HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS-ESS3-5, HS-ESS3-6
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*

- RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
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- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What geological changes and events, such as the creation of mountains, island arcs, earthquakes, volcanoes, and seafloor spreading, occur at convergent, divergent, and transform plate boundaries? • How are soils formed from parent material through weathering, transport, and deposition, and what are their key characteristics? • What are the similarities and differences in the properties of various soil types, and how do these properties influence their function as a resource? • What is the structure and composition of the Earth's atmosphere, including the percentages of its major gases? • How do environmental factors, such as solar energy and Earth's rotation, result in atmospheric circulation patterns? • What are the defining characteristics of a watershed, and how does it function within Earth's systems? • How does the sun's energy fundamentally affect the Earth's surface and drive various environmental processes? • In what ways does the Earth's geography (e.g., mountains, oceans) influence local and global weather and climate patterns? • What are the environmental changes and effects that result from El Niño or La Niña events (El Niño–Southern Oscillation)?	• Plate tectonics drives major geological changes and events, with convergent boundaries leading to mountain building, island arcs, and volcanoes; divergent boundaries causing seafloor spreading and volcanism; and transform boundaries resulting in earthquakes, all shaping Earth's surface and distributing resources. • Soils are a vital resource formed over long periods through the complex interplay of weathering of parent material, transport, and deposition, resulting in distinct layers and characteristics (e.g., texture, pH, nutrient content) that determine their ability to support life. • Different soil types possess unique physical and chemical properties (e.g., sand, silt, clay composition; organic matter content; pH) that determine their water retention, aeration, and nutrient availability, directly influencing their capacity to function as a productive resource for agriculture and ecosystems. • The Earth's atmosphere is a layered gaseous envelope primarily composed of nitrogen (approx. 78%) and oxygen (approx. 21%), with trace amounts of other gases, and its structure and composition are fundamental to regulating Earth's temperature, protecting life, and driving weather patterns. • Atmospheric circulation patterns are driven by the uneven heating of Earth's surface by solar energy, which creates temperature and pressure differentials, and are further modified by the Coriolis effect resulting from Earth's rotation, leading to global wind systems and climate zones. • A watershed is a defined land area where all precipitation drains to a common outlet, and its characteristics (e.g., topography, vegetation, human land use) significantly influence water quality, quantity, and flow within Earth's interconnected hydrologic systems. • The sun's energy is the primary driver of nearly all environmental processes on Earth's surface, powering the water cycle, atmospheric and oceanic circulation, photosynthesis, and ultimately all life, by transferring heat and light energy. • Earth's geography, including the presence of mountains, large bodies of water, and landmass distribution, profoundly influences local and global weather and climate patterns by affecting air masses, precipitation distribution, temperature moderation, and ocean currents. • El Niño and La Niña events, which are phases of the El Niño–Southern Oscillation (ENSO), represent significant shifts in Pacific Ocean temperatures and atmospheric pressure, leading to widespread and predictable changes in global weather patterns, including altered precipitation, temperatures, and extreme weather events.
Evidence of Learning	

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
● Coriolis Effect Activity ● Measuring Seismic Activity Trends ● Scientific reading/writing ● Mineral Mining and Extraction Activity ● AP Classroom progress check ● Individual student check ins	● Soil Mitigation and Sampling	● *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 8-9

Unit V: Land and Water Use

Unit Summary

In this unit, students will explore human activities that disrupt ecosystems both positively and negatively and the methods employed to reduce impact. It examines human use of natural resources through many means, including mining and clear-cutting, and the impacts on the environment. Agricultural practices, in particular, can cause environmental disruption. For example, one of the largest uses of freshwater is for irrigation. Every irrigation method employed for agriculture has its own benefits and drawbacks. In subsequent units, students will examine different types of energy resources, the consumption of these resources, and the impact on the environment.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-ESS2-2, HS-ESS2-5, HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS-ESS3-6, HS-LS2-7
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
● How do various human activities, both positive and negative, disrupt ecosystems, and what methods are employed to reduce these impacts? ● How does the concept of the "tragedy of the commons" apply to human use of shared natural resources? ● What are the effects of clear-cutting on forest ecosystems? ● How have agricultural practices changed over time, and what are the environmental consequences of these changes? ● What specific agricultural practices cause environmental damage, and what are the mechanisms of this damage? ● What are the different methods of irrigation used in agriculture, and what are the benefits and drawbacks of each?	● Human activities inherently interact with and alter ecosystems, causing both beneficial and detrimental disruptions, and understanding these impacts is crucial for developing and implementing effective methods to reduce negative consequences and promote ecological health. ● The "tragedy of the commons" illustrates how the rational self-interest of individuals can lead to the overexploitation and degradation of shared, finite natural resources, highlighting the need for collective management or regulation to ensure long-term sustainability. ● Clearcutting, while economically efficient, significantly alters forest ecosystems by leading to habitat loss, soil erosion, increased water runoff, nutrient depletion, and a reduction in biodiversity, impacting the long-term health and services provided by forests. ● Agricultural practices have evolved from traditional, localized methods to large-scale, industrialized systems, leading to increased food production but also significant environmental consequences such as habitat loss, soil degradation, water pollution, and increased greenhouse gas emissions. ● Specific agricultural practices, including monoculture, excessive use of synthetic fertilizers and pesticides, and intensive tillage, cause environmental damage through mechanisms such as nutrient runoff, soil compaction, loss of biodiversity, and pesticide resistance.

• What are the benefits and drawbacks of various methods of pest control in agriculture? • What are the different methods of meat production, and what are their associated benefits and drawbacks? • What are the causes and environmental problems associated with overfishing? • How does natural resource extraction through mining impact the environment, both ecologically and economically? • What are the environmental effects of urbanization, and how do they impact surrounding ecosystems? • What variables are measured in an ecological footprint, and what does it reveal about human resource consumption? • What is the concept of sustainability, and how does it apply to human resource use and environmental management? • What methods can be employed to mitigate problems related to urban runoff? • What is integrated pest management (IPM), and what are its benefits and drawbacks? • What are sustainable agricultural and food production practices, and how do they differ from conventional methods? • What are the benefits and drawbacks of aquaculture as a food production method? • What methods can be used to mitigate human impact on forests?	• Various irrigation methods (e.g., flood, furrow, drip, spray) are employed in agriculture, each offering distinct benefits in water delivery efficiency and cost, but also presenting drawbacks related to water waste, salinization, and energy consumption. • Different pest control methods (e.g., chemical pesticides, biological control, integrated pest management) offer benefits such as increased crop yields and reduced crop damage, but also present drawbacks including environmental contamination, harm to non-target species, and the development of pest resistance. • Various methods of meat production (e.g., concentrated animal feeding operations, free-range grazing) exist, each with benefits in terms of efficiency and cost, but also significant drawbacks related to environmental impact (e.g., greenhouse gas emissions, waste management), animal welfare, and resource consumption. • Overfishing is primarily caused by excessive fishing effort and inadequate management, leading to severe environmental problems such as depletion of fish stocks, disruption of marine food webs, and loss of marine biodiversity, threatening the long-term health of ocean ecosystems. • Overfishing is primarily caused by excessive fishing effort and inadequate management, leading to severe environmental problems such as depletion of fish stocks, disruption of marine food webs, and loss of marine biodiversity, threatening the long-term health of ocean ecosystems. • Urbanization leads to significant environmental effects, including habitat fragmentation, increased impervious surfaces, altered hydrological cycles (e.g., urban runoff), heat island effects, and increased pollution, which profoundly impact surrounding ecosystems and regional environmental quality. • An ecological footprint measures the amount of biologically productive land and water area required to support a population or activity, revealing the extent to which human resource consumption and waste assimilation demands exceed the Earth's regenerative capacity. • Sustainability is the principle of meeting the needs of the present generation without compromising the ability of future generations to meet their own needs, requiring a balance of environmental protection, social equity, and economic viability in human resource use and environmental management. • Problems related to urban runoff can be mitigated through various methods, including green infrastructure (e.g., rain gardens, permeable pavements), stormwater management policies, and pollution prevention strategies, all aimed at reducing water pollution and managing flood risks. • Integrated Pest Management (IPM) is an ecological approach to pest control that combines various strategies (e.g., biological, cultural, chemical) to minimize pest damage while reducing reliance on synthetic pesticides, offering benefits like environmental protection and reduced health risks, but potentially requiring more knowledge and management effort. • Sustainable agricultural and food production practices prioritize long-term environmental health, economic viability, and social equity, differing from conventional methods by focusing on soil conservation, biodiversity protection, reduced chemical inputs, and efficient resource use. • Aquaculture offers benefits such as increased food supply and reduced pressure on wild fish stocks, but also presents drawbacks, including potential for water pollution, disease transmission to wild populations, habitat destruction, and reliance on wild-caught fish for feed.

	● Human impact on forests can be mitigated through methods such as sustainable forestry practices, reforestation, protected area establishment, reducing demand for forest products, and combating illegal logging, all aimed at conserving forest ecosystems and their services.

Evidence of Learning		
Formative & Alternative Assessments: ● Scientific reading/writing ● Irrigation and Watershed Mapping ● Global Dietary Needs ● Food Waste Project ● AP Classroom progress check ● Individual student check ins with teacher	**Benchmark & Summative Assessments:** ● Building a Farm/Farm Budget Project ● Aquaponics Project	**Resources Needed:** ● Google Classroom

Unit VI: Energy Resource and Consumption

Unit Summary

In this unit, students will examine human use of renewable and nonrenewable sources of energy and their impact on the environment. Energy consumption differs throughout the world and the availability of natural energy resources depends on the region's geologic history.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-ESS3-2, HS-ESS3-3, HS-ESS3-4, HS-ESS3-6, HS-PS3-1, HS-PS3-2, HS-PS3-3
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
● How do human activities utilize renewable and nonrenewable energy sources, and what are the environmental impacts of this consumption? ● What are the key differences between nonrenewable and renewable energy sources? ● How do global and regional trends in energy consumption vary, and what factors influence these trends? ● What are the different types of fuels used for energy, and what are their primary applications? ● How does a region's geologic history influence the availability and distribution of natural energy resources? ● What are the methods used for	● Human societies rely on both finite nonrenewable and replenishable renewable energy sources, and the methods of their extraction, production, and consumption have diverse and significant environmental impacts that necessitate careful management and policy decisions. ● Nonrenewable energy sources are finite resources that are depleted much faster than they are formed (e.g., fossil fuels, nuclear), while renewable energy sources are naturally replenished on a human timescale (e.g., solar, wind, hydro), leading to fundamental differences in their sustainability and environmental footprints. ● Global and regional energy consumption trends are dynamic and influenced by a complex interplay of economic development, population growth, technological advancements, policy decisions, and the availability of local resources, leading to disparities in energy use and associated environmental impacts worldwide. ● Various types of fuels (e.g., coal, oil, natural gas, uranium, biomass, sunlight, wind) are utilized for energy, each with distinct chemical compositions and physical properties that determine their primary applications in sectors such as electricity generation, transportation, and heating.

power generation from fossil fuels, and what are their specific environmental effects? ● How is nuclear energy used for power generation, and what are the environmental effects associated with its use? ● What are the environmental effects of using biomass for power generation? ● How is solar energy utilized for power generation, and what are its environmental effects? ● How is hydroelectricity used for power generation, and what are its environmental effects? ● How is geothermal energy used for power generation, and what are its environmental effects? ● How are hydrogen fuel cells used for power generation, and what are their environmental effects? ● How is wind energy used for power generation, and what are its environmental effects? ● What are effective methods for conserving energy at the individual, community, and global levels?	● A region's unique geologic history, including tectonic activity, sedimentation, and volcanic processes over millions of years, directly determines the formation, availability, and distribution of its natural energy resources, particularly fossil fuels and geothermal potential. ● Power generation from fossil fuels primarily involves combustion to heat water and produce steam that drives turbines, a process that releases significant greenhouse gases, air pollutants, and contributes to environmental degradation through extraction and waste. ● Nuclear energy is generated through controlled nuclear fission in reactors, producing large amounts of electricity with minimal greenhouse gas emissions during operation, but posing significant environmental challenges related to radioactive waste disposal and the potential for catastrophic accidents. ● While renewable, the use of biomass for power generation can have varied environmental effects, including air pollution from combustion, potential deforestation if not sustainably managed, and impacts on land use and biodiversity, depending on the source and scale. ● Solar energy is utilized for power generation through photovoltaic cells (converting sunlight directly to electricity) or concentrated solar power (heating fluids to generate steam), offering benefits of low emissions during operation but having environmental effects related to land use, material extraction, and manufacturing waste. ● Hydroelectricity is generated by harnessing the kinetic energy of flowing water to spin turbines, providing a renewable and low-emission power source, but its use can have significant environmental effects, including habitat alteration, disruption of river ecosystems, and displacement of communities due to dam construction. ● Geothermal energy utilizes heat from within the Earth for power generation, offering a consistent and low-emission renewable source, but its use can have environmental effects such as localized air emissions, potential for groundwater contamination, and land subsidence. ● Hydrogen fuel cells generate electricity through an electrochemical reaction between hydrogen and oxygen, producing only water as a byproduct at the point of use, making them a clean energy option, but their overall environmental effects depend on the energy source used to produce the hydrogen. ● Wind energy is harnessed by wind turbines that convert wind's kinetic energy into electricity, providing a renewable and clean power source, but its environmental effects can include habitat fragmentation, bird and bat mortality, visual impact, and noise pollution. ● Effective energy conservation involves a combination of strategies at individual (e.g., behavioral changes, energy-efficient appliances), community (e.g., public transport, smart grids), and global levels (e.g., international agreements, technological innovation) to reduce overall energy demand and minimize environmental impact.

Evidence of Learning		
Formative & Alternative Assessments: ● Scientific reading/writing ● Energy Production Presentations ● AP Classroom progress check ● Individual student check ins with teacher	**Benchmark & Summative Assessments:** ● Energy Systems Podcasts ● Benchmark AP Practice Assessment (Summative Assessment #2)	**Resources Needed:** ● *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 12-13, 19-20

Unit VII: Atmospheric Pollution
Unit Summary
In this unit, students will explain that air pollution has many sources and effects, both indoors and outdoors. Air is a natural resource that covers the Earth and crosses many system boundaries. Human activities affect the quality of the air

both indoors and outdoors. Through legislation, the Clean Air Act regulates the emission of air pollutants that affect human health. The gases and particulates in the atmosphere come from both natural and human sources; once air pollution sources are identified, methods can be used to reduce it. Each ecosystem relies on biogeochemical cycles for survival. These cycles facilitate the acquisition and transfer of energy into usable forms, and they can be altered by human activities.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-ESS2-4, HS-ESS2-6, HS-ESS3-1, HS-ESS3-4, HS-ESS3-5, HS-ESS3-6, HS-LS2-7
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• What are the primary sources and diverse effects of air pollutants, both indoors and outdoors? • What are the causes and effects of photochemical smog, and what methods can be employed to reduce its formation? • How does a thermal inversion occur, and what is its relationship with air pollution concentrations? • What are the natural sources of carbon dioxide and particulate matter in the atmosphere? • What are the common indoor air pollutants, and what are their effects on human health? • How can air pollutants be effectively reduced at their source? • What is acid deposition, and what are its environmental effects? • What human activities result in noise pollution, and what are their impacts?	• Air pollutants originate from a wide range of natural and anthropogenic sources, both indoors and outdoors, and exert diverse detrimental effects on human health, ecosystems, and climate, necessitating a comprehensive understanding for effective management. • Photochemical smog is a complex mixture of air pollutants formed when sunlight reacts with nitrogen oxides and volatile organic compounds, causing respiratory problems and environmental damage, and its formation can be reduced by controlling emissions of its precursor chemicals from vehicles and industrial processes. • A thermal inversion occurs when a layer of warm air traps cooler air near the ground, preventing vertical mixing and leading to the accumulation of air pollutants at dangerous concentrations, exacerbating their negative impacts on human health and the environment. • Natural sources of carbon dioxide include respiration, decomposition, and volcanic activity, while natural sources of particulate matter include wildfires, dust storms, and volcanic eruptions, contributing to the Earth's atmospheric composition and natural cycles. • Common indoor air pollutants (e.g., radon, formaldehyde, VOCs, particulate matter, carbon monoxide) originate from various indoor sources and can have significant adverse effects on human health, ranging from respiratory issues to long-term chronic diseases. • Air pollutants can be most effectively reduced at their source through strategies such as improving fuel efficiency, transitioning to cleaner energy sources, implementing pollution control technologies, and promoting sustainable industrial and agricultural practices. • Acid deposition (acid rain) results from atmospheric reactions of sulfur dioxide and nitrogen oxides, primarily from fossil fuel combustion, leading to environmental effects such as acidification of aquatic ecosystems, damage to forests, corrosion of infrastructure, and impacts on soil chemistry. • Human activities such as transportation, construction, and industrial operations are major sources of noise pollution, which can have significant negative impacts on human health (e.g., stress, hearing loss) and wildlife (e.g., behavioral changes, communication disruption).

Evidence of Learning

Formative & Alternative Assessments:	Benchmark & Summative Assessments:	Resources Needed:
● Car Exhaust Measurement ● Scientific reading/writing ● Greenhouse Gas Simulation and Data Measurement ● AP Classroom progress check ● Individual student check ins with teacher	● Air Particulates Project ● Pollution Mysteries Assessment	● *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 15-17

Unit VIII: Aquatic and Terrestrial Pollution

Unit Summary

In this unit, students will explain how pollution created by human activities directly impacts ecosystems in the air, on land, and in water. The source of pollution can sometimes be easy to identify, but other times the source is diffused. There are many human health issues that can be linked to pollution. Legislation has been created to reduce discharges of pollution in water and regulate drinking water. Increases in waste cause global concerns for organisms that live on land and in water.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-ESS3-1, HS-ESS3-4, HS-ESS3-5, HS-ESS3-6
- RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
● How do human activities create pollution that directly impacts ecosystems in the air, on land, and in water? ● What are the key differences between point and nonpoint sources of pollution, and why is this distinction important for management? ● What are the various human health issues that can be directly linked to different types of pollution? ● How do human activities impact aquatic ecosystems, including wetlands and mangroves? ● What are endocrine disruptors, and what are their effects on ecosystems and human health? ● How do excessive uses of fertilizers and detergents environmentally affect aquatic ecosystems? ● What are the effects of thermal pollution on aquatic ecosystems?	● Human activities, through industrial processes, agriculture, waste generation, and energy consumption, introduce various pollutants into the air, on land, and in water, directly altering the chemical and physical properties of ecosystems and causing widespread environmental degradation. ● Point sources of pollution are identifiable and localized (e.g., factory pipes), while nonpoint sources are diffuse and widespread (e.g., agricultural runoff), and this distinction is crucial for effective pollution management strategies, as each requires different regulatory and mitigation approaches. ● Exposure to different types of pollution (e.g., air, water, soil contaminants) can directly lead to a wide range of human health issues, including respiratory diseases, neurological disorders, cancers, and developmental problems, underscoring the critical link between environmental quality and public health. ● Human activities, such as development, pollution, and climate change, significantly impact aquatic ecosystems, including vital wetlands and mangroves, by altering their hydrology, introducing contaminants, reducing biodiversity, and diminishing their capacity to provide essential ecosystem services. ● Endocrine disruptors are chemicals that interfere with the hormone systems of animals and humans, leading to adverse developmental, reproductive, neurological, and immune effects on organisms within ecosystems and posing significant risks to human health. ● Excessive use of fertilizers and detergents leads to nutrient runoff into aquatic ecosystems, causing eutrophication, which results in algal

• What are persistent organic pollutants (POPs), and what are their effects on ecosystems? • How do bioaccumulation and biomagnification occur, and what are their effects on organisms and ecosystems? • What are the different methods of solid waste disposal, and what are their environmental effects? • What changes to current practices could reduce the amount of generated waste, and what are their associated benefits and drawbacks? • What are the best practices in sewage treatment, and why are they important for environmental and public health? • What is the lethal dose 50% (LD50), and how are dose-response curves used to evaluate toxicity? • What are the primary sources of human health issues that are linked to pollution? • How do human pathogens cycle through the environment, and how does this relate to pollution? • How do environmental laws, such as those regulating water pollution and drinking water, help to reduce pollution discharges and protect public health? • Why do increases in waste cause global concerns for organisms living on land and in water?	blooms, oxygen depletion (hypoxia), and subsequent loss of aquatic life, severely degrading water quality and ecosystem health. • Thermal pollution, typically from industrial discharges, increases water temperatures, reducing dissolved oxygen levels, stressing aquatic organisms, altering metabolic rates, and changing species composition, thereby negatively impacting the health and biodiversity of aquatic ecosystems. • Persistent Organic Pollutants (POPs) are toxic chemicals that resist environmental degradation, bioaccumulate in organisms, biomagnify up food chains, and travel globally, causing long-term detrimental effects on ecosystems, including reproductive impairment, immune suppression, and mortality in wildlife. • Bioaccumulation is the buildup of toxins in an individual organism over its lifetime, while biomagnification is the increasing concentration of these toxins at successive trophic levels in a food chain, leading to severe health effects and ecological disruption, particularly for top predators. • Various methods of solid waste disposal (e.g., landfills, incineration, recycling, composting) each have distinct environmental effects, ranging from land use and greenhouse gas emissions to air and water pollution, necessitating careful management to minimize negative impacts. • Reducing waste generation requires systemic changes to current practices, including source reduction, reuse, and recycling, which offer benefits like resource conservation and reduced pollution but may involve drawbacks such as initial costs, behavioral shifts, and infrastructure development. • Best practices in sewage treatment involve multiple stages (primary, secondary, tertiary) to remove pollutants, pathogens, and nutrients from wastewater, which are crucial for protecting aquatic ecosystems from contamination, preventing waterborne diseases, and safeguarding public health. • Lethal Dose 50% (LD50) is the dose of a substance that kills 50% of a test population, and dose-response curves graphically illustrate the relationship between the dose of a substance and the observed effect, serving as essential tools for evaluating the toxicity and potential risks of various chemicals. • Human health issues linked to pollution stem from diverse sources, including industrial emissions, agricultural runoff, contaminated water and food, and hazardous waste, leading to widespread exposure to toxins and pathogens that compromise well-being. • Human pathogens cycle through the environment via various pathways (e.g., contaminated water, air, soil, vectors), and pollution, particularly from inadequate waste management and contaminated water sources, can facilitate the spread and persistence of these pathogens, increasing disease risk. • Environmental laws, such as the Clean Water Act and Safe Drinking Water Act, establish standards and regulations for pollution discharges and water quality, serving as critical tools to compel industries and municipalities to reduce contamination, thereby protecting aquatic ecosystems and safeguarding public health. • Increases in waste, particularly plastic and hazardous materials, cause global concerns for organisms on land and in water because they lead to habitat degradation, entanglement, ingestion of toxins, and disruption of ecological processes, threatening biodiversity and ecosystem health worldwide.

Evidence of Learning		
Formative & Alternative Assessments: • Scientific reading/writing • AP Classroom progress check • Wastewater Sampling	**Benchmark & Summative Assessments:** • Stream Sampling and Monitoring	**Resources Needed:** • *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 14-19

• LD50 Measurement Lab • Stormdrain Collection Activity • Individual student check ins with teacher	• Pollution Summative Assessment #3	

Unit IX: Global Change	
Unit Summary	
In this unit, students will understand the global impact of local and regional human activities. Humans can mitigate their impact through sustainable use of resources. Human activities can cause ozone depletion in the stratosphere and increases in the 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. Overall, this course provides an opportunity to examine the interrelationships among the natural world and challenges students to evaluate and propose solutions to a variety of environmental problems.	
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 *AP Environmental Science:*
• *2020 New Jersey Student Learning Standards: Science*
  ○ HS-ESS2-4, HS-ESS2-6, HS-ESS3-1, HS-ESS3-3, HS-ESS3-4, HS-ESS3-5, HS-ESS3-6, HS-LS4-5
• *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  ○ RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
• *2020 New Jersey Student Learning Standards: Social Studies*
  ○ 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
• *2023 New Jersey Student Learning Standards: Mathematics*
  ○ N.Q.A.1, A.CED.1
• *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, 9.4.12.IML.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 cause ozone depletion in the stratosphere and increases in atmospheric greenhouse gases? • Why is stratospheric ozone important to life on Earth? • What chemicals are used as substitutes for chlorofluorocarbons (CFCs), and how effective are they? • What are the major greenhouse gases, and what are their sources and relative potencies? • *What threats do increased greenhouse gas concentrations pose to human health and the environment? • *How do changes in climate, both short-term and long-term, impact ecosystems?	• *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, thereby lessening pressure on natural systems. • *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. • Stratospheric ozone is critically important to life on Earth because it absorbs most of the sun's harmful ultraviolet (UV) radiation, protecting living organisms from DNA damage, skin cancer, and other adverse health effects, and preventing widespread ecosystem disruption. • Hydrofluorocarbons (HFCs) and hydrochlorofluorocarbons (HCFCs) have been used as substitutes for CFCs, effectively reducing ozone depletion, but some of these substitutes are potent greenhouse gases themselves, necessitating further innovation for climate protection. • The major greenhouse gases include carbon dioxide (from fossil fuel combustion, deforestation), methane (from agriculture, fossil fuel extraction), nitrous oxide (from agriculture, industrial processes), and fluorinated gases (from refrigerants, industrial processes), each with varying sources and distinct global warming potentials (potencies) that contribute to atmospheric heat trapping. • *Increased greenhouse gas concentrations pose significant threats to human health (e.g., heat-related illnesses, respiratory problems, vector-borne diseases) and the environment (e.g., extreme weather

• What are the causes and effects of ocean warming? • What are the causes and effects of ocean acidification? • What are the environmental problems associated with invasive species, and what strategies can be used to control them? • *How do species become endangered, and what strategies are employed to combat this problem? • *How do human activities affect biodiversity, and what strategies can be implemented to combat biodiversity loss? • *How do the interrelationships among the natural world inform our understanding of environmental problems, and how can humans propose effective solutions?	events, sea level rise, ecosystem disruption, biodiversity loss), leading to widespread and interconnected negative impacts. • *Changes in climate, whether short-term (e.g., heatwaves, droughts) or long-term (e.g., altered precipitation patterns, rising average temperatures), profoundly impact ecosystems by shifting species distributions, altering phenology, increasing stress on organisms, and disrupting ecological processes, leading to biodiversity loss and ecosystem instability. • Ocean warming is primarily caused by the absorption of excess heat from rising atmospheric greenhouse gas concentrations, leading to effects such as coral bleaching, sea level rise, altered marine species distributions, and increased intensity of marine heatwaves, threatening ocean ecosystems and coastal communities. • Ocean acidification is caused by the absorption of excess atmospheric carbon dioxide by seawater, leading to a decrease in ocean pH, which has detrimental effects on marine organisms, particularly those with calcium carbonate shells or skeletons, disrupting marine food webs and ecosystems. • Invasive species cause significant environmental problems by outcompeting native species, altering habitats, disrupting food webs, and reducing biodiversity. Strategies to control them include prevention of introduction, early detection and rapid response, eradication, and long-term management. • *Species become endangered primarily due to habitat loss, overexploitation, pollution, climate change, and invasive species, and strategies to combat this problem include habitat protection and restoration, captive breeding programs, anti-poaching efforts, and international conservation agreements. • *Human activities such as habitat destruction, pollution, climate change, overexploitation, and the introduction of invasive species are major drivers of biodiversity loss, and strategies to combat this include establishing protected areas, promoting sustainable resource use, reducing pollution, mitigating climate change, and restoring degraded ecosystems. • *Understanding the complex interrelationships among Earth's natural systems (e.g., atmosphere, oceans, biosphere) is fundamental to comprehending the root causes and cascading effects of environmental problems, enabling the development of holistic and effective solutions that address systemic issues rather than isolated symptoms.

Evidence of Learning

Formative & Alternative Assessments:	**Benchmark & Summative Assessments:**	**Resources Needed:**
• Anthropogenic Biodiversity Influence Activity • Climate Tree Growth Lab • Ice Core activity • Scientific reading/writing • Cradle to Grave Project • Individual student check ins with teacher	• Sustainability Project	• *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 1-3

Unit X: Practices in Environmental Stewardship

Unit Summary

In this unit, students will explore environmental stewardship through the lens of global ecological trends and sustainability practices. By incorporating environmental strategies and scientific concepts, students will investigate current environmental challenges and examine the role of human responsibility in maintaining ecological balance. Emphasis will be placed on fostering reciprocity with nature, deepening students' understanding of core environmental principles. Through inquiry-based learning, students will develop critical problem-solving skills and apply experimental design methods to evaluate and propose real-world solutions for environmental issues.

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 *AP Environmental Science:*

- *2020 New Jersey Student Learning Standards: Science*
  - HS-ESS3-1, HS-ESS3-3, HS-ESS3-4, HS-ESS3-6, HS-LS2-6, HS-LS2-7, HS-ETS1-3
- *2023 New Jersey Student Learning Standards: English Language Arts for Grades 11-12*
  - RI.CR.9–10.1, RI.CR.11–12.1, RI.MF.11–12.6, RI.CT.11–12.8, WP.11–12.4, W.WR.9–10.5. Or W.WR.11-12.5:, W.SE.9–10.6, W.SE.11–12.6, SL.UM.9–10.5
- *2020 New Jersey Student Learning Standards: Social Studies*
  - 6.1.12.HistorySE.2.a, 6.1.12.CivicsDP.5.a, 6.1.12.GeoHE.5.a, 6.1.12.GeoHE.16.a, 6.2.12.EconGE.5.a
- *2023 New Jersey Student Learning Standards: Mathematics*
  - N.Q.A.1, A.CED.1
- *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, 9.4.12.IML.8, 9.4.12.TL.2

Unit Essential Questions	Unit Enduring Understandings
• How do global ecological trends and sustainability practices inform understanding of environmental stewardship? • How can environmental strategies and scientific concepts be applied to investigate current environmental challenges? • What is the role of human responsibility in maintaining ecological balance? • How does fostering reciprocity with nature deepen our understanding of core environmental principles? • How can scientific inquiry, including problem-solving and experimental design, be used to develop and evaluate real-world solutions for environmental issues? • In what ways do human actions significantly impact the health and sustainability of natural ecosystems? • Why are sustainable practices and ecological awareness essential for addressing current and future global environmental challenges? • How does building reciprocity with nature promote responsible decision-making and a deeper connection to the environment? • Why is a multidisciplinary understanding of environmental, social, economic, and ethical dimensions crucial for effective environmental stewardship?	• Global ecological trends (e.g., climate change, biodiversity loss) and the principles of sustainability provide the critical context and framework necessary to understand the urgency and multifaceted nature of environmental stewardship, guiding responsible human interaction with the planet. • Environmental strategies and core scientific concepts (e.g., energy flow, biogeochemical cycles, population dynamics) are indispensable tools for systematically investigating, analyzing, and understanding the complexities of current environmental challenges, enabling evidence-based problem-solving. • Humans bear a significant responsibility in maintaining ecological balance, as their actions profoundly influence ecosystem health, resource availability, and the well-being of all life, necessitating ethical considerations and informed decision-making. • Fostering a reciprocal relationship with nature, recognizing human dependence on healthy ecosystems and the intrinsic value of the natural world, deepens our understanding of core environmental principles and motivates sustainable behaviors. • Scientific inquiry, encompassing rigorous problem-solving and systematic experimental design, is a critical and iterative process for developing, testing, and evaluating the effectiveness of real-world solutions to complex environmental issues. • Human actions, through resource consumption, pollution, land use change, and population growth, exert profound and often detrimental impacts on the health, resilience, and long-term sustainability of natural ecosystems, necessitating conscious management. • Sustainable practices and a deep ecological awareness are essential for addressing current and future global environmental challenges because they promote resource conservation, minimize pollution, protect biodiversity, and foster long-term planetary health, ensuring the well-being of both human and natural systems. • Building reciprocity with nature cultivates a sense of interconnectedness and mutual dependence, leading to more responsible decision-making that values ecological integrity and fosters a deeper personal and collective commitment to environmental protection. • Effective environmental stewardship requires a comprehensive, multidisciplinary understanding that integrates environmental science with social, economic, and ethical considerations, as complex environmental problems are rarely solvable through a single lens and demand holistic approaches.
Evidence of Learning	

Formative & Alternative Assessments:	**Benchmark & Summative Assessments:**	**Resources Needed:**
● Scientific reading/writing ● Stewardship Discussion ● Environmental Betterment Projects ● Individual student check ins with teacher	● Yearlong Summative ● Summative Stewardship Projects	● *Environmental Science for the AP Course* 3rd Edition (Friedland & Relyea)-Chapters 1-3

Section IX: Unit Reflection

The *AP Environmental Science* instructional team must confer upon the completion of each instructional unit in the *AP Environmental Science* curriculum and rate the degrees 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 *AP Environmental Science* curriculum.

Unit Reflection Form: *AP 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)