AP* Environmental Science provides students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. The course draws upon various disciplines, including geology, biology, environmental studies, environmental science, chemistry, and geography in order to explore a variety of environmental topics. Topics explored 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 nonrenewable resources; land use; biodiversity; pollution; conservation; sustainability; and human impacts on the environment. The equivalent of an introductory college-level science course, AP Environmental Science prepares students for the AP exam and for further study in science, health sciences, or engineering.

The AP Environmental Science course provides a learning experience focused on allowing students to develop their critical thinking skills and cognitive strategies. 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. Frequent no- and low-stakes assessments allow students to measure their comprehension and improve their performance as they progress through each activity.

Students perform hands-on labs and projects that give them insight into the nature of science and help them understand environmental concepts, as well as how evidence can be obtained to support those concepts. Virtual lab activities enable students to engage in investigations that would otherwise require long periods of observation at remote locations and to explore simulations that enable environmental scientists to test predictions. During both hands-on and virtual labs, students form hypotheses; collect, analyze, and manipulate data; and report their findings and conclusions. 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.

Summative tests are offered at the end of each unit as well as at the end of each semester, and contain objective and constructed response items. Robust scaffolding, rigorous instruction, relevant material, and regular active learning opportunities ensure that students can achieve mastery of the skills necessary to excel on the AP exam.

This course has been authorized by the College Board® to use the AP designation.

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Length: Two Semesters

UNIT 1: INTRODUCTION TO AP ENVIRONMENTAL SCIENCE

LESSON 1: SCIENCE AND THE ENVIRONMENT

Study: The Interdisciplinary Science
Identify the many fields of science that contribute to the study and understanding of the interrelated, dynamic systems of Earth's environment. Relate examples of environmental studies and equipment to specialized fields of science. Recommend areas of expertise that might contribute information relevant to specific environmental issues.

Duration: 1 hr Scoring: 0 points

Quiz: The Interdisciplinary Science
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 10 points

Study: Applied Science and Technology
Describe the role of technology in environmental science and human society. Identify commonly used devices and systems that are important to environmental studies. Describe the importance of technology and environmental
studies to human health and well-being.

Duration: 1 hr Scoring: 0 points

Quiz: Applied Science and Technology
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 20 points

Practice: Science and the Environment
Identify the many fields of science that contribute to the study and understanding of the interrelated, dynamic systems of Earth's environment. Relate examples of environmental studies and equipment to specialized fields of science. Recommend areas of expertise that might contribute information relevant to specific environmental issues. Describe the role of technology in environmental science and human society. Identify commonly used devices and systems that are important to environmental studies. Use the Internet to locate and collect information about GPS and GIS technology. Discuss the validity and impact of scientific research on environmental issues related to human activities.

Duration: 0 hrs 30 mins Scoring: 10 points

Read: Science and the Environment
Read about science and the environment.

Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Science and the Environment
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 45 mins Scoring: 20 points

Explore: GPS and GIS Technology
Relate examples of environmental studies and equipment to specialized fields of science. Describe the role of technology in environmental science and human society. Identify commonly used devices and systems that are important to environmental studies. Describe the importance of technology and environmental studies to human health and well-being.

Duration: 1 hr 30 mins Scoring: 30 points

Lab: Investigate Your Ecological Footprint
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.

Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Your Ecological Footprint
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.

Duration: 0 hrs 20 mins Scoring: 10 points

LESSON 2: ENERGY AND SYSTEMS

Study: Matter and Energy
Recognize the major types of matter that make up the biosphere. Recognize the forms of energy that enter and flow through the geosphere. Identify the processes that transform energy as it moves through the geosphere. Compare the characteristics of different surfaces on Earth, including albedo and heat capacity. Differentiate among scavengers, decomposers, and detritivores. Trace the flow of matter and energy through a food chain and a food web.

Duration: 1 hr Scoring: 0 points

Quiz: Matter and Energy
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 20 points

Study: The Flow of Matter and Energy
Differentiate among scavengers, decomposers, and detritivores. Trace the flow of matter and energy through a food chain and a food web.

Duration: 1 hr Scoring: 0 points
Quizzes:

**Quiz: The Flow of Matter and Energy**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Biogeochemical Cycles**
Trace the movement of water in the water cycle from one part of the environment to another. Trace the movement of carbon in the carbon cycle from one part of the environment to another. Trace the movement of nitrogen and phosphorus from one part of the environment to another.
Duration: 1 hr Scoring: 0 points

**Quiz: Biogeochemical Cycles**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Practice: Matter and Energy in the Biosphere**
Recognize the major types of matter that make up the biosphere. Recognize the forms of energy that enter and flow through the geosphere. Identify the processes that transform energy as it moves through the geosphere. Compare the characteristics of different surfaces on Earth, including albedo and heat capacity. Differentiate among scavengers, decomposers, and detritivores. Trace the flow of matter and energy through a food chain and a food web.
Duration: 0 hrs 30 mins Scoring: 10 points

**Lab: Investigate Cycling of \( \text{O}_2 \) and \( \text{CO}_2 \)**
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins Scoring: 40 points

**Discuss: Investigate Cycling of \( \text{O}_2 \) and \( \text{CO}_2 \)**
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

**LESSON 3: INTRODUCTION TO AP ENVIRONMENTAL SCIENCE WRAP-UP**

**Test (CS): Introduction to AP Environmental Science**
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

**Test (TS): Introduction to AP Environmental Science**
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

**UNIT 2: EARTH’S PHYSICAL SYSTEMS**

**LESSON 1: THE HYDROSHERE**

**Project: Part I — Explore Your Local Physical Environment**
Research and describe the physical features and abiotic factors that characterize the geographical area in which you live.
Duration: 1 hr 30 mins Scoring: 10 points

**Study: Bodies of Water**
Identify the characteristics of the major types of bodies of water. Describe the formation of and characteristics of the major types of bodies of water.
Duration: 1 hr Scoring: 0 points

**Quiz: Bodies of Water**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Movements of the Hydrosphere**
Relate solar energy to ocean currents and the distribution of heat around the globe. Describe the causes and effects of ocean waves and tides. Trace the path of groundwater from soil to the ocean.

**Quiz: Movements of the Hydrosphere**
Take a quiz to assess your understanding of the material.

**Practice: The Hydrosphere**
Describe the reasons that liquid water can exist on Earth. Describe the formation of and characteristics of the major types of bodies of water. Relate solar energy to ocean currents and the distribution of heat around the globe. Identify reasons for fluctuations in sea level. Describe the causes and effects of ocean waves and tides. Trace the path of groundwater from soil to the ocean.

**Read: The Hydrosphere**
Read about the hydrosphere.

**Quiz: The Hydrosphere**
Take a quiz to assess your understanding of the material.

**Lab: Investigate Watershed Analysis**
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.

**Discuss: Investigate Watershed Analysis**
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.

**LESSON 2: THE ATMOSPHERE**

**Study: Structure and Movements of the Atmosphere**
Describe the structure, composition, and temperature of Earth's atmosphere. Identify the processes of wind generation and relate them to different types of local and global wind systems.

**Quiz: Structure and Movements of the Atmosphere**
Take a quiz to assess your understanding of the material.

**Study: Weather and Climate**
Describe the major climate zones and their characteristics. Explain how ocean currents, wind patterns, and topography affect climate. Explain how Earth's orbit, tilt, and wobble affect the planet's climate. Describe the effects of El Niño and La Niña on global weather patterns.

**Quiz: Weather and Climate**
Take a quiz to assess your understanding of the material.

**Practice: The Atmosphere**
Describe the structure, composition, and temperature of Earth's atmosphere. Identify the processes of wind generation and relate them to different types of local and global wind systems. Describe the major climate zones and their characteristics. Explain how ocean currents, wind patterns, and topography affect climate. Explain how Earth's orbit, tilt,
and wobble affect the planet’s climate. Describe the effects of El Niño and La Niña on global weather patterns. Discuss the validity and impact of scientific research on environmental issues related to human activities.

Duration: 0 hrs 30 mins Scoring: 10 points

**Lab: Investigate Passive Heating and Cooling**
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins Scoring: 40 points

**Discuss: Investigate Passive Heating and Cooling**
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

**LESSON 3: THE GEOSPHERE**

**Study: Earth’s Crust and Landforms**
Relate the surface features of Earth’s crust to the theory of plate tectonics. Distinguish erosional features and depositional features of Earth’s crust.
Duration: 1 hr Scoring: 0 points

**Quiz: Earth’s Crust and Landforms**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Soil Composition and Structure**
Identify the types of weathering and the agents of each type of weathering. Describe the types of soil and the processes of soil formation.
Duration: 1 hr Scoring: 0 points

**Quiz: Soil Composition and Structure**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Movements of Land and Soil**
Identify the types of erosion and their effects on Earth’s crust. Relate the different types of faults to the different types of tectonic plate boundaries.
Duration: 1 hr Scoring: 0 points

**Quiz: Movements of Land and Soil**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Checkup: The Geosphere**
Relate the surface features of Earth’s crust to the theory of plate tectonics. Distinguish erosional features and depositional features of Earth’s crust. Identify the types of weathering and the agents of each type of weathering. Describe the types of soil and the processes of soil formation. Identify the types of erosion and their effects on Earth’s crust. Relate the different types of faults to the different types of tectonic plate boundaries. Discuss the validity and impact of scientific research on environmental issues related to human activities.
Duration: 0 hrs 30 mins Scoring: 0 points

**Read: The Geosphere**
Read about the geosphere.
Duration: 1 hr 30 mins Scoring: 0 points

**Quiz: The Geosphere**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points
Explore: Earthquake Prediction and Readiness
Recognize areas on Earth where earthquakes are likely to occur. Distinguish the three types of earthquake waves. Describe how geologists rate the destructive force of an earthquake. Identify ways that human communities in earthquake zones can prepare for and limit damages caused by strong earthquakes.
Duration: 1 hr 30 mins Scoring: 30 points

LESSON 4: EARTH’S PHYSICAL SYSTEMS WRAP-UP
Project: Part II — Explore Your Local Physical Environment
Research and describe the physical features and abiotic factors that characterize the geographical area in which you live.
Duration: 1 hr 30 mins Scoring: 40 points

Test (CS): Earth's Physical Systems
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Earth's Physical Systems
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 3: ECOSYSTEM STRUCTURE
LESSON 1: NATURE OF ECOSYSTEMS
Project: Part I — Explore Your Local Ecosystem
Recognize the major types of biotic factors in an ecosystem and their roles in the biosphere. Distinguish biological species, populations, and communities. Identify the abiotic factors in an ecosystem and their importance to living organisms. Explain how biotic factors interact with the abiotic factors of an ecosystem.
Duration: 1 hr 30 mins Scoring: 10 points

Study: What Is a Biological Community?
Distinguish biological communities from populations and ecosystems. Identify major types of biological communities.
Duration: 1 hr Scoring: 0 points

Quiz: What Is a Biological Community?
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: Species Interactions
Describe the types of interactions that occur among the species in biological communities. Analyze food chains and food webs that describe the interactions of species in a biological community. Explain the nature and importance of ecological niches.
Duration: 1 hr Scoring: 0 points

Quiz: Species Interactions
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: Community Structure
Model the makeup of communities using ecological pyramids. Understand the factors that affect community stability and biodiversity.
Duration: 1 hr Scoring: 0 points

Quiz: Community Structure
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Practice: Nature of Ecosystems
Distinguish biological communities from populations and ecosystems. Identify major types of biological communities. Describe the types of interactions that occur among the species in biological communities. Analyze food chains and food webs that describe the interactions of species in a biological community. Explain the nature and importance of an...
ecological niche. Model the makeup of communities using ecological pyramids. Understand the factors that affect community stability and biodiversity.

**Explore: The Importance of Coral Reefs**
Describe characteristics of aquatic ecosystems. Evaluate the importance of individual ecosystems to the health of biomes and the biosphere.

**LESSON 2: CHANGES IN ECOSYSTEMS**

**Study: Natural Disturbances and Succession**
Describe how destructive natural events in the geosphere can affect ecosystems. Predict the effects of the removal of species from biological communities. Predict the effects of the introduction of nonnative species on communities.

**Quiz: Natural Disturbances and Succession**
Take a quiz to assess your understanding of the material.

**Study: Evolution and Biodiversity**
Identify the sources and importance of genetic diversity in natural populations, ecosystems, and the biosphere. Summarize the process of natural selection and its role in biological evolution. Predict changes that may occur in an ecosystem when its amount of biodiversity changes.

**Quiz: Evolution and Biodiversity**
Take a quiz to assess your understanding of the material.

**Checkup: Changes in Ecosystems**
Describe how destructive natural events in the geosphere can affect ecosystems. Predict the effects of the removal of species from biological communities. Predict the effects of the introduction of nonnative species on communities. Recognize the sources and importance of genetic diversity in natural populations, ecosystems, and the biosphere. Summarize the process of natural selection and its role in biological evolution. Predict changes that may occur in an ecosystem when its amount of biodiversity changes. Discuss the validity and impact of scientific research on environmental issues related to human activities.

**Read: Changes in Ecosystems**
Read about changes in ecosystems.

**Quiz: Changes in Ecosystems**
Take a quiz to assess your understanding of the material.

**Lab: Investigate Using a Dichotomous Key**
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.

**Discuss: Investigate Using a Dichotomous Key**
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.

**LESSON 3: ECOSYSTEMS AND BIOMES**
Study: Aquatic Ecosystems
Describe characteristics of aquatic ecosystems.
Duration: 1 hr Scoring: 0 points

Quiz: Aquatic Ecosystems
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: Land Ecosystems
Identify the major land and aquatic biomes. Describe the distinguishing biotic and abiotic features of a given biome. Compare the plants and animals of your local biome with those of the other major biomes found in North America.
Duration: 1 hr Scoring: 0 points

Quiz: Land Ecosystems
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Read: Ecosystems and Biomes
Read about ecosystems and biomes.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Ecosystems and Biomes
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Checkup: Ecosystems and Biomes
Describe characteristics of land ecosystems. Describe characteristics of aquatic ecosystems. Identify the major land and aquatic biomes. Describe the distinguishing biotic and abiotic features of a given biome. Compare the plants and animals of your local biome with those of the other major biomes found in North America. Evaluate the importance of individual ecosystems to the health of biomes and the biosphere. Discuss the validity and impact of scientific research on environmental issues related to human activities.
Duration: 0 hrs 30 mins Scoring: 0 points

Lab: Investigate Primary Productivity
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Primary Productivity
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

LESSON 4: ECOSYSTEM STRUCTURE WRAP-UP

Project: Part II — Explore Your Local Ecosystem
Recognize the major types of biotic factors in an ecosystem and their roles in the biosphere. Distinguish biological species, populations, and communities. Identify the abiotic factors in an ecosystem and their importance to living organisms. Explain how biotic factors interact with the abiotic factors of an ecosystem.
Duration: 1 hr 30 mins Scoring: 40 points

Test (CS): Ecosystem Structure
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Ecosystem Structure
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points
UNIT 4: POPULATION ECOLOGY

LESSON 1: POPULATION BIOLOGY

Study: Characteristics of Populations
Identify characteristics used to describe populations. Identify limiting factors that affect populations and their characteristics. Describe a population's carrying capacity and the factors that determine the carrying capacity. Explain how populations change in size.
Duration: 1 hr  Scoring: 0 points

Quiz: Characteristics of Populations
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins  Scoring: 20 points

Study: Population Growth
Describe the factors that produce both positive and negative population growth. Compare exponential and logistic patterns of population growth. Explain the significance of studying populations over time.
Duration: 1 hr  Scoring: 0 points

Quiz: Population Growth
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins  Scoring: 20 points

Practice: Population Biology
Identify characteristics used to describe populations. Identify limiting factors that affect populations and their characteristics. Describe a population's carrying capacity and the factors that determine the carrying capacity. Explain how populations change in size. Describe the factors that produce both positive and negative population growth. Compare exponential and logistic patterns of population growth. Explain the significance of studying populations over time.
Duration: 0 hrs 30 mins  Scoring: 10 points

Lab: Investigate Estimating Population Size
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins  Scoring: 40 points

Discuss: Investigate Estimating Population Size
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins  Scoring: 10 points

LESSON 2: HUMAN POPULATIONS

Study: Human Population Dynamics
Describe historical trends in human population growth and distribution. Identify characteristics of human populations.
Duration: 1 hr  Scoring: 0 points

Quiz: Human Population Dynamics
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins  Scoring: 20 points

Study: Human Communities
Describe the purposes of human communities. Identify different kinds of human communities. Explain how individuals work together in groups. Explain how individuals and groups work together in communities.
Duration: 1 hr  Scoring: 0 points

Quiz: Human Communities
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins  Scoring: 20 points
Checkup: Human Populations
Describe historical trends in human population growth and distribution. Identify characteristics of human populations. Describe the purposes of human communities. Identify different kinds of human communities. Explain how individuals work together in groups. Explain how individuals and groups work together in communities.
Duration: 0 hrs 30 mins Scoring: 0 points

Read: Human Populations
Read about human populations.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Human Populations
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Explore: Public Health Policies
Research objectives and accomplishments of public health policies.
Duration: 1 hr 30 mins Scoring: 30 points

LESSON 3: IMPACTS OF POPULATION GROWTH

Study: Renewable Resources
Identify renewable resources on which humans depend. Differentiate between renewable and nonrenewable resources. Evaluate the cost-benefit trade-offs of using renewable resources instead of nonrenewable resources.
Duration: 1 hr Scoring: 0 points

Quiz: Renewable Resources
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: Nonrenewable Resources
Identify nonrenewable resources on which humans depend. Differentiate between renewable and nonrenewable resources. Describe how the use of natural resources will affect future generations of humans.
Duration: 1 hr Scoring: 0 points

Quiz: Nonrenewable Resources
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Practice: Impacts of Population Growth
Identify renewable resources on which humans depend. Identify nonrenewable resources on which humans depend. Differentiate between renewable and nonrenewable resources. Evaluate the cost-benefit trade-offs of using renewable resources instead of nonrenewable resources. Describe how the use of natural resources will affect future generations of humans. Describe alternative forms of energy production.
Duration: 0 hrs 30 mins Scoring: 10 points

Read: Impacts of Population Growth
Read about impacts of population growth.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Impacts of Population Growth
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Lab: Investigate Resource Consumption
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Resource Consumption
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.

Duration: 0 hrs 20 mins Scoring: 10 points

**LESSON 4: POPULATIONS WRAP-UP**

**Test (CS): Population Ecology**
Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

**Test (TS): Population Ecology**
Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

**UNIT 5: SEMESTER 1 WRAP-UP**

**LESSON 1: SEMESTER 1 WRAP-UP**

**Exam: Semester 1 Computer-Scored Exam**
Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 40 mins Scoring: 100 points

**Final Exam: Semester 1 Teacher-Scored Exam**
Take a teacher-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 1 hr Scoring: 50 points

**UNIT 6: LAND AND WATER USE**

**LESSON 1: OBTAINING EARTH'S RESOURCES**

**Project: Part I — Explore Your Local Environmental Challenges**
Research and describe environmental challenges that affect the geographical area in which you live.

Duration: 1 hr 30 mins Scoring: 10 points

**Study: Land and Water Resources**
Identify natural resources obtained from Earth's land and water and used to support the lifestyles of humans. Recognize the interdependence of natural resources. Evaluate the economic significance of natural resources.

Duration: 1 hr Scoring: 0 points

**Quiz: Land and Water Resources**
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Agriculture, Forestry, and Fishing**
Identify types and sources of biological resources used to produce food and goods that support human lifestyles. Evaluate the economic significance of natural resources. Recognize the interdependence of natural resources.

Duration: 1 hr Scoring: 0 points

**Quiz: Biological Resources**
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Mineral Resources and Mining**
Identify types and sources of mineral resources used to produce goods and energy that support human lifestyles. Learn about types of mining and the environmental effects of mining. Recognize the interdependence of natural resources.

Duration: 1 hr Scoring: 0 points

**Quiz: Mineral and Energy Resources**
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 20 points
**Practice: Earth’s Natural Resources**
Identify the types of Earth’s land and water used to support the lifestyles of humans. Identify types and sources of mineral resources used to produce goods and energy that support human lifestyles. Recognize the interdependence of natural resources. Identify types and sources of biological resources used to produce food and goods that support human lifestyles.
Duration: 0 hrs 30 mins Scoring: 10 points

**Lab: Investigate How Pollutants Affect Plants**
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins Scoring: 40 points

**Discuss: Investigate How Pollutants Affect Plants**
Discuss the results of the investigation.
Duration: 0 hrs 20 mins Scoring: 10 points

**LESSON 2: RECREATION AND URBAN DEVELOPMENT**

**Study: Recreation, Conservation, and Urban Development**
Summarize the effects on natural ecosystems of human activities such as recreation, urbanization, conservation, preservation, restoration, and resource gathering and management.
Duration: 1 hr Scoring: 0 points

**Quiz: Recreation, Conservation, and Urban Development**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Human Cultures and Societies**
Summarize the nature and purpose of human cultures and societies. Identify examples of different types of human cultures and societies.
Duration: 1 hr Scoring: 0 points

**Quiz: Human Cultures and Societies**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Practice: Land Use and Its Effects**
Evaluate the economic significance of natural resources. Summarize the effects and cost-benefit trade-offs of practices used in commercial agriculture, forestry, and fishing. Evaluate the hazards and risks involved in obtaining natural resources. Evaluate the hazards and risks to human health and well-being involved in obtaining and managing natural resources. Summarize the advantages and disadvantages of using different energy resources. Summarize the effects on natural ecosystems of human activities such as recreation, urbanization, conservation, preservation, restoration, and resource gathering and management. Discuss the validity and impact of scientific research on environmental issues related to human activities.
Duration: 0 hrs 30 mins Scoring: 10 points

**Read: Recreation and Urban Development**
Read about recreation and urban development.
Duration: 1 hr 30 mins Scoring: 0 points

**Quiz: Recreation and Urban Development**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

**Explore: Effects of Climate Change**
Explore scientists’ predictions about the effects of global climate change on the biosphere.
Duration: 1 hr 30 mins Scoring: 30 points
Study: Sustainable Food Production
Explain the goal of using sustainable practices in food production, resource management, and human societal development. Describe sustainable methods of food production, resource management, and human societal development. Compare traditional practices used in food production, resource management, and human societal development with sustainable practices. Identify advantages and disadvantages of using “green” and sustainable practices in food production, resource management, and human societal development.
Duration: 1 hr Scoring: 0 points

Quiz: Sustainable Food Production
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: Sustainable Resource Management
Explain the goal of using sustainable practices in food production, resource management, and human societal development. Describe sustainable methods of food production, resource management, and human societal development. Compare traditional practices used in food production, resource management, and human societal development with sustainable practices. Identify advantages and disadvantages of using “green” and sustainable practices in food production, resource management, and human societal development.
Duration: 1 hr Scoring: 0 points

Quiz: Sustainable Resource Management
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Checkup: Sustainable Practices
Explain the goal of using sustainable practices in food production, resource management, and human societal development. Describe sustainable methods of food production, resource management, and human societal development. Compare traditional practices used in food production, resource management, and human societal development with sustainable practices. Identify advantages and disadvantages of using “green” and sustainable practices in food production, resource management, and human societal development. Summarize the process of carbon dioxide sequestration and technologies that achieve it. Discuss the validity and impact of scientific research on environmental issues related to human activities.
Duration: 0 hrs 30 mins Scoring: 0 points

Read: Sustainable Practices
Read about sustainable practices.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Sustainable Practices
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Lab: Investigate Food Security
Conduct a scientific investigation, using a scientific process and demonstrating the proper and safe use of laboratory equipment. Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error.
Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Food Security
Discuss the results of the investigation.
Duration: 0 hrs 20 mins Scoring: 10 points

LESSON 4: LAND AND WATER USE WRAP-UP

Project: Part II — Explore Your Local Environmental Challenges
Research and describe environmental challenges that affect the geographical area in which you live.
Duration: 1 hr 30 mins Scoring: 40 points

Test (CS): Land and Water Use
UNIT 7: ENERGY CONSUMPTION AND RESOURCES

LESSON 1: ENERGY CONCEPTS AND TRADITIONAL SOURCES

Study: Types of Energy
Learn about different types of energy and examples of each type.
Duration: 1 hr Scoring: 0 points

Quiz: Types of Energy
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 20 mins Scoring: 20 points

Study: Fossil Fuels
Identify types and sources of mineral resources used to produce goods and energy that support human lifestyles. Recognize the interdependence of natural resources.
Duration: 1 hr Scoring: 0 points

Quiz: Fossil Fuels
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Practice: Energy Concepts and Traditional Sources
Identify the types of Earth's land and water used to support the lifestyles of humans. Identify types and sources of mineral resources used to produce goods and energy that support human lifestyles. Recognize the interdependence of natural resources. Identify types and sources of biological resources used to produce food and goods that support human lifestyles.
Duration: 0 hrs 30 mins Scoring: 10 points

Read: Energy Concepts and Traditional Sources
Read about energy concepts and traditional sources.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Energy Concepts and Traditional Sources
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Lab: Investigate Home Energy Usage
Conduct a home energy audit.
Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Home Energy Audits
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

LESSON 2: ENERGY AND SUSTAINABILITY

Study: Energy and Sustainability
Learn about the advantages and disadvantages of different energy sources; learn how to apply scientific reasoning to analyze socially relevant energy issues.
Duration: 1 hr Scoring: 0 points

Quiz: Energy and Sustainability
Take a quiz to assess your understanding of the material.
Study: Alternative Energy Resources
Describe how the use of natural resources will affect future generations of humans. Describe alternative forms of energy production.

Duration: 1 hr Scoring: 0 points

Quiz: Alternative Energy Resources
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 15 mins Scoring: 20 points

Practice: Resource Availability
Identify renewable resources on which humans depend. Identify nonrenewable resources on which humans depend. Differentiate between renewable and nonrenewable resources. Evaluate the cost-benefit trade-offs of using renewable resources instead of nonrenewable resources. Describe how the use of natural resources will affect future generations of humans. Describe alternative forms of energy production.

Duration: 0 hrs 30 mins Scoring: 10 points

Explore: Fluid-Injection Wells and Induced Seismicity
Explore and evaluate fluid-injection wells and induced seismicity.

Duration: 1 hr 30 mins Scoring: 30 points

Read: Energy and Sustainability
Read about energy and sustainability.

Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Energy and Sustainability
Take a quiz to assess your understanding of the material.

Duration: 0 hrs 45 mins Scoring: 20 points

Lab: Investigate Sustainable Energy
Determine sustainable combinations of practices for generating and using energy.

Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Sustainable Energy
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.

Duration: 0 hrs 20 mins Scoring: 10 points

LESSON 3: ENERGY CONSUMPTION AND RESOURCES WRAP-UP

Test (CS): Energy Consumption and Resources
Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Energy Consumption and Resources
Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 8: POLLUTION AND WASTE MANAGEMENT

LESSON 1: POLLUTION AND WASTE MANAGEMENT

Study: Water, Air, and Land Pollution
Identify point sources and nonpoint sources of air, land, and water pollution. Describe the effects of pollution on oceans, freshwater supplies, air, and land. Recognize the consequences of air, land, and water pollution on human health and societies. Evaluate the hazards pollutants pose to wildlife and other types of natural resources.

Duration: 1 hr Scoring: 0 points

Quiz: Water, Air, and Land Pollution
Take a quiz to assess your understanding of the material.
**Study: Waste Management**
Describe methods of waste management, including burial in a landfill, dumping, incineration, composting, recycling, and reuse. Evaluate the impact of waste management and reduction strategies on resource availability.
Duration: 1 hr Scoring: 0 points

**Quiz: Waste Management**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Practice: Pollution and Waste Management**
Identify point sources and nonpoint sources of air, land, and water pollution. Describe the effects of pollution on oceans, freshwater supplies, air, and land. Recognize the consequences of air, land, and water pollution on human health and societies. Evaluate the hazards pollutants pose to wildlife and other types of natural resources. Describe methods of waste management, including burial in a landfill, dumping, incineration, composting, recycling, and reuse. Evaluate the impact of waste management and reduction strategies on resource availability.
Duration: 0 hrs 30 mins Scoring: 10 points

**Read: Pollution and Waste Management**
Read about pollution and waste management.
Duration: 1 hr 30 mins Scoring: 0 points

**Quiz: Pollution and Waste Management**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

**Lab: Investigate Recycling Practices**
Compare the effectiveness of recycling techniques.
Duration: 1 hr 30 mins Scoring: 40 points

**Discuss: Investigate Recycling Practices**
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

**LESSON 2: IMPACTS OF POLLUTION**

**Study: The Tragedy of the Commons**
Recognize the definition and examples of a "common." Describe how the overuse and degradation of natural resources affects the biosphere and human societies.
Duration: 1 hr Scoring: 0 points

**Quiz: The Tragedy of the Commons**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Managing the Commons**
Describe how conservation and preservation of natural resources affect their availability and quality. Relate conservation and preservation of natural resources to the sustainability of ecosystems and human societies.
Duration: 1 hr Scoring: 0 points

**Quiz: Managing the Commons**
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

**Study: Protecting Water, Air, and Land**
Quiz: Protecting Water, Air, and Land
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Checkup: The Concept of the Commons
Recognize the definition and examples of a "common." Describe how the overuse and degradation of natural resources affects the biosphere and human societies. Describe how conservation and preservation of natural resources affect their availability and quality. Relate conservation and preservation of natural resources to the sustainability of ecosystems and human societies.
Duration: 0 hrs 30 mins

Explore: Carbon Dioxide Sequestration
Summarize the process of carbon dioxide sequestration and technologies that achieve it.
Duration: 1 hr 30 mins Scoring: 30 points

Lab: Investigate Air Quality
Identify point source and nonpoint source causes of air pollution.
Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Air Quality
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

LESSON 3: POLLUTION AND WASTE MANAGEMENT WRAP-UP

Test (CS): Pollution and Waste Management
Take a computer-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Pollution and Waste Management
Take a teacher-scored test to assess what you have learned in this unit.
Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 9: GLOBAL CHALLENGES

LESSON 1: THE GLOBAL COMMUNITY

Project: Part I — Explore Sustainability for Your Local Environment
Identify your state and local legislation designed to protect the environment and natural resources. Evaluate the effects of national, state, and local environmental and resource protection laws on your local environment. Identify sustainable practices that have been adopted in your local environment. Recommend practices that might contribute to the sustainability of your local environment.
Duration: 1 hr 30 mins Scoring: 10 points

Study: Sustainable Societal Development
Explain the goal of using sustainable practices in food production, resource management, and human societal development. Describe sustainable methods of food production, resource management, and human societal development. Compare traditional practices used in food production, resource management, and human societal development with sustainable practices. Identify advantages and disadvantages of using "green" and sustainable practices in food production, resource management, and human societal development.
Duration: 1 hr Scoring: 0 points

Quiz: Sustainable Societal Development
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: The Global Economy
Recognize the interrelatedness of the global economy. Identify complex real-world problems faced by the global
Evaluate possible solutions to complex real-world problems in a global economy. Evaluate the need for cooperative human behaviors in mitigating and preventing complex real-world problems.

Quiz: The Global Economy
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Practice: The Global Community
Summarize the nature and purpose of human cultures and societies. Identify examples of different types of human cultures and societies. Recognize the interrelatedness of the global economy. Identify complex real-world problems faced by the global economy. Evaluate possible solutions to complex real-world problems in a global economy. Evaluate the need for cooperative human behaviors in mitigating and preventing complex real-world problems.
Duration: 0 hrs 30 mins Scoring: 10 points

Read: The Global Community
Read about the global community.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: The Global Community
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Lab: Investigate Human Carrying Capacity
Determine Earth's carrying capacity for human populations.
Duration: 1 hr 30 mins Scoring: 40 points

Discuss: Investigate Human Carrying Capacity
Analyze data by using data tables, calculating the range and average of a set of measurements, and identifying sources of error. Evaluate lab procedures and results in a discussion with your peers.
Duration: 0 hrs 20 mins Scoring: 10 points

Lesson 2: Global Climate Change
Study: Climate Change
Describe effects of air pollution on the natural systems that regulate Earth's climate. Analyze the historical trends observed in global climate data. Relate human activities to observed changes in global climate. Evaluate differing views on global warming and climate change.
Duration: 1 hr Scoring: 0 points

Quiz: Climate Change
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Study: Effects of Climate Change
Summarize scientists' predictions about the effects of global climate change on the biosphere. Evaluate differing views on global warming and climate change.
Duration: 1 hr Scoring: 0 points

Quiz: Effects of Climate Change
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 15 mins Scoring: 20 points

Checkup: Environmental Change
Describe effects of air pollution on the natural systems that regulate Earth's climate. Analyze the historical trends observed in global climate data. Relate human activities to observed changes in global climate. Evaluate differing views on global warming and climate change. Summarize scientists' predictions about the effects of global climate change on the biosphere. Discuss the validity and impact of scientific research on environmental issues related to human activities.
Duration: 0 hrs 30 mins Scoring: 0 points
Read: Global Environmental Policies
Read about global environmental policies.
Duration: 1 hr 30 mins Scoring: 0 points

Quiz: Global Environmental Policies
Take a quiz to assess your understanding of the material.
Duration: 0 hrs 45 mins Scoring: 20 points

Explore: Biodiversity Hot Spots
Summarize the process of natural selection and its role in biological evolution. Explain the importance of biodiversity in the biosphere.

Duration: 1 hr 30 mins Scoring: 30 points

LESSON 4: GLOBAL CHALLENGES WRAP-UP

Project: Part II — Explore Sustainability for Your Local Environment
Identify your state and local legislation designed to protect the environment and natural resources. Evaluate the effects of national, state, and local environmental and resource protection laws on your local environment. Identify sustainable practices that have been adopted in your local environment. Recommend practices that might contribute to the sustainability of your local environment.

Duration: 1 hr 30 mins Scoring: 40 points

Test (CS): Global Challenges
Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

Test (TS): Global Challenges
Take a teacher-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 10: SEMESTER 2 WRAP-UP

LESSON 1: SEMESTER 2 WRAP-UP

Exam: Semester 2 Computer-Scored Exam
Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 0 hrs 40 mins Scoring: 100 points

Final Exam: Semester 2 Teacher-Scored Exam
Take a teacher-scored exam to demonstrate your mastery of concepts and skills covered in this semester.

Duration: 1 hr Scoring: 50 points