Curriculum at a Glance

AP Environmental Science

Level: 400

Grades 11 or 12

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. The following outline of major topics serves to describe the scope of the AP Environmental Science course and exam. The order of topics in the outline holds no special significance, since there are many different sequences in which the topics can be appropriately addressed in the course.

Unit Name/Description	Content and/or Skills
Structure of a Dynamic Earth	• Earth Science concepts (geologic time scale; plate tectonics, earthquakes, volcanism; seasons; solar intensity and latitude) • The Atmosphere (composition; structure; weather and climate; atmospheric circulation and the Coriolis Effect; atmosphere–ocean interactions; ENSO) • Global Water Resources and Use (freshwater/saltwater; ocean circulation; agricultural, industrial, and domestic use; surface and groundwater issues; global problems; conservation) • Soil and Soil Dynamics (rock cycle; formation; composition; physical and chemical properties; main soil types; erosion and other soil problems; soil conservation)
The Living World	• Ecosystem Structure (biological populations and communities; ecological niches; interactions among species; keystone species; species diversity and edge effects; major terrestrial and aquatic biomes) • Energy Flow (photosynthesis and cellular respiration; food webs and trophic levels; ecological pyramids) • Ecosystem Diversity (biodiversity; natural selection; evolution; ecosystem services) • Natural Ecosystem Change (climate shifts; species movement; ecological succession) • Natural Biogeochemical Cycles (carbon, nitrogen, phosphorus, sulfur, water, conservation of matter)

Population	• Population Biology Concepts (Population ecology; carrying capacity; reproductive strategies; survivorship) • Human population dynamics (Historical population sizes; distribution; fertility rates; growth rates and doubling times; demographic transition; age-structure diagrams) • Human Population size (Strategies for sustainability; case studies; national policies) • Impacts of human population growth (Hunger; disease; economic effects; resource use; habitat destruction)
Land and Water Use	• Agriculture (Feeding a growing population; human nutritional requirements; types of agriculture; Green Revolution; genetic engineering and crop production; deforestation; irrigation; sustainable agriculture) 2. Controlling pests (Types of pesticides; costs and benefits of pesticide use; integrated pest management; relevant laws) • Forestry (Tree plantations; old growth forests; forest fires; forest management; national forests) • Rangelands (Overgrazing; deforestation; desertification; rangeland management; federal rangelands) • Other Land Use (Urban land development; transportation infrastructure; public and federal lands; conservation options and sustainable land-use strategies; mining; fishing and overfishing) • Global Economics (Globalization; World Bank; Tragedy of the Commons) • Relevant laws and treaties
Energy Resources and Consumption	• Energy Concepts (Energy forms; power; units; conversions; Laws of Thermodynamics) • Energy Consumption (Historical, present, and future needs) • Fossil Fuel Resources and Use (Formation of coal, oil, and natural gas; extraction/purification methods; world reserves and global demand) • Nuclear Energy (Nuclear fission process; nuclear fuel; electricity production; nuclear reactor types; safety issues; radiation and human health; radioactive wastes; nuclear fusion) • Hydroelectric Power (Dams; flood control; salmon; silting; other impacts) • Energy Conservation (Energy efficiency; CAFE standards; hybrid electric vehicles; mass transit)

	• Renewable Energy (Solar energy; solar electricity; hydrogen fuel cells; biomass; wind energy; small-scale hydroelectric; ocean waves and tidal energy; geothermal)
Pollution	• Air pollution (Sources — primary and secondary; major air pollutants; measurement units; smog; acid deposition — causes and effects; heat islands and temperature inversions; indoor air pollution; remediation and reduction strategies) • Noise pollution (Sources and effects; control measures) • Water pollution (Sources, causes, and effects; cultural eutrophication; groundwater pollution; maintaining water quality; water purification; sewage treatment/septic systems) • Solid and hazardous waste (disposal, reduction, site clean-up) • Environmental and human health impacts (Risk analysis; dose-response relationships; biomagnification) • Economic Impacts (Cost-benefit analysis; externalities; sustainability) • Relevant laws and treaties
Global Change	• Stratospheric Ozone (Formation of stratospheric ozone; ultraviolet radiation; causes of ozone depletion; effects of ozone depletion; strategies for reducing ozone depletion) • Global Warming (Greenhouse gases and the greenhouse effect; impacts and consequences of global warming; reducing climate change) • Relevant laws and treaties • Loss of Biodiversity (Habitat loss; overharvesting; pollution; introduced species; endangered and extinct species; impact on ecosystem services; conservation biology) • Relevant laws and treaties