Science 5

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

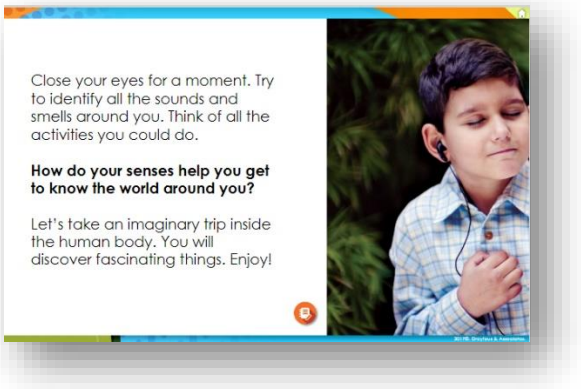
The course Science 5 is composed of ten units. Each unit is composed of lessons. Each lesson is divided into sections that develop their individual topics. Each lesson contains a descriptive log, activities, worksheets and handouts that are related to the content and, as in most cases, website links and resources. It also proposes assessment exercises in order to help the students in different tasks.

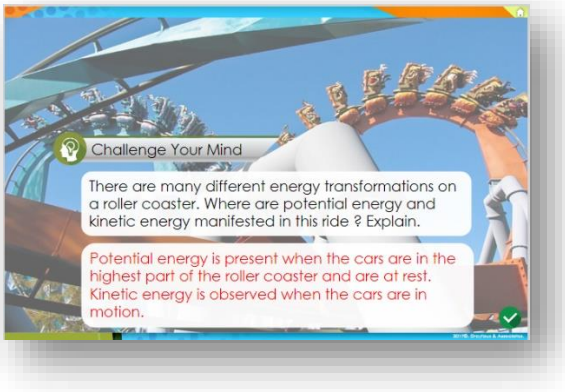
Here are some of the sections normally found in each lesson's presentation and documents.

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 several 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: C417G05U00L00

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
- tube
- coat
- latex gloves
- lighter
- microscope
- microscope slide
- mortar and pestle
- objective lenses
- ocular lens
- safety goggles
- scale
- scientific skills
- stage
- stage clips
- test tube
- test tube rack

Lesson 1. Scientific Knowledge

Code: C417G05U00L01

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: C417G05U00L02

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: C417G05U00L03

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: C417G05U00L04

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. Cells

Code: C417G05U00L05

Objetives

- Recognize that the cell is the basic unit of life.
- Recognize that all living things are made up of cells.
- Mention the different parts of the cell and explain that all of these parts work together for the cell to live.
- Explain that the combination of many similar cells forms tissues.
- Explain that the combination of several tissues forms organs.
- Recognize that the combination of several organs forms systems with specific functions in the body.

Topics

- History of cells
- Classification and types of cells
- Part of cells
- Cells work together

Keywords

- cell wall
- cytoplasm
- mitochondria
- multicellular
- organelles
- photosynthesis
- tissues
- unicellular
- vacuole

Unit I. Let's get to know plants

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

Lesson 0. Let's get to know plants

Code: C417G05U01L00

Unit's documents: Scientific Zone, Let's investigate, Scientists in action, Evaluation, Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. Plants and their parts

Code: C417G05U01L01

Objetives

- Classify leaves according to shape and edges.
- Define the terms root, stem and leaf.
- Describe the function of the roots, stems and leaves.
- Explain the transportation of substance in vascular plants.
- Identify and discover different types of roots and their parts.
- Identify and discover different types of stem.
- Identify the structures that make a leaf.

Topics

- Plant structure
- Types of roots
- Stems
- Leaves: function and types
- The flower
- Transport of substances in a plant
- Benefit of plants

Keywords

- aerial stems
- blade
- cane
- chlorophyll
- creeping stems
- fibrous roots
- flower parts
- heart leaves
- leaf parts
- leaf shapes
- needle leaves
- oval leaves
- petals
- petiole
- phloem
- pistil
- respiration
- root hairs
- sepal
- smooth leaves
- spear leaves
- stamen
- stems
- stipe
- subterranean streams
- taproot roots

Lesson 2. Plant classification

Code: C417G05U01L02

Objetives

- Explain what a plant is.
- Distinguish between a bryophyte and a pteridophyte.
- Identify and describe non-vascular plants like moss and liverworts.
- Identify and describe non-seeded plants.
- Classify plants as gymnosperm and angiosperm.
- Identify plants as monocotyledonous and dicotyledonous.
- Explain what herbaceous and woody stems are.
- Mention a variation of plants that are classified as annual, biennial and perennial.

Topics

- Scientific classification of plants
- Bryophytes or non-vascular plants
- Tracheophytes or vasculae plants
- Other ways to classify plants

Keywords

- angiosperm
- annual
- biennial
- bryophyte: moss
- cotyledon
- dicotyledonous (conifers)
- gymnosperm
- herbaceous
- liverwort
- medicinal
- monocotyledonous
- non-seeded plants
- ornament plants
- perennial
- pteridophyte
- rings
- woody

Lesson 3. Plant diversity

Code: C417G05U01L03

Objetives

- Describe the importance of plants.
- Explain the importance of plant diversity.

Topics

- Plant diversity
- Let's travel around the world
- Medicinal plants
- Desert plants
- Redwods and sequoias
- Plants of the prairies

Keywords

- adaptations
- agave
- algae
- aloe
- big bluestem grass
- cactus
- chamomile
- climate
- conifers
- desert
- coneflower
- Hyperion
- jade
- kelp
- lavandula
- Masdevallia Caesia
- Mimosa Pudica
- niche
- oceans
- stinging nettle
- plankton
- plant
- medicinal plants
- prairies
- Rafflesia arnoldii
- Redwood

Lesson 4. Puerto Rico: Tropical paradise

Code: C417G05U01L04

Objetives

- Describe diverse types of flora around the Island's coastal zone.
- Identify and describe flora found in Puerto Rico's valleys and plains.
- Identify and describe flora within the mountainous zone of the Island.
- Identify and describe Puerto Rico's geographical zones.
- Identify flora in Puerto Rico's different geographical zones.
- Identify Puerto Rico's variety of vines.

Topics

- Puerto Rico: Tropical paradise
- Flora of coastal zones
- Flora in Puerto Rico's valley and plains
- Plants in mountain areas
- Vines and climbing plants of Puerto Rico

Keywords

- coasts
- flora
- highlands
- mangrove (red,white, black and buttonwood)
- medicinal plants
- mountainous
- plains
- valleys

Unit 2. Diversity within the Animal Kingdom

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

Lesson 0. Diversity within the Animal Kingdom

Code: C417G05U02L00

Unit's documents: Scientific Zone, Let's investigate, Scientists in action, Evaluation, Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. Invertebrates: benefits and dangers

Code: C417G05U02L01

Objetives

- Analyze the importance of invertebrates in the environment and life.
- Classify invertebrates in different groups.
- Classify muscles and the three different groups these are divided into.
- Explain how some invertebrate species can be harmful to humans.
- Explain the difference between flatworms, roundworms and segmented worms.
- Identify characteristics of invertebrates that are useful and harmful to humans.
- Identify the 4 major types of arthropods.

Topics

- Invertebrates: benefits and dangers
- Sponges
- Cnidarians
- Echinoderms
- Flat worms
- Segmented worms
- Roundworms
- Mollusks
- Arthropods
- Our positive relationship with invertebrates
- Adverse effects of some invertebrates

Keywords

- arachnids
- arthropods
- biocontrol
- bivalve
- cephalopods
- cnidarians

- crustaceans
- diplopods
- echinoderm
- gastropods
- herbivory (herbivores)
- hermaphrodite
- insects
- invertebrate
- mollusks
- mutualism
- nematoda
- segmented worms
- sporangium (sporangia)

Lesson 2. The wonderful world of vertebrates

Code: C417G05U02L02

Objetives

- List the characteristics that are used to classify vertebrate animals.
- Classify the five groups vertebrates are divided into.
- Compare the difference between three species of fish that exist.
- Mention and identify a variety of reptiles in existence.
- Compare the difference between reptiles and birds and how these take cares of their eggs and offspring.
- Explain the difference between the three groups of mammals, according to how they reproduce.

Topics

- The wonderful world of vertebrates
- Fish
- Amphibians
- Reptiles
- Birds
- Mammals

Keywords

- amphibians
- backbone
- birds
- bony fish
- cartilaginous fish
- cold blood
- fish
- fish with jaws
- gills
- jawless fish
- mammals
- mammary gland
- marsupials
- marsupium
- metamorphosis
- monotremes
- placentals
- reptiles
- vertebrate

Lesson 3. Vertebrate survival

Code: C417G05U02L03

Objetives

- Define and list examples of adaptation.
- Describe vertebrate adaptation according to the environment in which they live.
- Describe vertebrate physiological adaptation.
- Explain and identify different types of vertebrate adaptation due to feeding (diet).
- Explain and identify the different types of movement (circumstances or situations) that led to adaptation.

Topics

- Vertebrate survival
- Charges in structure
- Motion adaptation
- Physiological adaptation
- Behavioral adapation
- Taking advantage of adaptation resources

Keywords

- adaptation
- adaptation morphological
- behavior adaptation
- metabolism
- mimicry
- motion adaptation
- physiological adaptation
- thermal insulation

Lesson 4. Know and preserve our country's fauna

Code: C417G05U02L04

Objetives

- Describe mammals that are part of Puerto Rico's fauna.
- Explain different categories that classify species within our wildlife.
- Identify and classify the species that form part of Puerto Rico's fauna.
- Identify and describe amphibians and reptiles that are part of Puerto Rico's fauna.
- Identify birds in the Island's wildlife.
- Identify marine and freshwater fauna.
- Mention endangered species.

Topics

- Know and preserve our country's fauna
- Our wildfire
- Our reptile
- Amphibians like the coqui
- Pluvial and marine fauna
- Knowing our avifauna

Keywords

- avifauna
- endemic
- fauna
- herpetofauna
- indigenous (native)
- migratory
- resident

Lesson 5. Learn about and preserve the Dominican Republic's fauna

Code: C417G05U02L05

Objetives

- Identify the predominant groups of animals in Dominican fauna.
- Recognize the Ministry of the Environment as the institution in charge of securing the well-being of Dominican fauna.
- Mention examples of species present in Dominican fauna.
- Identify different endangered species in Dominican fauna.
- Describe the reasons that have caused different fauna species to be endangered.

Topics

- Fauna in the Dominican Republic
- Presevation of our fauna

Keywords

- Ecotourism
- endangered species
- endemic
- exotic
- native

Unit 3. The human body

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

Lesson 0. The human body

Code: C417G05U03L00

Unit's documents: Scientific Zone, Stimulate Your Mind, Let's investigate, Scientists in action, Evaluation, Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. Our senses

Code: C417G05U03L01

Objetives

- Identify the importance of the senses.
- Explain how our senses help us learn about the world around us.
- Identify and describe parts of the eye.
- Explain how our eyes work and how we must care for them.
- Identify the parts of the nose and their functions.
- Explain how our tongue and skin work.
- Explain how our ears work and how we must care for them.

Topics

- Our senses
- Sight
- Sell
- Taste
- Touch
- Hearing

Keywords

- auditory nerve
- cornea
- dermis
- ear canal
- epidermis
- hearing
- inner ear
- iris
- lens
- middle ear
- nose
- nostrils
- pupil
- retina
- smell
- taste buds
- taste
- tongue
- touch
- skin

- vision

Lesson 2. Bones and muscles: body support

Code: C417G05U03L02

Objetives

- Describe the importance of bones and skeleton in the human body.
- Explain the bone structure.
- Identify and describe different types of joints.
- Infer the functions of each part of the skeleton
- Identify the main parts of the human skeleton.
- Analyze the importance of muscles for human beings and the importance of keeping them healthy.
- Distinguish between voluntary and involuntary muscles

Topics

- The skeleton: our body's armor
- Let's investigate the bone structure
- Joints: The foundation of movement
- Muscles and bones are a team
- Muscle and bones in action

Keywords

- biceps
- bone marrow
- cancellous bone
- compact bone
- cortical bone
- extremities
- fixed
- hinge
- involuntary
- joints
- ligaments
- muscles
- muscular system
- rotating
- skeletal system
- skull
- socket
- spinal column
- spongy bone
- synovium
- tendons
- thorax
- trabecular bone
- voluntary

Lesson 3. Circulatory system

Code: C417G05U03L03

Objetives

- Describe the different mechanisms living organisms have to transport nutrients inside their bodies.
- Describe the composition of blood.
- Name and describe the organs that make up the circulatory system.
- Explain how the organs in the circulatory system works.
- Explain how greater and lesser circulation occurs.
- Predict the effects of exercise on our pulse.
- Explain the illnesses that affect the circulatory system and the ways we can prevent them.

Topics

- The circulatory system
- Know the nutrient transportation path
- The circulatory system and its parts
- Blood circulation in our body
- How to take care of our circulatory system

Keywords

- arteries
- arteriosclerosis
- capillary vessels
- circulatory system
- greater circulation
- heart
- heart attack
- Illnesses
- lesser circulation
- multicellular organisms
- plasma
- platelet
- red blood
- stroke
- unicellular
- veins
- ventricular septum
- white blood cells

Lesson 4. The nervous system

Code: C417G05U03L04

Objetives

- Name and describe the function of the different types of nerves cells.
- Identify and describe the structures made up by the central nervous system.
- Describe the peripheral nervous system and its functions.
- Describe the autonomous nervous system and its functions.

- Explain the reflex arc and how it works.
- Analyze the importance of each part of the nervous system and the importance of taking care of it
- Define what a balanced diet is.

Topics

- The nervous system
- The central nervous system
- Peripheral nervous system
- Autonomic nervous system
- Reflex arc
- Taking care of our nervous system
- Recreation and rest
- Balanced diet

Keywords

- autonomic nervous system
- alanced diet
- rain stem
- rain
- entral nervous system
- cerebellum
- interneurons
- motor nerves
- My Plate
- neurons
- peripheral nervous system
- reflex arc
- response
- spinal cord
- stimulation

Lesson 5. The digestive system and the respiratory system

Code: C417G05U03L05

Objetives

- Identify the organs and their functions of the digestive system.
- Mention strategies for keeping the digestive system healthy.
- Identify the organs and their functions of the respiratory system.
- Describe some ways to keep the digestive and respiratory systems healthy.

Topics

- Ingesting and digesting
- Am I sick?
- Taking care of your digestive system
- Inhale and exhale
- How do I breathe?
- Illnesses… How do I take care of myself?

Keywords

- digestion
- ingestion
- large intestine
- oxidation
- small intestine
- villi

Lesson 6. The immune system

Code: C417G05U03L06

Objetives

- Explain how vaccines help the immune system do its job.
- Describe the importance of following the vaccine itinerary.
- Identify the different cells that work in the immune system and describe their functions.
- Identify and locate the organs that make up the immune system.
- Describe different ways to keep the immune system healthy.
- Compare and contrast the innate and adaptive immune responses.
- Describe how the immune system acts towards an antigen.

Topics

- The immune system
- Functioning on the immune system
- Let's collaborate with the immune system

Keywords

- adaptive or acquired response
- antibodies
- antigens
- B lymphocytes
- immune system
- immune response
- innate response
- leukocytes
- phagocytes
- T lymphocytes

Lesson 7. Nutition

Code: C417G05U03L07

Objetives

- Define what a balanced diet is.
- Design a menu based on a balanced diet.
- Explain the consequences of not having a balanced diet.
- Identify the foods that should be consumed to maintain good nutrition.

Topics

- Let's explore
- A balanced diet
- Nutrients
- The food pyramid

Keywords

- balanced diet
- calories
- carbohydrates
- fats
- food pyramid
- minerals
- nutrients
- proteins
- vitamins

Lesson 8. The development of human body

Code: C417G05U03L08

Objetives

- Mention and describe the stages of human development.
- Identify important characteristics of each stage of human development.
- Compare the female and male changes that occur during adolescence.
- Explain the importance of maintaining healthy habits throughout all of the stages of human development.

Topics

- Development stages of the human body
- Characteristics of each development stage

Keywords

- adolescence
- adulthood
- childhood
- early adulthood
- infancy
- old age
- prenatal

Unit 4. Everything that exists is matter

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

Lesson 0. Everything that exists is matter

Code: C417G05U04L00

Unit's documents: Scientific Zone, Mind, Let's investigate, Scientists in action, Evaluation, Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. Properties of matter

Code: C417G05U04L01

Objetives

- Name and define the properties of matter.
- Classify observations as quantitative and qualitative
- Define and explain physical properties of matter
- Describe physical properties in some objects in substances
- Define density
- Define and explain chemical properties in matter.

Topics

- Properties of matter
- How do you perceive me? I am matter!
- Measuring matter
- Matter and space
- Matter density
- Forming new substances

Keywords

- chemical changes
- chemical properties
- density
- mass
- observations
- physical properties
- qualitative
- quantitative
- temperature
- volume
- weight

Lesson 2. States of matter

Code: C417G05U04L02

Objetives

- Identify the states of matter and their characteristics.
- Distinguishes the molecular arrangement of each one of the states of matter.
- Knows the effects of heat on the states of matter.
- Observes different situations when the state of matter changes when heat is either added or removed.
- Analyze how heat is absorbed or released in each of the states of matter
- Define solidification, evaporation and condensation.

Topics

- Solid like rocks
- Changes in state in solids
- Liquid like rain
- Changes of state in liquids
- Gas like the wind
- Changes in state in gases
- The fourth state of matter
- Energy in changes of state

Keywords

- boiling point
- cohesive force
- condensation
- evaporation
- freezing point
- fusion
- phase changes
- repulsive force
- solidification
- stages
- matter
- solid
- liquid
- gas
- thermal energy

Lesson 3. Interactions of matter

Code: C417G05U04L03

Objetives

- Describe pure substances and name their characteristics.
- Describe the elements and their characteristics.
- Name examples of elements, compounds and mixtures
- Describe the characteristics of homogenous and heterogeneous mixtures.
- Compare and contrast the difference between homogeneous and heterogeneous mixtures.

Topics

- Interactions of matter
- Primer matter
- Homogeneous mixtures
- Heterogeneus mixtures

Keywords

- colloid
- compound
- decantation
- elements
- filtration
- heterogeneous mixtures
- homogeneous mixtures
- mixtures
- raw material
- solution
- suspension

Lesson 4. Organization of matter

Code: C417G05U04L04

Objetives

- Define matter and indicate how it is established and organized.
- Mention different characteristics of matter.
- Discuss what atoms are and analyze the relationship that exist between atoms, elements and molecules.
- Detail the structure of an atom and create a model.
- Describe parts and particles of an atom.
- List atoms characteristics and how these transfer electrons.

Topics

- Organization of matter
- Theory of matter
- Atomic structure
- Forms matter acquires
- Electrical storms are like…

Keywords

- atoms
- compound
- electron
- matter
- molecules
- neutron
- nucleus
- proton

Unit 5. Force, work, and motion

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

Lesson 0. Force, Work and Motion

Code: C417G05U05L00

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

Lesson 1. Force

Code: C417G05U05L01

Objetives

- Define force and discuss the effect it has over objects.
- Know the different uses of the term "work" and its scientific meaning.
- Establish the relation between the terms force, work and energy.
- Define and discuss the difference between the forces of pulling and pushing.
- List different sources of energy that help us with everyday tasks.
- Define and discuss other forces in nature such as gravity, pressure and friction.

Topics

- How does force behave?
- Pull or push?
- What is work?
- Energy and work
- Types of force

Keywords

- energy
- force
- friction
- gravity
- pressure
- pull
- push
- work

Lesson 2. Motion

Code: C417G05U05L02

Objetives

- Define position and motion.
- Describe the position and motion of objects.
- Learns Newton's first Law of Motion and applies it to different situations.
- Define velocity and discusses its relation with distance and time.
- Calculates the velocity of an object in motion.
- Learns Newton's second Law of Motion and applies it to different situations.
- Learns Newton's third Law of Motion and applies it to different situations.

Topics

- The first law of motion
- Speed
- Velocity
- Acceleration and Newton's second law of motion
- Deceleration
- Newton's third of law of motion

Keywords

- acceleration
- action
- distance
- first law of motion
- inertia
- motion
- position
- reaction
- second law of motion
- speed
- third law of motion
- time
- velocity

Lesson 3. Magnetic force

Code: C417G05U05L03

Objetives

- Describe characteristics and exert force of magnets.
- Discuss magnetic force and magnetic field.
- Explain the many uses of electromagnets.
- List how magnets are used at home and different industries.
- Explain how magnetic force has been appied to the development of various devices.
- Demonstrate how to build a compass and how it works.

Topics

- Earth: A powerful magnet
- Compasses and Planet Earth
- Magnets in ou rdaily lives
- Electromagnets are powerful
- More curiosities

Keywords

- compass
- electromagnet
- magnetic field
- magnetic force
- magnets

Lesson 4. Machines and energy

Code: C417G05U05L04

Objetives

- Describe the usefulness of machines.
- Define and identify simple machines and its different kinds.
- Discuss how simple machines help us perform everyday tasks.
- Distinguish between simple and compound machines.
- Discuss how simple machines help us perform everyday tasks.
- List examples of compound machines.
- Build models of compound machines.

Topics

- Machines and energy
- Force and levers
- Pulleys
- Wheel and axle
- Simple machines
- More about simple machines
- Compound machines
- Energy and mechanical advantage

Keywords

- axle
- compound machine
- inclined plane
- lever
- machine
- pulley
- screw
- simple machine
- wedge
- wheel

Unit 6. Let's talk about energy

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

Lesson 0. Let's talk about energy

Code: C417G05U06L00

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

Lesson 1. Forms of energy

Code: C417G05U06L01

Objetives

- Explain how energy can be converted from one form to another.
- Define kinetic and potential energy.
- Identify and describe different forms of kinetic and potential energy.
- Explain what electricity is and how it can be seen.
- Identify and describe mechanical, thermal, and chemical energy.
- Identify and describe static and kinetic energy.
- Discuss and describe characteristics of radiant energy.

Topics

- Kinetic and potential energy
- Forms of energy
- Electricity
- Radiant energy

Keywords

- calories
- chemical
- electricity
- energy
- forms of energy
- kinetic
- mechanical
- potential
- radiant energy
- radiation
- static energy
- thermal
- ultraviolet
- visible light
- X-rays

Lesson 2. Energy transformation

Code: C417G05U06L02

Objetives

- Define energy sources and energy receivers.
- Describe electrical energy transformation to other forms of energy.
- Define energy transformation.
- Identify the energy transformations that happen in a flashlight.
- Explain the transformations from electric energy into other forms of energy.
- Identify and describe a closed and open circuit.
- Identify and distinguish a series circuit from a parallel circuit.

Topics

- Energy transformation
- Radiant energy transfer
- Chain reaction
- Flow of electrical current
- Electric power transformation

Keywords

- cable
- conductors
- conduction
- convection
- electric
- circuit
- electric current
- energy receiver
- energy source
- energy transfer
- energy transformation
- parallel circuit
- radiation
- receiver
- series circuit

Lesson 3. Alternative energy sources

Code: C417G05U06L03

Objetives

- Define the term fossil fuel.
- Describe the origin, characteristics, and uses of coal, petroleum, and natural gas.
- Describe the use of fossil fuel as an energy source.
- Recognize the necessity to find alternative sources of energy.
- Mention and identify alternative sources of energy.
- Describe alternative energy sources, such as wind, water, solar, nuclear, and geothermal.
- List the advantages and disadvantages of using different energy sources.

Topics

- Alternative energy sources
- Origin and use of fossil fuels
- Fossil fuels and their environmental impact
- Eureka! There are alternatives
- The use of wind energy
- Water, is it just for drinking?
- Geothermal energy
- A very bright energy source, the Sun!
- Nuclear ene

Keywords

- acid rain
- alternative energy sources
- cable conductors
- coal co-generator
- conduction
- energy source
- energy transfer
- fossil fuel
- geothermal
- hydroelectric
- in parallel circuit
- methane
- natural gas
- non-renewable resources
- nuclear energy
- nuclear fission
- nuclear reactors
- oil
- radiation
- series circuit
- solar collectors
- thermonuclear fission

Unit 7. Electricity and magnetism

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

Lesson 0. The wheather and climate

Code: C417G05U07L00

Unit's documents: Scientific Zone, Let's investigate, Scientists in action, Evaluation, Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. The wheather and climate

Code: C417G05U07L01

Objetives

- Define climate and explain how it influences the lives of human beings an other organisms
- Identify and discuss the factors that determine the climate.
- Identify the factors that determine the climate in a specific region.
- Recognize the importance of climatology and meteorology
- Mention and recognizes the effects of wind and water in the Earth's characteristics.

Topics

- Earth's climate
- Other atmospheric factors that influence the climate
- Interactions among climatic factors
- Wind and water change Earth's surface

Keywords

- atmosphere
- climate
- climatic factors
- climatology
- humidity
- meteorology
- precipitation
- radiation
- solar
- temperature
- thermometer
- time
- wind

Lesson 2. Types of climate

Code: C417G05U07L02

Objetives

- Describe how sun rays impact Earth.
- Name and classify climate zones
- Identify and discuss climate zones
- Name different types of climate such as cold and humid, warm and humid, warm and rainy, dry and polar.
- Discuss how the types of climate subdivide by regions
- Describe the most important characteristics of each type of climate.

Topics

- Types of climate
- More about the types of climate
- Dry climates
- Temperate humid climates
- Continental climates
- Polar climates
- Alpine climates

Keywords

- arid
- desert
- climate zones
- cold humid climate
- dry climates
- dry-subtropical
- humid climate
- humid continental
- humid subtropical
- humid
- Mediterranean
- mid-latitude marine
- polar cap
- polar climates
- rainy climate
- subarctic
- tropical rainforest
- tropical savannah
- tundra
- warm
- warm summers
- wetlands

Lesson 3. Air masses in a changing atmosphere

Code: C417G05U07L03

Objetives

- Explain the movement of air masses in the coasts.
- Describe sea breeze and land breeze.
- Describe air masses ant their movement in the atmosphere.
- Describe an air front.
- Classify and describe the different types of fronts.
- Classify and describe the groups of air masses according to the region where they form.

Topics

- Air masses in a changing atmosphere
- A dynamic atmosphere
- Clashing air masses
- Fronts
- Air mass classifications

Keywords

- air masses
- cold fronts
- continental air masses
- convection currents
- maritime air masses
- land breeze
- occluded fronts
- polar air masses
- sea breeze
- tropical air masses
- stationary fronts
- warm fronts

Lesson 4. Weather and the atmosphere

Code: C417G05U07L04

Objetives

- Describe the characteristics of the atmosphere.
- Identify and describe the layers of the Earth's atmosphere.
- Take the air's temperature using a thermometer.
- Identify different instruments used form measuring some of the air's properties.
- Describe atmospheric pressure and discuss how it affects humans.
- Define air humidity and describe how it generates.
- Define precipitation and describe how it generates.

Topics

- The atmosphere
- Weather characteristics
- Air temperature
- Atmospheric pressure
- Air humidity
- Precipitation

Keywords

- air
- air humidity
- atmosphere
- atmospheric pressure
- carbon dioxide
- Celsius
- distillation
- exosphere
- Fahrenheit
- ionosphere
- Kelvin
- mesosphere
- mist
- monsoon
- nitrogen
- oxygen
- pluviometer
- precipitation
- steam
- stratosphere
- temperature
- thermometer

Lesson 5. Puerto Rico's climate

Code: C417G05U07L05

Objetives

- Identify and describe the factors that influence Puerto Rico's climate
- Identify and describe the elements that make up Puerto Rico's climate
- Learn about the functions and importance of the National Weather Service.
- Identify the factors that determine the climate of specific region.
- Identify and describe the climatic regions of Puerto Rico.
- Compare Puerto Rico's climatic regions taking into consideration each region's temperature and precipitation.

Topics

- Factors that influence Puerto Rico's climate
- Elements that make up Puerto Rico's climate
- Puerto Rico: a tropical island
- Puerto Rico's climate regions

Keywords

- dry south
- east
- height
- sea level
- humid mountainous region
- humid north
- latitude
- orientation
- exposure
- position
- precipitation
- Puerto Rico's climate region
- temperature
- west
- occidental
- winds

Unit 8. Our Planet Earth

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

Lesson 0. Our Planet Earth

Code: C417G05U08L00

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

Lesson 1. Earth's structure

Code: C417G05U08L01

Objetives

- Describe planet Earth and explain its origin.
- Recognize how artificial satellites contribute to the study of Earth.
- Describe how scientists use models to conduct studies.
- List and describe the Earth's outer layers.
- Describe the characteristics and the composition of the hydrosphere.
- Name and describe the Earth's inner layers.

Topics

- Ideas about Earth
- The composition of our Planet
- Earth's solid layer
- The water sphere
- An immense layer: the atmosphere
- The internal layers of Earth

Keywords

- artificial satellites
- atmosphere
- biosphere
- core
- Earth
- erosion
- exosphere
- hydrosphere
- inner layers
- ionosphere
- layers
- lithosphere
- mantle
- mental
- mesosphere
- models
- outer layers
- physical
- rocky crust
- stratosphere
- terrain
- troposphere
- upper crust

Lesson 2. Continental drift

Code: C417G05U08L02

Objetives

- Describe the origin of the Earth's crust and its movement.
- Describe the theory of Pangea about the origin of the continents.
- List and explain evidence about the theory of continental drift.
- Recognizes that the theory of plate tectonics explains the changes of the Earth's crust.
- Identify seismic movements and explain how they occur.
- Explain the relation between volcanos and earthquakes.
- Values the importance of community help especially in times of emergencies caused by seismic movements.

Topics

- Primitive supercontinent
- Theory of continent drift
- Do the plates move?
- Forces in action

Keywords

- continental drift
- convergent
- divergent
- earthquakes
- faults
- forces in action
- intensity
- lava
- magma
- magnitude
- Pangea
- plate tectonics
- plates
- Richter scale
- seismograph
- seismologist
- supercontinent
- transform
- volcano
- Wegener

Lesson 3. Earth's changing surface

Code: C417G05U08L03

Objetives

- Name and identify the elements that produce changes on the Earth's surface.
- Describe the agents of erosion that modify the Earth's surface.
- Explain how gravity and wind cause erosion.
- Learn that water is an agent of erosion.
- Explain the erosive effects of glaciers.
- Recognize the importance of preserving soils and list ways we can make proper use of them.

Topics

- Effects of gravity on landscapes
- The wind's erosive force
- I move through water
- Aquifers
- Glaciers

Keywords

- agents of erosion
- aquifer
- dune
- erosion
- glaciers
- gravity
- groundwater
- rain
- sedimentation
- soil erosion
- underground
- water
- wind

Lesson 4. Goegraphical features

Code: C417G05U08L04

Objetives

- Identify landscape features.
- Recognize the natural agents that intervene in the changes that take place in the landscape of a place.
- Mention the characteristics of a mountainous landscape.
- Describe the landscape of rivers and beaches.
- Describe caves and caverns.

Topics

- Landscape features
- Towers of water
- Saltwater, freshwater
- Prehistoric home

Keywords

- beach
- canyon
- cave
- cavern
- cliff
- coast
- column
- delta
- erosion
- estuary
- geographical features
- lake
- meander
- mountain
- mountain range
- plateau
- river
- sand
- sinkhole
- stalactite
- stalagmite
- stream
- tributary
- valley
- waterfall

Lesson 5. Puerto Rico's landscape

Code: C417G05U08L05

Objetives

- Identify the characteristics of Puerto Rico's landscape.
- Explain what natural agents intervene with landscape changes.
- Name the characteristics of Puerto Rico's mountainous landscapes.
- Describe the landscape of rivers and beaches of Puerto Rico.
- Describe caves and caverns as a part of Puerto Rico's landscape.
- Name the characteristics of the types of forest you can find in Puerto Rico.

Topics

- Borinquen, mansion of everything good
- Our central mountain range
- Northern karst region
- Alluvian plains
- Water, devine treasure
- Forests: lungs of the world

Keywords

- alluvium
- beaches
- caverns
- caves
- coral reefs
- dry
- forest
- geomorphic
- humid
- karst
- karst zone
- landscape
- mangroves
- mountain
- mountain range
- northern karst
- pluvial
- rivers
- scenery
- sinkholes
- speleologist
- subtropical

Unit 9. 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: C417G05U09L00

Unit's documents: Scientific Zone, Let's investigate, Scientists in action, Evaluation, Ecological Awareness 1, Ecological Awareness 2, My Scientific Journal

Lesson 1. The origin and composition of the universe

Code: C417G05U09L01

Objetives

- Discuss the Big Bang theory in regards to the origin of the Universe.
- Describe both nebular and tidal theories in regards to the origin of the Solar System.
- Explain the clouds of dust and gases theory.
- Detail the origin of Earth.
- Demonstrate how Earth's crust, atmosphere and oceans were created.
- Describe the characteristics of the primitive atmosphere.

Topics

- The origin of the Solar System
- Stars, nebulas, and galazies
- The Solar System
- Earth's origins
- The primitive atmosphere

Keywords

- asteroid
- Big Bang Theory
- celestial body
- Dust Cloud Theory
- galaxy
- meteorite
- nebula
- Nebular Theory
- photosphere
- planets
- primitive atmosphere
- satellite
- Solar System
- stars
- Sun
- Tidal Theory

Lesson 2. The celestial body that make up our Solar System

Code: C417G05U09L02

Objetives

- Identify the components of the Solar System.
- Describe how the Solar System is assembled.
- Identify and describe the planets.
- Describe the movement of the planets.
- Identify and describe terrestrial and outer planets.

Topics

- Terrestrial planets
- Outer planets
- More planets!

Keywords

- asteroid
- Big Bang Theory
- celestial body
- Dust Cloud Theory
- galaxy
- meteorite
- nebula
- Nebular Theory
- photosphere
- planets
- primitive atmosphere
- satellite
- Solar System
- stars
- Sun
- Tidal Theory

Lesson 3. Humans looking at the cosmos

Code: C417G05U09L03

Objetives

- Explain the ways humans learn about the cosmos.
- Name some of the astronomical instruments humans have invented for acquiring more knowledge about the Universe.
- Explain the importance of space travel for humankind.
- Identify and describe some of the types of ships that have been built to explore space.
- Describe the characteristics of a space shuttle.

Topics

- Observatories and astronomical instruments
- Humans and space xplorations
- Rockets and space ships
- Space shuttles today

Keywords

- Apolo XI
- artificial satellites
- astronomical instruments
- cosmos
- observatory
- Pathfinder
- radio telescope
- rocket
- space shuttle
- telescope
- spectroscope
- Vostok I

Lesson 4. The celestial vault

Code: C417G05U09L04

Objetives

- Describe the Sun and explain its characteristics regarding its role in the daytime sky.
- Explain what are sunspots and solar flares.
- Describe the different types of clouds.
- Name and describe the phases of the Moon.
- Define eclipse.
- Explain how solar and lunar eclipses happen.
- Describe the stars and constellation as part of the night sky

Topics

- Daytime sky: The sun
- Night sky: The moon
- Solar and lunar eclipses
- Night sky: Stars and constellations

Keywords

- altocumulus
- Cassiopeia
- Cepheus
- cirrus
- clouds
- constellations
- cumulus
- eclipse
- first quarter
- full moon
- last quarter
- lunar eclipse
- moon phases
- new moon
- sky
- solar eclipse
- solar flares
- stratus
- Sun
- sunspots
- Ursa Major
- Ursa Minor
- water cycl

Unit 10. Preserving our planet

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

Lesson 0. Protecting our environment

Code: C417G05U10L00

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

Lesson 1. Air, water, and soil components of our environment

Code: C417G05U10L01

Objetives

- Discuss what natural resources are.
- Define renewable and non-renewable natural resources and list their differences.
- Analyze the importance of the main components of our environment: air water and soil.
- Describe the characteristics and composition of water and discuss its uses as a natural resource.
- Explain the characteristics and composition of air.
- Describe the composition of soil and its uses as a natural resource.

Topics

- Formation of natural resources
- Water: a presiouc liquid
- Air: a natural resource
- Soil: a natural resource

Keywords

- air
- conservation
- humus
- hydrogen
- natural resources
- non-renewable resources
- oxygen
- renewable resources
- soil
- Water

Lesson 2. Our environment's natural balance

Code: C417G05U10L02

Objetives

- Analyze what makes up the natural balance of nature.
- Explain how plants help to maintain balance in ecosystems.
- Analyze the role of animals to maintain the balance of the ecosystems.
- Describe what happens when drastic changes occur in nature.
- Name and explain the ways in which humans can alter the equilibrium of the ecosystems.
- Explain how deforestation is a threat to the natural flora.
- Explain why it is important to promote reforestation.

Topics

- The environment on a tightrope
- Green helpers
- The contribution of animals
- How do we alter the natural balance?
- Controlling the environment

Keywords

- animals
- balance
- environment
- forestry
- inexhaustible resource
- natural balance
- natural resources
- non-renewable resources
- photosynthesis
- plants
- renewable resources

Lesson 3. Ecological initiatives in Puerto Rico

Code: C417G05U10L03

Objetives

- Name the government agencies created in Puerto Rico to protect the environment and natural resources
- Discuss Act #9 about Environmental Public Policy
- Describe the role of the Industrial Mission of Puerto Rico organization.
- Name towns where you have seen examples of environmental movements
- Define recycling and explain its advantages.
- Name recyclable materials
- Differentiate between a recycling center and a recycling collection center

Topics

- Roles of environmental porection agencies
- That's the Government's job!
- Environmental movements
- Alternatives for environmental protection
- Recycling
- The advantage of recyclible

Keywords

- collection centers
- environmental
- Environmental Impact Declaration
- Environmental Protection Agency
- movements
- recycling
- recycling center