

WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Introduction to Environmental Science Virt.

Course Number: 10372

Course Prerequisites: None

Course Description: This course focuses on the principles of ecology and the interdependence of natural and human systems. Students will develop skills in making informed decisions and taking constructive actions. Relevant lab activities will be incorporated throughout, utilizing scientific inquiry and appropriate technology. Final assessment required.

Suggested Grade Level: Grade 9

Length of Course: Two Semesters

Units of Credit: 1

PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:

CSPG 32, CSPG 34, CSPG 43, CSPG 46, CSPG 56, CSPG 30, CSPG 40, and CSPG 54

To find the CSPG information, go to [CSPG](#)

Certification verified by the WCSD Human Resources Department: ☒ Yes ☐ No

WCSD STUDENT DATA SYSTEM INFORMATION

Course Level: Academic

Mark Types: Check all that apply.

☒ F – Final Average ☒ MP – Marking Period ☒ EXM – Final Exam

GPA Type: ☐ GPAEL-GPA Elementary ☐ GPAML-GPA for Middle Level ☒ NHS-National Honor Society

☒ UGPA-Non-Weighted Grade Point Average ☒ GPA-Weighted Grade Point Average

State Course Code: 03003

To find the State Course Code, go to [State Course Code](#), download the Excel file for SCED, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

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TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title: Environmental Science Your World Your Turn
Publisher: Pearson
ISBN #: 978-0-13-372475-2
Copyright Date: 2011
WCSD Board Approval Date: [Click or tap here to enter text.](#)

Supplemental Materials: Accelerate Virtual Education

Curriculum Document

WCSD Board Approval:

Date Finalized: 4/27/2023
Date Approved: 6/26/2023
Implementation Year: 2023.2024

SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

SCOPE AND SEQUENCE OF CONTENT AND CONCEPTS

Marking Period 1

Lesson 1: An introduction to Environmental Science

Lesson 3: Earth's Environmental Systems

Lesson 4: Population Ecology

Marking Period 2

Lesson 5: Evolution and Community Ecology

Lesson 7: Biodiversity and Conservation

Lesson 9: Environmental Health

Marking Period 3

Lesson 10: Urbanization

Lesson 15: The Atmosphere

Lesson 17: Nonrenewable Energy

Marking Period 4

Lesson 19: Waste Management

Lesson 12: Soil and Agriculture

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PLANNED INSTRUCTION

Standards/Eligible Content and Skills

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Explain the focus of environmental science.	Bio 3.1.10	MP 1
Describe the recent trends in human population and resource consumption.	Bio 4.4.10	MP 1
Explain what science is.	Bio B 3.3.1	MP 1
Describe the process of science.	Bio B 3.3.1	MP 1
Describe the major roles of the scientific community.	Bio B 3.1.10	MP 1
Explain the study of environmental ethics.	Bio B 4.5.10	MP 1
Describe feedback loops.	Bio B 4.1.3	MP 1
Define Earth's geosphere, lithosphere, biosphere, atmosphere and hydrosphere.	Bio B 4.2.2	MP 1
Describe earth's biosphere and atmosphere.	Bio B 4.1.3	MP 1
Explain how the law of conservation of matter applies to the behavior of nutrients in the environment.	Bio B 4.2.2	MP 1
Describe the biogeochemical cycles.	Bio B 4.1.3	MP 1
Describe three ways populations can be distributed.	Bio 3.1.10	MP 1
Explain what age structure diagrams tell you about a population.	Bio 4.1.10	MP 1
Describe the factors that influence a population's growth rate.	Bio 4.1.10	MP 1
Explain how limiting factors and biotic potential affect population growth.	Bio 4.1.10	MP 1
Describe the four primary mechanisms of biological evolution.	Bio 3.1.10	MP 1
Describe how speciation and extinction affect the diversity of life on Earth.	Bio 3.1.10	MP 1
Discuss the factors that influence an organism's niche.	Bio 4.1.10	MP 1
Compare and contrast predation – parasitism and herbivory.	Bio B 4.2.12	MP 1
Describe mutualism and commensalism.	Bio B 4.2.12	MP 1
Explain the difference between a producer and a consumer.	Bio B 4.2.12	MP 1
Explain the effect of inefficient energy transfer on community structure.	Bio B 4.2.12	MP 1
Describe how feeding relationships can have both direct and indirect effects on community members.	Bio B 4.2.12	MP 1
Describe what happens to a community after a disturbance.	Bio 4.1.10	MP 1
Explain the conditions necessary for a species to become invasive.	Bio 4.2.10	MP 1
Explain how biomes are characterized.	Bio 4.1.10	MP 2
Describe how net primary production varies among biomes.	Bio 4.1.10	MP 2
Explain how organisms are adapted to the conditions of their biomes.	Bio 4.1.10	MP 2
Describe the criteria ecologists use to classify aquatic ecosystems.	Bio 4.2.10	MP 2
List the major categories of freshwater ecosystems.	Bio 4.2.10	MP 2
Explain the ecological importance of estuaries.	Bio 4.2.10	MP 2

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
List the three major zones of the ocean.	Bio 4.1.10	MP 2
Discuss how an organism's habitat relates to its survival.	Bio 4.1.10	MP 2
Explain the usefulness of tracking population size.	Bio 3.1.10	MP 2
Differentiate between the components of biodiversity.	Bio 4.3.10	MP 2
Explain two ways in which biodiversity varies across groups or geography.	Bio 4.3.40	MP 2
Describe the economic benefits of biodiversity.	Bio 4.5.10	MP 2
Describe how biodiversity is monitored and explain current biodiversity trends.	Bio 4.5.10	MP 2
List the major causes of biodiversity loss.	Bio 4.5.10	MP 2
Explain legal actions nations can take to protect biodiversity.	Bio 4.5.10	MP 2
Explain the goal of Species Survival Plans.	Bio 4.5.10	MP 2
Describe three strategies for managing whole ecosystems and habitats.	Bio 4.1.10	MP 2
Explain recent trends in population growth.	Bio 4.5.10	MP 2
Identify characteristics of human population that are studied by demographers.	Bio 4.5.10	MP 2
Describe total fertility rates and replacement fertility.	Bio 4.5.10	MP 2
Explain how the age structure and sex ratio of a population define its potential for growth.	Bio 3.1.10	MP 2
Describe the demographic transition.	Bio 4.3.10	MP 2
Discuss social factors that affect population growth.	Bio 4.5.10	MP 2
Describe how humans impact their environments.	Bio 4.5.10	MP 2
Discuss the negative and positive impacts of technology.	Bio 4.5.10	MP 2
Describe the reasons why individuals respond differently to the same environmental hazards.	Bio 4.5.10	MP 2
Discuss risk assessment.	Bio 4.5.10	MP 2
Explain why emerging diseases are important to monitor and control.	Bio 3.1.10	MP 2
Differentiate between social hazards that are lifestyle choices and those that cannot be controlled.	Bio 4.5.10	MP 2
Explain what makes chemicals hazardous.	Bio 3.1.10	MP 2
Describe how infectious diseases spread.	Bio 3.1.10	MP 2
Discuss how chemical hazards affect human health.	Bio 3.1.10	MP 2
List some indoor chemical hazards.	Bio 3.1.10	MP 2
Discuss where chemical hazards can be found in the environment.	Bio 3.1.10	MP 2
Discuss how earthquakes affect structures on the Earth's surface.	Bio 3.1.10	MP 2
Describe bio magnification.	Bio 4.3.10	MP 2
Discuss how volcanoes affect human lives and property.	Bio 3.1.10	MP 2
Describe tornadoes, hurricanes and thunderstorms.	Bio 3.1.10	MP 2
Discuss the dangers of avalanches.	Bio 3.1.10	MP 2

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Differentiate between land cover and land use, and describe how people affect both.	Bio 4.3.10	MP 2
Explain how and where urbanization occurs.	Bio 4.5.10	MP 2
Describe the contributors to sprawl and its patterns.	Bio 4.5.10	MP 2
Explain the impacts sprawl has on our area.	Bio 4.5.10	MP 2
Describe four different components of city planning.	Bio 4.5.10	MP 2
Explain the importance of mass transit options to a city and its residents.	Bio 4.5.10	MP 2
Explain the importance of open space to a livable city.	Bio 4.5.10	MP 2
Differentiate green buildings from conventional buildings.	Bio 4.5.10	MP 2
Discuss the progress toward sustainability some cities have made and its importance to the world.	Bio 4.5.10	MP 2
Describe the properties of the atmosphere.	Bio 3.3.10	MP 3
Identify the four main layers of the atmosphere.	Bio 3.3.10	MP 3
Explain heat transfer and the interaction of air masses in the troposphere.	Bio 3.3.10	MP 3
Explain how both natural processes and human activities can cause air pollution.	Bio 4.1.10	MP 3
Describe how air pollutants affect human health.	Bio 4.5.10	MP 3
Explain what causes smog and how temperature inversions affect it and other forms of air pollution.	Bio 4.1.10	MP 3
Explain how acid deposition occurs and describe its effects.	Bio 4.3.10	MP 3
Explain how the provisions of the Clean Air Act have reduced air pollution in the US.	Bio 4.5.10	MP 3
Describe international efforts to reduce the ozone hole.	Bio 4.3.10	MP 3
Describe factors that affect how the sun warms the Earth.	Bio 3.3.10	MP 3
Discuss the role of wind patterns in determining climate.	Bio 3.3.10	MP 3
Explain how the oceans affect climate.	Bio 4.3.10	MP 3
Describe how climate is affected by topography, volcanoes, regional vegetation and periodic changes in Earth's orbit.	Bio 3.3.10	MP 3
Identify evidence of global warming.	Bio 4.5.10	MP 3
Explain three methods used to study climate change.	Bio 4.3.10	MP 3
State the probable cause of global climate change.	Bio 4.5.10	MP 3
State ways in which the warming atmosphere affects ecosystems and organisms.	Bio 4.5.10	MP 3
Explain how climate change is affecting people now.	Bio 4.5.10	MP 3
Predict future effects of climate change on people.	Bio 4.5.10	MP 3
List ways to reduce greenhouse gases related to the use and generation of electricity.	Bio 4.3.10	MP 3
Describe some of the ways of reducing greenhouse gases related to transportation.	Bio 4.3.10	MP 3

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Describe other strategies for reducing greenhouse gases.	Bio 4.3.10	MP 3
Explain how nations are working together to try to address climate change.	Bio 4.3.10	MP 3
Define energy and differentiate between kinetic and potential energy.	Bio 3.3.10	MP 3
Identify different forms of energy.	Bio 3.3.10	MP 3
Describe how human society uses energy resources.	Bio 4.3.10	MP 3
Explain how fossil fuels formed.	Bio 4.3.10	MP 3
Describe the uses of coal and how it is removed from the ground.	Bio 4.3.10	MP 3
Describe the uses of oil and how it is extracted.	Bio 4.3.10	MP 3
Explain the characteristics and uses of natural gas.	Bio 4.3.10	MP 3
Relate nuclear fission to the production of energy.	Bio 4.3.10	MP 3
Describe how a nuclear power plant generates electricity.	Bio 4.3.10	MP 3
Identify the advantages and disadvantages of nuclear power.	Bio 4.3.10	MP 3
Contrast nuclear fusion with nuclear fission, and explain the issues related to nuclear fusion.	Bio 4.3.10	MP 3
Ch 18 Explain the benefits and current status of renewable energy resources.	Bio 4.3.10	MP 3
Define biomass energy and explain how it is used.	Bio 4.3.10	MP 3
Explain how river water can be used to generate electricity.	Bio 4.3.10	MP 3
Identify benefits and costs of hydropower.	Bio 4.3.10	MP 3
Describe how energy from the ocean can generate electricity.	Bio 4.3.10	MP 3
Describe techniques for using solar energy to heat buildings and generate electricity.	Bio 4.3.10	MP 3
Analyze the benefits and costs of solar energy.	Bio 4.3.10	MP 3
Explain how wind energy can be used to produce electricity.	Bio 4.3.10	MP 3
Analyze the benefits and costs of wind energy.	Bio 4.3.10	MP 3
Describe how hydrogen fuel can be produced.	Bio 4.3.10	MP 3
Explain the way fuel cells work and how they are used.	Bio 4.3.10	MP 3
Ch 19 Identify the three categories of waste.	Bio 4.3.10	MP 3
Describe conventional waste disposal methods	Bio 4.3.10	MP 3
Discuss the importance of reducing waste.	Bio 4.3.10	MP 3
Describe how composting and recycling help reduce the amount of waste.	Bio 4.3.10	MP 3
Define hazardous waste.	Bio 4.3.10	MP 3
Describe some of the sources of hazardous wastes	Bio 4.3.10	MP 3
Describe the danger of radioactive waste.	Bio 4.3.10	MP 3
Identify the agencies that regulate hazardous waste.	Bio 4.3.10	MP 3
List some of the ecological and economical values of forest resources.	Bio 4.3.10	MP 4

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Describe the costs and benefits of the different methods of timber harvesting.	Bio 4.3.10	MP 4
Discuss the current levels of deforestation in the US and developing nations.	Bio 4.3.10	MP 4
Explain how logging is managed in US national forests.	Bio 4.3.10	MP 4
Describe where most logging in the US takes place.	Bio 4.4.10	MP 4
Discuss the potential effects of fire suppression on an ecosystem and on future fires.	Bio 4.4.10	MP 4
Explain how consumer demand is important to sustainable forestry.	Bio 4.4.10	MP 4
Explain how logging is managed in US National Parks.	Bio 4.4.10	MP 4
Ch 12 Explain three process by which soil forms.	Bio 4.3.10	MP 4
Describe the horizons that make up a soil profile.	Bio 4.3.10	MP 4
List the four characteristics used to classify soil.	Bio 4.3.10	MP 4
Describe some practices that can lead to soil erosion and some that can prevent it.	Bio 4.3.10	MP 4
Identify the causes and effects of deforestation.	Bio 4.3.10	MP 4
Discuss the activities of US and international agricultural organizations.	Bio 4.4.10	MP 4
Explain how irrigation and pesticide use can cause soil pollution.	Bio 4.3.10	MP 4
Discuss the beginnings of agriculture.	Bio 4.4.10	MP 4
Explain the importance of industrial agriculture and the green revolution.	Bio 4.4.10	MP 4
Identify different types of pest control.	Bio 4.4.10	MP 4
Explain the importance of pollinators to agriculture.	Bio 4.4.10	MP 4
Explain why the world needs to grow more food and to grow it sustainably.	Bio 4.4.10	MP 4
Describe the advantages and disadvantages of industrial food production.	Bio 4.4.10	MP 4
Discuss sustainable agriculture.	Bio 3.3.10	MP 4
Ch 13 Explain what a mineral is.	Bio 3.3.10	MP 4
Describe how minerals form.	Bio 3.3.10	MP 4
Identify types of rocks and the stages of the rock cycle.	Bio 3.3.10	MP 4
Identify the types of resources that are mined.	Bio 3.3.10	MP 4
Describe different methods used for mining.	Bio 3.3.10	MP 4
Explain how metals are processed.	Bio 3.3.10	MP 4
Describe the negative impacts of mining on the environment and society.	Bio 4.5.10	MP 4
Explain how mining is regulated.	Bio 4.5.10	MP 4
Describe ways that mineral use can become more responsible.	Bio 4.5.10	MP 4
Ch 14 Discuss how fresh water can be both renewable and limited.	Bio 4.3.10	MP 4

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Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Explain the significance of a watershed.	Bio 4.3.10	MP 4
Explain how most groundwater is accessed.	Bio 4.3.10	MP 4
List the three primary categories of freshwater use.	Bio 4.3.10	MP 4
Relate the causes of surface water depletion to their effects.	Bio 4.2.10	MP 4
Explain the major cause and effects of groundwater depletion.	Bio 4.5.10	MP 4
Describe strategies for addressing water depletion.	Bio 4.3.10	MP 4
Discuss the main categories of water pollution.	Bio 4.3.10	MP 4
Explain why groundwater pollution is difficult to clean up.	Bio 4.3.10	MP 4
Discuss the sources and effects of major pollutants found in the ocean.	Bio 4.3.10	MP 4
Describe how water is regulated and treated.	Bio 4.5.10	MP 4

ASSESSMENTS

PDE Academic Standards, Assessment Anchors, and Eligible Content: The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

Formative Assessments: The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

Effective formative assessments for this course include: Study Guide and quizzes.

Summative Assessments: The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

Effective summative assessments for this course include: Chapter Test and Quarterly Exams