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Marking Period 1 (MP1)	HS Science Curriculum Pacing Guide -AP ENVIORMENTAL
MP1 **Standards for Science Content**	HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-3: Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. HS-LS2-4: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. HS-LS2-6: Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. HS-LS2-8: Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce. HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. HS-ESS2-1: Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. HS-ESS2-3: Develop a model based on evidence to illustrate the relationships between systems or between components of a system. Earth's interior to describe the cycling of matter by thermal convection. HS-ESS2-4: Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. HS-ESS2-7: Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
MP1 **Topics**	Unit 1: The Living World: Ecosystems Unit 2: The Living World: Biodiversity Unit 3: Populations
MP1 **Skills/Concepts**	ENERGY TRANSFER: Energy conversions underlie all ecological processes. Energy cannot be created; it must come from somewhere. As energy flows through systems, at each step, more of it becomes unusable. INTERACTIONS BETWEEN EARTH SYSTEMS: The Earth is one interconnected system. Natural systems change over time and space. Biogeochemical systems vary in ability to recover from disturbances. INTERACTIONS BETWEEN DIFFERENT SPECIES AND THE ENVIRONMENT: Humans alter natural systems and have had an impact on the environment for millions of years. Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.
MP1 **Core Materials**	Mastering Environmental - The Science Behind the Stories 7th Edition

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Marking Period 2 (MP2)	HS Science Curriculum Pacing Guide -AP ENVIORMENTAL
MP2	HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
Standards for Science Content	HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-4: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. HS-LS2-6: Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. HS-LS2-8: Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce. HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. HS-LS4-2: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. HS-LS4-3: Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. HS-LS4-4: Construct an explanation based on evidence for how natural selection leads to adaptation of populations. HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. HS-LS4-6: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity. HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems. HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. HS-ETS1-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
Topic	Unit 4: Earth Systems and Resources Unit 5: Land and Water Use Unit 6: Energy Resources & Consumption
MP2 **Skills/Concepts**	ENERGY TRANSFER: Most of Earth's atmospheric processes are driven by input of energy from the sun. Humans use energy from a variety of sources, resulting in positive and negative consequences. INTERACTIONS BETWEEN EARTH SYSTEMS: Earth's systems interact, resulting in a state of balance over time. INTERACTIONS BETWEEN DIFFERENT SPECIES AND THE ENVIRONMENT: When humans use natural resources, they alter natural systems. BIG IDEA 4: SUSTAINABILITY: Human can mitigate their impact on land and water resources through sustainable use.
MP2 **Core Materials**	Mastering Environmental - The Science Behind the Stories 7th Edition

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Marking Period 3 (MP3)	HS Science Curriculum Pacing Guide -AP ENVIORMENTAL
MP3	HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.
Standards for Science Content	HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-4: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. HS-LS2-5: Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. HS-LS2-6: Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. HS-LS2-8: Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce. HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. HS-LS4-2: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. HS-LS4-3: Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. HS-LS4-4: Construct an explanation based on evidence for how natural selection leads to adaptation of populations. HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. HS-LS4-6: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity. HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. HS-ESS2-5: Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. HS-ESS2-6: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. HS-ESS3-1: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. HS-ESS3-2: Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. HS-ESS3-3: Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems. HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. HS-PS3-3: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. HS-PS3-4: Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).

	HS-PS4-5: Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy. HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. HS-ETS1-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
MP3 **Topics**	Unit 6: Energy Resources and Consumption Unit 7: Air Pollution Unit 8: Aquatic and Terrestrial Pollution
MP3 **Skills/Concepts**	Unit 6: This unit examines human use of renewable and nonrenewable sources of energy and its impact on the environment. Energy consumption differs throughout the world and the availability of natural energy resources depends on the region's geologic history. Subsequent units will examine the impact of human activity on the atmosphere, land, and water. Unit 7: 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. Subsequent units will focus on pollution's impacts to land and water Unit 8: 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. In the final unit, students will explore how local and regional human activities can have a global impact.
MP3 **Core Materials**	Mastering Environmental - The Science Behind the Stories 7th Edition

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Marking Period 4 (MP4)	HS Science Curriculum Pacing Guide -AP ENVIORMENTAL
MP4 **Standards for Science Content**	HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedback that cause changes to other Earth systems. HS-ESS2-4: Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. HS-ESS2-6: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.
MP4 **Topics**	Global Change
MP4 **Skills/Concepts**	BIG IDEA: Interactions between different species and the environment (EIN)– Humans alter natural systems and have had an impact on the environment for millions of years. Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment. Why are laws created to protect endangered species? BIG IDEA: Sustainability (STB)– Human survival depends on developing practices that will achieve sustainable systems. A suitable combination of conservation and development is required. The management of resources is essential. Understanding the role of cultural, social, and economic factors is vital to the development of solutions. How can local human activities have global impact?
MP4 **Core Materials**	Mastering Environmental - The Science Behind the Stories 7th Edition