Colegio
Santa María
Mixto - Bilingüe

Course: 1° year A and B.
Year: 2017
Subject: Science
Teacher: M. Laura Laco

EXAM SYLLABUS

UNIT 1 – Scientific skills

- Branches of Science.
- The Scientific Method and asking questions (make an observation, ask a question, make a hypothesis, conduct an experiment, draw conclusions, report results).
- Lab equipment; Safety in the lab (lab rules).
- Different ways to measure the size of biological specimens. Units of length, area, volume, weight, time and temperature. Dependent and Independent Variables. The importance of a control group.
- The light Microscope and calculating magnification.
- Lab practice and recording data (making tables, plot graphs, scientific drawing, labels, magnification and description of what you see).
- Reporting: How to make a lab report. Glossary of terms used in science papers.

UNIT 2 – Cell structure and organisation

- Parts of the cell (cell membrane, nucleus, cytoplasm, ribosomes (either or not on rough endoplasmatic reticulum), vesicles, mitochondria. Cell wall, chloroplasts and vacuoles if applicable. Identify these parts in diagrams and images of cells.
- Comparison between the structures of a plant cell with an animal cell, as seen under a light microscope.
- State the functions of the structures seen under the light microscope in the plant cell and in the animal cell.
- State that aerobic respiration occurs in mitochondria; and that cells with high rates of metabolism require large numbers of mitochondria to provide sufficient energy.
- How to make a protein.

• Levels of organisation: tissue, organ, organ system. Define and identify the different levels of organisation in drawings, diagrams and images of familiar material.

UNIT 3 – Characteristics of living organisms

• "MRS GREN". Describe the characteristics of living organisms by defining the terms: movement, respiration, sensitivity, growth, reproduction, excretion, nutrition.
• Concepts and use of classification system: binomial nomenclature rules. Definition of species and the binomial system.
• Characteristics we can use to define "life" (from the video: made of cells; grown and development; energy from the sun + autotrophs/heterotrophs; environmental stimuli and homeostasis; evolution).
• Features of organisms used to place them into the appropriate kingdom. The Whittaker five-kingdom scheme. The Woese three domain system.
• Animal kingdom phyla (porifera - coelenterates - flatworms - nematode – annelids – molluscs – arthropods – echinoderms – chordata). The main group of vertebrates (mammals, birds, reptiles, amphibians, fish). The main group of arthropods (myriapods, insects, arachnids, crustaceans).
• Plant kingdom divisions (red algae, brown algae, green algae, bryophytes, vascular plants). Vascular plants classes, with emphasis on ferns and flowering plants: Monocotyledons; dicotyledons. Parts of the flower and parts of the seed.
• Dichotomous keys. Construct and use simple dichotomous keys based on easily identifiable features.

UNIT 4 – Organisms and their environment

• Energy flow. Sun as a source of energy and flow of energy through organisms.
• Food chains and food webs (definitions of food chain, food web, producer, consumer, herbivore, carnivore, decomposer).
• Food pyramids or pyramids of numbers. Loss of energy between levels (inefficiency).
• Energy transfer by ingestion. Photosynthesis. Trophic level definition; biomass definition. Recycling by decomposers.
• Nutrient cycles: Water cycle; carbon cycle and its relation with the increase of Earth temperature since industrial revolution; Nitrogen cycle.

UNIT 5 – Ecosystems and Human impact on ecosystems

- Definition of Populations, communities and ecosystems.
- Sustainable resources: definition. Renewable and non-renewable resources.
- The human impact on the environment: Habitat destruction; the effects of overharvesting; overfishing; deforestation; combustion, greenhouse effect and global warming; air pollution and acid rain.

BIBLIOGRAPHY:

• Cambridge IGCSE Biology, Mackean D.G. (2016).
• Cambridge IGCSE, Biology 0610 syllabus for 2019.