

Wyoming Department of Education Required Virtual Education Course Syllabus

BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Science
Course ID	CASC86336	Grade Level	9, 10, 11, 12
Course Name	AP Environmental SC B	# of Credits	0.5
SCED Code	03207E0.5022	Curriculum Type	Connections Academy

COURSE DESCRIPTION

The goal of AP Environmental Science is to provide the student with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world and to identify and analyze environmental problems that are natural and made by humans. The student will evaluate the relative risks associated with these problems and examine alternative solutions for resolving or preventing problems. Laboratory experiments support student content mastery in both hands-on and virtual experiences.

WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
HS-ESS2-2	Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.
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-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-ESS3-3	Use computational tools 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-ESS3-5	Analyze 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 the results of a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES
<p>Unit 1: Atmosphere and Climate Change This unit deals with the atmosphere and climate change. Topics discussed in this unit include the atmosphere, air pollution, global climate change, acid deposition, and ozone layer thinning.</p>	<p>HS-ESS2-2, HS-ESS2-4, HS-ESS3-1, HS-ESS3-4, HS-ESS3-5, HS-ESS3-6</p>	<ul style="list-style-type: none"> •distinguish between a primary pollutant and a secondary pollutant •outline the process of thermal inversion •describe the sources, control strategies, and environmental and human health effects of common air pollutants regulated by the Clean Air Act •describe the formation and types of smog •distinguish between ground-level ozone and upper atmospheric ozone •outline the chemistry of ozone loss •discuss the scope and effectiveness of the Montreal Protocol •describe the effects of ozone depletion •describe how acid deposition occurs •describe the environmental effects of acid deposition •describe sources of indoor air pollution •evaluate the effects of indoor pollutants on human beings •evaluate the best ways to remediate and reduce asbestos and radon •describe how human actions affect the carbon cycle •summarize evidence for climate change •describe climate change effects on the biosphere •differentiate between human-induced and natural climate change •describe practical actions to take to mitigate human-induced climate change

<p>Unit 2: Land and Food Soil, soil pollution, agriculture, pesticides, and land conservation are the main topics of this unit.</p>	<p>HS-ESS2-2, HS-ESS3-4</p>	<ul style="list-style-type: none"> •describe how soil is formed •compare and contrast soil types across the United States and around the world •describe the physical and chemical composition of soil •describe the characteristics of main soil horizons •describe the causes, processes, and effects of soil erosion and desertification •describe methods to maintain soil fertility and reduce erosion for various areas •describe soil conservation methods •use a model to draw conclusions about a real-world problem •distinguish between various types of agriculture •describe the causes and effects of the Green Revolution •evaluate the potential of aquaculture for increasing fish production and environmental effects •identify the factors that control food distribution and affect starvation •describe types of pesticides •discuss the advantages and disadvantages of pesticide use •summarize threats to wildlife and the human population resulting from use and overuse of pesticides •examine alternative pest management strategies that control food distribution and affect starvation <ul style="list-style-type: none"> •differentiate among land conservation options •recognize land conservation options for specific situations •identify primary methods of soil remediation
<p>Unit 3: Water This unit is all about water: water pollution, water supply, and water quality.</p>	<p>HS-ESS2-5, HS-ESS3-4</p>	<ul style="list-style-type: none"> •describe the physical properties that make water unique •identify the major sources of freshwater and how freshwater is stored •examine causes of water supply issues •identify ways to prevent unnecessary water waste •evaluate the water supply problems of a specific locality •identify water pollution types, sources, health, and environmental effects •compare and contrast the indicators of water quality •evaluate pollution prevention and control methods and strategies •examine and evaluate effectiveness of water quality legislation •describe how drinking water is protected and purified •distinguish among primary, secondary, and advanced sewage treatment •summarize a natural approach to water purification
<p>Unit 4: Toxicology and Risk Toxicology is the topic of this unit. Human health and risk are also important topics included here.</p>	<p>Unit 3: Water This unit is all about water: water pollution, water supply, and water quality.</p>	<ul style="list-style-type: none"> •identify the precautionary principle and discuss the importance of its application •identify the major types of hazards and give examples •compare and contrast risk assessment and risk management •distinguish between transmissible and non-transmissible diseases •evaluate a strategy for reducing smoking in the United States •examine dietary changes that can help prevent cancer •describe the relationship between developments in medicine and population growth •summarize the ways humans can minimize risk of infectious disease •describe acute and chronic effects of pollution •distinguish between locations of toxic events •model, simulate, and evaluate dose-response situations

<p>Unit 5: Recycling and Sustainability Topics described in this unit are solid waste, hazardous waste, and recycling. The final lesson of the course emphasizes the theme of sustainability, which has been woven throughout the second half of this course.</p>	<p>HS-ESS3-3, HS-ESS3-4</p>	<ul style="list-style-type: none"> •identify options for disposal of solid waste •describe the structures in a modern sanitary landfill •compare and contrast landfills and incinerators •analyze the status of export of wastes globally •evaluate legal and economic aspects of solid waste •explain the characteristics of hazardous waste •examine hazardous waste-related legislation and evaluate its effectiveness •describe options for disposal of hazardous wastes •describe how legislation related to hazardous waste is developed •apply reduce, reuse, and recycle strategies at a variety of locations •describe the process of composting and describe the benefits •compare and contrast models for recycling •analyze key components of an ecological footprint •discuss the relationship of biodiversity to sustainability •evaluate global energy options •discuss the Green Revolution and its affect on sustainability •discuss the relationship of population growth to pollution •evaluate representations of sustainable and unsustainable living
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