AP exam study guide v.2 (bigger)

MATERIAL:

Unit 1: The Living World: Ecosystems

- Definition and components of an ecosystem, including abiotic and biotic factors
- Types of ecosystems, including terrestrial, freshwater, and marine ecosystems
- Primary productivity, including gross and net primary productivity
- Food webs and trophic levels, including producers, consumers, and decomposers
- Energy flow and nutrient cycling in ecosystems, including the carbon cycle, nitrogen cycle, and phosphorus cycle
- Ecological succession, including primary and secondary succession
- Disturbances in ecosystems, including natural and human-caused disturbances

Unit 2: The Living World: Biodiversity

- Definition and importance of biodiversity, including ecosystem services
- Levels of biodiversity, including genetic, species, and ecosystem diversity
- Threats to biodiversity, including habitat destruction, pollution, overharvesting, and invasive species
- Conservation strategies for preserving biodiversity, including habitat conservation, restoration, and protected areas

Unit 3: Populations

- Definition and characteristics of a population, including population density and distribution
- Factors that affect population size, including birth rates, death rates, immigration, and emigration
- Population growth models, including exponential and logistic growth models
- Carrying capacity and population regulation, including density-dependent and density-independent factors
- Human population growth, including historical trends and future projections

Unit 4: Earth Systems and Resources

- The structure and composition of the earth's atmosphere, lithosphere, and hydrosphere

- The carbon cycle, including sources and sinks of carbon, and the impacts of human activities on the carbon cycle
- The nitrogen cycle, including sources and sinks of nitrogen, and the impacts of human activities on the nitrogen cycle
- The phosphorus cycle, including sources and sinks of phosphorus, and the impacts of human activities on the phosphorus cycle
- The water cycle, including water availability and water management strategies
- Soil types and properties, including physical, chemical, and biological properties
- Land use practices, including agricultural practices, urbanization, and deforestation, and their impacts on the environment

Unit 5: Land and Water Use

- Different types of land use, including agriculture, urban development, mining, and forestry, and their impacts on the environment
- Soil erosion and conservation practices, including conservation tillage and crop rotation
- Water use and management, including groundwater depletion, water pollution, and water conservation strategies
- Impacts of dams and other water management strategies on aquatic ecosystems

Unit 6: Energy Resources and Consumption

- Types of energy sources, including fossil fuels, nuclear, and renewable energy sources, and their advantages and disadvantages
- The energy crisis and energy conservation, including energy efficiency and demand-side management
- The impacts of energy use on the environment, including air pollution, water pollution, and climate change
- The relationship between energy use and economic development, including the concept of energy intensity

Unit 7: Atmospheric Pollution

- Different types of air pollutants, including particulate matter, sulfur dioxide, nitrogen oxides, and ozone, and their sources and effects on human health and the environment
- Sources of air pollution, including natural and anthropogenic sources, and strategies for reducing air pollution, including regulations and technologies
- The Clean Air Act and its history and impact on air pollution control

Unit 8: Aquatic and Terrestrial Pollution

- Different types of water pollution, including point source and non-point source pollution, and their sources and effects on aquatic ecosystems and human health
- Different types of soil pollution, including chemical and biological pollution, and their sources and effects on terrestrial ecosystems and human health
- Strategies for reducing water and soil pollution, including regulations and technologies, conservation practices, and pollution prevention strategies

- The Clean Water Act and its history and impact on water pollution control
- The Superfund program and its role in cleaning up contaminated sites
  Unit 9: Global Change
  - The causes and effects of climate change, including greenhouse gas emissions, ocean acidification, and sea level rise
  - Mitigation strategies for climate change, including reducing greenhouse gas emissions, carbon capture and storage, and renewable energy sources
  - Adaptation strategies for climate change, including adjusting to changing climate patterns and protecting vulnerable populations and ecosystems
  - The impact of human activities on the ozone layer, including the production and use of ozone-depleting substances
  - The impacts of deforestation and desertification on the environment, including loss of biodiversity and ecosystem services, and strategies for addressing these issues

LEGISLATION:

Unit 1: The Living World: Ecosystems

- Endangered Species Act (1973): Protects endangered and threatened species and their habitats
- National Environmental Policy Act (1969): Requires federal agencies to evaluate the environmental impact of their actions and decisions
- Clean Water Act (1972): Regulates and protects the quality of water in the United States
- Clean Air Act (1963): Regulates and reduces air pollution in the United States

Unit 2: The Living World: Biodiversity

- Endangered Species Act (1973): Protects endangered and threatened species and their habitats
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973): Regulates and monitors international trade in endangered species
- National Environmental Policy Act (1969): Requires federal agencies to evaluate the environmental impact of their actions and decisions

Unit 3: Populations

- Clean Air Act (1963): Regulates and reduces air pollution in the United States
- Clean Water Act (1972): Regulates and protects the quality of water in the United States
- Resource Conservation and Recovery Act (1976): Regulates the management of hazardous waste

Unit 4: Earth Systems and Resources

- Clean Water Act (1972): Regulates and protects the quality of water in the United States

- Clean Air Act (1963): Regulates and reduces air pollution in the United States
- Resource Conservation and Recovery Act (1976): Regulates the management of hazardous waste
- National Environmental Policy Act (1969): Requires federal agencies to evaluate the environmental impact of their actions and decisions

Unit 5: Land and Water Use

- Clean Water Act (1972): Regulates and protects the quality of water in the United States
- National Environmental Policy Act (1969): Requires federal agencies to evaluate the environmental impact of their actions and decisions
- Endangered Species Act (1973): Protects endangered and threatened species and their habitats

Unit 6: Energy Resources and Consumption

- Clean Air Act (1963): Regulates and reduces air pollution in the United States
- Energy Policy Act (2005): Encourages the development of renewable energy sources and energy efficiency
- National Environmental Policy Act (1969): Requires federal agencies to evaluate the environmental impact of their actions and decisions

Unit 7: Atmospheric Pollution

- Clean Air Act (1963): Regulates and reduces air pollution in the United States
- Montreal Protocol (1987): Regulates the production and use of ozone-depleting substances

Unit 8: Aquatic and Terrestrial Pollution

- Clean Water Act (1972): Regulates and protects the quality of water in the United States
- Resource Conservation and Recovery Act (1976): Regulates the management of hazardous waste
- Superfund Amendments and Reauthorization Act (1986): Provides funding for the cleanup of hazardous waste sites

Unit 9: Global Change

- Paris Agreement (2015): An international agreement to combat climate change by reducing greenhouse gas emissions
- Clean Air Act (1963): Regulates and reduces air pollution in the United States
- National Environmental Policy Act (1969): Requires federal agencies to evaluate the environmental impact of their actions and decisions

RESOURCES:

Unit 1: The Living World: Ecosystems

- Khan Academy: Ecosystems and biogeochemical cycles
- Crash Course: Ecology

Unit 2: The Living World: Biodiversity

- Khan Academy: Biodiversity and conservation biology
- The Nature Conservancy: Biodiversity 101

Unit 3: Populations

- Khan Academy: Population ecology
- Crash Course: Population ecology

Unit 4: Earth Systems and Resources

- Khan Academy: Earth's systems and the geosphere
- Crash Course: Geology and earth science

Unit 5: Land and Water Use

- Khan Academy: Land use and water resources
- The Environmental Working Group: Farming and land use

Unit 6: Energy Resources and Consumption

- Khan Academy: Energy and the environment
- US Energy Information Administration: Energy sources and usage

Unit 7: Atmospheric Pollution

- Khan Academy: Air pollution and the Clean Air Act
- Environmental Defense Fund: Air pollution basics

Unit 8: Aquatic and Terrestrial Pollution

- Khan Academy: Water pollution and water management
- National Geographic: Soil pollution

Unit 9: Global Change

- Khan Academy: Climate change and its impacts
- United Nations Framework Convention on Climate Change: Climate change and policy

MOST DIFFICULT (based off previous APES students reviews) *regardless of unit*

1. Climate change and its impacts on the environment and human society
2. The impacts of human activities on the natural environment, including habitat destruction, pollution, and overexploitation of natural resources
3. Mitigation and adaptation strategies for climate change
4. Understanding biogeochemical cycles, including the carbon cycle, nitrogen cycle, phosphorus cycle, and water cycle
5. The complex interrelationships between different components of ecosystems, including food webs, trophic levels, and energy flow
6. Understanding population dynamics, including factors that affect population growth and carrying capacity
7. Understanding the different types and sources of pollution, including water, air, and soil pollution, and strategies for reducing pollution
8. Understanding the different types of land use, including agriculture, urban development, mining, and forestry, and their impacts on the environment
9. Understanding the different types of energy sources, including fossil fuels, nuclear, and renewable energy sources, and their advantages and disadvantages
10. Understanding the economic, political, and social factors that influence environmental policy and decision-making.

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