

AP Environmental Science Cheat Sheet

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Unit 1: Ecosystems

• Ecological Relationships

- **Predator–Prey:** One hunts another.
- **Mutualism:** Both benefit.
- **Commensalism:** One benefits, other unaffected.
- **Parasitism:** One benefits, one harmed.
- **Competition:** Compete for resources.

• Biomes

- **Terrestrial:** Tundra, Taiga, Temperate Forests, Tropical Rainforests, Grasslands, Savanna, Desert.
- **Aquatic:** Coral Reefs, Estuaries, Ponds, Lakes, Rivers, Oceans.

• Cycles

- **Carbon Cycle:** Photosynthesis, respiration.
- **Nitrogen Cycle:** Fixation, nitrification, denitrification.
- **Phosphorus Cycle:** Rocks, soil.
- **Hydrologic Cycle:** Precipitation, evaporation.

• Productivity & Trophic Levels

- **GPP:** Total energy captured.
- **NPP:** Energy after plant use.
- **Trophic Levels:** Producers, Consumers, Decomposers.
- **10% Rule:** Energy transfer efficiency.

• Food Web

- Flow of energy and nutrients.

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Unit 2: Biodiversity.

- **Types of Diversity**

- Genetic, Species, Ecosystem Diversity.

- **Ecosystem Services**

- Supporting, Provisioning, Regulating, Cultural.

- **Island Biogeography**

- **Larger Islands:** More species.
- **Proximity:** Closer islands = more species.

- **Ecological Tolerance & Succession**

- **Tolerance:** Survive environmental changes.
- **Succession:** Primary (new areas), Secondary (recovery).

- **Keystone Species**

- Critical for ecosystem balance.

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Unit 3: Populations

- **Species Types**
 - **Generalist:** Broad niche.
 - **Specialist:** Narrow niche.
- **Growth Strategies**
 - **K-Strategists:** Few offspring, high care.
 - **r-Strategists:** Many offspring, low care.
- **Survivorship Curves**
 - **Type I, II, III:** Varying mortality rates.
- **Population Metrics**
 - **Carrying Capacity:** Max supportable population.
 - **Age Structure Diagrams:** Population age distribution.
 - **Growth Curves:** Exponential (J-curve), Logistic (S-curve).
- **Rates**
 - **Total Fertility Rate:** Average children per woman.
 - **Infant Mortality Rate:** Deaths before age one.
 - **Rule of 70:** Doubling time ($70/\text{growth rate}$).

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Unit 4: Earth Systems & Resources

- **Plate Tectonics**

- Convergent, Divergent, Transform Boundaries.

- **Soil & Atmosphere**

- **Soil Horizons:** O, A, E, B, C layers.
- **Atmosphere Layers:** Troposphere, Stratosphere, Mesosphere, Thermosphere.

- **Climate & Water**

- **Global Wind Patterns, Coriolis Effect.**
- **Watersheds:** Drainage areas.

- **El Niño/La Niña**

- **El Niño:** Warmer ocean surface.
- **La Niña:** Cooler ocean surface.

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Unit 5: Land & Water Use

- **Commons & Agriculture**

- **Tragedy of the Commons:** Overuse of resources.
- **Green Revolution:** Agricultural advancements.

- **Practices & Production**

- Monocropping, Tilling, Fertilizers.
- **Irrigation:** Drip, Flood.
- **Meat Production:** CAFOs, pasture-raised.

- **Mining & Urbanization**

- Surface/Subsurface Mining.
- **Urban Sprawl:** Spread into rural areas.

- **Sustainability**

- Reduce, Reuse, Recycle.
- **Energy Efficiency:** Using less energy.

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Unit 6: Energy Resources & Consumption

- **Energy Types**

- **Nonrenewable:** Oil, Coal, Natural Gas.
- **Renewable:** Solar, Wind, Hydroelectric, Geothermal, Biomass.

- **Efficiency & Conservation**

- **Energy Conservation:** Reduce usage.
- **Energy Efficiency:** Better technology.

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Unit 7: Atmospheric Pollution

- **Introduction to Air Pollution**

- Sources, effects, and solutions.

- **Photochemical Smog**

- Formation and impacts.

- **Indoor Air Pollution**

- Common pollutants and health effects.

- **Methods to Reduce Air Pollutants**

- Technological and regulatory measures.

- **Acid Rain**

- Causes, effects, and mitigation.

- **Noise Pollution**

- Sources and impacts on health and environment.

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Unit 8: Aquatic and Terrestrial Pollution

- **Sources of Pollution**

- Point and non-point sources.

- **Human Impact on Ecosystems**

- Habitat destruction, pollution, and climate change.

- **Thermal Pollution**

- Causes and effects on aquatic systems.

- **Solid Waste Disposal and Waste Reduction Methods**

- Landfills, recycling, composting.

- **Pollution and Human Health**

- Health effects of various pollutants.

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Key Policies

- Atomic Energy Act (**AEA**)
- Clean Water Act (**CWA**)
- Endangered Species Act (**ESA**)
- Kyoto Protocol (**KP**)
- Montreal Protocol (**MP**)
- Safe Drinking Water Act (**SDWA**)
- Food Quality Protection Act (**FQPA**)
- Federal Land Policy and Management Act (**FLPMA**)

Additional Notes: