



International School

COURSE DESCRIPTION – 7th GRADE

Subject Area: Science
Course Title: Life Science
Professor: Mr. Jose L. Melendez
Course Length: 1 year

Objective: The purpose of this course is to provide opportunities for the study of general concepts, exploratory experiences, applications, and activities relating to the life sciences.

A. Major Concepts/Content. The content should include, but not be limited to, the following:

- The nature of science
- Cell biology and the chemical basis of life
- Plants, animals, and microorganisms
- General organization of the living world
- Genetics, heredity, and diversity
- Systems of the human body
- Ecology and human impact
- Biological change through time
- Careers and technology in the life sciences

B. Special Note. This course shall include laboratory investigations of life science concepts which incorporate the use of measurement, problem solving, laboratory apparatus, safety procedures, and experimental procedures (e.g., designing, recording, and communicating).

C. Course Requirements. These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate.

After successfully completing this course, the student will:

1. Apply knowledge of the unifying concepts and processes of science and scientific habits of mind to conduct safe and effective scientific investigations.

- Know that scientific knowledge is subject to modification as new information challenges prevailing theories and as a new theory leads to looking at old observations in a new way.
- Know that the study of the events that led scientists to discoveries can provide information about the inquiry process and its effects.
- Know that science disciplines differ from one another in topic, techniques, and outcomes but that they share a common purpose, philosophy, and enterprise.
- Know that accurate record keeping, openness, and replication are essential to maintaining an investigator's credibility with other scientists and society.
- Know that a change in one or more variables may alter the outcome of an investigation.
- Recognize the scientific contributions that are made by individuals of diverse backgrounds, interest, talents, and motivations.
- Know that when similar investigations give different results, the scientific challenge is to verify whether the differences are significant by further study.
- Recognize that patterns exist within and across systems.
- Know that science ethics demand that scientists must not knowingly subject coworkers, students, the neighborhood, or the community to health or property risks.
- Know that special care must be taken in using animals in scientific research.
- Know that in research involving human subjects, the ethics of science require that potential subjects be fully informed about the risks and benefits associated with the research and of their right to refuse to participate.
- Know that technological design should require taking into account constraints such as natural laws, the properties of the materials used, and economic, political, social, ethical, and aesthetic values.

2. Demonstrate knowledge of the functional units and basic processes of living things.

- Understand that living things are composed of major systems that function in reproduction, growth, maintenance, and regulation.
- Know that the structural basis of most organisms is the cell and most organisms are single cells, while some, including humans, are multi-cellular.

- Know that in multi-cellular organisms cells grow and divide to make more cells in order to form and repair various organs and tissues.
- Explain how the life functions of organisms are related to what occurs within the cell.
- Know that the cells with similar functions have similar structures whereas those with different structures have different functions.
- Know that the interactions of organisms with each other and with the nonliving parts of their environments result in the flow of energy and the cycling of matter throughout the system.
- Know that life is maintained by a continuous input of energy from the sun and by the recycling of the atoms that make up the molecules of living organisms.

3. Describe the characteristics and roles of plants, animals, and microorganisms.

- Know that the structural basis of most organisms is the cell and most organisms are single cells, while some, including humans, are multi-cellular.
- Know that behavior is a response to the environment and influences growth, development, maintenance, and reproduction.
- Know the patterns and advantages of sexual and asexual reproduction in plants and animals.
- Know that viruses depend on other living things.

4. Demonstrate understanding of the similarities of living things.

- Know that in multi-cellular organisms cells grow and divide to make more cells in order to form and repair various organs and tissues.
- Know that the levels of structural organization for function in living things include cells, tissues, organs, systems, and organisms.
- Understand that the classification of living things is based on a given set of criteria and is a tool for understanding biodiversity and interrelationships.

5. Describe principles of genetics, heredity, and diversity.

- Know the patterns and advantages of sexual and asexual reproduction in plants and animals.

- Know that the variation in each species is due to the exchange and interaction of genetic information as it is passed from parent to offspring.

6. Demonstrate knowledge of the major human biological systems and their functions.

- Understand that living things are composed of major systems that function in reproduction, growth, maintenance, and regulation.
- Know that the levels of structural organization for function in living things include cells, tissues, organs, systems, and organisms.

7. Demonstrate knowledge of the principles of ecology and human impact on the environment.

- Understand that quality of life is relevant to personal experience.
- Know the positive and negative consequences of human action on the Earth's systems.
- Know that the interactions of organisms with each other and with the nonliving parts of their environments result in the flow of energy and the cycling of matter throughout the system.
- Know that some resources are renewable and others are nonrenewable.
- Know that all biotic and abiotic factors are interrelated and that if one factor is changed or removed, it impacts the availability of other resources within the system.
- Know that a brief change in the limited resources of an ecosystem may alter the size of a population or the average size of individual organisms and that long-term change may result in the elimination of animal and plant populations inhabiting the Earth.
- Understand that humans are a part of an ecosystem and their activities may deliberately or inadvertently alter the equilibrium in ecosystems.

8. Demonstrate understanding of biological change through time.

- Know that over the whole Earth, organisms are growing, dying, and decaying as new organisms are produced by the old ones.
- Know that generally organisms in a population live long enough to reproduce because they have survival characteristics.

- Know that the fossil record provides evidence that changes in the kinds of plants and animals in the environment have been occurring over time.
- Know that biological adaptations include changes in structures, behaviors, or physiology that enhance reproductive success in a particular environment.

9. Demonstrate knowledge of career opportunities and new technologies in the life sciences.

- Recognize the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.
- Understand that contributions to the advancement of science, mathematics, and technology have been made by different kinds of people, in different cultures, at different times and are an intrinsic part of the development of human culture.
- Know that no matter who does science and mathematics or invents things, or when or where they do it, the knowledge and technology that result can eventually become available to everyone.
- Know that computers speed up and extend people's ability to collect, sort, and analyze data; prepare research reports; and share data and ideas with others