Marking Period 1 (MP1)	Science Curriculum Pacing Guide Grade HS BIO + HONORS
MP1 **Standards for Science Content**	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-LS1-1: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells. HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. HS-LS1-3: Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. HS-LS1-6: Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
MP1 **Topics**	Introduction to Biology Unit: Cell Systems
MP1 **Skills/Concepts**	Big Idea: The big ideas serve as foundation of the course and allow students to create meaningful connections among concepts. Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis. Organisms are made of one or more cells. Multicellular organisms have a hierarchical organization of cells, tissues, organs and organ systems that work together to keep the cells alive. Cells need a supply of energy and molecules to carry out life processes.
MP1 **Core Materials**	Cengage - National Geographic Biology

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Marking Period 2 (MP2)	Science Curriculum Pacing Guide Grade HS BIO + HONORS
MP2 **Standards for Science Content**	HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy. 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-LS2-5. 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-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.
MP2 **Topics**	Unit 1: Relationships in Ecosystems Unit 2: Cell Systems
MP2 **Skills/Concepts**	Biological systems interact, and these systems and their interactions possess complex properties. Biological systems utilize free energy and molecular building blocks to grow, to reproduce and to maintain dynamic homeostasis. Organisms are made of one or more cells. Multicellular organisms have a hierarchical organization of cells, tissues, organs and organ systems that work together to keep the cells alive. Cells need a supply of energy and molecules to carry out life processes.
MP2 **Core Materials**	Cengage - National Geographic Biology

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Marking Period 3 (MP3)	Science Curriculum Pacing Guide Grade HS BIO + HONORS
MP3 **Standards for Science Content**	HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population 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
MP3 **Topics**	Unit 2 - Cell Systems; Unit 4 - Genetics
MP3 **Skills/Concepts**	Biology centers on the unifying idea that life is an organized system built from cells, guided by genetic information, and shaped by energy and the environment. Students study cell systems to understand how structure and function work together to maintain life, from how molecules move across membranes to how cells grow, divide, and respond to their surroundings. Genetics explains how information is stored, expressed, and passed on, allowing students to make sense of traits, disease, and variation in organisms. Together, these topics give students a framework for understanding health, biotechnology, evolution, and ecological relationships. By learning cell biology and genetics, students develop scientific thinking skills and gain insight into real-world issues such as medical advances, genetic testing, and ethical decision-making in science, helping them become informed citizens and critical thinkers in a world shaped by biology. Living systems store, retrieve, transmit and respond to information essential to life processes. Genetic information provides for continuity of life, and, in most cases, this information is passed from parent to offspring via DNA. Nonheritable information transmission influences behavior within and between cells, organisms, and populations. These behaviors are directed by underlying genetic information, and responses to information are vital to natural selection and evolution. Genetic information is a repository of instructions necessary for the survival, growth, and reproduction of the organism. Genetic variation can be advantageous for the long-term survival and evolution of a species.
MP3 **Core Materials**	National Geographic Biology Textbook

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Marking Period 4(MP4)	Science Curriculum Pacing Guide Grade HS BIO + HONORS
MP4 **Standards for Science Content**	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 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-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
MP4 **Topics**	Unit 5 - Evolution and Changing Environments
MP4 **Skills/Concepts**	In this unit of study, students will learn that living systems store, retrieve, transmit and respond to information essential to life processes. Genetic information provides for continuity of life, and, in most cases, this information is passed on from parents to offspring via DNA. Nonheritable information transmission influences behavior within and between cells, organisms, and populations. These behaviors are directed by underlying genetic information, and responses to information are vital to natural selection and evolution. Genetic information is a repository of instructions necessary for the survival, growth, and reproduction of the organism. Genetic variation can be advantageous for the long-term survival and evolution of a species.
MP4 **Core Materials**	National Geographic Biology (Cengage)