Mount Pleasant Central School District

AP Environmental Science

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Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
The Living World: Ecosystems	September/ October	1.1 Introduction to Ecosystems 1.2 Terrestrial Biomes 1.3 Aquatic Biomes 1.4 The Carbon Cycle 1.5 The Nitrogen Cycle 1.6 The Phosphorus Cycle 1.7 The Hydrologic (Water) Cycle 1.8 Primary Productivity 1.9 Trophic Levels 1	**-Resource Partitioning**: where two species divide a resource based on differences in the species' behavior or morphology; prevents competition **-Symbiotic Relationship:** the relationship of two species that live in close association with each other **-Gross Primary Productivity - GPP:** the total amount of solar energy that the producers in an	**LS1.C: Organization for Matter and Energy Flow in Organisms** The process of photosynthesis converts light energy to stored chemical energy by converting carbon dioxide plus water into sugars plus released oxygen. (HS-LS1-5) The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules (such as proteins or DNA), used for example to form new cells. (HS-LS1-6) As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products. (HS-LS1-6),(HS-LS1-7)	- Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations Analyze visual representations of environmental concepts and processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test	BIG IDEA 1 Energy Transfer ENG § How does energy change forms? BIG IDEA 2 Interactions Between Earth Systems ERT § How old is the water you drink?	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom that includes multiple choice and free response questions Labs: Climatogram Lab, Biomeviewer Lab, water testing, Model My Watershed, Carbon Cycle Lab, Nitrogen Cycle Lab, Ecological Pyramids Lab

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		1.10 Energy Flow and the 10% Rule 1.11 Food Chains and Food Webs	ecosystem capture via photosynthesis over a given amount of time **-The 4 Major Biogeochemical Cycles:** Nitrogen, Phosphorus, Carbon, and Water/Hydrologic Cycles -- the movement of matter within and between ecosystems	As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment. (HS-LS1-7) **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes. (HS-LS2-3) Plants or algae form the lowest level of the food web. At each link upward in a food web, only a small fraction of	environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and interpret quantitative data represented in tables, charts, and graphs Apply quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		

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				the matter consumed at the lower level is transferred upward, to produce growth and release energy in cellular respiration at the higher level. Given this inefficiency, there are generally fewer organisms at higher levels of a food web. Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded. The chemical elements that make up the molecules of organisms pass through food webs and into and out of the atmosphere and soil, and they are combined and recombined in different ways. At each link in an ecosystem, matter and energy are conserved. (HS-LS2-4) Photosynthesis and cellular respiration are important components of the carbon cycle, in which carbon is exchanged among the biosphere, atmosphere,			

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				oceans, and geosphere through chemical, physical, geological, and biological processes. (HS-LS2-5) **PS3.D: Energy in Chemical Processes** • The main way that solar energy is captured and stored on Earth is through the complex chemical process known as photosynthesis. *(secondary to HS-LS2-5)*			
The Living World: Biodiversity	October/November	- 2.1 Introduction to 1 Biodiversity ERT 2.2 Ecosystem Services 1 ERT 2.3 Island Biogeography 1 ERT	- **4 Ecosystem Services:** important environmental benefits provided to people such as clean	**LS4.A: Evidence of Common Ancestry and Diversity** Genetic information, like the fossil record, provides evidence of evolution. DNA sequences vary among species, but there are many	- - Concept Explanation Explain environmental concepts, processes, and models presented	BIG IDEA 2 Interactions Between Earth Systems ERT § Can an invasive species be considered	AP Classroom topic questions AP Classroom progress check

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		2.4 Ecological Tolerance 3 ERT 2.5 Natural Disruptions to Ecosystems 5 ERT 2.6 Adaptations 5 ERT 2.7 Ecological Succession	air and water and fertile soil -- regulatory, cultural, supporting, provisional **-Species Diversity:** number of different species (species richness) combined with the relative abundance of individuals within each of those species (species evenness) -**Bottleneck Effect**: a change in allele frequency following a dramatic reduction in the size of a	overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence. (HS-LS4-1) **LS4.B: Natural Selection** Natural selection occurs only if there is both (1) variation in the genetic information between organisms in a population and (2) variation in the expression of that genetic information—that is, trait variation—that leads to differences in performance among individuals. (HS-LS4-2),(HS-LS4-3) The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. (HS-LS4-3)	in written format. - Visual Representations Analyze visual representations of environmental concepts and processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical	a native species if it occupies a place for a long time?	AP Style Exam made using AP Classroom that includes multiple choice and free response questions Labs: Estimating Population size, Island Biogeography, Survival in an Estuary

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			population	**LS4.C: Adaptation** Evolution is a consequence of the interaction of four factors: (1) the potential for a species to increase in number, (2) the genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for an environment's limited supply of the resources that individuals need in order to survive and reproduce, and (4) the ensuing proliferation of those organisms that are better able to survive and reproduce in that environment. (HS-LS4-2) Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment. That is, the differential survival and reproduction of organisms in a population that have an	Routines -Environmental Solutions Analyze and interpret quantitative data represented in tables, charts, and graphs Apply quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		

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				advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not. (HS-LS4-3),(HS-LS4-4) Adaptation also means that the distribution of traits in a population can change when conditions change. (HS-LS4-3) Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species. (HS-LS4-5) Species become extinct because they can no longer survive and reproduce in their			

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				altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species' evolution is lost. (HS-LS4-5)			
Populations	November/ December	- 3.1 Generalist and Specialist Species 1 ERT 3.2 K-Selected r-Selected Species 5 ERT 3.3 Survivorship Curves 5 ERT 3.4 Carrying Capacity 5 ERT 3.5 Population Growth and Resource Availability 6 EIN 3.6 Age Structure Diagrams 5 EIN 3.7 Total Fertility Rate 5 EIN 3.8 Human	-**Biotic Potential**: maximum rate at which a population can increase under ideal conditions, exponential growth -**Doubling Time (Years):** number of years it will take for a population to double = to 70%/population growth rate (%) -**Demographic**	**Analyzing and Interpreting Data** Analyzing data in 9–12 builds on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data. Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible. (HS-LS4-3) **Constructing Explanations and Designing Solutions**	- - Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations Analyze visual representations of environmental concepts and processes. - Text Analysis	BIG IDEA 2 Interactions Between Earth Systems ERT § How do changes in habitats influence changes in species over time? BIG IDEA 3 Interactions Between Different Species and the Environment EIN § How is educational opportunity for women connected to human population	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom that includes multiple choice and free response questions Labs: Cemetery Lab

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		Population Dynamics 7 EIN 3.9 Demographic Transition	**Transition Model:** a sequence of demographic changes in which a country moves from high birth and death rates to low birth and death rates through time	Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-LS4-2),(HS-LS4-4) **Engaging in Argument from Evidence** Engaging in argument from evidence in 9-12 builds on	Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and interpret quantitative data represented in tables, charts, and graphs Apply quantitative methods to address	changes?	

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				K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current or historical episodes in science. Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments. (HS-LS4-5) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs. Communicate scientific information (e.g., about phenomena and/or the process of development and	environmental concepts Propose and justify solutions to environmental problems		

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				the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically). (HS-LS4-1)			
Earth Systems and Resources	September	- 4.1 Plate Tectonics 2 ERT 4.2 Soil Formation and Erosion 4 ERT 4.3 Soil Composition and Properties 4 ERT 4.4 Earth's Atmosphere 2 ERT 4.5 Global Wind Patterns 2 ERT 4.6 Watersheds 1 ENG 4.7 Solar Radiation and Earth's Seasons 2 ENG 4.8 Earth's Geography and Climate 2 ENG	- **Coriolis Effect:** the effect of Earth's rotation on the direction of winds and currents **-El Nino:** the periodic changes in winds and ocean currents, causing cooler and wetter conditions in the southeastern United States and unusually dry weather in	**ESS1.C: The History of Planet Earth** Continental rocks, which can be older than 4 billion years, are generally much older than the rocks of the ocean floor, which are less than 200 million years old. (HS-ESS1-5) Although active geologic processes, such as plate tectonics and erosion, have destroyed or altered most of the very early rock record on Earth, other objects in the solar system, such as lunar rocks, asteroids, and meteorites, have changed little over billions of years. Studying these objects can	- - Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations Analyze visual representations of environmental concepts and processes. - Text Analysis	BIG IDEA 1 Energy Transfer ENG § How does energy from the sun influence the weather? BIG IDEA 2 Interactions Between Earth Systems ERT § How can earthquakes be predicted?	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom that includes multiple choice and free response questions Labs: Edible soil horizons

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		4.9 El Niño and La Niña	southern Africa and Southeast Asia **-Soil Horizons:** a layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes **-Lithosphere:** a rigid layer made up of the uppermost part of the mantle & the crust	provide information about Earth's formation and early history. (HS-ESS1-6) **ESS2.A: Earth Materials and Systems** Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes. (HS-ESS2-1),*(Note: This Disciplinary Core Idea is also addressed by HS-ESS2-2.)* **ESS2.B: Plate Tectonics and Large-Scale System Interactions** Plate tectonics is the unifying theory that explains the past and current movements of the rocks at Earth's surface and provides a framework for understanding its geologic history. *(ESS2.B Grade 8 GBE) (secondary to HS-ESS1-5)*,(HS-ESS2-1) Plate movements are responsible for most continental and ocean-floor features and for the	Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and interpret quantitative data represented in tables, charts, and graphs Apply quantitative methods to address		

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				distribution of most rocks and minerals within Earth's crust. *(ESS2.B Grade 8 GBE)* (HS-ESS2-1) **PS1.C: Nuclear Processes** Spontaneous radioactive decays follow a characteristic exponential decay law. Nuclear lifetimes allow radiometric dating to be used to determine the ages of rocks and other materials. *(secondary to HS-ESS1-5),(secondary to HS-ESS1-6)*	environmental concepts Propose and justify solutions to environmental problems		
Land and Water Use	January	- 5.1 The Tragedy of the 1 Commons EIN 5.2 Clearcutting 1 EIN 5.3 The Green Revolution 3 EIN 5.4 Impacts of Agricultural 1 Practices EIN 5.5 Irrigation Methods 7	- **Green Revolution:** a shift in agricultural practices in the twentieth century that included new management techniques, mechanization,	**Developing and Using Models** Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed world(s). Develop a model based on	- - Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations	BIG IDEA 3 Interactions Between Different Species and the Environment EIN § How does your use of natural resources impact the world? BIG IDEA 4 Sustainability	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom

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		EIN 5.6 Pest Control Methods 7 EIN 5.7 Meat Production 5 Methods EIN 5.8 Impacts of Overfishing 7 EIN 5.9 Impacts of Mining 7 EIN 5.10 Impacts of Urbanization 7 EIN 5.11 Ecological Footprints 5 STB 5.12 Introduction to 5 Sustainability STB 5.13 Methods to Reduce 4 Urban Runoff STB 5.14 Integrated Pest Management 7 STB 5.15 Sustainable Agriculture 7 STB 5.16 Aquaculture 7 STB	fertilization, irrigation, and improved crop varieties with increased yields **-Synthetic Fertilizer:** produced commercially, normally with the use of fossil fuels a.k.a as inorganic fertilizers **-No-Till Agriculture:** an agricultural method in which farmers do not turn the soil between seasons as a means of reducing topsoil erosion	evidence to illustrate the relationships between systems or between components of a system. (HS-ESS2-1) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. Apply scientific reasoning to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion. (HS-ESS1-6) **Engaging in Argument from Evidence** Engaging in argument from evidence in 9–12 builds on K–8 experiences and	Analyze visual representations of environmental concepts and processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and	STB § Why are sustainable practices difficult to implement?	that includes multiple choice and free response questions Labs: Tragedy of the Commons Project: Designing Sustainable Cities

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		5.17 Sustainable Forestry	**-Drip Irrigation:** the practice of using small pipes that slowly drip water just above ground to conserve water to use for crops (highly efficient 75-95%)	progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science. Evaluate evidence behind currently accepted explanations or solutions to determine the merits of arguments. (HS-ESS1-5)	interpret quantitative data represented in tables, charts, and graphs Apply quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		
Energy Resources and Consumption	February	- 6.1 Renewable and Nonrenewable Resources 1 ENG 6.2 Global Energy Consumption 6 ENG 6.3 Fuel Types and Uses 1 ENG 6.4 Distribution of Natural	- **Nuclear Fission:** a nuclear reaction in which a massive nucleus splits into smaller nuclei with the simultaneous release of energy	**PS3.B: Conservation of Energy and Energy Transfer** Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system. (HS-PS3-1) Energy cannot be created or destroyed, but it can be transported from one place to	- - Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations	BIG IDEA 1 Energy Transfer ENG § Why are fossil fuels the most widely used energy resources if they are nonrenewable?	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom

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		Energy Resources 2 ENG 6.5 Fossil Fuels 7 ENG 6.6 Nuclear Power 2 ENG 6.7 Energy from Biomass 7 ENG 6.8 Solar Energy 5 ENG 6.9 Hydroelectric Power 7 ENG 6.10 Geothermal Energy 1 ENG 6.11 Hydrogen Fuel Cell 1 ENG 6.12 Wind Energy 7 ENG 6.13 Energy Conservation	**-Dams**: a barrier constructed to hold back water and raise its level, the resulting reservoir being used in the generation of electricity or as a water supply **-Energy Efficient:** energy efficient homes are composed of a network of elements working together to reduce the overall amount of energy consumption **-Fossil Fuels:** coal, oil, natural gas, and other fuels that are	another and transferred between systems. (HS-PS3-1),(HS-PS3-4) Mathematical expressions, which quantify how the stored energy in a system depends on its configuration (e.g. relative positions of charged particles, compression of a spring) and how kinetic energy depends on mass and speed, allow the concept of conservation of energy to be used to predict and describe system behavior. (HS-PS3-1) The availability of energy limits what can occur in any system. (HS-PS3-1) Uncontrolled systems always evolve toward more stable states—that is, toward more uniform energy distribution (e.g., water flows downhill, objects hotter than their surrounding environment cool down). (HS-PS3-4)	Analyze visual representations of environmental concepts and processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and		that includes multiple choice and free response questions Labs: Energy Audit

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			ancient remains of plants and animals		interpret quantitative data represented in tables, charts, and graphs Apply quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		
Atmospheric Pollution	March	- 7.1 Introduction to Air 4 Pollution STB 7.2 Photochemical Smog 5 STB 7.3 Thermal Inversion 2 STB 7.4 Atmospheric CO2 and Particulates 4 STB 7.5 Indoor Air Pollutants 5 STB 7.6 Reduction of	- **Sulfur Dioxide:** SO2, a gas produced by coal burning which increases the acidification of rain water **-Tropospheric Ozone:** O3, ozone		- - Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations Analyze visual	BIG IDEA 4 Sustainability STB § Where does air pollution go once it is airborne?	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom that includes multiple

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		Air Pollutants 7 STB 7.7 Acid Rain 4 STB 7.8 Noise Pollution	that occurs in the troposphere, where it is a secondary pollutant created by the interaction of sunlight, heat, nitrogen oxides, and volatile carbon containing chemicals **-Clean Air Act:** 1970- law that established national standards for states, strict auto emissions guidelines, and regulations, which set air pollution standards for private industry **-Secondary**		representations of environmental concepts and processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and interpret quantitative		choice and free response questions

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			Pollutant: a primary pollutant that has undergone transformation in the presence of sunlight, water, oxygen, or other compounds		data represented in tables, charts, and graphs Apply quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		
Aquatic and Terrestrial Pollution	March	- 8.1 Sources of Pollution 1 STB 8.2 Human Impacts on Ecosystems 6 STB 8.3 Endocrine Disruptors 1 STB 8.4 Human Impacts on Wetlands and Mangroves 7 STB 8.5 Eutrophication 2 STB 8.6 Thermal	- **Eutrophication**: process by which nutrients, particularly phosphorus and nitrogen, become highly concentrated in a body of water, leading to increased growth of organisms such as algae or		- - Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations Analyze visual representations of	BIG IDEA 3 Interactions Between Different Species and the Environment EIN § How does pollution impact your health? BIG IDEA 4 Sustainability STB § How can you decrease your waste?	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom that includes multiple choice and free

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Unit Title	Month	Content	Vocabulary	Standards	Skills	Big Ideas	Assessments
		Pollution 1 STB 8.7 Persistent Organic Pollutants (POPs) 1 STB 8.8 Bioaccumulation and Biomagnification 4 STB 8.9 Solid Waste Disposal 7 STB 8.10 Waste Reduction Methods 6 STB 8.11 Sewage Treatment 8.12 Lethal Dose 50% (LD50) 6 EIN 8.13 Dose Response Curve 5 EIN 8.14 Pollution and Human Health 4 EIN 8.15 Pathogens and Infectious Diseases	cyanobacteria **-Biomagnification**: the concentration of toxins in an organism as a result of its ingesting other plants or animals in which the toxins are more widely disbursed **-LD50:** the amount of a chemical that kills 50% of the animals in a test population, measured on the dose-response curve **-Leachate:** polluted liquid produced by		environmental concepts and processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and interpret quantitative data represented in		response questions Pollution Case Studies

Mount Pleasant Central School District

AP Environmental Science

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			water passing through buried wastes in a landfill		tables, charts, and graphs Apply quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		
Global Change	April/May	- 9.1 Stratospheric Ozone 1 Depletion STB 9.2 Reducing Ozone Depletion 7 STB 9.3 The Greenhouse Effect 1 STB 9.4 Increases in the Greenhouse Gases 2 STB 9.5 Global Climate Change 5 STB 9.6 Ocean Warming 7	- **Greenhouse Gases**: gases such as water vapor, carbon dioxide, and methane that absorb heat leaving the Earth's surface adding to the greenhouse effect, where certain atmospheric gases	**ESS2.D: Weather and Climate** Current models predict that, although future regional climate changes will be complex and varied, average global temperatures will continue to rise. The outcomes predicted by global climate models strongly depend on the amounts of human-generated greenhouse gases added to the atmosphere each year and by the ways in which	- Concept Explanation Explain environmental concepts, processes, and models presented in written format. - Visual Representations Analyze visual representations of environmental concepts and	BIG IDEA 3 Interactions Between Different Species and the Environment EIN § Why are laws created to protect endangered species? BIG IDEA 2 Sustainability STB § How can local human activities have a global	AP Classroom topic questions AP Classroom progress check AP Style Exam made using AP Classroom that includes multiple choice and free response questions

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		STB 9.7 Ocean Acidification 1 EIN 9.8 Invasive Species 7 EIN 9.9 Endangered Species 7 EIN 9.10 Human Impacts on Biodiversity	allow visible light to pass but traps infrared heat heat **-Kyoto Protocol**: 1997 treaty that calls for industrialized countries to reduce greenhouse gas emissions **-Endangered Species Act:** 1973 U.S. legislation that implements CITES, Convention on International Trade of Endangered Species, designed to protect species from extinction; identifies/protects	these gases are absorbed by the ocean and biosphere. *(secondary to HS-ESS3-6)* **ESS3.A: Natural Resources** Resource availability has guided the development of human society. (HS-ESS3-1) All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2) **ESS3.B: Natural Hazards** Natural hazards and other geologic events have shaped the course of human history; [they] have significantly altered the sizes of human populations and have driven human migrations. (HS-ESS3-1) **ESS3.C: Human Impacts on Earth Systems** The sustainability of human	processes. - Text Analysis Analyze sources of information about environmental issues - Scientific Experiments Analyze research studies that test environmental principles - Data Analysis Mathematical Routines -Environmental Solutions Analyze and interpret quantitative data represented in tables, charts, and graphs Apply	impact?	Climate Change Escape Room 3 Practice AP Exams

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			threatened and endangered species **-Sea Level Rise:** increase in average sea level over time, caused by thermal expansion of seawater and melting of land-based glaciers resulting in coastal flooding and more severe storm surges	societies and the biodiversity that supports them requires responsible management of natural resources. (HS-ESS3-3) Scientists and engineers can make major contributions by developing technologies that produce less pollution and waste and that preclude ecosystem degradation. (HS-ESS3-4) **ESS3.D: Global Climate Change** Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities. (HS-ESS3-6) **ETS1.B: Developing Possible Solutions** When evaluating solutions, it is important to take into account a range of constraints, including cost,	quantitative methods to address environmental concepts Propose and justify solutions to environmental problems		

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				safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. *(secondary to HS-ESS3-2),(secondary HS-ESS3-4)*			
Sustainability	May/June	- The three pillars of sustainability: the environment, the economy, the people (society) - Supply chain	- Sustainability	**ETS1.B: Developing Possible Solutions** When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.	- Text Analysis Analyze sources of information about environmental issues	BIG IDEA 2 Sustainability STB § How can local human activities have a global impact?	Individual sustainability projects: students research any product/business/industry they want and evaluate the sustainability using the 3 pillars of sustainability and all the parts of the supply chain
		-	-		-		