

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Environmental Studies

Board Approval Date: December 16, 2021	Course Length: 2 Semesters
Grading: A-F	Credits: 5 Credits per Semester
Proposed Grade Level(s): 11, 12	Subject Area: Elective Elective Area (if applicable): Physical Science, Life Science
Prerequisite(s): “C” or better in two college prep science courses; “C” or better in Integrated Math 1	Corequisite(s):
CTE Sector/Pathway:	
Intent to Pursue ‘A-G’ College Prep Status: No	
A-G Course Identifier:	
Graduation Requirement: No	
Course Intent: District Course Program (if applicable):	
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COURSE DESCRIPTION:

Environmental Studies explores the biological, physical, and sociological principles related to the environment in which organisms live on Earth, the biosphere. Course topics include natural systems on Earth, biogeochemical cycles, the nature of matter and energy, the flow of matter and energy through living systems, populations, communities, ecosystems, ecological pyramids, renewable and non-renewable natural resources, land use, biodiversity, pollution, conservation, sustainability, and human impacts on the environment.

The course provides students with opportunities to learn and practice scientific skills within the context of relevant scientific questions. Scientific inquiry skills are embedded in the direct instruction, wherein students learn to ask scientific questions, deconstruct claims, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts. Case studies of current environmental challenges introduce each content lesson and acquaint students with real-life environmental issues, debates, and solutions. Lab activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science. Virtual Lab activities enable students to engage in investigations that require long periods of observation at remote locations and to explore simulations that enable environmental scientists to test predictions. Throughout this course, students are given an opportunity to understand how biology, earth science, and physical science are applied to the study of the environment and how technology and engineering are contributing solutions for studying and creating a sustainable biosphere. This course is built to state standards.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Introduction to Environmental Science	What technology can be used to study the environment? How can scientific data help us to mitigate human impacts?	*Explore: GPS and GIS Technology *Practice: Science and the Environment	*Lab: Investigate Cycling of O ₂ and CO ₂ *Unit Test
2. Earth's Physical Systems	How does solar energy affect ocean currents and the distribution of heat worldwide? How do ocean currents, wind patterns and topography affect climate?	*Practice: The Hydrosphere *Explore: Earthquake *Prediction and Readiness Practice: The Atmosphere	*Project: Explore Your Local Physical Environment *Lab: Investigate Weathering and Erosion *Unit Test
3. The Biosphere	What are the forms of energy that enter and flow through the biosphere and how do they transform as they move? What is photosynthesis and how does it transform light energy into chemical energy?	*Practice: Nature of the Biosphere *Practice: Matter and Energy in the Biosphere *Explore: The Importance of Coral Reefs	*Project: Explore Your Local Ecosystem *Lab: Investigate Using a Dichotomous Key *Unit Test
4. Ecology	Which factors influence population growth?	*Practice: Populations *Practice: Communities	*Lab: Investigate Cycling of Matter and

	Which factors affect community stability and biodiversity?	*Explore: Biodiversity Hotspots	Energy *Unit Test
5. Humans and the Environment	Which resources are used to support human life? What is the economic significance of these resources? How does urbanization affect biodiversity and populations in ecosystems?	*Explore: Public Health Policies *Practice: Earth's Natural Resources *Practice: Land Use and Its Effects	*Lab: Investigate *Resource Consumption *Unit Test
6. Environmental Challenges	What are the effects of pollution on oceans, freshwater, air, and land? What hazards to pollutants pose to humans and wildlife? Can you relate human activities to observed changes in global climate?	*Practice: Resource Availability *Practice: Pollution and Waste Management *Explore: Effects of Climate Change	*Project: Explore Your Local Environmental Challenges *Lab: Investigate How Pollutants Affect Plants *Unit Test
7. Politics and the Environment	How can you determine that scientific research on environmental issues related to human activities is valid? How does the overuse of natural resources affect societies? How do conservation and preservation of natural resources affect their availability and quality?	*Practice: The Concept of the Commons *Explore: Species Survival Plans *Practice: Global Environmental Policies	*Lab: Investigate Your Ecological Footprint *Unit Test
8. Sustainability for the Future	Can you describe the historical trends in climate change? How does the availability of natural resources, the occurrence of natural hazards, and changes in climate influence the global economy?	*Practice: The Global Community *Explore: Carbon Dioxide Sequestration	*Project: Explore Sustainability for Your Local Environment *Lab: Investigate Food Security *Unit Test

ESSENTIAL STANDARDS:

NGSS

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity

HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.

HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

HS-ESS2-1. Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean floor features.

HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedback that causes changes to other Earth's systems.

HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.

HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions but changing conditions may result in a new ecosystem.

HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1)

increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/pd/ca/sc/documents/cangsshsearthspsci-dci.pdf>

<https://www.cde.ca.gov/pd/ca/sc/documents/cangsshs-dcilifesci.pdf>

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
Yes		<i>APEX: Environmental Studies</i>		APEX Online Courses		2019

Other Resource Materials

N/A

Supplemental Materials

Board approved supplemental materials (Including but not limited to: Film Clips, Digital Resources, Supplemental texts, DVDs, Programs (Pebble Creek, DBQ, etc.):

N/A