

## APES REVIEW TOPICS

### I. **Earth Systems and Resources (10%–15%)**

- A. Earth Science Concepts (Geologic time scale; plate tectonics, earthquakes, volcanism; seasons; solar intensity and latitude)
- B. The Atmosphere (Composition; structure; weather and climate; atmospheric circulation and the Coriolis effect; atmosphere-ocean interactions; ENSO)
- C. Global Water Resources and Use (Freshwater/saltwater; ocean circulation; agricultural, industrial, and domestic use; surface and groundwater issues; global problems; conservation)
- D. Soil and Soil Dynamics (Rock cycle; formation; composition; physical and chemical properties; main soil types; erosion and other soil problems; soil conservation)

### II. **The Living World (10%–15%)**

- A. Ecosystem Structure (Biological populations and communities; ecological niches; interactions among species; keystone species; species diversity and edge effects; major terrestrial and aquatic biomes)
- B. Energy Flow (Photosynthesis and cellular respiration; food webs and trophic levels; ecological pyramids)
- C. Ecosystem Diversity (Biodiversity; natural selection; evolution; ecosystem services)
- D. Natural Ecosystem Change (Climate shifts; species movement; ecological succession)
- E. Natural Biogeochemical Cycles (Carbon, nitrogen, phosphorus, sulfur, water, conservation of matter)

### III. **Population (10%–15%)**

- A. Population Biology Concepts (Population ecology; carrying capacity; reproductive strategies; survivorship)
- B. Human Population

### IV. **Land and Water Use (10%–15%)**

- A. Agriculture
- B. Forestry (Tree plantations; old growth forests; forest fires; forest management; national forests)
- C. Rangelands (Overgrazing; deforestation; desertification; rangeland management; federal rangelands)
- D. Other Land Use
- E. Mining (Mineral formation; extraction; global reserves; relevant laws and treaties)
- F. Fishing (Fishing techniques; overfishing; aquaculture; relevant laws and treaties)
- G. Global Economics (Globalization; World Bank; Tragedy of the Commons; relevant laws and treaties)

### V. **Energy Resources and Consumption (10%–15%)**

- A. Energy Concepts (Energy forms; power; units; conversions; Laws of Thermodynamics)
- B. Energy Consumption
- 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)
- 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)
- E. Hydroelectric Power (Dams; flood control; salmon; silting; other impacts)
- F. Energy Conservation (Energy efficiency; CAFE standards; hybrid electric vehicles; mass transit)
- 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)

### VI. **Pollution (25%–30%)**

- A. Pollution Types
- B. Impacts on the Environment and Human Health
- C. Economic Impacts (Cost-benefit analysis; externalities; marginal costs; sustainability)

### VII. **Global Change (10%–15%)**

- 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)
- B. Global Warming (Greenhouse gases and the greenhouse effect; impacts and consequences of global warming; reducing climate change; relevant laws and treaties)
- C. Loss of Biodiversity