Summary: YEAR 5- Natural Science 2018/19

UNIT 1

This unit focuses on the basic structure and vital functions of living beings and their classification.

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CONTENT and ASSESSMENT

- Parts of the cell and how they work.
- Cells and organisation: unicellular and multicellular organisms.
- Tissues, organs and systems.
- The vital functions
- The nutrition function: processes and types.
- The interaction function in living beings.
- The reproduction function: asexual and sexual.
- The five kingdoms of living beings and the characteristics of each.

METHODOLOGY

As pupils study this unit, they will gain understanding of cells, vital functions and the levels of organisation of living beings. They will also develop basic competencies for observing nature with respect and will use mathematical strategies and ICT to solve problems and investigate living beings. They will acquire vocabulary to express their knowledge, both orally and in writing

UNIT 2

The contents and activities in this unit focus on the monera, proctista and fungi kingdoms. Pupils will learn what each kingdom consists of and how to classify organisms based off of general characteristics. They will also learn about viruses and learn about mushrooms and spores.

CONTENTS AND ASSESSMENT

- The monera kingdom: bacteria, general forms and characteristics.
- The benefits and dangers of bacteria in human beings.
- The protoctista kingdom: general characteristics.
- Protozoa: general characteristics and relationship with human beings.
- Algae: general characteristics and relationship with human beings.
- The benefits provided by and the dangers caused by algae in human beings.
- The fungi kingdom: general characteristics.
- Types of fungi.
- Beneficial and dangerous effects of fungi on the biosphere and for human beings.
- Lichens.
- Viruses.
- Carrying out experiments to observe mushrooms and spores.
- Understanding images of living beings that belong to the monera, protoctista and fungi kingdoms.
- The importance of scientific understanding and its application to food and medicine.
- The importance of the living beings in the first three kingdoms in the biosphere as a whole.

METHODOLOGY

The students now know the general characteristics of living beings and how they are divided into five kingdoms. Pupils will gain a better understanding of and will study the specific aspects of each kingdom in more detail.

It is important that pupils are aware of the biological importance of these three kingdoms, as well as their importance in the lives of animals and plants since these are aspects that are often overlooked. Therefore, the fact that they are all around us, the role they play in relation to our health and illnesses, in biological processes that we use in our everyday lives, etc. will be emphasised.

UNIT 3

The content and activities in this unit focus on various aspects of plants, such as identifying their different parts, expanding knowledge of the vital functions nutrition, interaction and reproduction learning how to classify the main groups of plants; and evaluating the importance of plants to life on the planet and for our survival. Pupils will use different strategies and resources to acquire and express their knowledge about plants

CONTENT AND ASSESSMENT

- The parts of the plant and their functions.
- Identification and description through photos and drawings.
- The processes of nutrition in plants: absorbing substances, formation of nutrients, circulation, respiration and expelling waste.
- Description of processes using photos and drawings.
- The interaction function in plants.
- Asexual reproduction in plants. Mechanisms of asexual reproduction.
- Sexual reproduction in plants.
- Reproduction of plants with flowers. Parts and functions of a flower, and stages of the reproduction process.
- Structure and variety of fruits and seeds.
- Classification of plants.
- Importance of photosynthesis in relation to atmospheric gases and as food for other living beings.
- Understanding information, learning vocabulary, using language as a tool for communication and keeping a positive attitude towards reading.
- Knowledge of and use of mathematical operations and mathematical strategies to resolve problems.
- Understanding social reality and being responsible citizens, showing respect and solidarity to nature.
- Knowledge and responsible use of ICT to investigate plants.
- Using strategies to process information and applying it to different contexts.
- Initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working in a group.

METHODOLOGY

As pupils study this unit they will gain a further understanding on what plants are and their different parts. They will explore the nutrition function in plants as well as respiration. Pupils will learn how plants interact with the world around them using interaction functions and the different ways they reproduce. They will learn how to classify plants and about the importance of photosynthesis.

UNIT 4

Animals.

We finish studying the five animal kingdoms with a topic focused on animals. Following the guidelines of the previous units, we will study the general characteristics of this kingdom and then describe in detail the features of the important vertebrate and invertebrate groups.

In this unit we will study the organisation and classification of animals, vertebrates: fish, amphibians, reptiles, birds and mammals. Invertebrates: sponges, cnidarians, annelids,

echinoderms, molluscs and arthropods. Finally, we will cover the external and internal anatomy of a fish as well as the extinction of some animals.

CONTENT AND ASSESSMENT

- The general characteristics of animals.
- The organisation of animals' bodies.
- The characteristics of vertebrates and invertebrates.
- The characteristics of fish and types of fish.
- The characteristics of amphibians and types of amphibians.
- The characteristics of reptiles and types of reptile.
- The characteristics of birds and types of birds.
- The characteristics of mammals and types of mammals.
- The characteristics of the different and most relevant groups of invertebrates: sponges, cnidarians, annelids, echinoderms, molluscs and arthropods.
- The observation and description of animals: anatomy, environment where they live, means of obtaining food and oxygen, types of embryonic development, etc.
- The observation and description of the external and internal anatomy of a fish: trout dissection.

METHODOLOGY

Pupils will gain a better understanding of the organisation of the animals' bodies and whether they are classified as vertebrates or invertebrates. As well as the characteristics of fish, amphibians, reptiles, birds and mammals, focusing on their body structure, breathing, nutrition and reproduction, with some of the important subdivisions in each group. They will also go into more into depth about the main invertebrate groups (sponges, cnidarians, annelids, echinoderms, molluscs and arthropods), describing their most important anatomical features, the habitats in which they live and, in some cases, the most characteristic subgroups.

UNIT 5

This unit focuses on ecosystems and the relationships between the different kingdoms of living beings and changing factors that affect their survival, as well as the impact of man on the planet. Pupils will learn about the elements that characterise ecosystems; feeding and other relationships; the adaptations of organisms in an ecosystem; the impact of man on ecosystems. This unit includes two projects: investigating an ecosystem (the Arctic) and environmental improvement.

CONTENT AND ASSESSMENT

- Ecosystems and their elements.
- The biotopes of ecosystems. Types of ecosystems according to their biotopes.
- The biocenosis, relationships and balance in ecosystems.
- Description, in real life and through pictures, of ecosystems and their elements.

Identify and describe actions that change the balance in an ecosystem.

- Feeding relationships in ecosystems. Producers, consumers and decomposers.
- Relationships in the ecosystems between beings of the same species: gregarious associations, families and societies. Mutualism, commensalism and parasitism.
- Relationships in the ecosystems between beings of different species: • Anatomical and behavioural adaptations of living beings in their ecosystems.
- Characteristics of the development of humanity in relation to the impact on the planet's ecosystems.
- Sustainable development and its basic principles.
- Guidelines for the study and description of an ecosystem.
- Respect for nature and a positive attitude towards the conservation balance in the ecosystems.
- Understanding information, learning vocabulary, using language as a tool for communication and keeping a positive attitude towards reading.
- Knowledge of and use of mathematical operations and mathematical strategies to resolve problems.
- Knowledge and responsible use of ICT to investigate ecosystems.
- Using strategies to process information and applying it to different contexts.
- Initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working in a group.

METHODOLOGY

As pupils study this unit, they will broaden their knowledge of ecosystems, their components and classification. They will be able to define biocenosis, identify relationships in ecosystems and understand the adaptations of living beings. The will learn about renewable natural resources and understand the impact of man on ecosystems, thereby developing their awareness of environmental problems and sustainable development.

UNIT 6

The unit provides an in-depth study of the relationships between living being and humans, ensuring that the students become aware of their responsibility in looking after and sustaining the planet. They will study the types of ecosystems, the affects human activity has on the

ecosystem, the main threats to Earth, ways to protect our planet, ecological footprints, lichens as biological indicators of pollution and the problems created by rubbish and ways to reduce it.

CONTENT AND ASSESSMENT

- Types of ecosystem. Varieties and characteristics.
- Understanding images that show different ecosystems.
- Changes in ecosystems caused by human societies throughout history.
- Main threats to ecosystems: deterioration, destruction and disappearance of species and soil loss.
- Guidelines to contribute to sustainable development.
- Government actions to protect nature.
- Ecological footprint and human activities that produce it.
- Use of information and the application of mathematical procedures to calculate the ecological footprint.
- Appreciation of the impact that human activity has on ecosystems as well as an awareness and positive attitude towards the protection of the environment.

METHODOLOGY

In this unit pupils will gain a better understanding of biodiversity on land and in aquatic ecosystems. They will study the historical processes of "humanising" natural ecosystems, from the rise of agriculture and livestock to the current technological society. They will have a further understanding of some of the greatest problems that threaten biodiversity: deterioration of ecosystems, extinction of species and soil loss. Finally they will learn about social and individual measures they can take to contribute to sustainable development and to prevent and correct threats.

UNIT 7

This unit is mainly descriptive but several experiments are suggested that can be done in the classroom using common tools and materials. Pupils should understand that science is constantly evolving and changing, and that scientific knowledge improves our quality of life and, helps us to have a better understanding of the world around us. In this unit we will learn about matter, its states and general properties; mass and volume, and the instruments and units used to measure them; the specific properties of matter in solids, liquids and gases; density as a specific property that allows us to distinguish between substances, pure substances and mixtures and how we use matter. The projects discuss designing objects and choosing appropriate materials

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CONTENT AND ASSESSMENT

- Matter and its different states.
- General properties of matter.
- Units and procedures to find out the mass and volume of solids and liquids.
- Specific properties associated with the states of matter.
- A very important specific property: density. How to calculate density.
- Pure substances and mixtures.
- Types of mixtures.
- Natural materials, modifications and use.
- Man-made materials, production and use.
- Identification of materials, their origin and the properties that make them suitable for certain uses.
- Understanding information, learning vocabulary, using language as a tool for communication and keeping a positive attitude towards reading.
- Knowledge of and use of mathematical operations and mathematical strategies to resolve problems.
- Understanding social reality and showing respect towards society and nature.
- Knowledge and responsible use of ICT to investigate matter.
- Using strategies to process information and applying it to different contexts.
- Initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working in a group.

METHODOLOGY

As students progress through the unit they will be able to define matter and know how its general properties are measured; define density; distinguish pure substances and mixtures; differentiate between natural materials and man-made materials; apply mathematical and strategies for measuring mass, volume and density.

UNIT 8

In this unit we will study energy and the changes that energy and force produce in matter and ultimately, in the world around us. We will go deeper into the concept of energy, naming the various ways in which it occurs and specifying the physical and chemical changes that are produced in matter. The project explains the process involved in making a cake.

CONTENT AND ASSESSMENT

- Energy and its characteristics.
- The forms energy can take.
- Energy and the changes it produces.
- Types of change: physical and chemical.
- Heat and temperature.
- Effects of heat on objects: size variations and temperature changes.
- Changes of state and heat.
- Types of force.
- Effects of forces: deformations and changes in movement.
- Performing experiments to observe expansion of solids, liquids and gases.
- Carrying out changes of state experiments.
- Differentiate between mass and weight.
- Understanding information, learning vocabulary, using language as a tool for communication and keeping a positive attitude towards reading.
- Knowledge of and use of mathematical operations and mathematical strategies to resolve problems.
- Understanding social reality and showing respect towards society and nature.
- Knowledge and responsible use of ICT to investigate matter.
- Using strategies to process information and applying it to different contexts.
- Initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working together.

METHODOLOGY

As they work through this unit, pupils will be able to learn about some of the forms energy can take and relate them to natural phenomena; recognise physical and chemical changes in the environment; identify changes of state; define force and learn about some of its effects and consequences.

UNIT 9

In this unit we will look at the main energy transformation in nature, and devices and equipment to transform and use energy; energy sources currently available; modern society with growing energy needs; machines, their types and their presence in our lives; breakthroughs in science and technology. There are two projects in this unit: making your own hydro-powered turbine and transforming chemical to magnetic energy..

CONTENT and ASSESSMENT

- Energy transformation in nature.
- Transformation of energy in devices and appliances: alternators, batteries, solar panels, electric and combustion engines.
- Interpretation and description of phenomena where energy is present and where its transformation can be seen.
- Renewable and non-renewable sources of energy.
- Plants producing electricity. Types of power plants.
- Parts and operation of a thermal (coal-fired) power plant and a hydroelectric power plant.
- Parts and operation of • Use of energy in human activities.
- Environmental issues arising from the production of electricity and the use of fossil fuels.
- Tips for "saving energy in homes." • Being green.
- Machines and energy. Machines: Simple and Compound.
- Use of machines in human activities.
- Advances in science and technology.
- Two projects: making a hydro-powered turbine and transforming chemical energy to magnetic.
- Understanding information, learning vocabulary, using language as a tool for communication and keeping a positive attitude towards reading.
- Knowledge of and use of mathematical operations and mathematical strategies to resolve problems.
- Understanding social reality and showing respect towards society and nature.
- Knowledge and responsible use of ICT to investigate matter.
- Use strategies to process information, convert it to knowledge and apply it, participating actively in their own learning process.
- Initiative and perseverance in tackling problems and defending opinions, developing attitudes of respect and collaboration when working in a group.

METHODOLOGY

As they work through this unit, pupils will identify energy transformation in nature and in appliances; differentiate between non-renewable and renewable energy, and know some of the energy transformations that occur in machines and plants producing electricity; understand the need for energy and the problems associated with its use; acquire basic energy saving ideas; learn about simple and compound machines, how they work and their uses in human activities; apply mathematical operations and strategies to calculate energy consumption; understand information and acquire vocabulary about energy and machines to express their knowledge both orally and in writing and use ICT to handle information and turn it into knowledge, actively participating in the learning process. Finally, they will review knowledge learned in the unit and throughout the course.

Assessment criteria

Observation and understanding of processes: 20%

Classwork and presentation: 20%

Classroom Tests: 60%.

- End of term topic tests
- Lesson plenary to ascertain if pupils are grasping concepts
- Oral communication with regards to topics -
- Vocabulary understood
  -Understanding of unusual concepts
  -Diagram and or map reading skills
  -Discuss the topics, scientific / historical terms and similarities with other topics.

Time sequence

There are 9 units il all and 3 units will be covered per term in the order they appear in the contents