Science Department Curriculum Guide **Environmental Science – AP**

Course Description
The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science, through which students engage with the scientific principles, concepts, and methodologies required to understand the interrelationships within the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.

Course Content	Science Practices
The AP Environmental Science course is organized into nine units arrananged in a logical sequence. Students will spend about 25% of instructional time engaged in hands-on, inquiry-based investigations. ■ Unit 1: The Living World: Ecosystems ■ Unit 2: The Living World: Biodiversity ■ Unit 3: Populations ■ Unit 4: Earth Systems and Resources ■ Unit 5: Land and Water Use ■ Unit 6: Energy Resources and Consumption ■ Unit 7: Atmospheric Pollution ■ Unit 8: Aquatic and Terrestrial Pollution ■ Unit 9: Global Change	■ **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. ■ **Data Analysis**: Analyze and interpret quantitative data represented in tables, charts, and graphs. ■ **Mathematical Routines**: Apply quantitative that test environmental principles.methods to address environmental concepts. ■ **Environmental Solutions**: Propose and justify solutions to environmental problems.

Textbook
Exploring Environmental Science For AP, by Tyler Miller and Scott Spoolman; published by Cengage Learning, 2021 Authors Tyler Miller and Scott Spoolman created Exploring Environmental Science for AP specifically to prepare students for the AP Exam in Environmental Science. With a key focus on sustainability, the program encourages students to think critically about all aspect of environmental science issues and how those issues impact the quality of life and the health of the planet. National Geographic Explorers, images, maps, and graphics capture student interest, while digital enhancements in MindTap provide additional media to support key concepts and practice tools to prepare students for success on the AP Exam.

Subject: Environmental Science – AP

Units	Topics	Activities May Include
The Living World: Ecosystems Term 1 September Chapters 1, 2, 3	▪ Introduction to Ecosystems ▪ Terrestrial Biomes ▪ Aquatic Biomes ▪ The Carbon Cycle ▪ The Nitrogen Cycle ▪ The phosphorus Cycle ▪ The Hydrologic Cycle ▪ Primary Productivity ▪ Trophic Levels ▪ Energy Flow and the 10% Rule ▪ Food Chains and Food Webs	▪ Energy Transfer lab ▪ Review Questions ▪ Practice Exam ▪ Kahoot Game ▪ Biomagnification Lab
The Living World: Biodiversity Term 1 October Chapters 4, 5, 6	▪ Introduction to Biodiversity ▪ Ecosystem Services ▪ Island Biogeography ▪ Ecological Tolerance ▪ Natural Disruptions to Ecosystems ▪ Adaptations ▪ Ecological Succession	▪ Biome Project ▪ GPP/NPP lab ▪ Review Questions ▪ Practice Exam ▪ Kahoot
Populations Term 2 November Chapters 7, 8, 9	▪ Generalist and Specialist Species ▪ K-Selected r-selected Species ▪ Survivorship Curves ▪ Carrying Capacity ▪ Population Growth and Resource Availability ▪ Age Structure Diagrams ▪ Total Fertility Rate ▪ Human Population Dynamics ▪ Demographic Transition	▪ Lemna Population lab ▪ Review Questions ▪ Kahoot ▪ Practice Exam ▪ Math Practice Problems
Earth Systems and Resources Term 2 December Chapters 10, 11, 12	▪ Plate Tectonics ▪ Soil Formation and Erosion ▪ Soil Composition and Properties ▪ Earth's Atmosphere ▪ Global Wind Patterns ▪ Watersheds ▪ Solar Radiation and Earth's Seasons ▪ Earth's Geography and Climate ▪ El Nino and La Nina	▪ Tectonic Plate and Rock Cycle Interactive ▪ Soil Formation Lab (multi-part) ▪ Soil Composition and Properties Lab (multi-part) ▪ Review Questions ▪ Practice Exam ▪ Kahoot

Units	Topics	Activities May Include
Land and Water Use Term 2 January Chapter 13, 14, 15	▪ The Tragedy of the Commons ▪ Clearcutting ▪ The Green Revolution ▪ Impacts of Agricultural Practices ▪ Irrigation Methods ▪ Pest Control Methods ▪ Meat Production Methods ▪ Impacts of Overfishing ▪ Impacts of Mining ▪ Impacts of Urbanization ▪ Ecological Footprints ▪ Introduction to Sustainability ▪ Methods to Reduce Urban Runoff ▪ Integrated Pest Management ▪ Sustainable Agriculture ▪ Aquaculture ▪ Sustainable Forestry	▪ Tragedy of the Commons Lab ▪ Review Questions ▪ Practice Exam ▪ Kahoot
Energy Resources & Consumption Term 3 February Chapters 16, 17	▪ Renewable and Nonrenewable Resources ▪ Global Energy Consumption ▪ Fuel Types and Uses ▪ Distribution of Natural Energy Resources ▪ Fossil Fuels ▪ Nuclear Power ▪ Energy from Biomass ▪ Solar Energy ▪ Hydroelectric Power ▪ Geothermal Energy ▪ Hydrogen Fuel Cells ▪ Wind Energy ▪ Energy Conservation	▪ Calculations and Dimensional Analysis Activity ▪ Review Questions ▪ Kahoot ▪ Practice Exam
Atmospheric Pollution Term 3 February - March Chapters 18, 19	▪ Introduction to Air Pollution ▪ Photochemical Smog ▪ Thermal Inversion ▪ Atmospheric carbon dioxide and Particulates ▪ Indoor Air Pollutants ▪ Reduction of Air Pollution ▪ Acid Rain ▪ Noise Pollution	▪ Graphic Organizers ▪ Air Pollution Chart ▪ Review Questions ▪ Kahoot ▪ Practice Exam

Units	Topics	Activities May Include
Aquatic and Terrestrial Pollution Term 3 March Chapter 20 & wrap-up	▪ Sources of Pollution ▪ Human Impacts on Ecosystems ▪ Endocrine Disruptors ▪ Human IMpacts on Wetlands and Mangroves ▪ Eutrophication ▪ Thermal Pollution ▪ Persistent Organic Pollutants ▪ Bioaccumulation and Biomagnification ▪ Solid Waste Disposal ▪ Waste Reduction Methods ▪ Sewage Treatment ▪ Lethal Dose 50% ▪ Dose Response Curve ▪ Pollution and Human Health ▪ Pathogens and Infectious Disease	▪ Water testing lab ▪ Review Questions ▪ Kahoot ▪ Practice Exam ▪ Biointeractive Data Analysis and Text Analysis (set of 6)
Global Change Term 4 April Review	▪ Stratospheric Ozone ▪ Reducing Ozone Depletion ▪ The Greenhouse Effect ▪ Increases in the Greenhouse Gases ▪ Global Climate Change ▪ Ocean Warming ▪ Ocean Acidification ▪ Invasive Species ▪ Endangered Species ▪ Human Impacts on Biodiversity	▪ NOVA climate lab ▪ Review Questions ▪ Kahoot ▪ Practice Exam ▪ Read David Attenborough's, "A Life on Earth" and answer guided questions
AP Exam Practice Term 4 April - May	Review the AP scoring methodology. Spend the remaining class periods reviewing content to further prepare students for the AP exam, which is typically scheduled in early May.	▪ Review Packets ▪ FRQ ▪ Progress Checks ▪ AP Classroom ▪ Albert.io
Post AP Exam Term 4 May - June	Students will have a voice in the research, projects, and labs that will make the remainder of the school year so it is meaningful, interesting, enjoyable, challenging, and fun.	▪ Student selected topics for research, projects, and labs