DREYFOUS

Course Overview

Earth and Space Science

TABLE OF CONTENTS

7th-9th Course Description

EduSystem's 7th-9th Science courses were developed and updated based on the curricular designs, content standards and grade-level expectations of the Department of Education of Puerto Rico (*Puerto Rico Core Standards*), and the Curriculum Framework. Furthermore, the content has been enriched by the study of curricular programs designed by other educational institutions and private schools.

The courses introduce their content in a dynamic, innovative, and recreational way. Additionally, they allow the students to build on their own knowledge through the cognitive development of scientific concepts, principles, and laws. They also encourage the study of this discipline by presenting scientific research, skills, and science processes within accessible content.

Basic Concepts and Conceptual Support Elements

EduSystem's 7th-9th Science courses are supported in their design and conceptualization by several basic principles.

1. 1. Emphasis on the need to:
    - Stimulate in the student the use of logical and analytical thinking for reasoning, interpreting, and solving problems, as well as reflection and decision-making throughout the process.
    - Learn Science while "doing Science" by carrying out various activities, experimentation, and scientific research.
    - Promote curriculum integration and the application of scientific concepts in real-life situations.
    - Structure the teaching process systematically (in sequence and from the concrete to the abstract).
    - Stimulate the development of multiple talents and the opportunity to express them in different ways.
    - Promote the development of science concepts, principles, laws, processes, and skills in an articulated way.

- Provide strategies to address the individual differences of the students that make up the school population.

2. The development of the activities integrates a constructivist focus which provides and promotes an environment for the students to play a bigger role in the construction of their knowledge and the development of their skills.

General Objectives

- Promote learning through concrete experiences.
- Encourage the use of information technology as a learning scenario.
- Raise awareness in the students regarding the protection and conservation of the environment.
- Encourage reflection and self-assessment during the learning process.
- Promote experiences that develop the values of science and our surrounding environment.
- Integrate scientific disciplines (Chemistry, Physics, Biology, among others) with other fields.
- Encourage participation in scientific research and in the development of science concepts, skills, and processes.
- Integrate science standards and expectations.
- Facilitate situations, activities, and exercises to actively build knowledge and apply it to different situations.
- Work with concrete and abstract concepts.
- Contribute to the development of language as a means of individual and collective communication and incorporate scientific vocabulary.
- Enrich the lessons with texts, exercises, and activities that are appropriate for the level.
- Highlight the scientific environment according to the level.

Course Structure

Earth and Space Science is composed of twenty units plus an introductory unit. Within each unit, you will find the lessons that make up the unit. Each lesson consists of a presentation divided into sections that develop the topic of study. Each lesson includes work documents, and as a general rule, contains videos or web links.

We invite you to familiarize yourself with the sections of the presentations and the documents generally found in the lessons of the EduSystem Earth and Space Science course.

Units are made up of the following sections:

Lesson 0

This lesson consists of unit documents, a series of diagnostic, formative, and cumulative assessment documents that will be used before, during, and after the study of each unit. Other documents found on L00 are the following:

- **Activity** Varied and fun activities are carried out to verify what has been learned.
- **Ecological Commitment** Topics related to the ecological point of view and how the student can contribute to the conservation of the environment are introduced.
- **Assessment Exercises** Activities that verify the knowledge acquired in each unit.
- **Laboratory** Research activities are carried out by applying the scientific method. Subjects studied in class are applied during laboratory practice.

Lessons

Each unit consists of several lessons divided according to the topics to be studied. Likewise, each lesson consists of a presentation and the following documents:

- **Evaluate My Progress** Reflective exercise regarding the subject studied in the lesson.
- **Descriptive Log** The lesson plan. This includes specific lesson objectives, standards, and expectations, teaching strategies and resources, keywords, web links, references, among others.

- **Let's Do Science!** A research activity is developed in which the students can learn science by "doing science", through the execution of several assorted activities and scientific research.
- **Did You Know...?** Very interesting topics and scientific curiosities that will stimulate student's imagination are presented.
- **Supplementary Projects** A variety of activities, exercises, games, and manipulatives related to the topics presented in the lesson.
- **Vocabulary** New terms are defined.
- **Knowledge Check** Various activities that check the knowledge acquired in each subject.

Unit Breakdown

Below you will find the units divided by their lessons with detailed objectives and concepts for each of them.

Unit 1. Matter and Energy Sources
At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Matter and Energy Sources
Code: C429G0SU01L00
Unit documents: Laboratory, Assessment Exercises, and Lesson Keys

Lesson 1. What Is Earth & Space Science?
Code: C429G0SU01L01
Objective
- Recognize the importance of the study of Earth & Space Science and the use of the Scientific Method to solve problems.

Key Terms
- hypothesis
- manipulated variable
- responding variable
- theory

Lesson 2. Structure and Properties of Matter
Code: C429G0SU01L02
Objective
- Relate the structure of the atom to the composition of matter.

Key Terms
- atom
- activation energy
- compound
- electrons
- isotopes
- neutrons
- protons
- valence shell

Lesson 3. Physical and Chemical Changes, and the Law of Conservation of Matter
Code: C429G0SU01L03
Objectives
- Describe the characteristics of the physical and chemical changes.
- Identify the primary sources of energy.

Key Terms
- change of state

Lesson 4. Types of Energy

Code: C429G0SU01L04

Objective

- Identify the primary sources of energy.

Key Terms

- carbon
- kerosene
- oceanic basins

Lesson 5. Nuclear Energy

Code: C429G0SU01L05

Objective

- Define the concepts of renewable energy and non-renewable energy.

Key Terms

- genetic material
- mutations

Unit 2. Maps

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Maps

Code: C429G0SU02L00

Unit documents: Activity, Laboratory, Assessment Exercises, and Lesson Keys

Lesson 1. Models and Maps

Code: C429G0SU02L01

Objectives

- Recognize the importance of maps in the study of Earth Science.
- Distinguish between the different types of maps.

Key Terms

- legend
- scale

Lesson 2. Topographic Maps

Code: C429G0SU02L02

Objective

- Distinguish between the different types of maps.

Key Terms

- fossils
- topography

Lesson 3. Hydrological Maps

Code: C429G0SU02L03

Objective

- Describe the characteristics of topographic and hydrological maps.

Key Terms

- drainage basin
- river systems
- supply
- tributary

Lesson 4. Time on Earth

Code: C429G0SU02L04

Objective

- Explain the movements of the Earth and their relation with the time.

Key Terms

- equinox
- summer solstice
- winter solstice

Unit 3. Earth's Composition

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Earth's Composition

Code: C429G0SU03L00

Unit documents: Activity, Laboratory, Assessment Exercises, and Lesson Keys

Lesson 1. The Origin of Earth

Code: C429G0SU03L01

Objective

- Mention the hypothesis about the origin of Earth.

Key Terms

- chemical evolution
- collision
- heterotroph

Lesson 2. The Biomes of Planet Earth

Code: C429G0SU03L02

Objective

- Distinguish between the different terrestrial biomes and the factors that determine their characteristics.

Key Terms

- ecosystems
- taiga
- temperate deciduous forest
- tundra biome

Lesson 3. Life Zones

Code: C429G0SU03L03

Objective

- Identifying the six regions of Earth where animal diversity is distributed.

Key Terms

- ornithological fauna

Lesson 4. The Dynamics of the Environment

Code: C429G0SU03L04

Objective

- Evaluate the effects of environmental changes.

Key Terms

- ecological niche
- ecological succession
- ecosystem
- homeostasis
- phytoremediation

Unit 4. Earth and Its Natural Satellite

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Earth and Its Natural Satellite

Code: C429G0SU04L00

Unit documents: Activity, Assessment Exercises, and Lesson Keys

Lesson 1. Earth: A Privileged Planet

Code: C429G0SU04L01

Objectives

- Explain the possible origin of the Solar System.
- Describe the structure and composition of Earth's atmosphere.

Key Terms

- atmosphere
- biosphere
- centrifugal force
- hydrosphere
- lithosphere
- peripheral
- protoplanets
- trace

Lesson 2. Earth's Movements

Code: C429G0SU04L02

Objective

- Define the movements of Earth and how they affect us.

Key Terms

- ellipse
- elliptical orbit
- equinox
- inertia
- mass
- precession
- rotation
- translation

Lesson 3. The Moon, My Natural Satellite

Code: C429G0SU04L03

Objective

- Describe the movements and phases of the Moon.

Key Terms

- apogee
- dark side
- eclipse
- perigee
- phases

Unit 5. Geological Activity

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Geological Activity

Code: C429G0SU05L00

Unit documents: Activity and Lesson Keys

Lesson 1. The Supercontinent of Pangea

Code: C429G0SU05L01

Objectives

- Use the geologic time-scale to compare the ages and events of Earth's history.
- Explain and identify the evidence that supports the Continental Drift or the Plate Tectonic Theory.

Key Terms

- Continental Drift or Plate Tectonic Theory
- Cretaceous
- Jurassic
- Mesozoic Era
- Paleozoic Era

Lesson 2. How Did the Tectonic Plate Theory Arise?

Code: C429G0SU05L02

Objective

- Explain and identify the evidence that supports the Continental Drift or the Plate Tectonic Theory.

Key Terms

- basalt rocks
- crust
- echo sounding
- granite
- inner core
- mantle
- Mid-Atlantic Ridge
- oceanography
- outer core
- paleomagnetism

Lesson 3. The Birth of the Continents

Code: C429G0SU05L03

Objective

- Explain and identify the evidence that supports the Continental Drift or the Plate Tectonic Theory.
- Identify the main factors of seismic and volcanic activity.
- Analyze the relationship between geological activity and the characteristics of the Earth's surface.

Key Terms

- fault zone
- fixed points
- magma
- subduction zone

Lesson 4. Puerto Rico is Born

Code: C429G0SU05L04

Objective

- Describe the geological history of Puerto Rico and the Caribbean.

Key Terms

- karst zone
- mogote
- platform
- trench

Lesson 5. The Tectonic Plates and their Geological Activity

Code: C429G0SU05L05

Objectives

- Identify the main factors of seismic and volcanic activity.
- Analyze the relationship between geological activity and the characteristics of the Earth's surface.

Key Terms

- earthquakes
- geological activity
- volcanic activity

Lesson 6. Why Do Volcanoes Exist?

Code: C429G0SU05L06

Objectives

- Identify the main factors of seismic and volcanic activity.
- Analyze the relationship between geological activity and the characteristics of the Earth's surface.

Key Terms

- silica
- viscosity
- volcano

Unit 6. How Are Rocks Formed?

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. How Are Rocks Formed?

Code: C429G0SU06L00

Unit documents: Activity and Lesson Keys

Lesson 1. Igneous and Metamorphic Rocks

Code: C429G0SU06L01

Objectives

- Relate the study of rocks with the history and formation of planet Earth.
- Describe the origin, formation, and classification of igneous, sedimentary, and metamorphic rocks.
- Recognize the processes of the rock cycle.

Key Terms

- lithify
- metamorphic rocks
- porphyritic

Lesson 2. Weathering and Sedimentary Rocks

Code: C429G0SU06L02

Objectives

- Describe the origin, formation, and classification of igneous, sedimentary, and metamorphic rocks.
- Distinguish between clastic and non-clastic rocks.

Key Terms

- clasts
- evaporite
- exfoliation
- sedimentary rocks

Lesson 3. Soil: The Base of Life

Code: C429G0SU06L03

Objective

- Identify the main components of soil.

Key Terms

- humus
- percolate
- sieves
- soil
- subsoil
- topsoil

Unit 7. Minerals

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Minerals

Code: C429G0SU07L00

Unit documents: Activity and Lesson Keys

Lesson 1. The Formation of Minerals

Code: C429G0SU07L01

Objectives

- Define and describe the characteristics and properties of minerals.
- Explain the formation and origin of minerals.

Key Terms

- abrasion
- apatite
- calcite
- cleavage
- corundum
- diamond
- element
- fluorite
- Friedrich Mohs
- gypsum
- hardness
- hornblende
- mica
- mineral
- olivine
- potassium feldspar
- pyroxene
- quartz
- silicate mineral
- talc
- topaz

Lesson 2. How Are Minerals Classified?

Code: C429G0SU07L02

Objective

- Classify minerals based on their properties.

Key Terms

- baryte
- calcite
- carbonates
- corundum
- halite
- mineral
- native elements
- oxides
- sulfates
- sulfites

Unit 8. Geologic Time

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Geologic Time

Code: C429G0SU08L00

Unit documents: Activity, Assessment Exercises, and Lesson Keys

Lesson 1. The Study of Fossils: The Origin of Life

Code: C429G0SU08L01

Objective

- Explain the formation of a fossil.

Key Terms

- anoxic event
- Buffon
- catastrophism
- Charles Darwin
- Cuvier
- evolution
- fossil
- Haldane
- Hutton
- Lamarck
- lipids
- Lyell
- Miller
- monomers
- Oparin
- origin
- Robert Hooke
- uniformitarianism

Lesson 2. Changes in Life-Forms

Code: C429G0SU08L02

Objectives

- Describe the origin of the first living being on Earth.
- Describe how fossils are the key to understanding the events of the past.

Key Terms

- atmosphere
- autotroph
- bacteria
- cyanobacteria
- engulfed
- fossil
- invaginations
- photosynthetic cells
- prokaryotic cells
- stromatolite
- symbionts

Lesson 3. The Eras and the Age of the Earth

Code: C429G0SU08L03

Objectives

- Use the geological time scale to compare eras and periods.
- Describe the geological history of the Earth in terms of life development.

Key Terms

- Archean
- Basin
- Cambrian
- Carboniferous
- Cenozoic
- Cretaceous
- Cryptic
- Devonian
- Eoarchean
- Eocene
- eon
- epoch
- era
- Hadean
- Holocene
- hominids
- Imbrian
- Jurassic
- Mesoarchean
- Mesoproterozoic
- Mesozoic
- Miocene
- Mississipian
- Nectarian
- Neoarchean
- Neogene
- Neoproterozoic
- Oligocene
- Ordovician
- Paleoarchean
- Paleocene
- Paleogene
- Paleoproterozoic
- Paleozoic
- Pangaea
- Pennsylvanian
- period
- Permian
- Pharenozoic
- Pliocene
- Pleistocene
- Precambrian
- Proterozoic
- Quaternary
- Silurian
- supereon
- Triassic

Unit 9. Our Atmosphere

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Our Atmosphere

Code: C429G0SU09L00

Unit documents: Activity, Laboratory, Assessment Exercises, and Lesson Keys

Lesson 1. The Characteristics of the Atmosphere

Code: C429G0SU09L01

Objectives

- Describe the composition and characteristics of the atmosphere.
- Compare and contrast the five layers of the atmosphere.

Key Terms

- atmosphere
- biota
- cosmic rays
- denitrification
- macronutrients
- nodules
- ozone layer
- percolate
- reservoirs
- trace

Lesson 2. The Formation of Clouds

Code: C429G0SU09L02

Objective

- Explain the formation and importance of clouds.

Key Terms

- air bubbles
- air convergence
- altostratus
- atmospheric pressure
- cirrostratus
- cirrus
- clouds
- clusters
- condensation level
- convection heat
- infrared energy
- nimbostratus
- stable atmosphere
- surface
- topography
- unstable atmosphere

Lesson 3. Wind Patterns

Code: C429G0SU09L03

Objective

- Describe the movement patterns of the air.

Key Terms

- air pressure
- atmospheric pressure
- barometer
- Coriolis force
- friction layer
- hemispheres

- isobars
- jet streams
- magnitude
- pressure-gradient force

Lesson 4. The Greenhouse Effect

Code: C429G0SU09L04

Objective

- Associate the atmosphere, climate patterns, and human activity.

Key Terms

- albedo
- convection
- diffused light
- energy radiation
- global warming
- greenhouse effect
- greenhouse gases
- infrared radiation
- solar radiation

Unit 10. Weather Conditions

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Weather Conditions

Code: C429G0SU10L00

Unit documents: Activity, Assessment Exercises, and Lesson Keys

Lesson 1. Seasons and Climate

Code: C429G0SU10L01

Objective

- Relate the seasons of the year and the climate.

Key Terms

- elliptical pattern
- equinox
- leap
- oblique
- solstice

Lesson 2. Why Do Climate Zones Exist?

Code: C429G0SU10L02

Objectives

- Compare and contrast the climate zones and their climate differences.
- Describe the five climate types.

Key Terms

- climate conditions
- climate control
- dry climate
- fauna
- flora
- humid climate
- meteorologist
- polar climate
- pressure changes
- rain forest
- weather barriers

Lesson 3. Factors That Alter Weather Conditions

Code: C429G0SU10L03

Objective

- Mention the factors that affect weather conditions.

Key Terms

- aerosols
- emissions
- feedback
- Milankovitch Theory

Lesson 4. Hurricanes

Code: C429G0SU10L04

Objective

- Explain how hurricanes and other climate phenomena are formed.

Key Terms

- convergence
- eye of the hurricane
- saturation
- tornadoes

Unit 11. Atmospheric Pollution

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Atmospheric Pollution

Code: C429G0SU11L00

Unit documents: Activity, Assessment Exercises, and Lesson Keys

Lesson 1. Types of Atmospheric Pollution

Code: C429G0SU11L01

Objectives

- List and describe the types of atmospheric pollution.
- Distinguish between natural and artificial sources of pollution.

Key Terms

- arsenic
- asbestos
- carbon monoxides
- carcinogens
- congenital

Lesson 2. Air Pollution Factors

Code: C429G0SU11L02

Objective

- Explain the factors that affect air pollution.

Key Terms

- altitude
- atmospheric stability
- dilution
- inversion layer
- inversion effect
- mixed depth
- mixed layer
- temperature changes
- wind speed

Lesson 3. Acid Rains

Code: C429G0SU11L03

Objective

- Describe acid rain and its consequences on the environment.

Key Terms

- acid fog
- acid rain
- acid sediment
- dry sediment
- gases
- humid sediment
- liquid sediment
- particles
- silt

Unit 12. Our Oceans

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Our Oceans

Code: C429G0SU12L00

Unit documents: Activity and Lesson Keys

Lesson 1. Oceanography

Code: C429G0SU12L01

Objective

- Define oceanography and recognize its importance.

Key Terms

- dredgers
- oceanography
- radiolaria
- trawling

Lesson 2. Marine Biomes

Code: C429G0SU12L02

Objective

- Distinguish between the ocean and the sea.

Key Terms

- hydrosphere
- marine biome
- ocean
- sea
- subterranean waters
- water cycle

Lesson 3. Physical and Chemical Characteristics of the Ocean

Code: C429G0SU12L03

Objective

- Mention the physical and chemical properties of the ocean.

Key Terms

- minerals
- pressure
- salinity
- transparency

Lesson 4. The Formation of the Oceans and Oceanic Topography

Code: C429G0SU12L04

Objective

- Describe the formation and topography of the ocean.

Key Terms

- abyss
- abyssal plain
- basins
- border
- continental shelf
- continental slope

- mid-ocean ridges
- oceanic ridges
- oceanic trench

Lesson 5. *El Niño* Phenomenon and Its Effects

Code: C429G0SU12L05

Objective

- Explain the *El Niño* phenomenon and its effects.

Key Terms

- *La Niña*
- Southern Oscillation
- trade winds
- winter monsoon

Unit 13. Marine Ecosystems

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Marine Ecosystems

Code: C429G0SU13L00

Unit documents: Activity, Express Yourself, and Lesson Keys

Lesson 1. Marine Ecosystems

Code: C429G0SU13L01

Objectives

- Learn and understand the marine ecosystem as an integrated functional body.
- Identify different species that live in a determined area of the biosphere and the environment with which they interact.

Key Terms

- benthic zone
- euryhaline
- marine ecosystem
- pelagic zone
- stenohaline

Lesson 2. Marine Life

Code: C429G0SU13L02

Objective

- Recognize the different types of life that exist in oceans.

Key Terms

- benthos
- bioluminescence
- chemosynthesis
- microbenthos
- nekton
- neuston
- phanerogams
- phytoplankton
- plankton
- sessile
- zooplankton

Lesson 3. Marine Currents

Code: C429G0SU13L03

Objective

- Learn what submarine currents are and their importance in ecosystems.

Key Terms

- equatorial currents
- marine currents
- resurgent waters
- surface currents

Lesson 4. Bioluminescent Bays

Code: C429G0SU13L04

Objective

- Learn about bioluminescence and fluorescence and how to distinguish between them.

Key Terms

- heterotroph
- photoprotein
- photosynthetic
- symbiotic

Lesson 5. Our Coastal Zones

Code: C429G0SU13L05

Objective

- Understand coastal zones and all of their components.

Key Terms

- corals
- displacement
- erosion
- granules
- meteorization
- reefs
- rocky coasts
- sands

Lesson 6. Mangroves

Code: C429G0SU13L06

Objectives

- Recognize that mangroves shelter a large variety of organisms that include bacteria and fungus, which intervene in the basic processes of decomposition.
- Understand the importance of preserving the ecosystem.

Key Terms

- adventitious roots
- mangrove forest
- mangrove tree
- pneumatophores
- saltpeter

Lesson 7. Bioconservation

Code: C429G0SU13L07

Objective

- Understand the importance of bioconservation to preserve the life of all species.

Key Terms

- agriculture
- bioconservation
- erosion
- petroleum
- pollution
- radioactive pollution
- runoff
- waste

Unit 14. Aquatic Environments

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Aquatic Environments

Code: C429G0SU14L00

Unit documents: Activity, Laboratory, Assessment Exercises, and Lesson Keys

Lesson 1. Characteristics of Aquatic Environments

Code: C429G0SU14L01

Objective

- Describe the characteristics of the aquatic environment.

Key Terms

- biological oxygen demand
- epilimnion
- eutrophication
- euphotic zone
- heterotroph
- hypolimnion
- oligotroph
- thermocline

Lesson 2. Surface Water and Groundwater

Code: C429G0SU14L02

Objective

- Mention the difference between surface water and groundwater.

Key Terms

- aquifers
- groundwater
- Hydrogeology
- Hydrology
- influent currents
- sinkholes
- surface water

Lesson 3. Aquatic Life

Code: C429G0SU14L03

Objective

- Build aquatic food chains.

Key Terms

- consumers
- crustaceans
- decomposers
- producers
- rotifers

Lesson 4. The Management of Our Waters

Code: C429G0SU14L04

Objective

- Recognize the factors of pollution and the importance of conservation.

Key Terms

- artesian aquifer
- sanitary waters
- sustainability
- use of sustainable water
- water quality standards

Lesson 5. Could Desalination Be a Valid Alternative?

Code: C429G0SU14L05

Objective

- Learn the process of water desalination.

Key Terms

- desalination
- distillation
- dome
- electrodialysis
- ion
- ion exchange
- reverse osmosis

Lesson 6. Pollution and Conservation

Code: C429G0SU14L06

Objective

- Recognize the factors of pollution and the importance of conservation.

Key Terms

- diffused sources
- dilution
- localized sources
- pollutant

Unit 15. Renewable Resources

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Renewable Resources

Code: C429G0SU15L00

Unit documents: Activity, Ecological Commitment, and Lesson Keys

Lesson 1. What Are Our Renewable Resources?

Code: C429G0SU15L01

Objectives

- Define the concept of natural renewable resources.
- Identify Puerto Rico's natural renewable resources.

Key Terms

- biogeochemical cycles
- conservation
- ecology
- ecosystems
- Gaia hypothesis
- global
- habitat
- natural resources
- planning
- renewable resources
- sustainability
- sustainable life

Lesson 2. Air Quality

Code: C429G0SU15L02

Objectives

- List the air pollutants that affect the environment the most.
- Recognize the importance of maintaining air and water quality in optimal conditions.

Key Terms

- air quality
- area sources
- atmospheric pollution
- diffused sources
- fugitive sources
- mobile sources
- primary limits
- primary pollutants
- secondary limits
- secondary pollutants
- stationary sources

Lesson 3. Water Quality

Code: C429G0SU15L03

Objective

- Recognize the importance of maintaining air and water quality in optimal conditions.

Key Terms

- aquifers
- artificial lakes
- erosion
- eutrophication
- hydrographic basins
- hydrologic cycle

- inorganic compounds
- nutrients
- pollutants
- pollution
- reservoirs
- runoff
- sedimentation
- subterranean waters
- supply
- water pollutants
- water quality

Lesson 4. Agriculture: Its Impact on the Environment

Code: C429G0SU15L04

Objective

- Learn the agricultural practices that could negatively impact the environment.

Key Terms

- biological control
- carrying capacity
- conservation tillage
- ecological revolution
- fertility
- grazing
- marginal lands
- phreatic level
- physical erosion
- sediments
- soil vulnerability
- sustainability
- tillage
- tillage practices

Lesson 5. Species Bioconservation

Code: C429G0SU15L05

Objective

- Recognize the importance of species bioconservation.

Key Terms

- bioconservation
- biosphere
- DNA
- ecology
- ecosystems
- endangered species
- environmental risk
- genetic risk
- moral right
- natural disasters
- population risk
- rare species
- species
- vulnerable species

Unit 16. Nonrenewable Resources

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Nonrenewable Resources

Code: C429G0SU16L00

Unit documents: Activity, Laboratory, and Lesson Keys

Lesson 1. Mineral Resources and Their Impact on the Environment

Code: C429G0SU16L01

Objectives

- Distinguish between renewable and nonrenewable natural resources.
- Recognize the importance of minerals and their impact on the environment.
- Describe the importance of mineral resources and their impact on the environment.

Key Terms

- bioabsorption
- bioleaching
- biooxidation
- biotechnology
- direct impact
- ecological cycle
- environmental degradation
- filtration
- geological inheritance
- indirect impact
- living standards
- mineral deposits
- mineral resource cycle
- mineral resources
- natural deposits
- open-pit mining
- percolate
- runoff water
- subterranean mines
- surface mines
- sustainable source
- trace elements

Lesson 2. Nonmetallic Minerals

Code: C429G0SU16L02

Objectives

- Recognize the importance of minerals and their impact on the environment.
- Describe the importance of mineral resources and their impact on the environment.

Key Terms

- biological processes
- evaporite
- igneous formation
- sedimentary processes
- tectonic plates

Lesson 3. The Fossil Environment and Its Impact on the Environment

Code: C429G0SU16L03

Objective

- Recognize the environmental impact of fossil fuels.

Key Terms

- disposition basin
- fossil environment
- fractional distillation
- oil film
- percolation
- refinery
- reservoir rocks
- runoff
- secondary recovery
- terrain collapse
- well
- well drilling

Lesson 4. Recycling: An Alternative

Code: C429G0SU16L04

Objective

- Consider recycling as an environmental conservation alternative.

Key Terms

- biogeochemical cycles
- biosphere
- consumption patterns
- raw material
- recycling
- solid residue
- landfill

Unit 17. Human Population

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Human Population

Code: C429G0SU17L00

Unit documents: Activity, Laboratory, Assessment Exercises, and Lesson Keys

Lesson 1. Demography

Code: C429G0SU17L01

Objectives

- Recognize the impact of overpopulation and its implications for future generations.
- Define demographic terms related to the populations.

Key Terms

- birth rate
- death rate
- demography
- fertility rate
- genetic material
- growth rate
- metropolis
- migration
- population
- population density
- territorial area

Lesson 2. The Malthusian Theory

Code: C429G0SU17L02

Objectives

- Explain the Malthusian theory.
- Mention the factors that affect the size of populations.

Key Terms

- anti-Malthusianism
- birth controls
- chlorofluorocarbon
- hunger
- innovative technology
- malnutrition
- Malthusian
- ozone layer
- Thomas Robert Malthus

Lesson 3. The Impact of Overpopulation

Code: C429G0SU17L03

Objectives

- Mention the factors that affect the size of populations.
- Identify alternatives to the overpopulation problem and its effect on natural resources.

Key Terms

- availability per capita
- carrying capacity
- duplication time
- demographic transition

- logistic growth curve
- limiting elements
- population growth

Unit 18. The Universe

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. The Universe

Code: C429G0SU18L00

Unit documents: Activity, Ecological Commitment, and Lesson Keys

Lesson 1. The Universe

Code: C429G0SU18L01

Objectives

- Identify the theories on the origin of the Universe.
- Analyze the movement of the planets and the physical laws that govern them.

Key Terms

- Albert Einstein
- *Big Bang*
- *Big Crunch*
- elliptical
- Galileo Galilei
- General Theory of Relativity
- gravitational force
- heliocentric theory
- Isaac Newton
- Johannes Kepler
- Kepler laws
- Laplace protosolar nebula
- Law of Universal Gravitation
- light-year
- natural laws
- Nicolaus Copernicus
- orbits
- oscillating universe
- static universe
- Tycho Brahe
- universal gravitation

Lesson 2. Galaxies and Stars

Code: C429G0SU18L02

Objectives

- Describe how a star is formed.
- Compare the life cycles of stars based on their size.

Key Terms

- constellations
- energy
- galaxies
- Greeks
- legends
- luminosity
- Milky Way
- nebula
- nuclear fusion
- Orion
- stars

Lesson 3. Telescopes and Radio Telescopes

Code: C429G0SU18L03

Objective

- Evaluate the use of telescopes and radio telescopes and their importance in space discovery.

Key Terms

- concave plane
- convex plane
- observatories
- optic telescope
- radio astronomers
- radio astronomy
- radio receiver
- radio telescope
- radio waves
- receiver
- reflectors
- refractor telescope
- space telescopes
- telescope

Unit 19. Our Solar System

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Our Solar System

Code: C429G0SU19L00

Unit documents: Activity

Lesson 1. The Sun

Code: C429G0SU19L01

Objectives

- Describe how the Solar System is organized.
- Mention the characteristics that distinguish our Solar System.
- Describe the function and importance of the Sun in the Solar System.

Key Terms

- Aristotle
- Babcock
- chromosphere
- core layer
- corona
- fusion
- Galileo
- helium
- hydrogen
- magnetic field
- nucleus
- primary sunspot
- secondary sunspot
- sunspots

Lesson 2. Inner Planets

Code: C429G0SU19L02

Objective

- Describe the characteristics and composition of the inner planets.

Key Terms

- atmosphere
- cloud cover
- crust
- Earth's crust
- erosive agents
- inner planets
- infrared rays
- iron
- Ishtar Terra
- liquid iron
- magnetic field
- mantle
- natural satellites
- nickel
- nitrogen
- nucleus
- orbital modules
- outer planets
- oxygen
- plain
- ridge
- tectonic plates

Lesson 3. The Outer Planets and Dwarf Planets

Code: C429G0SU19L03

Objective

- Describe the characteristics and composition of the outer planets and dwarf planets.

Key Terms

- ammonia
- Clyde Tombaugh
- density
- elliptical
- frozen methane
- helium
- hydrogen
- ice volcanoes
- Johan Galle
- planetary nebula
- rings
- space probe
- sulfur compounds
- William Herschel

Unit 20. Space Travels

At the end of this unit, the student will have completed the objectives found in the following lessons.

Lesson 0. Space Travels

Code: C429G0SU20L00

Unit documents: Activity, Assessment Exercises, and Lesson Keys

Lesson 1. Brief History of Space Travel

Code: C429G0SU20L01

Objective

- Detail the history of space travel.

Key Terms

- Apollo missions
- crew
- NASA
- Neil Armstrong
- orbit
- satellites
- space missions
- Space Race

Lesson 2. The Space Shuttle

Code: C429G0SU20L02

Objective

- Distinguish between the different types of space shuttles.

Key Terms

- astronauts
- atmospheric pressure
- booster rockets
- cargo hold
- crew cabin
- fuel
- launch
- liquid nitrogen
- liquid oxygen
- propellant
- space shuttles

Lesson 3. Satellites and Space Probes

Code: C429G0SU20L03

Objectives

- Identify the function of different satellites
- Distinguish between satellites and space probes.

Key Terms

- climates
- equatorial orbit
- polar orbit
- probes
- satellites
- space probes
- stationary satellites
- sterilized equipment

Lesson 4. Space Stations

Code: C429G0SU20L04

Objectives

- Identify the function of different satellites
- Distinguish between satellites and space probes.

Key Terms

- antenna
- compartments
- fixed orbit
- gravity
- gyroscope
- Mir
- Skylab
- space station

Lesson 5. The Future of Space

Code: C429G0SU20L05

Objective

- Recognize the importance of space travel and the current knowledge of the Universe.

Key Terms

- Cassini-Huygens
- CDA
- gaseous storms
- Hubble telescope
- iodine
- light-years
- oxygen
- supernova