Science 4

Course Description

edusystem by Dreyfous

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Series Description

This EduSystem's Science K-6 series was developed based on the curricular design Puerto Rico Core Standards and the Curriculum Framework created by the Department of Education of Puerto Rico. Additionally, the content has been enriched with curricular frameworks developed by other educational entities and private schools.

This series presents the content in a dynamic, stimulating, innovative and recreational manner. The series gives the students the opportunity to build their knowledge through the cognitive development of scientific keywords, principles, and laws. The series also encourages the study of this discipline by putting scientific research, science skills, and the scientific method within the student's reach.

Conceptual Framework

The design and conceptualization of the K-6 series is founded upon the following basic principles:

1. The need for emphasis on:
   - Encouraging students to think logically and analytically to develop reasoning and interpretive skills used for problem solving during the learning process.
   - Learning science by "doing science" through the completion of various activities, experiments, and scientific inquiry.
   - Promoting curricular integration and the application of scientific keywords to real life situations.
   - Systematically organizing the learning process (in sequence, going from the concrete to the abstract).
   - Encouraging the development of multiple talents and the opportunity to express them in different ways.
   - Promoting the development of keywords, principles, laws, scientific processes, and related skills.
   - Providing strategies to address the individuality of each student

2. The activities integrate a constructivist approach by encouraging more student participation in the building of knowledge and the development of skills.

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General Objectives

The objectives of this Series are to:

- Promote learning through real life experiences.
- Encourage the use of information technology as a learning tool.
- Educate students on the protection and conservation of the environment.
- Promote reflection and self-evaluation during the learning process
- Promotes experiences for the development and appreciation of science and the world around us
- Integrate the different scientific disciplines, such as chemistry, physics, and biology, among others with disciplines from other fields.
- Encourage participation in scientific inquiry and the development of keywords, skills and scientific processes.
- Integrate standards and grade level expectations. Encourage students to work with both concrete and abstract keywords.
- Provide situations, activities, and exercises to actively build and apply knowledge to different situations.
- Encourage students to work with both concrete and abstract keywords.
- Contribute to the development of language as a means of individual and collective communication while incorporation of scientific vocabulary.
- Enrich the lessons with level appropriate documents, activities, and exercises.
- Highlight the scientific environment in accordance with grade level.

Course Structure

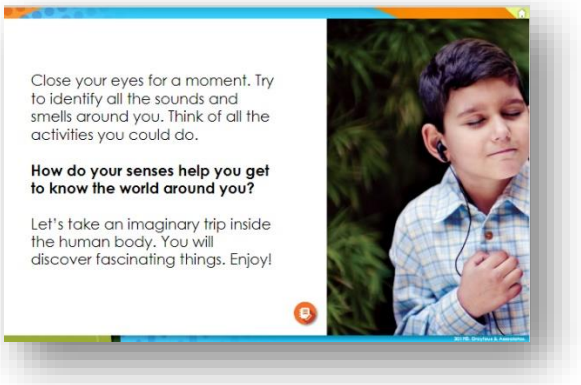
The course Science 4 is composed of ten units. Each unit is composed of lessons. Each lesson is divided into sections that develop their individual topics. Each lesson contains a descriptive log, activities, worksheets and handouts that are related to the content and, as in most cases, website links and resources. It also proposes assessment exercises in order to help the students in different tasks.

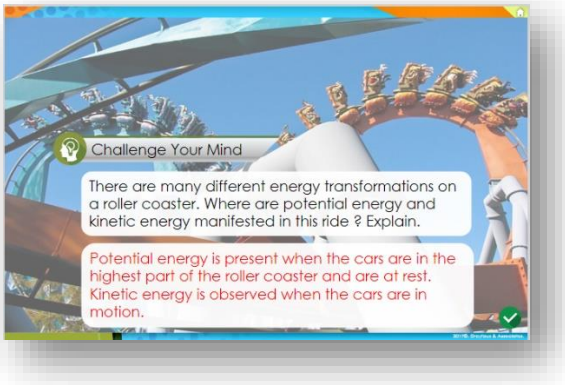
Here are some of the sections normally found in each lesson's presentation and documents.

Presentation

Let's Explore

In this section, the students will look at important details of a photograph. Additionally, they will discuss and answer questions geared toward increasing their curiosity towards different topics that will be discussed in the lessons.





Topics

Concept development, where the content will be discussed using specific situations for exploration while presenting other examples

Icons

Each of the sections in our lessons is identified with an icon. These help both the student and the teacher compliment their ideas and activities. Below, you will find the icon next to a description of its function.

Challenge Your Mind

A situation or an exercise Will be presented to the students so they can develop their critical thinking skills.

Connect What You Have Learned

that can be applied to daily life. This will also help them understand what was studied in class.

Scientists in Action

Diverse assessment activities in which the students can express themselves and apply what they have learned about any topic discussed in class.

Link with…

In this section, students will be able to relate the topics with other branches of Science.

Think

The students will answer questions that will encourage them to think and give their opinion about the topic presented in **Link with**… section.

Interactive Icons

Audio

Diagram

Images

Videos

Games

Answers

Lecture

Internet

Animation

Steps

Information

Writing Assignments

Music

Let's Solve Together

Handouts and Worksheets

Let's Investigate

This document presents an inquiry activity in which the students will learn science by "doing science" and participate in activities related to scientific investigation.

Did you know?

This document presents intriguing scientific topics and trivia to stimulate students' imaginations

Stimulate your mind

This document includes a number of stimulating activities that will help students better understand the topics discussed in class.

Ecological Awareness

This document will prompt the students to learn and actively contribute to the preservation of our environment.

Scientific Zone

This document presents a scientific concept related to a specific process in such a way that learning can be integrated along with a single scientific skill.

Complementary Documents

A variety of activities, exercises, and games related to the topics discussed in the lesson.

Vocabulary

Definitions of the most important keywords in the lesson.

Evaluation

Practical exercises to verify the student's learning process.

The lessons 00 contain unit documents that may be used at the beginning, during, or after discussing the corresponding unit.

Unit Breakdown

Below is an itemization of the division of each unit in lessons, including the name of each lesson with its corresponding objectives and keywords

Unit 0. Let's Investigate Science

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

Lesson 0. Basic Concepts

Code: C417G04U00L00

Objetives

- Identify instruments that are commonly used in the laboratory and describe their function.
- Recognize the skills for carrying out scientific processes.
- Identify the safety equipment necessary to work in the laboratory.
- Describe the safety rules for working in the laboratory and in the field.
- Recognize the scientists that contributed to the invention of the light microscope.
- Identify the parts of the light microscope and their functions.
- Recognize the International System of Units as the system of measurements used in science in the whole world.

Topics

- Scientific Instruments
- The Microscop
- Safety in Science
- Scientific Skills
- International System of Units

Keywords

- arm
- base
- beaker
- coarse focus
- fine focus
- flask
- funnel
- graduated cylinder
- illuminator
- laboratory coat
- latex gloves
- lighter
- microscope
- microscope slide
- mortar and pestle
- objective lenses
- ocular lens
- safety goggles
- scale
- scientific skills

Lesson 1. Scientific Knowledge

Code: C417G04U00L01

Objetives

- Identify information as scientific or non-scientific data.
- Distinguish what science is from what pseudoscience is.

Topics

- Common Knowledge and Scientific Knowledge
- Science and Pseudoscience

Keywords

- common knowledge
- empirical knowledge
- pseudoscience
- science
- scientific knowledge

Lesson 2. The Scientific Method

Code: C417G04U00L02

Objetives

- Describe the history and origin of the scientific method.
- Identify Galileo's role in the development of modern science.
- Describe the characteristics of the scientific method.
- Explain the stages of the scientific method.
- Develop a simple investigation following the scientific method.

Topics

- History and Origin
- Definition and Characeristics

Keywords

- experimental method
- logical method
- scientific method

Lesson 3. Scientific Research

Code: C417G04U00L03

Objetives

- Describe the role of technology in scientific research.
- Identify and explain examples of scientific fraud.
- Distinguish reliable sources of information from ones that are not.
- Identify the different classifications into which scientific research can be grouped.
- Identify the main characteristics that scientific research must have.

Topics

- The Truth and Change
- Technology and Mathematics
- Validity, Reliability and Objectivity
- Fraud in Science

Keywords

- objectivity
- reliability
- research
- scientific fraud
- scientific knowledge
- validity

Lesson 4. The Scientific Method Everywhere

Code: C417G04U00L04

Objetives

- Identify possible scenarios and situations in which the scientific method can be used to conduct research.
- Identify the scientific method as a way of researching that can be used by anyone.
- Explain how the scientific method can be used in different investigative scenarios.

Topics

- The Scientific Method in Daily Life
- The Scientific Method, in the Garden?

Keywords

- scientific method
-

Lesson 5. Classifying Plants and Animals

Code: C417G04U00L05

Objetives

- Explain the ways in which living things are classified.
- Mention and describe the characteristics of living things.

Topics

- Characteristics of Life
- Classifying Living Things

Keywords

- bacteria
- biologists
- blue-green algae or cyanobacteria
- fungi
- kingdoms
- metabolism
- organisms
- positive geotropism
- protista
- reproduction
- unicellular

Unit I. Plants

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

Lesson 0. Plants

Code: C417G04U01L00

Unit's documents: Scientists in Action, Let's investigate, Scientific Zone, Evaluation, My scientific Journal

Lesson 1. Adventure Through the Plant Kingdom

Code: C417G04U01L01

Objetives

- Identify the main parts of a plant.
- List the function of each part of a plant.
- Draw a plant and identify its parts.
- Explain the importance of plants on our planet.
- Compare vascular and non-vascular plants.
- List the characteristics of angiosperms and gymnosperms.
- Distinguish between monocot and dicot plants.

Topics

- The World of Plants
- Roots Underground
- The Food Factory
- Growing Up
- A Variety of Plants
- Reproduction: With and Without Seeds

Keywords

- angiosperms
- dicot
- flowers
- fruit
- gymnosperms
- leaves
- main root
- monocot
- non-vascular plants
- phloem
- photosynthesis
- plants
- respiration
- root
- root cap
- root hair
- seeds
- stem
- transpiration
- vascular plants
- xylem

Lesson 2. A New Life

Code: C417G04U01L02

Objetives

- Explain sexual and asexual reproduction in plants.
- Identify the main parts of a flower.
- Describe the process of pollination.
- Name the two parts of a fruit.
- Survive in different environments.
- Define adaptation.
- Note the importance of adaptation in plants.

Topics

- Just Like My Parents
- The Beauty of a Flower
- From Flower to Flower
- What is a fruit
- Diversity Everywhere
- Plant Defense

Keywords

- adaptation
- asexual reproduction
- buds
- pericarp
- petals
- pistil
- pollination
- reproduction
- seed
- sepal
- sexual reproduction
- spores
- stamen
- stem

Lesson 3. Natural Medicine

Code: C417G04U01L03

Objetives

- Define natural medicine.
- Identify the advantages of using natural medicine.
- Name medicinal plants commonly found.
- Describe the illnesses that can be treated with medicinal plants.
- Investigate how family members have used medicinal plants and the results they obtained.

Topics

- Natural Medicine
- The Riches of Natural Medicine
- I'm treasured because…

Keywords

- medicinal plant
- natural medicine

Lesson 4. The Endemic and Native Plants of the Dominican Republic

Code: C417G04U01L04

Objetives

- Classify plants according to people's uses for them.
- Distinguish between an endemic species and a native species.
- Identify and describe at least three of the endemic plants of the Dominican Republic and three native ones.
- Point out at least two species of endangered Dominican flora.
- Identify and describe the national flower of the Dominican Republic.
- Observe and identify the parts of the plants in their immediate surroundings.
- Investigate diseases of plants that inhabit their immediate surroundings or town.

Topics

- The Plant Kingdom
- Endemic and Native Plants of Our Island

Keywords

- endemic
- native

Unit 2. Animals

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

Lesson 0. Animals

Code: C417G04U02L00

Unit documents: Scientific Zone, Scientists in action, Evaluation, My scientific journal

Lesson 1. The Animal World

Code: C417G04U02L01

Objetives

- Explain the classification of animals according to their characteristics.
- List the characteristics of vertebrates.
- Explain what is oviparate and viviparate.
- Show appreciation and respect for animals.
- Name the main characteristics of invertebrates.
- Name different classes of vertebrates and invertebrates.
- Identify characteristics and examples of worm, mollusks, echinoderms, and arthropods

Topics

- Nourishment
- With or without wpine
- And the offspring… Where do they come from
- Invertebrates… There are so many of them!

Keywords

- animals
- arthropods
- carnivore
- cnidarian
- echinoderms
- herbivore
- invertebrate
- invertebrates
- mollusks
- omnivore
- oviparate
- sponges
- vertebrate
- viviparate
- worms

Lesson 2. I have a skeleton!

Code: C417G04U02L02

Objetives

- Define what a vertebrate animal is.
- Name the five groups in which vertebrates are classified.
- Identify the characteristics of each of the five groups of vertebrates.
- Show appreciation and respect for the conservation of vertebrates.
- Define adaptation.
- Identify and explain the different types of adaptations exhibited by organisms.
- Analyze how adaptation relates with the survival of organisms.

Topics

- I have a skeleton!
- We love water!
- We are cold blooded
- We crawl on the ground
- Handsome feathers
- We are everywhere
- Surviving in the environment
- Deceitful Appearances

Keywords

- adaptations
- fish
- amphibians
- reptiles
- birds
- mammals
- vertebrates
- migration
- concealing coloration
- contrast coloration
- disguise

Lesson 3. Extintion is forever

Code: C417G04U02L03

Objetives

- Define extinct species and endangered species.
- Distinguish between natural extinction and provoked extinction.
- Identify the factors that can cause the extinction of a species.
- List some of the endangered animals of Puerto Rico.
- Offer ideas that would help diminish the problem of species extinction.
- Demonstrate affection and appreciation for animals.
- List some endangered species of Puerto Rico and the world.

Topics

- Extintion is forever
- Who is responsible?
- Know me, protetct me
- How can we prevent extinction?

Keywords

- endangered species
- endemic
- environmental pollution
- extinct species
- habitat destruction
- habitat
- human caused extinction
- invasive species
- natural extinction
- non-native species
-

Lesson 4. The endmic animals of the Dominican Republic

Code: C417G04U02L04

Objetives

- Investigate diseases of animals that inhabit their immediate surroundings or town.
- Identify different species of endemic animals by their common name and scientific name.
- Investigate endemic species of other countries.
- Classify the studied endemic animals as vertebrates or invertebrates.
- Identify different endemic animals by their description.

Topics

- Endemic animals of our island

Keywords

- endemic

Unit 3. Our Bodies

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

Lesson 0. Our body

Code: C417G04U03L00

Unit's documents: Scientific Zone, Evaluation, Scientists in Action, My scientific journal

Lesson 1. The cell: protagonist of life

Code: C417G04U03L01

Objetives

- Define cell.
- Identify the main parts of the cell.
- Classify cells in two groups: animal and plant.
- List the differences between animal and plant cells.
- Identify and explain the different levels of organization in the human body.
- Define: cell, tissue, organ, and system.
- Explain what some of the systems in the human body are made up of.

Topics

- The cell: protagonist of life
- What it's like
- Teamwork
- Organs and systems
- The systems

Keywords

- animal cell
- arteries
- capillaries
- cell
- cell membrane
- cell wall
- chloroplasts
- circulatory system
- cytoplasm
- digestive system
- endocrine system
- multicellular organisms
- muscular system
- nervous system
- nucleus
- organelles
- plant cell
- reproductive system
- respiratory

Lesson 2. The stages of development

Code: C417G04U03L02

Objetives

- Identify and distinguish between the stages in the cycle of life.
- Identify the role of the pituitary gland during puberty.
- Identify the changes associated with puberty.

Topics

- We all grow
- The stages of development
- What happens to us during adolescence?

Keywords

- adolescence
- conception
- hormones
- pituitary gland
- puberty

Lesson 3. Systems of the body

Code: C417G04U03L03

Objetives

- Identify the parts of the nervous system that we use to carry out different actions.
- Identify and distinguish the organs of the female and male reproductive systems.
- Describe the functions of the components of blood.
- Describe the function of the excretory system.
- Identify the organs of the digestive system and their functions.
- Recognize the importance of eating healthy food.
- Mention strategies for maintaining a healthy digestive system.
- Identify the organs of the respiratory system and their functions.
- Describe the digestive and respiratory processes.
- Mention some ways to prevent respiratory diseases.

Topics

- Hello! We are the systems!

Keywords

- autonomic nervous system
- central nervous system
- circulatory system
- digestive system
- endocrine system
- excretory system
- immune system
- muscular system
- nervous system
- peripheral nervous system
- reproductive system
- respiratory system
- skeletal system

Lesson 4. A body in optimal conditions

Code: C417G04U03L04

Objetives

- Indicate the necessary factors for a healthy body.
- Describe the functions of the five food groups within the body.
- Identify the food groups consumed in his or her diet with the purpose of evaluating and improving his or her eating habits.
- Indicate what exercises they practice in order to keep themselves healthy.
- Indicate the personal hygiene habits that help keep them healthy.
- Identify the personal hygiene practices they carry out.

Topics

- A body in optimal conditions
- What should I eat?
- Healthy mind, healthy body
- Totally clean
- Bedtime

Keywords

- personal hygiene
- rest
- dairy
- protein
- vegetables
- fruits
- grains.

Lesson 5. Tropical and viral diseases

Code: C417G04U03L05

Objetives

- Classify diseases according to their causes.
- Classify diseases according to their impact.
- Define what tropical and viral diseases are.
- Propose preventative measures against the viral diseases of the country.
- Identify the most impactful tropical diseases of the country.
- Describe at least five ways of preventing infection of tropical diseases.
- Identify vaccination as one of the most effective methods of preventing disease.

Topics

- Tropical diseases
- Viral diseases

Keywords

- disease
- endemic
- endogenous disease
- environmental disease
- epidemic
- exogenous disease
- pandemic
- sporadic
- symptoms
- tropical diseases
- vaccines
- vectors
- virus

Unit 4. Energy and the Sources of Sound

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

Lesson 0. Energy and sound sources

Code: C417G04U04L00

Unit's documents: Scientific Zone, Scientists in Action, Let's Investigate! Evaluation, My Scientific Journal

Lesson 1. Let's investigate energy and sound

Code: C417G04U04L01

Objetives

- Define energy and sound.
- List the types of energy and distinguish them from each other.
- Provide examples of the types of energy.
- Distinguish between renewable and non-renewable energy.
- Mention and explain the different forms in which energy manifests itself.
- Relate sound with the movement of matter.
- Explain how one's own voice produces an echo.

Topics

- Energy
- Types of energy
- Sources and ways to use energy
- The hisytory of energy
- Learning about sound
- Echo

Keywords

- echo
- electrical energy
- energy
- forms of energy
- geothermic energy
- kinetic energy
- light energy
- potential energy
- sound
- thermal energy
- wind energy

Lesson 2. Let's explore sound

Code: C417G04U04L02

Objetives

- Identify the state of matter that best transmits sound.
- Explain what volume and intensity of sound consist of.
- Identify strong sounds as well as sharp (high) sounds and bass (low) sounds in a musical recording.
- Indicate the difference between frequency and timbre.
- Explain how the human ear detects sound.
- List the parts of the ear.
- Assess which measures are necessary for taking care of the auditory organs.

Topics

- Sound travel
- Properties of sound
- Frequency and timbre
- The parts of the ear
- Animal sounds
- How to maximize the senses

Keywords

- amplitude of waves
- distance
- electromagnetic waves
- external ear
- frequency
- high-pitched tone
- inner ear
- intensity
- length of waves
- low tone
- mechanical waves
- middle ear
- molecules
- propagation of sound
- properties of sound
- reflection
- refraction
- senses
- sound waves

Lesson 3. Communicating with animals

Code: C417G04U04L03

Objetives

- Describe how animals use sound to communicate.
- Define ultrasound.
- Explain how ultrasound is used in the field of medicine and in navigation.
- Explain what a sonogram consists of and its use in the field of medicine.
- Explain what sound level meter is and how it is used.
- Identify the sources of noise pollution in his or her home community and school.
- Identify agents that help reduce noise pollution.

Topics

- Communicating with animals
- Sonograms
- Navigating by sound
- Ultrasound animals
- Measuring sound

Keywords

- echolocation
- sonar
- sonogram
- sound level meter
- ultrasound

Lesson 4. Energy transformation and transmission

Code: C417G04U04L04

Objetives

- Identify the different types of energy according to their uses and characteristics.
- Identify each of the three ways in which energy can transform and provide examples.
- Explain why the Sun is considered to be the main source of energy for the planet.
- Explain the importance of producing electric energy.
- Propose viable measures to guide the rationed use of electric energy.

Topics

- Energy
- Forms of energy
- Energy transference
- Energy transformation

Keywords

- aero generators
- chemical energy
- conduction
- convection
- energy
- luminous energy
- nuclear energy
- radiation
- wind power

Unit 5. Electricity Around Us

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

Lesson 0. Electricity around us

Code: C417G04U05L00

Unit's documents: Scientific Zone, Let's Investigate, Evaluation, My Scientific Journal

Lesson 1. Magnetic pull

Code: C417G04U05L01

Objetives

- Observe and mention the properties of magnets.
- Mention how magnets are used.
- Briefly describe the history of magnets and how they were used in antiquity.
- Distinguish between two types of magnets: natural and artificial.
- Define what a compass is and explain its use.
- Relate atomic structure to the phenomenon of static electricity.
- Define static electricity.

Topics

- Magnets
- The history of magnets
- Classifying magnets
- What is a compass?
- Electric planet
- Static electricity
- Static electricity in action

Keywords

- artificial magnet
- atom
- compass
- magnet
- magnetism
- magnetite
- natural magnet
- static electricity
- types of magnets

Lesson 2. It's electrifying!

Code: C417G04U05L02

Objetives

- Define electrical current.
- Describe electrical conductors, insulators, and semiconductors.
- Mention and identify the parts of an electrical circuit.
- Define and compare series circuits to parallel circuits.
- Describe and identify the parts of a battery.
- Describe what a power plant is.
- Mention the different types of power plants and establish the differences among them.
- Explain the process of electrical production in a thermoelectric power plant.

Topics

- It's electrifying!
- Electric conductors
- Electric circuits
- Classifying circuits
- What is a battery?
- Power plants
- Producing clean energy

Keywords

- Alessandro Volta
- alternating current
- amps
- atom
- battery
- clean energy
- closed circuit
- conductors
- consumption device
- continuous current
- electric circuit
- electrical current
- electricity
- electrolyte
- electrons
- electroscope
- generator
- geothermic energy
- hydro energy

Lesson 3. Let's save energy

Code: C417G04U05L03

Objetives

- Explain the importance of saving energy.
- Offer recommendations for saving electrical energy.
- Name the various alternate sources that can be used to produce electrical energy.
- Demonstrate the advantages and disadvantages of each of the alternative sources.
- Motivate to save electrical energy in the home, school, or community.
- Promote the conservation and improvement of natural resources.
- Identify alternatives that help preserve our natural resources.

Topics

- Saving energy
- Some recommendations
- Alternate energy sources
- How can we save electricity?
- Natural resources are important

Keywords

- alternate energy sources
- conservation
- fossil fuel
- geothermal energy
- hydro energy
- natural resources
- nonrenewable
- nuclear energy
- renewable
- saving energy
- solar energy
- wind energy

Unit 6. Light and heat

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

Lesson 0. Light and heat

Code: C417G04U06L00

Unit's documents: Scientific Zone, Scientists in Action! Evaluation, My Scientific Journal

Lesson 1. Lighten up!

Code: C417G04U06L01

Objetives

- Describe the characteristics of light.
- Explain how light behaves when it collides with matter.
- Identify both artificial and natural sources of light.
- Demonstrate and define: regular reflection, diffuse reflection, and refraction.
- Identify the characteristics of a transparent object, a translucent object, and an opaque object.
- Investigate what colors white light is made up of.
- Show how a rainbow is made.
- Define black and white colors from the visible spectrum.

Topics

- Lighten up
- Illumination
- Reflection or refraction
- Travel of light
- Colors of the sun
- In color
- You can make a rainbow

Keywords

- bioluminescence
- black color
- colors
- diffuse reflection
- light
- luminous object
- opaque
- prism
- refraction
- rainbow
- regular reflection
- translucent
- transparent
- visible spectrum of light
- white color

Lesson 2. I spy…

Code: C417G04U06L02

Objetives

- Investigate how light affects vision and the objects we observe.
- Identify the parts of the human eye.
- List the functions of each of the parts of the eye.
- Recognize how eyesight is produced.
- Prepare a list of the practices that help keep the eyes healthy.
- Observe the shape of different lenses and determine if they are concave or convex.
- Demonstrate empathy and solidarity with those who lack eyesight.

Topics

- Why do you see?
- Through the eyes
- How do you see?
- Look at your eyes
- Out of sight…

Keywords

- concave lens
- convex lens
- cornea
- eye
- eyebrows
- eyelashes
- eyelid
- eyesight
- iris
- lachrymal glands
- lens
- light
- optic nerve
- pupil
- retina
- tear ducts
- vision
- vitreous
- vitreous gel

Lesson 3. It feels hot outside!

Code: C417G04U06L03

Objetives

- Define what heat is.
- Identify the sources receivers of heat by using different examples.
- Demonstrate and define the processes of heat transmission: conduction, convection, and radiation.
- Differentiate between a cold blooded animal and a warm blooded animal.
- List some of the uses for heat in medicine, the home, and industry.
- Identify, in different examples, the fuel, the oxidizing agent, and the initial temperature.
- Recognize the application of solar energy.
- Recognize the importance of the Sun as source of energy for Earth.

Topics

- Why is it hot?
- Sources or receivers?
- Transferring heat
- Temperature
- Hot or cold?
- How is heat used?
- Produced heat
- Uses of solar energy
- Earth's heat

Keywords

- cold-blooded animal
- combustion
- conduction
- convection
- fuel
- heat
- initial temperature
- oxidizing agent
- radiation
- receiver
- source of heat
- temperature
- uses of heat
- warm-blooded animal

Unit 7. Adventure Through the Solar System

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

Lesson 0. Adventure through the Solar System

Code: C417G04U07L00

Unit's documents Scientific Zone, Scientists in Action! Evaluation, My Scientific Journal

Lesson 1. 0

Code: C417G04U07L01

Objetives

- Indicate what gasses the Sun is made up of.
- Indicate and describe both the internal and external parts of the Sun.
- Explain how eclipses and auroras happen.
- Describe solar phenomena such as sunspots and solar flares.
- Explain the importance Earth's elements.
- List Earth's layers.
- Differentiate between interior planets and exterior planets.

Topics

- Daytime Sun
- What is the sun like?
- Solar events
- Polar spectacles
- Planet Earth
- What is Planet Earth like
- Travel around the planets

Keywords

- atmosphere
- aurora australis
- aurora borealis
- aurora
- biosphere
- chromosphere
- core
- corona
- Earth
- exterior planets
- fusion
- hydrosphere
- interior planets
- lithosphere
- photosphere
- planets
- solar eclipse
- solar flares
- Sun
- sunspots

Lesson 2. The moon and constellations

Code: C417G04U07L02

Objetives

- Identify certain important aspects about the Moon: its position in relation to Earth, the duration of day, and night, among others.
- Describe the surface of the Moon.
- Mention and describe the phases of the Moon.
- Identify the relation between the Moon and the tides.
- Define constellation.
- Explain the origin of constellations.
- Classify stars by temperature.

Topics

- The moon and constellations
- What is the moon like?
- Lunar movement and phases
- The moon and the sea
- Group of stars
- Knowing the constellations
- Stars: cold or hot?

Keywords

- constellations
- crescent Moon
- full Moon
- Moon
- new Moon
- stars
- tides
- waxing Moon

Lesson 3. Space trip

Code: C417G04U07L03

Objetives

- Define what a telescope is and what its main function is.
- Define what a radio telescope is and what its main function is.
- Describe what the planets in the Solar System would look like through a telescope.
- Recognize the history of space travel and mention the contributions of certain important figures.
- Discuss how advances in space exploration depend on technological advances.
- List and describe the celestial bodies.

Topics

- Space trip
- Arecibo's radio telescope
- The planets through a telescope
- Lunar exploration
- 3,2,1… take off!
- Moon landings
- The celestial bodies

Keywords

- Apollo Mission
- asteroid
- celestial body
- comet
- exploration of the Moon
- meteor
- radio telescope
- space travel
- technology
- telescope

Lesson 4. Natural phenomenons and earthquakes

Code: C417G04U07L04

Objetives

- Define the term natural phenomenon.
- Identify and describe the differences between the Earth's layers.
- Describe the relief of the lithosphere.
- Establish relationships between earthquakes and landslides.
- Establish relationships between earthquakes and energy.
- Identify and describe tsunamis as seismic phenomenons.
- Investigate the different types of rocks.

Topics

- Natural phenomenons
- Earthquakes

Keywords

- core
- crust
- epicenter
- hypocenter
- magma
- mantle
- natural phenomenons
- Richter scale
- seaquake
- tsunami

Lesson 5. Movement and trajectory of the planets of the Solar System

Code: C417G04U07L05

Objetives

- Establish relationships between the Earth's movement and time zones.
- Compare and contrast the Earth's movements of revolution and rotation.
- Explain why our planetary system is called the Solar System.
- Describe the orbit of the planets of the Solar System and of other celestial bodies like comets.

Topics

- The planets revolve around the Sun
- Ellipses

Keywords

- aphelion
- ellipse
- orbit
- perihelion
- revolution
- rotation

Unit 8. Let's Explore Our Natural Resources

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

Lesson 0. Let's explore our natural resources

Code: C417G04U08L00

Unit's documents Scientific Zone, Scientists in Action! Evaluation, Let's Investigate! Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. Mineral resources

Code: C417G04U08L01

Objetives

- Define what a mineral is.
- List the properties of minerals.
- Give examples of minerals.
- Offer examples of the uses given to minerals.
- List minerals commonly found in Puerto Rico.
- Localize, on a map of Puerto Rico, municipalities rich in mineral deposits.
- Identify minerals commonly found in Puerto Rico.

Topics

- What are minerals like
- How we benefit from minerals
- Are there minerals in Puerto Rico
- Minerals in Puerto Rico!

Keywords

- agate
- calcite
- chalcopyrite
- clay
- crystals
- decoration
- hematite
- jewelry
- magnetite
- marble
- medicine
- minerals
- nutrition
- quartz
- salt
- sand

Lesson 2. Let's study rocks!

Code: C417G04U08L02

Objetives

- Define what a rock is.
- Mention the characteristics of igneous rocks, sedimentary rocks, and metamorphic rocks.
- Understand the formational process of each of the three types of rocks.
- Identify types of rocks.
- Define what a fossil is.
- Identify fossilization or the formational process of fossils.
- Recognize the most important events of geological time.

Topics

- Let's study rocks!
- Formation and origin
- Other kinds of rock
- The history of fossils
- What are fossils like?
- Going back in time

Keywords

- clay rocks
- fossils
- igneous rock
- limestone rock
- metamorphic rock
- rock
- saline rock
- sedimentary rock
- siliceous rock

Lesson 3. Grains of sand

Code: C417G04U08L03

Objetives

- Define sand.
- Observe samples of sand and mention some of their characteristics.
- Classify sand by groups, according to origin.
- Define beach.
- Define dune.
- List and describe the three costal zones.
- Argue about the environmental issue created by the extraction of sand from the beaches of Puerto Rico.

Topics

- Grains of sand
- Where does Puerto Rico's sand come from?
- Classifying Puerto Rico's sand

Keywords

- backshore
- beach sand
- beach
- costal zones
- dunes
- foreshore
- inshore
- river sand
- sand
- siliceous sand

Lesson 4. Use of natural resources

Code: C417G04U08L04

Objetives

- Classify different resources as renewable and non-renewable.
- Explain the relationship between human beings and natural resources.
- Evaluate their use of natural resources.
- Explain how they can help in the conservation of natural resources.
- Identify the renewable resources that are used in the production of energy in Puerto Rico.
- Describe the problems that the misuse of natural resources can cause.

Topics

- Natural resources
- Natural resources: sources of energy

Keywords

- chemical energy
- electromagnetic spectrum
- geothermal energy
- geysers
- hydroelectric energy
- law of conservation of energy
- luminous energy
- natural resources
- non-renewable resources
- nuclear energy
- nuclear reactor
- renewable sources

Lesson 5. Puerto Rico and natural resources

Code: C417G04U08L05

Objetives

- Define the concepts lake, reservoir and cave.
- Mention the main reservoirs of Puerto Rico.
- Define the process through which caves form.
- Define the concept of aquifer and the importance of its conservation.
- Define the concepts conservation and pollution.
- Define what a natural resource is.
- Mention some of Puerto Rico's natural resources.
- Mention what environmental conditions affect our natural resources.

Topics

- Puerto Rico and its natural resources
- A subterranean world
- Water, beneath the ground?
- Resources: renewable or non-renewable
- Do we contamine or conserve?

Keywords

- acid rain
- air
- aquifer
- cave
- conservation
- erosion
- karst zone
- lake
- natural resources
- non-renewable natural resources
- pollution
- renewable natural resources
- reservoir
- soil
- thermal water

Lesson 6. Natural resources in the Dominican Republic

Code: C417G04U08L06

Objetives

- Establish relationships between natural resources and environmental campaigns.
- Classify natural resources as renewable or non-renewable.
- Identify the natural resources that distinguish other countries of the region.
- Identify on a map the most plentiful natural resources in the different regions of the country.
- Identify the regions of the country where the main use of soil is agricultural activity.
- Mention the different types of forests that exist in the country.

Topics

- Dominican soil
- Our water resources
- Dominican forests
- Our air
- Conservation efforts

Keywords

- agricultural labor
- agriculture
- aquifers
- conserve
- forest
- mining
- natural resources
- preserve
- reforestation
- stockbreeding
- water resources

Unit 9. The Oceans

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

Lesson 0. The oceans

Code: C417G04U09L00

Unit's documents Scientific Zone, Let's Investigate! Scientists in Action! Evaluation, My Scientific Journal

Lesson 1. Water everywhere

Code: C417G04U09L01

Objetives

- Describe the water cycle.
- Distinguish the processes of evaporation, condensation, precipitation, and solidification.
- Distinguish between oceans and seas.
- Explain what causes waves and ocean currents.
- Describe what the surface of the bottom of the ocean is like.
- Explain how scientists obtain information about the bottom of the ocean.
- Mention and describe the different areas or sections that have been identified at the bottom of the ocean.

Topics

- Water always returns
- Seas and oceans… only one
- What makes the water move?
- Other movements
- Without water… what would you see?
- Deeper and deeper
- The dark side of the ocean

Keywords

- condensation
- continental shelf
- continental slope
- evaporation
- ocean currents
- ocean ridges
- ocean
- oceanic basin
- oceanic trench
- precipitation

- sea
- sonar
- telluric movement
- tides
- tsunami
- water cycle
- wave

Lesson 2. The ocean and its wonders

Code: C417G04U09L02

Objetives

- Describe life in the oceans.
- Give examples of sea organisms.
- Demonstrate how life is distributed in the oceans.
- Define what a coastal zone is.
- Describe life in the depths of the ocean.
- Reflect on the importance of the oceans in terms of commerce, tourism, and economy.
- Recognize oceans as a natural resource.
- Mention the benefits we receive from the oceans.

Topics

- The ocean and its wonders
- Where do I live?
- Life in the deep
- Oceans and humans
- The sea and its resources

Keywords

- algae
- coastal zone
- fishing
- kelp
- minerals
- natural resource
- node
- petroleum
- producers

Lesson 3. Pollution: Everyone's problem

Code: C417G04U09L03

Objetives

- Identify the sources of contamination that affect the ocean.
- Describe the causes of an oil spill.
- List the consequences of the contamination of the ocean for sea life.
- Comprehend how the contamination that happens on the earth reaches the oceans.
- Design a strategy for cleaning up an oil spill in a diorama.
- Describe how solid waste left on beaches and deforestation affects organisms.
- Show how they can contribute to help reduce environmental contamination in coastal zones.

Topics

- Pollution: Everyone's problem
- Enemis of the ocean
- Other enemis of the ocean

Keywords

- marine habitats
- oil spill
- pollution
- solid waste

Unit 10. Ecology and the Conservation of Our Environment

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

Lesson 0. Ecology and the conservation of our environment

Code: C417G04U10L00

Unit's documents Scientific Zone, Scientists in Action! Let's Investigate! Evaluation, My Scientific Journal

Lesson 1. The environment around us

Code: C417G04U10L01

Objetives

- Define ecosystem.
- Identify biotic and abiotic elements in different ecosystems.
- Define what ecology is.
- Show and explain what the elements of an ecosystem are.
- Define forest.
- Explain why forests are a valuable natural resource.

Topics

- The environment around us
- An ecosystem? Let's investigate
- The actors in our ecosystem
- Our valuable forests
- Puerto Rico's beautiful forests

Keywords

- abiotic factor
- biosphere
- biotic factor
- community
- ecology
- ecosystem
- forest
- habitat
- organisms
- population

Lesson 2. Recover, reduce, reuse, recycle

Code: C417G04U10L02

Objetives

- Define recycling.
- Explain the significance of the recycling symbol.
- Identify recyclable materials.
- Mention the benefits of recycling for the environment.
- Explain how recycling contributes to the preservation of the environment.
- Carry out activities at school as well as at home that contribute to the preservation of the environment.
- Organize or participate in activities that promote recycling in school.

Topics

- Recover, reduce, reuse, recycle
- A great alternative
- Recovering for recycling
- We can recycle
- We win by recycling
- Recycling at school

Keywords

- glass
- metals
- paper
- plastic
- recover
- recyclable materials
- recycle
- recycled materials
- reduce
- reuse

Lesson 3. Flow of energy in ecosystems

Code: C417G04U10L03

Objetives

- Classify different organisms as producers, consumers or decomposers.
- Analyze and explain the importance of maintaining the balance of ecosystems.
- Identify the ways in which people can help maintain the balance of ecosystems.
- Evaluate the role of decomposers in ecosystems.
- Describe the different types of ecosystems.
- Represent the flow of energy in an ecosystem with a food chain.
- Identify the producer and the different types of consumers in a food chain.

Topics

- Ecosystem
- Food relationship
- Flow of energy

Keywords

- abiotic factors
- aquatic ecosystems
- autotrophs
- biocenosis
- biotic factors
- biotope
- decomposers
- ecosystem
- food chain
- food network
- heterotrophs
- homeostasis
- mixed ecosystems
- photosynthesis
- primary consumer
- secondary consumer
- sun
- terrestrial ecosystems
- tertiary

Unit 11. Matter and Mechanics

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

Lesson 1. Matter

Code: C417G04U11L01

Objetives

- Describe the conditions of the term matter.
- Compare and contrast homogeneous and heterogeneous mixtures.
- Identify water as the only substance that can be found in nature in the three states of matter.
- Classify different examples of physical and chemical changes.
- Identify what is matter and what is not.
- Determine the buoyancy of matter in water.
- Distinguish between what is matter and what is not.
- Determine the method of separation of mixtures that is best for different types of mixtures.
- Compare and contrast the three states of matter.
- Calculate the density of different examples of matter according to their mass and volume.
- Identify the different changes in states of matter.

Topics

- What is matter?
- States of matter
- Classifying matter
- Changes in matter
- Mixtures

Keywords

- atoms
- buoyancy
- chemical change
- condensation
- decantation
- density
- distillation
- elements
- evaporation
- filtration
- fusion
- gaseous
- heterogeneous mixtures
- homogeneous mixtures
- liquid
- magnetic separation

- mass
- matter
- mixture
- plasma
- physical changes
- physical propert

Lesson 2. Motion

Code: C417G04U11L02

Objetives

- Design demonstrations for each one of the laws of motion.
- Explain the effects of air and gravity on falling bodies.
- Identify the different forces that act on different daily situations.
- Correctly calculate the speed of the motion of a body.
- Apply the formula of velocity to determine the position of a body after a given time.
- Identify the difference between acceleration and deceleration.
- Distinguish between speed and velocity.

Topics

- Motion
- Speed and velocity
- Acceleration and deceleration
- Law of motion
- Types of force

Keywords

- acceleration
- circular motion
- deceleration
- friction
- force of gravity
- inertia
- linear motion
- magnetic force
- motion
- net force
- revolution
- speed
- tension
- velocity

Lesson 3. Machines

Code: C417G04U11L03

Objetives

- Distinguish between simple machines and compound machines.
- Identify and describe different simple machines.
- Classify different machines as simple or compound.

- Identify what type of machine is best for doing a job.
- Describe the importance of machines for human beings.
- Design an activity to demonstrate the interactions between work, force and energy.

Topics

- Simple machines
- Compound machines

Keywords

- compound machines
- fulcrum
- inclined plane
- lever
- load
- machines
- power
- pulley
- resistance
- screw
- simple machines
- wedge
- wheel and axle

Lesson 4. Technology in medicine

Code: C417G04U11L04

Objetives

- Mention and describe at least three technological advances that have helped the progress of medicine.
- Explain the importance of technology for the progress of medicine and science in general.
- Mention and describe at least three optical instruments used in medicine.
- Identify at least three medical analyses commonly used in diagnosing illnesses.
- Evaluate the role of the microscope in the advancement of medicine.

Topics

- Technology and medicine
- Radiography
- Medical analyses
- Optical instruments

Keywords

- electronic microscope
- endoscope
- glasses
- medical analyses
- optical instruments
- radiographies