APES VOCABULARY REVIEW FOR AP EXAM

ENVIRONMENTAL UNDERSTANDING, ETHICS & PHILOSOPHY

Key Vocabulary
Aesthetics
Anthropocentric
Anthropogenic
Appropriate Technology
Biocentric
Conservation
Ecotourism
Gaia
Hypothesis
Intrinsic (Inherent) value
Luddite
Nihilism
Paradigm
Preservation
NIMBY (not in my backyard)
Utilitarianism

Review Questions
What are the major philosophies regarding nature preservation?
What is the world population presently?
Which countries are the most populated?
What percentage of people are considered wealthy and acutely poor?

BIOLOGICAL COMMUNITIES AND SPECIES INTERACTION

Key Vocabulary
Abundance
Adaptation
Biome
Climax community
Commensalism
Competition
Competive Exclusion
Community
Control
Diversity
Ecological succession
Ecosystem
Evolution

Genetic Drift
Habitat
Indicator Species
Keystone species
Limiting factor
Mutualism
Natural selection
Niche
Parasitism
Physiological
Pioneer species
Population
Predation
Primary productivity
Primary succession
Producers
Range of Tolerance
Resilience
Resource partitioning
Richness
Saprophytism
Secondary succession
Selective pressure
Species
Succession
Tolerance limits
Variable

Review Questions
What are the various stages of ecological succession in our area?
What are the main types of species interactions?
What are the reasons for intraspecific and interspecific competition?
What is the relationship between physiological adaptations and evolutionary success?
Be able to differentiate between non-inheritable traits and genetically transferable ones in an organism.
What limits species abundance?
What factors influence community diversity?
How does abundance and diversity change in relation to latitude?
What are the differences between primary and secondary succession?
Know how to set up a controlled experiment to test a hypothesis. Be able to create a hypothetical experiment from beginning to end.

BIODIVERSITY

Key Vocabulary
Biodiversity

Captive Breeding
Endangered species
Endangered Species Act (ESA)
Exotic species
Extinction
Flagship species
International Wildlife Treaties Convention on International Trade of Endangered Species (CITES)
Introduced Species
Island Biogeography
Keystone Species
Threatened species
Vulnerable species

Essential Questions
How do the mass extinctions in the pass differ from the rate of biodiversity loss experienced today? (Know the geological name of our present time period).
How long does it take biodiversity to recover after a mass extinction?
What are the major challenges to preserving the biodiversity on the planet?
What characteristics do most endangered species share in terms of territory size requirements? What other features do many endangered species have in common?
The Endangered Species Act (ESA) identifies threatened and endangered species in the US and puts their protection ahead of what kind of considerations?
What are some of the shortcoming of the ESA and what might be a better way to successfully protect species?
The Convention on International Trade in Endangered Species (CITES) lists species that cannot be traded in what form?
Why do exotic species have such a field day in their new environment?

MATTER, ENERGY AND LIFE

Key Vocabulary
Abiotic
Aerobic respiration
Ammonification
Assimilation
Autotroph
Biomass
Biotic
Carbon Cycle
Carnivore
Chlorophyll
Consumers
Decomposers
Denitrification
Detritus feeders

Energy Cycle
Entrophy
First law of thermodynamics
Food chain
Food web
Herbivore
Heterotroph
Keystone species
Legumes
Nitrification
Nitrogen Cycle
Nitrogen fixation
Nutrient cycle
Omnivore
Phosphate
Phosphorus cycle
Photosynthesis
Primary consumer
Producer
Second law of thermodynamics
Secondary consumer
Sulfur Cycle
Tertiary consumer
Trophic level

Review Questions
Know how the first and second law of thermodynamics govern ecosystem dynamics.
What is the difference between low and high quality energy?
Energy doesn't recycle, but does matter?
Be able to make a food chain and food web for organisms in our area.
What are the major steps to the carbon cycle, nitrogen, phosphorus and water cycles?
Which cycle slowly and which are quick?
What are the largest storage reservoirs for C, N, P and S?
Be able to diagram the tropic levels for organisms in our local ecosystem.
Know the names of each trophic level and be able to give examples.
Know the 10% rule of energy flow between trophic levels

BIOMES AND MANAGEMENT OF NATURE PRESERVES

Key Vocabulary
Aphotic
Aquatic Biomes
Benthic plant
Biome
Boreal Forest

Chapparal
Corridors
Desert
Ecotourism
Ecosystem
Estuary
Fresh water
Fragmentation
Grassland
Habitat
Intertidal
Mitigate
Neritic
Oceanic
Permafrost
Reclamation
Re-creation
Rehabilitation
Remediation
Restoration
Savanna
Taiga
Temperate Forest
Tropical Rain Forest
Tundra
Wetlands

Essential Questions

A biome is a large distinct terrestrial region having what kind of similar features?
What are the characteristics of the major biomes of the Earth?
Specifically where are the major biomes located?
What common plants and/or animals are associated with each biome?
What is the impact of park fragmentation on the diversity of the species?
What are the ways to protect, repair and manage ecological hot spots?
Why are wetlands so valuable as a resource?
How do wetlands control flooding?
How can parks and preserves be designed to accommodate species with a large range and to protect the biodiversity of the park?
Know the degree of restricted use in:

a. National Forest & National Resource lands,
b. National Wildlife Refuges
c. National Wilderness Preservation System & National Parks

LAND USE

Key Vocabulary
Clearcutting
Deforestation
Desertification
Island Biogeography
Old Growth Forest
Overgrazing
Selective Cutting
Sustainable Forestry

Essential Questions
What are some of the negative results of deforestation?
What are the positive benefits of leaving the forest untouched?
How can one remove trees for timber with minimal damage to the ecosystem?

POPULATION DYNAMICS

Key Vocabulary

Arithmetic growth
Biotic potential
Carrying capacity
Density-dependent factor
Density-independent factor
Dieback
Dynamic State of Equilibrium
Exponential increase
Environmental resistance
J-curve
K strategist
Logistic
Overshoot
Population
Population density
R strategist
S-curve

Essential Questions
How do you estimate the population of groups of organisms in a large area?
What factors might regulate the population growth of an organism?

HUMAN POPULATIONS

Key Vocabulary
Age structure
Age structure histograms
Birth rates
Birth control
Crude birth rate
Crude death rate
Death rate
Demographic transition
Developed countries
Developing countries
Doubling time
Histogram
Industrial stage
Infant mortality
Preindustrial stage
Replacement fertility level
Rule of 70
Survivorship Curves
Transitional stage

Essential Questions
What are some possible solutions to the soaring world population growth?
How does the growth rate of humans affect the use of world resources and health of the environment?
How do developed and underdeveloped countries differ in age structure, birth rates, infant mortality, death rates, male to female ratios and population growth?
Know how to read age structure diagrams.
Know how to calculate the annual percent growth rate (including immigration and emigration numbers).
Understand how to read survival curves for different organisms.
How do you calculate the doubling time of organisms and the growth rate of a population?
How does the birth and death rate change as a developing society becomes more industrialized?

ENVIRONMENTAL HEALTH AND TOXICOLOGY

Key Vocabulary
Acute
Antigens
Asbestos fibers

Background radiation
Bioaccumulation
Biomagnification
Carcinogen
Chronic
Half-life
HAZMAT (hazardous material)
LD50
Morbidity
Mortality
Mutagen
Neurotoxin
Radioactive decay
Radioisotope
Synergism
Teratogen
Threshold level
Toxicology

Essential Questions

What are the biggest biological and chemical threats to human life? How do the threats to Americans differ from people who live in places like Mali, India or Iraq!
What are the most tragic cases of life lost by toxic disasters around the world?
How do you measure the concentration of the toxicity of a substance? Also know your conversions from ppm to ppb!

ex. 550 parts per million (ppm) would be equivalent to
a. 5.5 ppb
b. 55 ppb
c. 5.500 ppb
d. 55,000 ppb
e. 550,000 ppb

What is the significance of the LD50 dose and the threshold level of toxicity?
How does the damage to an organism differ between a chronic and an acute dose of a toxin?
What information is given in a dose-response curve graph?
How do the results of toxicity tests relate to environmental degradation and human health?
A mutagen, teratogen and carcinogen all affect humans in what ways? Would that be considered a hereditary illness?
What are safe alternatives to using HAZMATS in the home?
Roughly how many people are estimated to have AIDS right now?
How does the amount of radioactive material change with each consecutive half life?
How is risk measured?

ENVIRONMENTAL GEOLOGY

Key Vocabulary
Convergent plate boundary
Divergent plate boundary
Epicenter
Erosion
Ore
Plate tectonics
Seismograph
Strip mining
Subduction
Tectonic plates
Weathering

Essential Questions
How did plate tectonics affect the diversity of organisms in terms of habitat change and evolution?
How do volcanic eruptions affect weather patterns?
How does the pattern of volcanoes and earthquakes relate to plate tectonics?
What major land forms are created by the different types of plate boundaries.
Know the major periods and eras of the Earth's history and when each major life form appeared.
Know how each rock type formed and what are the most common elements in the Earth's crust.
What are the advantages and disadvantages of surface mining?
How do you read a seismogram?
How do volcanic eruptions affect weather patterns?

FOOD AND AGRICULTURE

Key Vocabulary
Aquaculture
Bedload
Biotechnology
Capillary action
Castings
Compost
Contour plowing
Crop rotation
Food additives
Free range
Genetically Modified Organisms
GRAS list Green revolution
Hydroponics
Humus

Infiltration
Industrial Revolution
Irradating food
Leaching
Leaf litter
Loam
Monoculture
Mulch
No-till agriculture
Organic agriculture
Organic Food
Overcultivation
Parent Material
Percolation
Purse seining
Sand
Sediment
Slash-and-burn agriculture
Soil
Soil Horizons
Strip cropping
Subsistence farming
Subsoil
Sustainable agriculture
Terracing
Topsoil
Weathering

Essential Questions
What are the ways to retard soil erosion in agriculture?
What are the methods of mechanical and chemical weathering?
How is soil formed? How is humus formed?
What is the order of sediments from larger to smallest?
How do you identify the different soil types using the texture test?
What are the soil horizons in a soil profile?
What kinds of soil hold water?
What do the three numbers on fertilizer packages refer to?
What components of the soil are important for growing healthy plants?
What kinds of soil hold the most water? Which kinds drain the fastest?
Why is monoculture and decreased genetic diversity in crops a problem in todays agriculture?
Should humans eat high or low on the food chain to lessen the impact on limited land resources?

PEST CONTROL

Key Vocabulary
Biological control
Broad-spectrum pesticide
Chlorinated hydrocarbons
ex. DDT (dichlorodiphenyltrichloroethane)
Fungicide
Herbicide
Host specific
Insecticide
IPM (integrated pest management)
Natural chemical control
Nonpersistent
Non-point sources
Organophosphate Pesticide (ex. Malathion)
Persistent
Pesticide Treadmill
POP (persistent organic pollutants)
Resistance
Second generation pesticide

Essential Questions
How do you measure the success of a pesticide?
How are pesticides classified?
What are the benefits of pesticide use?
What are the negative effects of pesticide use?
What are some alternatives to pesticides?
What are some examples of IPM?

AIR, WEATHER AND CLIMATE

Key Vocabulary
Carbon dioxide
Adiabatic Cooling
Convection currents
El Nino
Evapotranspiration
Hadley cell
Humidity
Global warming
Greenhouse effect
Greenhouse gases
Monsoon
Rainshadows
Stratosphere
Transpiration
Troposphere

Essential Questions

How does the differential heating of the planet create global wind patterns?
What are the differences between a cold and warm front?
How is the energy from sunlight distributed throughout the Earth and its atmosphere?
What are the layers of the atmosphere?
What affect does El Nino and La Nina have on global weather patterns?
How has the level of CO2 changed since the Industrial revolution?
How does the greenhouse affect work, what are typical greenhouse gasses, their sources, and how can we reduce the emission of these gasses?
What are the global repercussions of the greenhouse affect?
What will be the impact of global warming on our Midwestern farmland and Northeastern hardwoods?
What is the composition and percentages of the first two elements in the air?
What percentage of C02 emissions does the US emit?

AIR POLLUTION

Key Vocabulary

Aerosols
Acid deposition
Acid precipitation
Alkaline
Ambient standards
Catalytic converter
CFC (Chlorofluorocarbons)
Criteria pollutants
EPA- Environmental Protection Agency
Fly ash
Hydrocarbon
Incinerator
Inorganic compounds
Legionnaires Disease
Methane
Nitric acid (NHO3)
Nitric oxides
Open Burning
Ozone (O3)
Ozone hole
PAN (peroxyacetylnitrates)
Particulates
Petroxyacyl nitrates
Photochemical smog
Radon
Sick building syndrome
Sulfur dioxide (SO2)
Sulfuric oxides

Temperature (Thermal) Inversion
Ultraviolet Radiation
Volatile organic compounds

Essential Questions
What are the main types and consequences of air pollution in the developing versus the undeveloped countries?
At what pH is rain considered acid rain?
What are the affects of acid rain on the environment?
How can we remediate lakes that have become too acidic? Is this a long term solution?
How do we reduce the emission of pollutants that cause acid rain?
How do weather patterns affect the deposition of acid precipitation?
How does weather and topography relate to air pollution?
What substance is causing the thinning of the ozone?
Why is the protection of the ozone layer important to us?
What are the main primary and secondary sources of air pollution and the solutions for their reduction.
What regulations do the Clean Air Act cover and what is its biggest threat?
What is sick building syndrome and its causes?
How does radon enter a home?

WATER USE AND MANAGEMENT

Key Vocabulary
Aral Sea
Aswan High Dam
Aqueduct
Aquifer
Brackish water
Buffering Capacity
Center Pivot irrigation
Cone of depression
Desalinization
Drainage Basin
Drought
Fish Ladder
Gray water
Groundwater remediation
Hard water
Hydraulic gradient
Mono Lake
Nonconsumptive water use
Ogallala Aquifer
Potable water
Residence time
Saltwater intrusion

Seep
Sink hole
Soft water
Storm water
Subsidence
Surface water
Tennessee Valley Authority (TVA)
Three Gorges Dam
Turbidity
Water table
Watershed (drainage basin)
Xeriscaping

Essential Questions
What are the most common pathways in the water cycle?
What is the percent distribution of fresh and salt water on the Earth? Where is most of the fresh water located?
What defines a watershed (water drainage basin)?
What are the patterns of domestic water use in the U.S. versus worldwide usage?
What indoor water conservation tips would you give to your family to cut down on your home water use?
Be able to illustrate a cross section of groundwater before and after heavy well pumping and be able to identify the zone of aeration, zone of saturation and the water table. How is the hydraulic gradient affected by wells?
What are the consequences of groundwater depletion?
What is the difference between soft and hard water and why is hard water a problem for shower takers?
What is the biggest watershed in the US?

WATER POLLUTION

Key Vocabulary
Activated sludge
Algae
Algae bloom
Aquatic Species Monitoring
Biological nutrient removal
Biosolids
BOD (Biological Oxygen Demand)
Chlorination
Clean Water Act of 1972
Coliform bacteria
Cooling tower
Cultural eutrophication
DO (Dissolved oxygen)
Eutrophic

Eutrophication
Fecal coliform test
Grit chamber
Heavy metal
Hypoxia
Indicator organisms
Indicator species
National Priority List
Natural biological control
Non-point source
Oligotrophic
Pathogenic Organisms
PCB (polycholorinated biphenyls)
Point source
Primary treatment
Red Tide
Secondary treatment
Septic System
Thermal pollution
Treated sludge
Trickling filter system
Turbidity
Waste Lagoons
Water Remediation

Review Questions
How can aquatic insects be used to determine the level of pollution in a river or stream?
What is the normal source of DO in water? Why does it fluctuate daily?
Explain the process of eutrophication including its sources, immediate and long term consequences. How does it affect the levels of BOD and DO at the site of polluted effluent versus farther downstream?
What is the relationship between BOD and DO?
What are the ways we can reduce water pollution?
What is the flow chart and operations of a sewage treatment plant?
What is the comparison of nitrogen, phosphorus, dissolved suspended solids, BOD, fecal coliform and toxic substances before and after sewage treatment?
What would you be measuring if you tested for water acidity, salinity, turbidity, hardness, BOD, and DO.
What are human feces NOT used on agricultural lands (besides the gross factor)
How could a sewage treatment plant MAKE energy?

ENVIRONMENTAL ECONOMICS, POLICY, AND LAW

Key Vocabulary
Agenda 21
Bottle law

Cost-benefit analysis
Cost-benefit ratio
Endangered species act
External Cost
GNP (Gross National Product)
Lacey Act
Lobbying
Mitigation
NIMTOO (Not in my term of office)
Nonrenewable resource
Renewable resource
Special Interest group
Tragedy of the Commons
True cost

Review Questions
What are the local state and national laws that apply to the air, water and toxic waste regulations?
How are cost-benefit ratios determined and how are they used in natural resources?

CONVENTIONAL ENERGY

Key Vocabulary
Arab Oil Embargo
Anthracite Coal
Blackouts
Breeder reactor
BTU (British Thermal Unit)
Chain reaction
Chernobyl
Containment Building
Deregulation
Enriched Uranium
Ethanol
Exxon Valdez
Fission
Fission products
Fossil fuels
Fusion
Fuel assembly
Fuel rods
High level waste
Land subsidence
Lignite
Low level waste
Meltdown

Nonrenewable resources
Nuclear power
Oil sand
Oil shale
OPEC (Organization of Petroleum Exporting Countries)
Operating efficiency
Peat
Potential energy
Power grid
Spent Fuel
Steam Generator
Synthetic Fuels
Tar sands
Three Mile Island
Turbine
Turbogenerator
Watt

Essential Questions
What are renewable and nonrenewable resources?
How do you determine the rate of energy use for a private home?
In your home survey, which items required the most electricity to run? Which items were the most inefficient to run in your house (lost the most energy to heat)?
How can the use of conventional energy resources be reduced?
What common products are derived from petroleum?
What are the different stages of the development of coal?
What is the history of energy use in the world/U.S.? What sources do we rely most on now?
How long are our world and U.S. oil reserves predicted to last?
Relatively how efficient is the production of electricity from nuclear power, coal and natural gas? What is the efficiency of a coal fired plant?
Know the parts and functions of a nuclear power plant.
What are the problems with relying on nuclear energy?
What new types of automobiles are being invented/produced that would reduce our dependence on oil? What are their draw backs?
Know the factor-label method for calculations.
Study the energy conversion problems we did in class.
Review how to do simple mathematical calculations without a calculator!

SUSTAINABLE ENERGY

Key Vocabulary
Alternative Energy
Bioconversion
Biogas
Biomass

Cogeneration
Fuel cells
Fuel wood
Gasohol
Geothermal
Maximum sustainable yield
Passive Solar Heating
Photovoltaic cells
Recycle
Renewable Energy Resources
Tidal power
Turbogenerator
Waste-to-energy
Wind turbines

Essential Questions
How do the different alternative energy uses compare in terms of consumption rate and efficiency?
How do we conserve and preserve energy resources in terms of reducing use, using efficient energy devices and alternative renewable resources?
How could the U.S. alter its energy use to become 100% sustainable? Why aren't we doing this?
Know the positive features and negative drawbacks of each type of alternative energy source.
Which types of alternative energy are the most feasible to replace our oil/nuclear power dependency?
What is the fastest growing renewable energy resource?
What is required to install passive versus active solar heating systems in a home?

URBANIZATION, SUSTAINABLE CITIES AND PERSONAL ACTION

Key Vocabulary
Consumptive Use
Sustainable development
Sustainability
Urban blight
Urban sprawl

Essential Questions
What factors have caused urban sprawl throughout the world?
What are some alternative uses of land that create an economical, ecological, uncontaminated and sustainable environment?
What are the goals of sustainable development?
What changes in urbanization are predicted in the next 50 years?
How could American cities be redesigned to be more ecologically sound and culturally amenable?

What are the principles of cluster development ?
How can you as an independent, educated citizen alter your lifestyle to live more sustainably?
What creates urban blight?
What methods do we have to encourage politicians to enact more environmentally sustainable policies?
What kinds of governmental regulations would be necessary to promote a sustainable American society?