AP Environmental Science Syllabus

AP Environmental Science Course Description and Schedule

 Text: Environmental Science for AP by Friedland and Relyea

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| **Area** | **Ch****in** **Text** | **Assessment** | **Labs** | **Targeted Completion Date** |
| Summer Work | How it all began!Read Rachel Carson’s “Silent Spring” | - | Questions:Several open ended questions dealing with the chapters in the book and relating how students felt before and after reading each chapter. |  Lab 1- Introduction to ecology through plants |  (2 days) |
| I. Introduction | A. Ecosystem ecology – study whole to understand parts (holistic) | 3 | Lab Data and Questions | Lab-Tulpehocken Creek -physical | (5 days) |
| B. Population ecology – study parts to understand whole | 6 |  |
| C. What, How, Why? Complexity | 1,2 |  |
| D. Practical application |  |
| II. Natural Selection | A. Geologic history of earth 1. Precambrian era 2. Paleozoic era 3. Mesozoic era 4. Cenozoic era | 5,8 | Chapter Review Lab Data and Questions | Lab-Tulpehocken Creek-Chemical | (8 days) |
| B. Evolution of life 1. Precambrian era 2. Paleozoic era 3. Mesozoic era 4. Cenozoic era | Chapter Review Lab Data and Questions | Lab-Blue Marsh Dam-Phys. & Chem. |
| C. Natural selection 1. Adaptation 2. Variation a. statistical analysis b. sources of variation 3. Types of selection4. Genetics of small populations | Chapter Review Lab Data and QuestionsTest on History of Earth | Lab-Cacoosing Creek-Phys. & Chem. |  (5 days) |
| D. Species and speciation 1. Allopatric 2. Sympatric 3. Parapatric 4. Isolating mechanisms 5. Adaptive radiation 6. Gradualism vs. punctualism | Lab Data and QuestionsTake home test on speciation | Lab-Cacoosing Creek-Biol. | (6 days) |

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| III. Conditions for Life | A. Homeostasis | 4 | Chapter Review Lab Data and Questions | Lab-Tulpehocken Creek-Biol |  (15 days) |
| B. Sun | Lab Data and Questions | Lab- Cacoosing Creek-Fish Shocking |
| C. Climate 1. Atmospheric movement 2. Relative humidity 3. Ocean currents 4. El Nino | Lab Data and QuestionsComparative write-up on status of Cacoosing vs Tulpehocken Creeks | Lab-Hawk Mtn.-raptor migration |
| D. Microclimates | Test on air and water flow on Earth |  |
| E. Climate modification |  |  |
| V. Temperature | A. Movement of heat | 3,6 | Lab Data and Questions | Lab-Population Studies-Middle Creek | (15 days) |
| B. Thermoregulation in animals 1. Poikilothermy 2. Homeothermy 3. Body size | Chapter Review Lab Data and Questions | Lab-Deciduous Forest-Penn State |
| C. Heat strategies 1. Behavioral 2. Morphological 3. Physiological a. continuously active b. periodically inactive | Chapter Review Lab Data and QuestionsTest on Thermoregulation | Lab-Coniferous Forest-Penn State |
| D. Plant adaptations to temperature |  |  |
| V. Moisture | A. Physical properties of water | 9 | Chapter Review Lab Data and Questions | Lab- succession- Lake Ontelaunee | (12 days) |
| B. Plant response to moisture |  | Lab-Population sampling techniques |
| C. Animal response to moisture | Lab Data and Questions |
| D. Salinity |  |  |
| E. Temperature moisture interaction |  |  |
| VI. Light | A. Nature of light | 3 |  |  | (11 days) |
| B. Shade tolerance | Lab Data and Questions | Lab-Snow Goose Ecology and Population sampling - Ontelaunee |
| C. Light in water |  |  |
| D. Photosynthesis 1. C3 cycle 2. C4 cycle 3. C.A.M. cycle | Lab Data and QuestionsLab paper on comparison of Jamaica waters to New York waters | Lab-Tropical Ecology- St. Ann’s Bay, Jamaica |
| E. Periodicity 1. Biological clocks 2. Daily 3. Annual 4. Other | Chapter Review Lab Data and QuestionsTest on Light | Lab-Population density and biomass |
| VII. Production in Ecosystems | A. Energy and thermodynamics |  | Lab Data and Questions | Lab-Avian Ecology and Identification-3 labs | (13 days) |
| B. Primary productivity 1. GPP vs. NPP 2. Shoot to root 3. Vertical distribution |  | Lab Data and Questions | Lab-NPP-Blue Marsh |
| C. Secondary productivity |  | Chapter Review Test on Productivity |  |
| VIII. Trophic structure | A. Food webs 1. Components 2. Major food “chains” | 3 | Lab Data and Questions | Lab-Microclimates-Blue Marsh | (7 days) |
| B. Nutrient flow  | Chapter Review  |  |
| IX. Soil | A. Soil development 1. Physical weathering 2. Biological weathering 3. Chemical weathering 4. Soil horizons | 8 | Lab Data and Questions | Lab-Deciduous and Coniferous Soil-Penn State Berks | (12 days) |
| B. Soil profiles | Lab Data and Questions | Lab-Agricultural Soil-Hartman’s farm |  |
| C. Soil characteristics 1. Chemistry 2. Texture 3. Moisture | Chapter Review Lab paper on comparison of soils in different forests vs agricultural fields. |  |
| D. Soil as an environment |  |  |
| E. Erosion |  |
| X. Ecosystems- (soil, climate, vegetation, animal life, human impact) | A. Grasslands | 4 | Chapter Review Lab Data and Questions | Lab-Bogs-Hawk Mountain  | (11 days) |
| B. Savanna |  |  |
| C. Shrubland |  |  |
| D. Desert |  |  |
| E. Tundra |  |  |
| F. Taiga | Lab Data and Questions | Lab-Man made ecosystems-Middle Creek |
| G. Temperate forests 1. Coniferous 2. Broadleaf |  |  |
| H. Tropical forests 1. Rainforest 2. Seasonal 3. Dry |  |  |
| I. Ponds and lakes | 413 |  |  |
| J. Wetlands 1. Marshes 2. Swamps 3. Bogs |  |  |
| K. Flowing water ecosystems |  |  |
| L. Estuaries |  |  |
| M. Open ocean 1. Benthos 2. Pelagic |  |  |
| N. Coral reef |  |  |
| O. Intertidal 1. Rocky 2. Sandy or muddy | Test on Ecosystems |  |

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|  | A. Overpopulation | 7 | Test on Human demographics |  |  |
| XI. Environmental Issues |

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| B. Loss of Biodiversity-Endangered plants and animals  |

 | 18 | Chapter Review Lab Data and Questions | Lab-Spring Twp. Sewage Treatment Plant | (29 days) |
| C. Global Warming and Ozone Depletion-Causes and solutions  | 15,19 | Chapter Review Lab Data and Questions | Lab-Western Berks Water Treatment Plant |
| D. Renewable Energy-Alternative sources of energy  | 12 | Chapter Review  |  |
| E. Air Pollution-Outdoor and indoor air pollution  | 14 | Chapter Review Lab Data and Questions | Lab-Air Pollution tests |
| F. Toxic and Solid Waste-Disposal, regulations, prevention  | 16 | Chapter Review Lab Data and Questions | Lab-Pioneer Sanitary Landfill |
| G. Pesticides-History, problems, and alternatives  | 18 | Chapter Review Lab Data and QuestionsTest on Air, water, and land pollution | Lab-Mid Atlantic Coastal Marine Ecology-Wallops Island Marine Science Consortium |
| H. Land and Water Management-Conservation, problems, and wilderness  | 10 | Chapter Review  |  |
| I. Preserving Animal Diversity-Human encroachment and sustainable management  | 17 | Chapter Review Test on Land Use |  |
| J. Economics, Politics, Ethics and the Environment-Dealing with environmental policy, problem solving, and environmental education | 11,20 | Chapter Review  |  |
| AP Final |  |  |  | (2 days) |
| Review AP Final for AP Exam |  |  |  |  (5 days) |
| Post Test Activities |  |  |  | (12 days) |