UNIT OF STUDY

Title: The Natural World	Subject/Course: Environmental Science	Length: 5 weeks
Topic: Ecosystems	Grade: 11-12	Designer: D Wright

UNIT GOALS AND EXPECTATIONS

IMPORTANT CONCEPTS/UNDERSTANDINGS:	ESSENTIAL QUESTIONS:
1. Humans are dependent on the natural world for survival. Basic needs such as clean air and water are obtained from the natural world. All resources and energy are obtained from the natural world. 2. Natural ecosystems are sustainable systems. We can learn a great deal about how to create a sustainable society by learning about how ecosystems are organized and function. 3. Limiting factors determine what can live where and climate is the major abiotic cause of differences between ecosystems. 4. The amazing species diversity among and within natural ecosystems can leads a person to a greater appreciation of the beauty of our planet. 5. The composition of molecules is important for understanding the biological and physical systems around us. 6. The First and Second Laws of Thermodynamics explain how energy flows. 7. The theory of evolution is fundamental to biology. Both natural selection and selective breeding work from existing alleles. New alleles are produce by random mutations.	What is the source of our basic needs for survival? How are the basic needs for human survival supplied by the natural world? How do natural ecosystems work to be sustainable? What are limiting factors in terms of human survival? How does climate, an abiotic factor, causes differences between ecosystems? What is the composition of molecules that forms life on earth? How does energy flow in an ecosystem? What are the first and second laws of thermodynamics? What are the biochemical cycles that move matter through an ecosystem? How do the fundamental mechanisms of population growth explain the differences in population size in different species in the same ecosystem? How do biologists explain the theory of evolution? What are alleles? What is meant by species diversity? What is the role of succession in species diversity? What is the main explanation for species extinction?
STUDENT LEARNING EXPECTATIONS: PD.1.ES.19-Describe the cycling of materials and energy. BD.2.ES.9-Explain how limiting factors affect populations and ecosystems. BD.2.ES.10-Describe the natural selection process in populations. BD.2.ES.1-Compare and contrast biomes. SP.3.ES.2- Investigate the relationships between human consumption of natural resources and the stewardship responsibility for reclamations.	SP.3.ES.8-Compare and contrast man-made environments and natural environments. NS.4.ES.1-Collect and analyze scientific data using appropriate mathematical calculations, figures and tables. NS.4.ES.3-Utilize technology to communicate research findings. PD.1.ES.17- Compare and contrast meteorological processes. PD.1.ES.18- Construct and interpret weather maps.
SPECIFIC DECLARATIVE KNOWLEDGE – What I know Identify the criteria used to identify or classify ecosystems. Describe the structure of ecosystems in trophic levels, trophic categories and trophic relationships. Identify and describe abiotic factors. Understand the role of climate in ecosystems. Name and describe the three major changes in human civilization that have affected the environment.	**SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do** Make clear and unbiased observations. Make predictions according to a pattern. Identify correctly information found on graphs, tables and charts. Use research skills to gather information.

UNIT ASSESSMENTS (Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)	
Discuss (in writing) the idea of a sustainable approach to the Earth's environment. Chapter Content Brainstorming	
Traditional Assessments: Unit test. Written quizzes. Chapter outline Activity analysis	Other Evidence of Learning: Daily notebook entries. TI-83 lab Chapter Content Brainstorming LHS 4-step vocabulary

ACTIVITIES AND LEARNING EXPERIENCES	Resources
Identify and define key words and vocabulary: (using LHS vocabulary format) biotic community, abiotic, species, population, ecosystem, ecotone, biomes, trophic structure, photosynthesis, organic, inorganic, chemosynthesis, autotrophs, heterotrophs, detritus feeders, decomposers, herbivores, consumers, carnivores, omnivores, detritus feeders, food chain, food web, trophic levels, biomass pyramid, mutualism, ecological niche, range of tolerance, limiting factor, synergism, climate, Neolithic Revolution, Industrial Revolution, Environmental Revolution, Matter, biosphere, lithosphere, hydrosphere, atmosphere, carbon, organic, inorganic, synthetic organic compounds, kinetic energy, potential energy, calorie, the law of conservation of energy, the first law of thermodynamics, second law of thermodynamics, entropy, cell respiration, anaerobic, nitrogen fixation, denitrification, incremental value, Population equilibrium, population explosion, biotic potential, recruitment, reproductive strategies, environmental resistance, carrying capacity, dynamic balance, density dependent, population density, density independent, critical number, threatened, endangered, overgrazing, interspecific competition, intraspecific competition, territoriality, riparian, epiphytes, natural selection, ecological succession, climax ecosystem, resilience, ecosystem management TI83 and CBL lab- "Like Moths Around A Flame" TI83 and CBL lab- "Variety is the spice of life." Research of soil types and their relationship to humans through their uses. Mineral Identification Lab Rock Density Lab Soil Chemical Analysis Lab Mechanical/Chemical Weathering	Environmental Science: Toward A Sustainable Future Media Center Internet Smartboard Power point Newspaper/Magazines Lab exercises TI-83 calculator w/ probes

Career Connections
Politician Economist Sociologist Ecologist Environmentalist