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## *Advanced Placement (AP) Standards and Alignments*

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The following are the seven content areas topics required by College Board for AP Environmental Science.

<u><b>Standards</b></u>	<u><b>Correlation</b></u>
<b>I. Earth Systems and Resources (10-15%)</b>	
A. Earth Science Concepts (Geologic time scale; plate tectonics, earthquakes, volcanism, season, solar intensity and latitude)	Class Notes: 2.1, 2.2, 2.4 Labs: 2:5, 2:6, 2:7, 2:8 Video: "Ring of Fire" Video Worksheet: 2.11.1
B. The Atmosphere (Composition; structure, weather and climate; atmospheric circulation and the Coriolis Effect; atmosphere-ocean interactions; ENSO)	Class Notes: 1.6, 2.5, 2.6, 2.7, 7.1 Labs: 7:25 Video: "Chasing El Niño" Worksheet: 2.17.1
C. Global Water Resources and Use (Freshwater/saltwater; ocean circulation; agricultural, industrial and domestic use; surface and groundwater issues; global problems; conservation)	Class Notes: 5.2, 8.1, 8.2, 8.3, 8.4, 8.5 Labs: 1.1 Video: "Planet Earth: Freshwater"
D. Soil and Soil Dynamics (Rock cycle; formation; composition; physical and chemical properties; main soil types; erosion and other soil problems; soil conservation)	Class Notes: 6.1, 6.3 Labs: 6:21, 6:22, 8:29

## ***Advanced Placement (AP) Standards and Alignments***

<u><b>Standards</b></u>	<u><b>Correlation</b></u>
<b>II. The Living World (10-15%)</b>	
A. Ecosystem Structure (Biological populations and communities; ecological niches; interactions among species; keystone species; species diversity and edge effects; major terrestrial and aquatic biomes)	Class Notes: 1.6, 1.7, 1.8, 1.9, 1.10, 3.1, 3.2, 4.3 Labs: 1:4, 3:10, 8:29
B. Energy Flow (Photosynthesis and cellular respiration; food webs and trophic levels; ecological pyramids)	Class Notes: 2.3, 3.6, 3.7, 8.1 Labs: 3:12, 8:31
C. Ecosystem Diversity (Biodiversity; natural selection; evolution; ecosystem services)	Class Notes: 3.3, 3.4, 3.5 Labs: 1:4, 3:9, 3:11, 6:23 Video: "Cane Toads" Video Worksheet: 3.5.1
D. Natural Ecosystem Change (Climate shifts; species movement; ecological succession)	Class Notes: 3.4, 3.8, 3.9 Labs: 3:9, 3:10, 6:23, 7:28
E. Natural Biogeochemical Cycles (Carbon, nitrogen, phosphorus, sulfur, water, conservation of matter)	Class Notes: 2.3, 5.1 Lab: 5:17, 5:18

## Advanced Placement (AP) Standards and Alignments

<u>Standards</u>	<u>Correlation</u>
<b>III. Population (10-15%)</b>	
A. Population Biology Concepts (Population ecology; carrying capacity; reproductive strategies; survivorship)	Class Notes: 4.1, 5.1 Labs: 3:9, 3:12, 4:13, 4:14, 4:16, 5:17 Video: "What They Say about Hunting"
B. Human Population	
B1. Human population dynamics (Historical population sizes; distribution; fertility rates; growth rates and doubling times; demo-graphic transition; age-structure diagrams)	Class Notes: 4.4, 4.5 Labs: 4:15 Videos: World Population "Guns, Germs and Steel"
B2. Population size (Strategies for sustainability; case studies; national policies)	Class Notes: 4.1, 4.2, 4.5 Labs: 4:13, 4:14 Video: "The World in Balance"
B3. Impacts of population growth (Hunger; disease; economic effects; resource use; habitat destruction)	Class Notes: 1.2, 4.7 Labs: 4:14, 4:15, 4:16 Video: "Secrets of the Dead" or "Hunt for the Killer Flu" Video Worksheet: 4.15.1

## Advanced Placement (AP) Standards and Alignments

<u>Standards</u>	<u>Correlation</u>
<b>IV. Land and Water Use (10-15%)</b>	
A. Agriculture	
A1. Feeding a growing population (Human nutritional requirements; types of agriculture; Green Revolution; genetic engineering and crop production; deforestation; irrigation; sustainable agriculture)	Class Notes: 1.8, 5.2, 6.5 Labs: 1:1, 5:17, 6:23 Video: "Harvest of Fear"
A2. Controlling pests (Types of pesticides; costs and benefits of pesticide use; integrated pest management; relevant laws)	Class Notes: 6.6 Labs: 3:11, 6:23, 6:24, 7:26, 7:28
B. Forestry (Tree plantations; old growth forests; forest fires; forest management; national forests)	Class Notes: 1.8, 6.4 Labs: 6:23, 7:27, 7:28
C. Rangelands (Overgrazing, deforestation; desertification; rangeland management; federal rangelands)	Class Notes: 1.10 Labs: 1:1, 6:23
D. Other Land Use	
D1. Urban land development (Planned development; suburban sprawl; urbanization)	Class Notes: 4.6 Labs: 4:15
D2. Transportation infrastructure (Federal highway systems, canals and channels, roadless areas, ecosystem impacts)	Class Notes: 1.8, 5.1 Labs: 2:7
D3. Public and federal lands (Management; wilderness areas; national parks; wildlife refuges; forests; wetlands)	Class Notes: 6.4 Labs: 1:1, 6:23
D4. Land conservation options (Preservation; remediation; mitigation; restoration)	Class Notes: 6.4 Labs: 1:1, 6:23
D5. Sustainable land-use strategies	Class Notes: 6.4, 6.5 Labs: 6:23
E. Mining : (Mineral formation; extraction; global reserves; relevant laws and treaties)	Class Notes: 6.2
F. Fishing (Fishing techniques; overfishing; aquaculture; relevant laws and treaties)	Class Notes: 8.3 Labs: 5:17
G. Global Economics (Globalization; World Bank; Tragedy of the Commons; relevant laws and treaties)	Class Notes: 1.1, 1.2 Labs: 1.1

## Advanced Placement (AP) Standards and Alignments

<u>Standards</u>	<u>Correlation</u>
<b>V. Energy Resources and Consumption</b>	
A. Energy Concepts (Energy forms; power; units; conversions; Laws of Thermodynamics)	Class Notes: 5.1 Labs: 5:17
B. Energy Consumption	Class Notes: Labs: 5:18
C. Fossil Fuel Resources and Use (Formation of coal, oil, and natural gas; extraction/purification methods; world reserves and global demand; synfuels; environmental advantages/ disadvantages of sources)	Class Notes: 5.4 Labs: 5:19
D. Nuclear Energy (Nuclear fission process; nuclear fuel; electricity production; nuclear reactor types; environmental advantages/disadvantages; safety issues; radiation and human health; radioactive wastes; nuclear fusion)	Class Notes: 5.4 Labs: 5:20 Video: "Back to Chernobyl" Video Worksheet: 5.12.1
E. Hydroelectric Power (Dams; flood control; salmon; silting; other impacts)	Class Notes: 5.3 Labs: 5:19
F. Energy Conservation (Energy efficiency; CAFE standards; hybrid electric vehicles; mass transit)	Class Notes: 5.3, 5.4, 4.6 Labs: 5:19
G. Renewable Energy (Solar energy; solar electricity; hydrogen fuel cells; biomass; wind energy; small-scale hydroelectric; ocean waves and tidal energy; geothermal; environmental advantages/disadvantages)	Class Notes: 5.3 Labs: 5:19

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<u>Standards</u>	<u>Correlation</u>
<b>VI. Pollution (25-30%)</b>	
A. Pollution Types	
A1. 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; Clean Air Act and other relevant laws)	Class Notes: 7.2, 7.3, 7.5 Labs: 7:26, 7:27 Video: “What’s Up with the Weather”
A2. Noise pollution (Sources; effects; control measures)	Class Notes: 4.6 Labs: 4:15
A3. Water pollution (Types; sources, causes, and effects; cultural eutrophication; ground- water pollution; maintaining water quality; water purification; sewage treatment/septic systems; Clean Water Act and other relevant laws)	Class Notes: 8.4, 8.6, 8.7 Labs: 8:30, 8:31, 8:32
A4. Solid waste (Types; disposal; reduction)	Class Notes: 6.6 Labs: 6:24
B. Impacts on the Environment and Human Health	
B1. Hazards to human health (Environmental risk analysis; acute and chronic effects; dose-response relationships; air pollutants; smoking and other risks)	Class Notes: 7.5 Labs: 7:26
B2. Hazardous chemicals in the environment (Types of hazardous waste; treatment/disposal of hazardous waste; cleanup of contaminated sites; biomagnification; relevant laws)	Class Notes: 6.6, 7.5 Labs: 2:6, 6:24
C. Economic Impacts (Cost-benefit analysis; externalities, marginal costs; sustainability)	Class Notes: 1.2, 7.5 Labs: 7:27, 8:30

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<u><b>Standards</b></u>	<u><b>Correlation</b></u>
<b>VII. Global Change (10-15%)</b>	
A. Stratospheric Ozone (Formation of stratospheric ozone; ultraviolet radiation; causes of ozone depletion; effects of ozone depletion; strategies for reducing ozone depletion; relevant laws and treaties)	Class Notes: 7.3 Labs: 7:28
B. Global Warming (Greenhouse gases and the greenhouse effect; impacts and consequences of global warming; reducing climate change; relevant laws and treaties)	Class Notes: 3.4, 7.4 Labs: 7:28 Videos: "Greenhouse Conspiracy" and "Inconvenient Truth"
C. Loss of Biodiversity	
C1. Habitat loss; overuse; pollution; introduced species; endangered and extinct species	Class Notes: 3.3, 3.4, 3.5, Labs: 3:9, 3:10, 6:23
C2. Maintenance through conservation	Class Notes: Labs: 3:9, 3:10
C3. Relevant laws and treaties	Class Notes: 3.5

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