

Chemistry in the Earth System integrates chemistry with biology and Earth science. Throughout the course, students apply fundamental chemistry concepts to better understand how matter and energy interact in the natural and designed world, how human activities impact Earth's systems, and how science can be used to develop new technologies and engineering solutions.

Course topics include the nature of matter, forces and energy, atomic structure, bonding in matter, chemical reactions, equilibrium and kinetics, thermodynamics, matter and energy in Earth's physical and living systems, energy and resource consumption, and environmental challenges.

Students discover new concepts through guided instruction and confirm their understanding in an interactive, feedback-rich environment. Scientific inquiry skills are embedded in the direct instruction, wherein students learn to ask scientific questions, form and test hypotheses, and use logic and evidence to draw conclusions about the concepts.

A variety of activities encourage students to think scientifically. Lab and Project activities reinforce critical thinking, writing, and communication skills and help students develop a deeper understanding of the nature of science and engineering. Virtual Lab activities enable students to engage in investigations that require long periods of observation at remote locations and to explore simulations that allow scientists to test predictions. In Discussions, students compare their lab or project results and exchange ideas about their investigations. Journal, Checkup, and Practice activities provide additional opportunities for students to apply learned concepts and practice their writing and scientific reasoning skills.

This course is built to Next Generation Science Standards. Throughout the course, students are evaluated via a variety of assessments designed to prepare them for the content, form, and depth of state exams.

UNIT 1: MATTER, FORCES, AND ENERGY

LESSON 1: MATTER

Study: Matter and Gravity

Learn about matter, the law of conservation of matter, and the forces that act on matter.

Duration: 1 hr Scoring: 0 points

Quiz: Matter and Gravity

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Newton's Law of Gravitation

Learn how to describe the motion of satellites and planets and how to solve problems involving the gravitational force between two objects.

Duration: 1 hr Scoring: 0 points

Quiz: Newton's Law of Gravitation

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Gravitational Force

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 2: ENERGY AND FORCES

Study: Types of Forces

Learn about the four fundamental forces and how the strengths of the different forces vary with distance.

Duration: 1 hr Scoring: 0 points

Quiz: Types of Forces

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Electric Force

Learn how to determine the force between two electric charges; learn how to calculate an electric field; learn how to use the right-hand rule to determine the direction of an electric force.

Duration: 1 hr Scoring: 0 points

Quiz: Electric Force

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Magnetic Force

Learn about properties of magnetic fields.

Duration: 1 hr Scoring: 0 points

Quiz: Magnetic Force

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Electric and Magnetic Force

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: CONSERVATION OF ENERGY

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: Calculating Energy

Learn how to calculate the kinetic energy of a moving object and the potential energy of a system; learn how temperature is related to the kinetic energy of molecules.

Duration: 1 hr Scoring: 0 points

Quiz: Calculating Energy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Conservation of Energy

Learn how energy transforms and is conserved in simple and complex systems; learn how to perform calculations that illustrate the law of conservation of energy.

Duration: 1 hr Scoring: 0 points

Quiz: Conservation of Energy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Energy and Change

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 4: DOING SCIENCE: MATTER, FORCES, AND ENERGY

Study: Science Experiments

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Science Experiments

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Conservation of Energy

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Conservation of Energy Lab

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: MATTER, FORCES, AND ENERGY WRAP-UP

Review: Unit Review

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 2: ATOMS AND THE PERIODIC TABLE

LESSON 1: ATOMS

Study: Atomic Structure

Learn about how all matter is made of atoms; learn about the history of atomic theory; understand the Bohr atom and the differences between neutrons, protons, and electrons.

Duration: 1 hr Scoring: 0 points

Quiz: Atomic Structure

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: The Periodic Table

Learn how to navigate the periodic table and use it to find numbers of protons, electrons, and neutrons.

Duration: 1 hr Scoring: 0 points

Quiz: The Periodic Table

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Simplifying Your View of Chemistry

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: ELEMENTS

Study: Organization and History of the Periodic Table

Learn about the history of the periodic table; the information in the periodic table; and how the table shows the unity, diversity, and organization of life.

Duration: 1 hr Scoring: 0 points

Quiz: Organization and History of the Periodic Table

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Elements on the Periodic Table

Learn about the elements of the periodic table.

Duration: 1 hr Scoring: 0 points

Quiz: Elements on the Periodic Table

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Atomic Structure

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 3: DOING SCIENCE: ATOMS AND THE PERIODIC TABLE

Study: Civil Engineering

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Civil Engineering

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Mass, Volume, and Density

Use the scientific method and scientific skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Mass, Volume, and Density

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: ATOMS AND THE PERIODIC TABLE WRAP-UP

Review: Unit Review

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 3: BONDING IN MATTER

LESSON 1: ELECTRONS AND PERIODICITY

Study: Electrons and Orbitals

Learn about energy levels of electrons, electron configurations, and the filling of orbitals.

Duration: 1 hr Scoring: 0 points

Quiz: Electrons and Orbitals

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Predictions and the Periodic Table

Learn about the patterns in the periodic table and the information that can be gained by using the table.

Duration: 1 hr Scoring: 0 points

Quiz: Predictions and the Periodic Table

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: BONDING AND FORCES

Study: Intramolecular Forces

Learn about forces within molecules, draw Lewis structures, and make predictions about the type of bond formed between two atoms.

Duration: 1 hr Scoring: 0 points

Quiz: Intramolecular Forces

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Intermolecular Forces

Learn about the forces between molecules and how they determine properties of substances.

Duration: 1 hr Scoring: 0 points

Quiz: Intermolecular Forces

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Intermolecular Forces and You

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Solutions

Learn about the properties of solutions, how mixtures are different from solutions, and what factors influence the rate of solution formation.

Duration: 1 hr Scoring: 0 points

Quiz: Solutions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: COMPOUNDS AND MOLECULES

Study: Molecular Shape

Learn how to predict molecular shape.

Duration: 1 hr Scoring: 0 points

Quiz: Molecular Shape

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Naming Substances

Learn about naming and writing formulas for compounds.

Duration: 1 hr Scoring: 0 points

Quiz: Naming Substances

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Bonding in Matter

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: BONDING IN MATTER

Study: Food Engineering

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Food Engineering

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Periodic Properties

Use the scientific method and scientific skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Periodic Properties

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: BONDING IN MATTER WRAP-UP

Review: Unit Review

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 4: CHEMICAL REACTIONS AND STOICHIOMETRY

LESSON 1: THE MOLE AND CHEMICAL QUANTITIES

Study: Unit Conversions

Learn about moles and their main uses and how to perform unit conversions.

Duration: 1 hr Scoring: 0 points

Quiz: Unit Conversions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Molar Mass and Percent Composition

Learn how to use moles to determine mass percent composition, the empirical formula, and the molecular formula.

Duration: 1 hr Scoring: 0 points

Quiz: Molar Mass and Percent Composition

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: CHANGES IN MATTER

Study: Chemical Reactions

Learn how to define chemical reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Chemical Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Types of Reactions

Learn about the main types of chemical reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Types of Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Reactions Around You

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: STOICHIOMETRY

Study: Balancing Inorganic Reactions

Learn about balancing inorganic chemical reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Balancing Inorganic Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Balancing Organic Reactions

Learn about the significance of organic reactions, such as combustion, and how to balance organic reactions.

Duration: 1 hr Scoring: 0 points

Quiz: Balancing Organic Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Calculating with Balanced Equations

Learn how to calculate average atomic mass and theoretical yield of products, and how to determine the limiting reagent and the percent yield.

Duration: 1 hr Scoring: 0 points

Quiz: Calculating with Balanced Equations

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Chemical Reactions

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 25 points

Practice: Stoichiometry

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 10 points

LESSON 4: DOING SCIENCE: CHEMICAL REACTIONS AND STOICHIOMETRY**Study: Engines, Fuel, and Green Design**

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Engines, Fuel, and Green Design

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Stoichiometry and Conservation of Matter

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Lab: Precipitation Reactions

Use the scientific method and scientific skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Precipitation Reactions

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: CHEMICAL REACTIONS AND STOICHIOMETRY WRAP-UP**Review: Unit Review**

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 5: PHASES, EQUILIBRIUM, AND KINETICS

LESSON 1: PHASES OF MATTER

Study: Kinetic Theory

Learn about how the kinetic theory explains phases.

Duration: 1 hr Scoring: 0 points

Quiz: Kinetic Theory

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Solids

Learn about the properties of solids, particularly metallic solids.

Duration: 1 hr Scoring: 0 points

Quiz: Solids

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Melting and Boiling

Learn about how intermolecular forces affect melting points, and how addition of solute affects melting and freezing points.

Duration: 1 hr Scoring: 0 points

Quiz: Melting and Boiling

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: EQUILIBRIUM

Study: The Equilibrium Constant

Learn about the concept of equilibrium, and about what happens when equilibrium is disturbed.

Duration: 1 hr Scoring: 0 points

Quiz: The Equilibrium Constant

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Acid and Base Equilibrium

Learn about acids and bases, and about the equilibria of acids and bases.

Duration: 1 hr Scoring: 0 points

Quiz: Acid and Base Equilibrium

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Equilibrium

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 10 points

LESSON 3: KINETICS

Study: Reaction Rate

Learn about reaction rate.

Duration: 1 hr Scoring: 0 points

Quiz: Reaction Rate

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Calculating the Reaction Rate

Learn about how to calculate reaction rate.

Duration: 1 hr Scoring: 0 points

Quiz: Calculating the Reaction Rate

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Kinetics

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 10 points

LESSON 4: DOING SCIENCE: PHASES, EQUILIBRIUM, AND KINETICS

Lab: Freezing Point Depression

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Freezing Point Depression

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

Lab: Disturbing Equilibrium

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Disturbing Equilibrium

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: PHASES, EQUILIBRIUM, AND KINETICS WRAP-UP

Review: Unit Review: Phases, Equilibrium, and Kinetics

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 6: SEMESTER WRAP-UP

LESSON 1: SEMESTER REVIEW AND EXAM

Review: Semester Review

Prepare for the final exam by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Exam: Semester 1 Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in Semester 1.

Duration: 0 hrs 40 mins Scoring: 100 points

UNIT 7: TRANSFERRING ENERGY

LESSON 1: TRANSFERRING HEAT

Study: Thermal Energy

Learn about thermal energy and heat flow.

Duration: 1 hr Scoring: 0 points

Quiz: Thermal Energy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Calculating Heat

Learn about specific heat and heat calculations.

Duration: 1 hr Scoring: 0 points

Quiz: Calculating Heat

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Journal: Heat Transfer Around You

Write about topics in chemistry that connect to daily life.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: ENTHALPY

Study: Enthalpy and Reactions

Learn about heat transfer in chemical reactions, about energy storage in chemical bonds, and about the enthalpy of reaction and the enthalpy of formation.

Duration: 1 hr Scoring: 0 points

Quiz: Enthalpy and Reactions

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Calculating Enthalpy

Learn about how to use Hess's law.

Duration: 1 hr Scoring: 0 points

Quiz: Calculating Enthalpy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: ENTROPY AND SPONTANEITY

Study: Entropy

Learn about entropy and its relationship to physical and chemical changes.

Duration: 1 hr Scoring: 0 points

Quiz: Entropy

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Spontaneity of a Reaction

Learn about the spontaneity of a reaction.

Duration: 1 hr Scoring: 0 points

Quiz: Spontaneity of a Reaction

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Transferring Energy

Practice problem-solving skills related to concepts in the lesson.

Duration: 0 hrs 40 mins Scoring: 25 points

LESSON 4: DOING SCIENCE: TRANSFERRING ENERGY

Study: Up Into Space

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Up Into Space

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Heats of Reaction

Use the scientific method and scientific skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Heats of Reaction

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 5: TRANSFERRING ENERGY WRAP-UP**Review: Unit Review**

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 8: EARTH'S PHYSICAL SYSTEMS**LESSON 1: EARTH'S HYDROSPHERE AND GEOSPHERE****Study: Structure and Movements of the Hydrosphere**

Describe the formation of and characteristics of the major types of bodies of water and ice. Relate solar energy to ocean currents and the distribution of heat around the globe. Trace the path of groundwater from soil to the ocean.

Duration: 1 hr Scoring: 0 points

Quiz: Structure and Movements of the Hydrosphere

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Structure and Movements of 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.

Duration: 1 hr Scoring: 0 points

Quiz: Structure and Movements of the Geosphere

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: EARTH'S 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.

Duration: 1 hr Scoring: 0 points

Quiz: Structure and Movements of the Atmosphere

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

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.

Duration: 1 hr Scoring: 0 points

Quiz: Weather and Climate

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Earth's 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 20 mins Scoring: 10 points

LESSON 3: DOING SCIENCE: EARTH'S PHYSICAL SYSTEMS

Study: Scientific Models

Learn about the process of scientific inquiry.

Duration: 1 hr Scoring: 0 points

Quiz: Scientific Models

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Thermodynamics and Earth's Systems

Use scientific methods and skills to perform a lab experiment.

Duration: 1 hr Scoring: 50 points

Discuss: Thermodynamics and Earth's Systems

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: EARTH'S PHYSICAL SYSTEMS WRAP-UP

Review: Unit Review

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 9: MATTER AND ENERGY IN THE BIOSPHERE

LESSON 1: NATURAL SYSTEMS

Study: Matter and Energy in Natural Systems

Recognize the major types of matter and energy that enter and flow through the biosphere and geosphere. Compare the characteristics of different surfaces on Earth, including albedo and heat capacity. Trace the flow of matter and energy through Earth's spheres.

Duration: 1 hr Scoring: 0 points

Quiz: Matter and Energy in Natural Systems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: The Flow of Matter and Energy Through Living Systems

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: The Flow of Matter and Energy through Living Systems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Practice: Natural Systems

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 20 mins Scoring: 10 points

LESSON 2: STRUCTURES AND CYCLES OF THE BIOSPHERE

Study: Ecosystems

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. Explain how biotic factors interact with the abiotic factors of an ecosystem. Learn about the major kinds of ecosystems found on Earth.

Duration: 1 hr Scoring: 0 points

Quiz: Ecosystems

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 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 20 mins Scoring: 20 points

Practice: Structures and Cycles of the Biosphere

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. 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: 0 hrs 20 mins Scoring: 10 points

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.

Duration: 1 hr 30 mins Scoring: 30 points

LESSON 3: DOING SCIENCE: MATTER AND ENERGY IN THE BIOSPHERE

Study: Investigate Cycling of O₂ and CO₂

Investigate the cycling of oxygen gas and carbon dioxide gas. Formulate a hypothesis and design a controlled experiment to test it. Describe common laboratory tools and techniques used to conduct the experiment you designed.

Duration: 1 hr Scoring: 0 points

Quiz: Investigate Cycling of O₂ and CO₂

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Investigate Cycling of O₂ and CO₂

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 Scoring: 50 points

Discuss: Investigate Cycling of O₂ and CO₂

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: 15 points

LESSON 4: MATTER AND ENERGY IN THE BIOSPHERE WRAP-UP

Review: The Biosphere

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 10: EARTH'S RESOURCES

LESSON 1: NATURAL RESOURCES

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 20 mins Scoring: 20 points

Study: Mineral and Energy Resources

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: Mineral and Energy Resources

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 2: RESOURCE AVAILABILITY

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 20 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 20 mins Scoring: 20 points

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 20 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 20 mins Scoring: 10 points

LESSON 3: DOING SCIENCE: EARTH'S RESOURCES

Study: Generating a Biofuel

Learn about writing predictions, reading graphs and analyzing variables in lab experiments.

Duration: 1 hr Scoring: 0 points

Quiz: Generating a Biofuel

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Generating a Biofuel

Perform a lab to observe how sugar availability affects fermentation

Duration: 1 hr Scoring: 50 points

Discuss: Generating a Biofuel

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: EARTH'S RESOURCES WRAP-UP

Review: Unit Review

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 11: ENVIRONMENTAL CHALLENGES

LESSON 1: ENVIRONMENTAL 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 20 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 20 mins Scoring: 0 points

Explore: Reading Graphs in Scientific Literature

Explore a topic that relates to the concepts in the lesson by applying scientific methods of analysis.

Duration: 1 hr 30 mins Scoring: 30 points

LESSON 2: HUMANS AND THE ENVIRONMENT

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.

Duration: 0 hrs 20 mins Scoring: 20 points

Study: Sustaining Earth's Resources

Learn about how science can impact the use of resources and waste management.

Duration: 1 hr Scoring: 0 points

Quiz: Sustaining Earth's Resources

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

LESSON 3: DOING SCIENCE: ENVIRONMENTAL CHALLENGES

Study: Acid Rain and Brine Shrimp

Learn about pH acids and bases

Duration: 1 hr Scoring: 0 points

Quiz: Acid Rain and Brine Shrimp

Take a quiz to assess your understanding of the material.

Duration: 0 hrs 20 mins Scoring: 20 points

Lab: Acid Rain and Brine Shrimp

Perform a lab to observe the impacts of acid rain on the environment

Duration: 1 hr Scoring: 50 points

Discuss: Acid Rain and Brine Shrimp

Discuss the results of your lab.

Duration: 0 hrs 20 mins Scoring: 15 points

LESSON 4: ENVIRONMENTAL CHALLENGES WRAP-UP

Review: Unit Review

Prepare for the unit test by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Test (CS): Computer-Scored Unit Test

Take a computer-scored test to assess what you have learned in this unit.

Duration: 0 hrs 30 mins Scoring: 50 points

UNIT 12: SEMESTER WRAP-UP

LESSON 1: SEMESTER REVIEW AND EXAM

Review: Semester Review

Prepare for the final exam by reviewing key concepts and skills.

Duration: 0 hrs 30 mins Scoring: 0 points

Exam: Semester 2 Exam

Take a computer-scored exam to demonstrate your mastery of concepts and skills covered in Semester 2.

Duration: 0 hrs 40 mins Scoring: 100 points