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|   | **Standards-Based EducationPriority Standards** |
| IB DP Environmental Systems and Societies |
| **12th Grade** |
| *Foundations of Environmental Systems and Societies* |
| 1.1 | Compare and contrast environmental value systems and justify your personal viewpoint on environmental issues. |
| 1.2 | Construct and analyze models involving flows and storage in a system; evaluate strengths and limitations of models |
| 1.3a | Explain how the first and second laws of thermodynamics impact ecological systems |
| 1.3b | Explain equilibria. positive and negative feedback, and the ecological consequences of tipping points |
| 1.4a | Discuss the value of ecosystem services, including natural capital and natural income |
| 1.4b | Evaluate the use of Environmental Impact Assessments. |
| 1.4c | Explain the relationship between Ecological Footprints and sustainability. |
| 1.5 | Evaluate the effectiveness of human intervention in pollution management |
| *Ecosystems and Ecology* |
| 2.1a | Interpret models of factors that affect an organisms' niche (e.g. competition, predator-prey relationships, organism. |
| 2.1b | Explain population growth curves using numbers and rates |
| 2.2a | Construct models of trophic levels in food chains, food webs, and food pyramids |
| 2.2b | Explain the transfer and transformation of energy as it flows through a system |
| 2.2c  | Describe photosynthesis and respiration in terms of inputs, outputs and energy transformations. |
| 2.3a | Construct and analyze a model of the flows of energy and matter in an ecosystem (e.g. carbon and nitrogen cycles) |
| 2.4a | Explain the distribution, structure and relative productivity of the various biomes. |
| 2.4b | Explain the changes in energy flow, gross and net productivity, diversity and mineral cycling in succession. |
| 2.5a | Describe and evaluate methods for estimating abundance of organisms and biomass. |
| 2.5b | Apply Simpson's diversity index and outline its significance, be able to define diversity. |
| 2.5c | Describe and evaluate methods for measuring changes in abiotic and biotic components of an ecosystem |
| *Human Systems and Conservation* |
| 3.1 | Distinguish between biodiversity, diversity of species, habitat diversity and genetic diversity. |
| 3.2 | Explain how plate activity has influenced evolution and biodiversity |
| 3.3 | Describe the threats to biodiversity from human activity in a given natural area. |
| 3.4 | Compare and contrast the role and activities of intergovernmental and non-governmental organizations; evaluate different approaches to protecting biodiversity |
| 8.1 | Discuss the cultural, historical, religious, social, political and economic factors that influence human population dynamics. |
| 8.2 | Explain the dynamic nature of natural capital, outline an example of how renewable and non-renewable natural capital has been mismanaged. |
| 8.3 | Describe and evaluate pollution management strategies to address solid domestic waste. |
| 8.4 | Evaluate the application of carrying capacity to local and global human populations. |
| *Food Production Systems and Societies* |
| 4.1 | Construct and analyse a diagram of the hydrological cycle, including human impacts. |
| 4.2 | Describe and evaluate the sustainability of freshwater resource usage. |
| 4.3 | Evaluate strategies to avoid unsustainable fishing (e.g. aquaculture), discuss the controversial harvesting of a named species |
| 4.4 | Analyse water pollution data; evaluate water pollution strategies; evaluate the process and impacts of eutrophication. |
| 5.1 | Outline how soil systems are complex ecosystems that determine primary productivity in an area. |
| 5.2 | Sustainability of terrestrial food production is influenced by consumer choices, socio-political factors, economics, and ecological factors. |
| 5.3 | Discuss the influences of human activities on soil fertility/erosion; evaluate soil management strategies of a given commercial farming system and subsistence farming system. |
| *Atmospheric Systems and Climate Change* |
| 6.1 | Describe the role of greenhouse gases in maintaining mean global temperature, include information on how human activities add to greenhouse gases |
| 6.2 | Evaluate the role of global organizations in reducing ozone |
| 6.3 | Describe and evaluate pollution management strategies for urban air pollution, particularly photochemical smog |
| 6.4 | Describe and evaluate pollution management strategies for acid deposition |
| 7.1 | Discuss the factors that affect the choice of energy sources adopted by different societies. |
| 7.2 | Discuss the feedback mechanisms that would be associated with a change in mean global temperature. |
| 7.3 | Discuss mitigation and adaptation strategies to deal with impacts of climate change. |
| *Science Practices and Literacy* |
| CXT | State a focused research question that connects to a relevant environmental issue |
| PLA | Design a repeatable method for answering research questions, considering sampling strategy and risk assessment. |
| RAC | Construct diagrams of relevant data, analyse the data, and interpret trends in the data to form a valid conclusion |
| DEV | Evaluate a conclusion in context of a larger environmental issue, discuss strengths/weaknesses of an experimental method, suggest modifications or further research |
| 11-12. RST.1 | Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. |
| 11-12 RST.3 | Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. |
| 11-12. RST.7 | Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. |
| 11-12. WHST.1 | Write arguments focused on discipline-specific content. |
| 11-12. WHST.4 | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. |